

Tesla: Disruptor or Sustaining Innovator

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Abstract

Tesla Inc (formerly Tesla Motors) is a pioneer of the first highway legal serial production all-electric car to use lithium-ion battery cells. Tesla launched Roadster, the first luxury electric car in the world in 2008 which received a humongous response. Initially, the customers were the affluent few. Tesla later launched less costlier versions such as the Model S, the Model X and the Model-3 to target the mass market. With the introduction of Roadster, Tesla did not compete within the confines of the existing industry or attempt to steal customers from the existing automobile rivals; but, developed an uncontested market space that made the competition irrelevant. It created a Blue Ocean, a previously unknown market space. The objective of the case is to develop conceptual clarity of what a Blue Ocean is, how it is different from a Red Ocean, analyze whether Tesla created a Blue Ocean. The case would also help discuss the future strategy for the company.

Key words: *Blue Ocean, electric car, innovation, transformation, competition*

Background of the Case

Across the world, people are becoming increasingly concerned about the environment. Sustainability has become a buzz word in the corporate sector as well as in academic literature. People are becoming conscious of the impact pollution has on the environment

and of the fact that transportation is a major contributor to it. Transportation is the second largest source of carbon emission in the world. Electric vehicles¹ (EVs) have zero emission potential as EVs produce zero direct emissions and plug-in hybrid electric vehicles (PHEV) produce zero tail pipe emissions when they are in all-electric mode, but they can produce

evaporative emissions. Powering EVs through solar charging stations could considerably reduce greenhouse gas emissions of a vehicle. In 2008, Tesla Motors launched Roadster, the first luxury electric car. By the introduction of the first electric vehicle, it created a Blue Ocean, a previously unknown market space.

History of Electric Vehicles (EV)

The very first EV in a very crude form was appeared on the road in 1902. The credit for this can be attributed to Walter C Baker. It was called the “Road Torpedo”. This became quite popular and many different versions appeared on road until Henry Ford launched Model-T in 1908. Model-T was manufactured on the assembly line, thus drastically lowering the price of an automobile. Model-T made automobiles affordable which were earlier only the prerogative of the rich and affluent. Interest in EVs resurfaced in the early 1970’s due to increasing fuel prices and launching of NASA’s Lunar Roving Vehicle which was an EV. It was around this time that Sebring-Vanguard launched an electric vehicle and became the 6th largest automaker in the world in 1975. However, due to the limitation of range as compared to fuel-based cars, it gradually lost its prominence by 1990s.

With environmental consciousness gaining ground all over the world, interest in EVs has grown. Government regulations were also introduced in this regard giving a further thrust to acceptance of EVs. Automobile manufacturers started launching EVs. Chrysler, Ford, GM, Honda, Toyota all launched EVs for the automobile market. Nissan Leaf was the first all-electric, zero emission vehicle produced for the mass market.

Since the introduction of electric vehicle Tesla has come a long way. It started with the launch of the Model S which was very expensive but later it launched low-cost versions for the mass market. It has better acceptance than the EVs which were launched earlier because Tesla provides a larger driving range, infrastructure for charging, facility for free charging between cities, and also on building back-up battery supply. It also provides infotainment which is not an essential feature of a vehicle but it is what customers’ desire. Additionally, it has adopted a unique distribution model of both direct and online sales

Hybrid Electric Vehicles Vs. Plug-in Hybrid Electric Vehicles

Hybrid Electric Vehicle (HEV) is a vehicle that no longer depends solely on

the internal combustion engine (ICE) to propel the engine, but rather uses an electric motor to propel the vehicle using electricity. While Plug-in Hybrid Electric Vehicles (PHEVs), are also called range-extended electric vehicles because the vehicles always have gasoline as a potential back-up that can extend the driving range. PHEV's are equipped with a larger and more powerful battery compared to HEVs which can be recharged at the electricity grid. Both HEVs and PHEVs are energy-efficient and environment-friendly hybrid electric vehicles that do not depend solely on an internal combustion engine as their only propulsion mechanism, instead they use bidirectional power flow. However, they have their fair share of differences in terms of efficiency, operating cost, maintenance cost, range, emissions, etc as shown in **Exhibit 1**.

Tesla Motors-The Company

Tesla Inc is an American multinational corporation which is popularly known for the manufacture of electric vehicles (EVs). Tesla Inc (formerly Tesla Motors) was established in the year 2003. Based in Palo Alto, California, it was founded by Martin Eberhard and Marc Tarpenning who wanted to build cars for people who had a passion for driving. In

2008, Tesla launched the first ever electric car-the Roadster and gained popularity the world over. Tesla, the company also specializes in the manufacture of lithium-ion battery energy storage, and residential photovoltaic panels (through the subsidiary company Solar City) energy storage and solar panels. It also sells Tesla Power wall and Power pack batteries, solar panels, and solar roof tiles.

Tesla Motors started small with a little over 80 employees, which included teams in California, the United Kingdom, and also Taiwan. The employees are drawn from diverse industry and expertise such as electronics, automotive, and software.

The Product

Tesla offered different models such as Roadster, and currently sells the Model S, Model X, Model 3. The company is also accepting bookings now for the upcoming Model Y. The power of the car is derived from its Lithium-ion Energy Storage System, or a battery pack, which can be charged in minimum time. These vehicles conform to US safety standards, environment, and durability standards. The cars have in-built safety features like the essential airbags, front crumple zones, side impact protection, and 2 and ½ mph bumpers.

Green Car-Green Initiative

Tesla is deep in the green car industry. This is the untapped market segment it is focusing on. It has devoted all its research and development (R&D) efforts for this purpose. Further, Tesla is a pioneer and a market leader of EVs and has about a five-year head start over other companies. While other companies are still evolving and developing their green car designs, Tesla has already made a name and a brand for itself. It is believed that the future is of electric cars which would be dependent on renewable sources of energy and Tesla is all in to derive benefits from this trend.

Transformation of the Auto-Industry

Tesla has had a significant impact on the auto industry and has been able to transform the auto industry. In time, all automobile manufacturers would be delivering EVs. Tesla has also introduced the concept of self-driving. It would be remembered as an innovator who transformed the automobile industry, and other automobile manufacturers followed suit (see **Exhibit-2**). The first product launched by Tesla was Roadster, which was priced at \$1,09,000. This was prohibitively expensive for the common man. As such, its target audience (consumers) was only the affluent few,

who were conscious of eco-friendliness. This included businessmen, politicians and celebrities. Later, it launched other lower priced brands. The Model-S was priced at \$69,900. This is the company's flagship Model. The Model-X, and the Model-3, priced at \$35,000, followed. Model-3 is aimed at a higher-volume segment. This received huge acceptance. It delivered around 1,03,000 vehicles in the fiscal year 2017 and 40,740 vehicles in the second quarter of 2018, and during the third quarter of 2018, Tesla delivered around 83,500 units, of which some 55,840 were deliveries of Tesla's Model 3, about 14,470 were Model S, and some 13,190 were deliveries of Model X (see **Exhibit-3**).

Product Strategy

Tesla followed a strategy which is typically adopted by the technological industry where initially an expensive product is launched targeting the affluent buyers and then launching products for the mass market. It followed a typical technological-product life cycle. In the words of its CEO Elon Musk, "New technology in any field takes a few versions to optimize before reaching the mass market, and in this case, it is competing with 150 years and trillions of dollars spent on gasoline cars."

Vertical Integration

The automobile industry is largely dependent upon its component suppliers, and only engine manufacturing and final assembly are undertaken by the manufacturer. Companies typically outsource component production to the extent of over 90 percent. Vertical integration is, in fact, rare in the automobile sector. In general, the auto industry does not have a single source; an OEM would have a range of suppliers.

Tesla's production strategy includes a high degree of vertical integration. This includes component production and proprietary charging infrastructure. The company has large factories to bring economies of scale. It builds electric power train components for vehicles from other automakers, like Daimler AG, and Toyota. Tesla has a limited number of suppliers and in most cases, a single supplier for certain components. Consequently, the company has much more supply-chain volatility as compared to most automakers.

Sales Strategy

Automobile manufacturers have a large network of dealers for distribution to their customers. They are dependent upon their dealers for sales of their products.

Rather Tesla does not resort to the conventional norm of selling through an extensive dealer network. It has adopted a unique strategy and sells its vehicles through company-owned showrooms as well as online.

Technology Strategy

The focus of Tesla's technology strategy is on pure-electric propulsion. It picks up approaches from the technology industry and transfers them to the transportation industry such as online software updates.

Acquisition Strategy

Tesla acquired Solar City in the year 2016. Through this it ventured into the manufacturing of solar panels, solar roof tiles, and battery storage. These batteries complement the generation profile of solar panels that charge only during the day when the sun is shining. It stores electricity for use on cloudy days and at night, which is needed to provide the on-demand electricity consumers are used to.

The company has also set up a large factory to produce battery at Nevada in partnership with Panasonic. The plant would undertake all aspects of battery production, from raw material to battery

pack. Further, the company also intends to sell its OEM batteries for non-automotive applications to increase production volume and reduce per unit cost of production.

Technical Differences

Tesla's Model S, its first electric vehicle, is unique. It has a 17-inch touch screen infotainment system which has become an industry benchmark for automotive display integration. It also has an optoelectronics display, which is the same technology which is used in smartphones and tablets. The system runs on a Linux-based operating system which offers navigation and also computes at a speed which is at par with most other systems. The system also includes an embedded 3G modem that runs on broadband data. This can receive software updates over the air and controls all the functions of infotainment, audio, navigation, Bluetooth phone, and even vehicle settings like windows, door locks, sunroof, trunk release, traction control, headlights, steering and also suspension settings.

Further, a 12.3 inch fully digital instrument cluster is placed in front of the driver with a processor which is used to handle a diverse range of graphics, and

content for the driver. The only familiar driver components are the steering wheel, pedals, and transmission shifter. The system is a class of its own, and Tesla has created a benchmark for the automobile industry.

Manufacturing Model

Tesla has a unique manufacturing model. It adopted the electronic manufacturing services (EMS) model of production that is a norm not in the automobile industry but the consumer electronics industry. Therefore, it is often seen as being a technology company than a traditional automobile company. It entered into a contract with leading EMS provider to build its central infotainment system, instrument cluster, and several other systems. This meant that Tesla needed to internalize much of the hardware and software development, and the systems integration. The company had an advantage in this regard as it had recruited its engineers from all over Silicon Valley. Since it adopts a design and builds model, it has direct control over the finished product, more control over the user experience and over quality and performance. This can be said to be its competitive advantage.

Design Innovation

Tesla expedited the pace of hardware, software, services, and application development and re-think design innovation. Tesla has a competitive advantage over design innovation. It recruited many design engineers from various leading technology companies to design and build the car. Tesla's software design is state-of-the-art. It can update vehicle software over-the-air (OTA) with ease. And as consumers and government pursue eco-friendly and low-emission transport options, Tesla stands to have an upper hand.

Design thinking² focuses on customer needs and designs a product accordingly. It can be said to be a customer-focused innovation. Tesla has embraced the concept of design thinking. Tesla believes in re-designing a vehicle about its energy source (electric) and its driver (based on artificial intelligence). It did not think about Tesla as a vehicle in isolation but how the vehicle could impact the planet. The EV is much more than transportation. It is about creating a sustainable planet. It thought about EV as not something that functions within an ecosystem but something that can transform that ecosystem.

Tesla and Artificial Intelligence (AI)

Tesla's Autopilot uses artificial intelligence³ to drive a Tesla vehicle with minimal assistance. This is also another innovation that other automobile manufacturers are trying to emulate and trying to keep pace with the innovation of Tesla.

Tesla has used machine learning⁴ in its Autopilot program. It used to handle a large amount of data created by its fleet of vehicles and the Autopilot sensor suite on those vehicles.

Customer Experience

Though the products offered, Tesla is providing a different customer experience that other automobile manufacturers would find difficult to copy and compete with. It is often said that people are not buying 'vehicles' when they buy Tesla, but they are buying 'futuristic experience'. And the key elements of the Tesla experience include the buying process, the lack of refueling cost, the lack of mandatory service checkups, the air improvements, lower depreciation, and the driving experience.

Tesla-An Innovator and Market Leader

Tesla, Inc's focus was on climate change. Tesla is the key driver of innovation, and these innovations have been around sustainable mobility and automotive technology. Consumers are increasingly becoming conscious of using environment friendly product, and Tesla tapped on this sentiment and has become one of the most recognizable brands in the world. It has been rated as the best car brand in terms of technology and innovation (see **Exhibit-4**).

Investor confidence has also grown and has resulted in an increase in its stock prices by tenfold. It has become a leader, and many companies are following its lead. Due to its incredible market value, people have included Tesla among the Big Three. People have started calling Tesla, GM, and Ford as the "New Big Three". As of 2017, Tesla was amongst the top 10 most valuable car brands worldwide, valued at 4.4 billion U.S. dollars. The reason why the automaker made it into the ranking was large because of its top-selling model, which is Model-S. The model beat out decades of brand building and production capacity of other giant automakers.

Brian Loh, a partner at McKinsey and Company, said, "Innovation is at an 'all-time high' in the auto industry right now, which is significant because historically, the auto industry is very slow to evolve." "There's so much change happening that the automakers are trying to make sure they're as successful in the next era as they were in the past." "The electronics innovation trend with the industry has been going on for a while, but I think it's accelerating. The mega trends we read about in the papers every day of automotive driving, electrification, connectivity, shared mobility. These are huge industry-shaping trends, and they are having a big impact in the industry at the OEM level and the supplier level, and it's leading to a lot of big investment". And Tesla has taken the lead, proved to be a disruptive innovator and making the industry to follow suit.

Tesla is today acknowledged being one of the most technologically innovative companies dealing with climate change. The company's focus on environmental sustainability, safety, and innovation made its electric cars immensely popular and got an overwhelming response. It is an innovator, and this innovation is its greatest strength. It has challenged the

norms and influenced and transformed what kinds of cars other automobile manufacturers should make. It has also transformed what kind of cars consumers

should drive. Tesla has been an inspiration in the industry and demonstrated that year-old convention could be defied.

¹ An electric vehicle (EV) is a vehicle which uses one or more electric motors for propulsion. EVs store electricity in an energy storage device, such as a battery. Electricity can be used as a transportation fuel to power battery electric vehicles (EVs).

² Design thinking is process of creative problem solving. It has a human-centered core and encourages organizations to focus the people needs..

³ Artificial intelligence (AI) is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.

⁴ Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed.

Exhibit 1: Difference between HEV's and PHEV's

Hybrid Vehicles	Plug-in Hybrid Vehicles
HEV is a vehicle whose propulsion energy is acquired from more than two types of energy sources, one of which is electric.	PHEVs are vehicles equipped with a large battery which can be plugged into the national grid or home outlets.
The battery can only be charged via regenerative braking and can call on gasoline to extend its range.	The battery can be charged via regenerative braking as well as by plugging it in any household 120-volt power outlet.
It reduces the toxic emissions by shutting down the ICE at idle and restarting it when needed.	Centralized electricity generation is much more efficient and products.

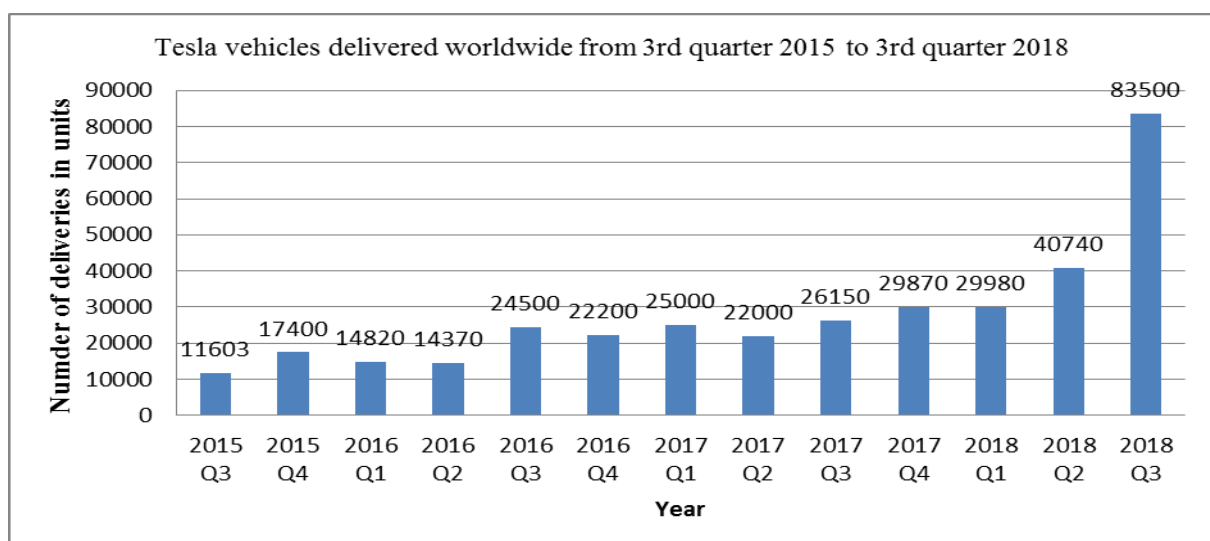
Exhibit 2: Other automobile manufacturer's growing interest in electric vehicles

In 2014, Mercedes approved an investment of over US 4 2 billion for purpose-built electric vehicles (Source: fool.com)

In 2014, General Motors announced an investment of US \$ 449 million for the next generation of electric vehicles and advanced battery technologies. (Source:gm.com)

In 2015, Ford announced a US \$ 4.5 billion investment in EV technology and 13 new electric models will be added by 2020. (Source: Ford Annual Report-2015)

In 2020, Volkswagen would be launching over twenty electric and plug-in hybrid electric vehicles, ranging from small-sized cars to large SUVs in China, its largest market. (Source: forbes.com)

Exhibit 3: Sales of Tesla depicting number of vehicles delivered worldwide

Source: www.statistica.com/statistics/502208/tesla-quarterly-vehicle-deliveries

Exhibit 4: Perception of best car brands (index score)

Vehicle	Index Score %
Tesla	33.90
Mercedes Benz	19.70
Toyota	19.50
Ford	19.50
BMW	18.20
Cadillac	18.10
Audi	16.50
Lexus	16.50
Chevrolet	11.30
Acura	11.30

Source: www.statistica.com/statistics/303737/US-car-owner-perception-of-best-car-brands-for-innovation/; Opinion Research Corporation, Consumer Union.

Exhibit 5: Tesla models specification with price

Models	Acceleration	Range	Price
Model Y	3.5-5.9 seconds	280-300 miles	\$39,000-47,000
Model 3	5.1-5.6 seconds	220-310 miles	\$35,000-44,000
Model S	4.1-4.3 seconds	259-335 miles	\$69,500-97,500
Model X	2.7-6 seconds	200-325 miles	\$80,000-1,44,000
Roadster	4.2-8.8 seconds	620 miles	\$2,50,000-2,00,000

Source: www.tesla.com

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