

DISRUPTIVE INNOVATION:  
HOW TESLA MOTORS, SPACEX AND SOLAR CITY  
ARE DISRUPTING INDUSTRIES

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**Abstract**

Innovation has been a forefront for progress and change. From the time of great industrial revolution to the internet revolution, innovation has become the epitome of every prospering economy. More and more developing nations stress on innovation for entrepreneurial development and self-sufficiency. According to a report published by the “Global Innovation Index”, developed economies such as Switzerland were ranked 1<sup>st</sup> in global innovation, followed by United Kingdom and Sweden. It ranked India as 76<sup>th</sup> spot below countries such as Peru, Georgia, Oman. A lot of factors decide on what is going to be invented and when. Economies which focuses on innovation, as the key growth factor, often are more successful, we can take the case of the Chinese intense manufacturing sector. But the question as to *what new innovations can be done, when almost everything has been achieved?* can be answered by the concept called as “Disruptive Innovation.” The concept, originally coined by Prof. Clayton Christensen of Harvard University in his book titled “*The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*”, talks about improvement in existing products and services/process which force’s firms to either adopt or fail to the change that is happening in the current consumer market for their survival. It also talks about the how changes at micro level of the market can drastically change the scenarios of market leaders. The same applies to the manufacturing sector as well. In this article, we explore three unique American companies headed by one entrepreneur whose business empire has showcased immense threat for survival to the public and private Automobile, Space Technology and Energy industries.

**Keyword:** Disruptive Innovation, Tesla Motors, SpaceX, Solar City

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## **Introduction:**

Disruptive Innovation is the process through which a product or service takes root, initially in simple applications at the bottom of the market and moves relentlessly upwards the market. Thereby, displacing or disrupting established competitors. It also means the radical or newer innovations which affect the existing product, service or even the entire process. The simplest example are the new generation Smartphone cameras which have outdated traditional point-and-shoot digital cameras. Within next few years experts predict that smartphones cameras are expected to affect the professional DSLR cameras.

Disruptive innovation also affects how an entire process system changes or adapts to the newer standards. For instance before Computer or even the Internet, documentation of work was only through papers. But as more and more people have access to internet through various mode, it has significantly affected how a company reaches its customers.

## **Objectives:**

**The objectives of this article are:**

1. To understand how disruptive innovation functions in any industry.
2. To understand how Tesla Motors, SpaceX and Solar City are disrupting the Automobile, Space Technology and Energy industries.
3. To identify the opportunities where disruptive innovation is required.
4. How market monopoly can be broken through disruptive innovation.
5. How industries can utilize the disruptive innovation as a challenge to ever-changing needs of the consumer market

## Literature Review

A significant review which basically discusses Innovation has been made.

In a paper titled “*Innovation and entrepreneurship in today’s scenario*” published in International Journal of Marketing, Financial Services & Management Research (Vol.1 Issue 8, August 2012, ISSN 2277 3622) by Mr. Sanjay Manocha, analyses Entrepreneurship and Innovation as more about creating a framework, it also identifies Innovation and Entrepreneurship as a good resource for categorizing and identifying sources for innovation.

In a report titled “*Disruptive Innovation: In Need of Better Theory*” published in The Product Innovation Management, (2006) by Mr. Constantinos Markides discusses two types of disruptive innovations, namely, business-model innovations and radical innovations. It argues that not all disruptive innovation are by theory same as explained by Prof. Christensen Clayton.

In a paper titles “Opportunities and Resources for Disruptive Technological Innovation” published in Institute for Manufacturing, University of Cambridge, (IFM 2011) by CC Hang and EW Garnsey talks about the entrepreneurial efforts for disruptive innovation, and that entrepreneurs detect and create opportunities.

## Tesla Motors – The Automotive Disruptor

Tesla motors is an automotivedesign and manufacturing company from US,incorporated in July 2003 by founders Martin Eberhard and Marc Tarpinning. Entrepreneur Elon Muskfunded and joined the company later as its Chairman. Tesla Motors manufactures lithium-ion battery packs and fully battery powered electric cars which can be used for day-to-day commute at par with motor engine based cars. It gained popularity with the introduction of battery powered sports car named “Tesla Roadster”. The company provides free electric charging stations across the United States for all its car owners. It aims to introduce a US\$35,000 “Tesla Model 3” by 2017. Tesla motors also aims to offer affordable electric cars to the masses within few years which is its long term strategy.

## Tesla Motors – Disruptive Strategy

Tesla’s market strategy is to target the niche or premium segment with its high performance cars (Tesla Roadster, Model S and Model X). And then, down to the masses with affordable electric cars (Tesla Model 3). It aims to “commercialize” the electric automobile. Tesla’s corporate strategy enumerates three step strategy (**SeeImage 1**).Namely, Step one: high price, low volume (Tesla Roadster). Step two: mid-price, mid volume (Model S). The third step will be low price, high volume (Model 3).

**Image 1: Image showing the stages of Tesla Motor’s 3 step strategy**

High Price, Low Volume  
(Tesla Roadster)

Mid-Price, Mid Volume (Model S)

Low Price, High Volume (Model 3)

Tesla Motor's primary goal to target early adopters and then move towards the price sensitive consumer market has ensured the car maker's influence in a highly competitive market. Further the question of real disruption by Tesla lies in its strategy of being a component supplier to other car manufacturers and selling its cars through exclusive showrooms and via internet.

The ability of Tesla motors to turn small innovations into a disruptive innovation had made it one of the most disruptive manufacturing company currently in the market. Few of its disruptive ideas as mentioned by Tesla's investor Peter Thiel are mentioned below:

- First Lithium-ion battery powered production car.
- AC induction motors.
- Advanced Power Electronics.
- Exclusive showrooms.
- Free car charging stations.
- Software based support for its cars.
- Screen based controls.
- All aluminum body and chassis.

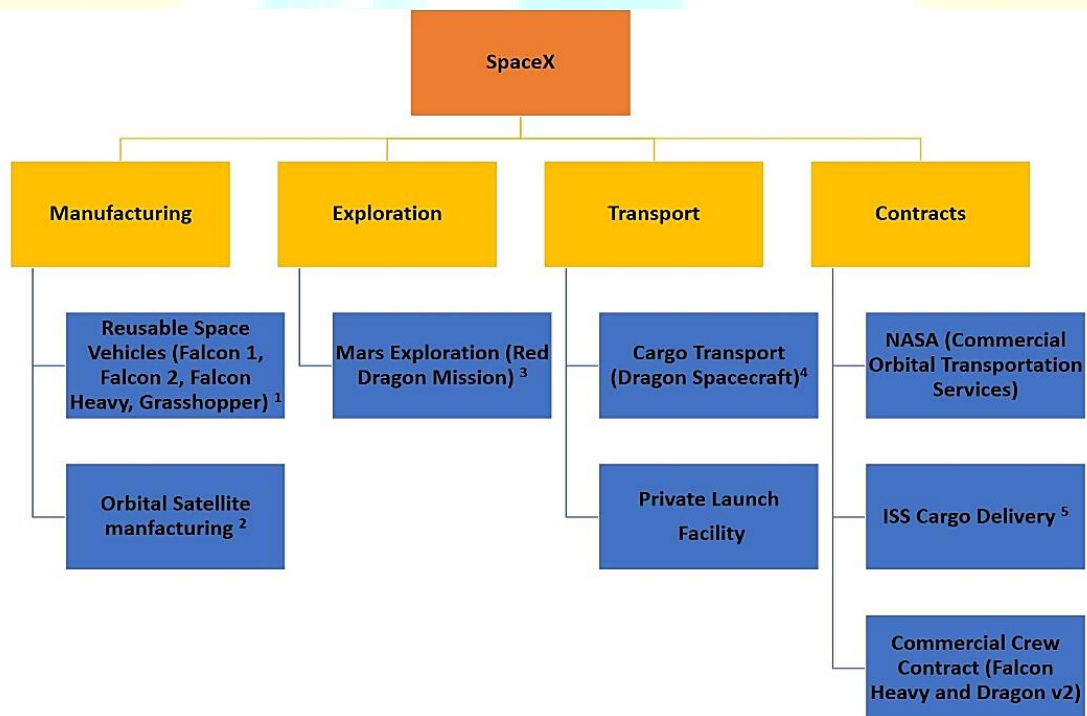
### **SpaceX – The Space Research Disruptor**

Space Exploration Technologies Corporation or SpaceX is another privately owned venture of entrepreneur and investor Elon Musk, established in the year 2002, which specializes in Aerospace design, Space Vehicle development and deployment at par with state sponsored space research agency NASA. The company's aim is to explore low cost space exploration and transportation. Currently the company's reusable space vehicle (Falcon 1 and Falcon 9) has made NASA to partner for various space missions. SpaceX is the first private company to design, launch and deploy cargo to the International Space Station (ISS). SpaceX future goals also include sending humans to Mars entirely developed and funded by itself.

## SpaceX - Disruptive Strategy

One of the main disruptive strategy of SpaceX is to enable low cost and reliable development and deployment of the spacecraft and transport. Elon Musk, the founder, aims to get the cost down to as low as 1/10<sup>th</sup> of the original cost. The company has ventured further into satellite Production, rocket engine design, cargo craft development, space crew vehicle design and a host of related design and development. Most of the SpaceX's venture is through public-private partnership like NASA. The detailed structure of SpaceX can be analyzed in the following diagram. (See Image 2)

Image 2: Image showing the structure of SpaceX



1. "Falcon series" & "Grasshopper" are names of the reusable rocket vehicles.
2. "Orbital Satellite" refers to communications satellite
3. "Red Dragon" is the name of Mars Mission.
4. "Dragon Spacecraft" is the name of cargo transport vehicle
5. "ISS" refers to International Space Station.



## SpaceX Disruptive Ideas

- Independent design and development of space vehicles thereby, threatening the monopoly.
- Contractual collaborations with government agency, thereby, stopping new entrants.
- Space vehicle launch services.
- Satellite manufacturing, foraying into communication business.

## SolarCity – The Energy Disruptor.

SolarCity is an energy services provider, founded in 2006 by Peter and Lyndon Rive along with investor Elon Musk. The company focuses on providing Solar power based product and services. Its main services include, power supply to cities, manufacturing of solar systems, solar energy stations for electric vehicles, financing and many more services.

Unlike any other Solar electricity based company, SolarCity's strategy is to provide low cost solar panels to households all over America. Further, it plans to setup Solar power based facilities which would supply and manufacture lithium-ion batteries for its Cars and Battery Packs named as "Gigafactory". Currently, "Gigafactory 1" is under construction which is scheduled to be finished in the 2017 in the state of Nevada, USA. The facility would have a production capacity of 35 GWh/year of cells and 50 GWh/year of battery packs.

### SolarCity – Disruptive Strategy:

Solar powered facilities and products usually have lesser demand because of cost and efficiency issue. To tackle the issue sustainability SolarCity follows vertical integration strategy. SolarCity being merely being a developer, financier and installer of solar panels shifted to their own supply and production of solar power and equipment. In near future the company's strategy would include setting up of more "Gigafactories" in various parts of US. Recently it acquired solar panel manufacturing and technology company "Silevo" for \$200 million.

Another strategy of SolarCity is the Power Purchase Agreement (PPA) which allows consumers to save on electricity bills with no need of capital costs. It acts as an intermediary between large financial institution and homeowners who save money under solar power tax incentives.

## SolarCity – Disruptive Ideas:

- Popularize electricity based cars (Tesla), thereby creating demand for batteries and equipment provided by SolarCity.
- Supply and installation of low cost Solar panel across households, thereby affecting traditional power supply companies.
- Setup of “Gigafactory” to generate and manufacture batteries and equipment for cars and houses.
- Achieving economies of scale after acquisition of Silevo, a solar panel technology and manufacturing company.

## Conclusion

The process of disruptive innovation may seem tedious, but once it starts it gradually challenges the existing market leaders and players. It makes the companies to rethink its strategies to the changing market format and needs. Few years ago, the survival of electric cars was questionable but Tesla Motors through its innovative strategies has threatened the future of fossil fuel based carmakers. Space exploration till date is under the absolute control of government agencies barring few equipment manufacturing by private firms. But, SpaceX has broken the monopoly of government agency and has ventured into design, manufacturing, exploration. A strategy that many Indian companies back home can learn. Another area where government and private monopoly is being challenged is the ever growing energy sector. The SolarCity project through its strategy of becoming manufacturing, supplier of solar panels to households has now made solar based electricity cheaper and affordable than the traditional energy supplier. Thus, the desire to change the current setup is only possible through disruptive innovation, any nation or economy can encourage innovation but at the same time disruptive innovation has to be learnt since a day might in near future where innovation just stops happening.



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