

SpaceX Report

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Executive Summary

Milestone Schedule: SpaceX is on schedule for the Demo-2 launch this May, one of the many smaller missions to test products such as parachutes and capsules before the long term goal of establishing a base on Mars becomes realistic (Weitering). As of last year, Musk and his team are building an interplanetary spacecraft for the journey to planet Mars, their long term goal (Wall).

Business Description: SpaceX is a private American company, founded by Elon Musk in 2002. The company specializes in manufacturing and testing space transportation products. SpaceX headquarters is located in Hawthorne, California where the team works together to design plans and products for space exploration (Spacexcmsadmin).

Legal Structure & Management Team: There are 21 key executives working for SpaceX, followed by more than 6,000 employees across the United States. Each position has different salaries and specific duties that pertain to the employees specialties (SpaceX Mission, Benefits, and Work Culture). This fast paced workplace is rated by its employees as one of the best engineering and space travel related jobs in the world (SpaceX Executive Team Score).

SWOT Analysis: There are many opportunities and strengths for SpaceX, as they are one of the leading space travel companies in the world who have made multiple space exploration breakthroughs. Threats and weaknesses pertain to the unknown factors and risks that are taken when traveling into space, and competitors such as other countries.

Location: SpaceX has multiple resource buildings located in California, Florida, Texas, New Mexico, Virginia, Washington and Washington DC (Mosher). These locations are host to company offices, space craft launchpads, factories and product test facilities (Spacexcmsadmin).

Marketing: SpaceX manufactures most space travel products, working closely with NASA and building satellites for the military (Wattles). SpaceX became well known by introducing new space exploration missions and partaking in risky space operations.

Finance and Project Budget: Each launch into space costs about \$57 million dollars. SpaceX has many well known investors, has a \$1.6 billion contract with NASA (Chaikin) for product production and testing, and they also make money producing satellites for the military (Wattles).

Critical Risks: Risks include equipment malfunction or failure, external events such as weather could affect a successful launch and human error such as lack of training, unclear responsibilities or mistakes while operating can result in an unsuccessful mission (Perera).

Harvest Strategy: SpaceX sets aside funds for future launches that need specific materials.

They also have contracts with specific companies and sponsors on specific missions. Funds are set aside to account for possible error or malfunction (Thesheetztweetz).

Company Information

SpaceX is one of the largest and most well-known companies in America. As stated in an article on SpaceX.com, “SpaceX is a private American aerospace manufacturer and space transportation service company headquartered in Hawthorne, California. It was founded in 2002 by Elon Musk with the goal of reducing space transportation costs to enable the colonization of Mars”(SpaceX, 2016, p.1). The mission statement of Space X is to eventually make mankind a multi planet species. Simply put, Elon Musk wants humans to have the ability to live on multiple planets, not just Earth alone. At this current point in time, his goals seem to be something that you would see in a science fiction movie. Earth currently doesn’t have the technology that would be needed to enable humans to live on any other planet. In recent years we’ve seen rapid improvements in our technology so maybe one day it will be possible for humans to live on other planets. If humans were to actually live on Mars we would need a way to provide ourselves with food, shelter and water, our basic needs. As of now from the research that scientists have done, there would be no way for us to grow food on Mars, also there isn’t a large supply of water. There isn’t much water at all but there has been recent evidence that suggests Mars had bodies of water at some point in its history. Other than essential items like those previously mentioned, we also currently don’t have a space ship that would be strong enough to deliver a large number of humans to Mars.

As stated before, SpaceX operates in the aerospace industry. The article “Aerospace” states that “Aerospace is the human effort in science, engineering, and business to fly in the atmosphere of Earth and surrounding space. Aerospace organizations research, design, manufacture, operate, or maintain aircraft or spacecraft”(Wiki,2020,P1). Despite all of this, most

of the aerospace industry is guided towards government work. This would make sense considering that the average civilian probably wouldn't have a need for space ships or high-tech aircraft. Not only would the average civilian not have a need for that type of technology, we probably wouldn't even be able to afford it. As stated in an article posted by airspacemag.com, "As advertised on the company's Web site, a Falcon 9 launch costs an average of \$57 million, which works out to less than \$2,500 per pound to orbit"(Sheetz,2019, P.1). SpaceX has huge revenues and are popular for their multi million dollar rocket launches, costing them tons of time and energy. Unfortunately you can never be 100% sure that a rocket launch will be successful, and this launch sadly failed and the company received masses of backlash.

SpaceX as a whole doesn't have much of a history since it is relatively still a new company. Space X has only been in business for about eighteen years. Before gaining world-wide publicity, SpaceX dealt with very humble beginnings. In the article "History Of SpaceX" it states that, " In 2001, Musk conceptualized "Mars Oasis", a project to land a miniature experimental greenhouse containing seeds with dehydrated gel on Mars to grow plants on Martian soil, so this would be the furthest that life's ever traveled in an attempt to regain public interest in space exploration and increase the budget of NASA. Musk realized that even with a much larger space budget, travel to Mars would be prohibitively expensive without a fundamental breakthrough in rocket technology"(Wiki,2020,P.1). In 2001 after taking a trip to Russia Musk discovered that rockets were being sold at \$8 million. He decided that this was too expensive and later would go on to create his own company that would create affordable rockets. SpaceX made the most revenue of all rocket companies last year pulling in two million dollars. According to an article published by cnbc.com, "SpaceX has hurtled to the top of the launch

industry over the past decade, last year bringing in more revenue than any other rocket company”(Sheetz,2020,P.1). This well-known company has brought new technologies and space exploration possibilities to the world of space travel, continuing to make history as we speak.

SWOT Analysis

Strengths

SpaceX is the first private rocket company to ever build reusable rockets for space travel. It has the potential to save millions of dollars when it comes to exploring space. Therefore, SpaceX has many advantages over other rocket building industries around the world. This being said, one of many strengths of SpaceX is that it has very little competition. There aren't many industries that share similar goals as SpaceX. As its ultimate goal is to make humans a multi-planet species, space travel is pretty expensive. In order to accomplish its initial goal, Elon Musk figured he must make space travel cheaper first. Hence, Falcon 9, a reusable rocket, was developed. Which carries on to the second strength of SpaceX. It has the leading role in rocket development. As mentioned, it is the finest rocket building company in the world. It has developed such powerful rockets that the world has never seen before, Falcon Heavy. Its rockets can be used more than 100 times which reduces the cost of travel by hundreds of millions of dollars.

Weakness

Although SpaceX has numbers of strengths which increases the probability of accomplishing its mission, it also has weaknesses. For example, since SpaceX is a private company the government can interfere with its mission. It can hinder the growth of the company anytime because it is not a government operated company. They can place sanctions limiting how much they could possibly perform. This is a huge liability because SpaceX have to experiment in various ways and the government can easily restrict them from doing so which will delay their process and have to find alternative solutions. Another weakness within SpaceX is that it cost a lot of money to operate its products and experiments. Since it's a private company, Elon Musk

alone cannot fund the entire project. It needs individuals and other companies to invest in its project for growth. This is also a liability because without proper funding it delays the project and possibly can limit the project from achieving its maximum potential.

Opportunity and Threats

SpaceX is known for its revolutionary space technology and its ultimate goal. Along with its strengths and weaknesses, it certainly does have countless opportunities. With SpaceX's reusable rockets, it eliminates "Im" from impossible. It will allow scientists to discover space more in depth with much cheaper cost. In general, it will reduce the cost of space travel tremendously. SpaceX has developed a project called Dear Moon. It is a lunar tourism mission to have a SpaceX Starship that is sent on a private spaceflight, flying once around the moon. This spaceship is made to be reusable to further humanity's goal of being a multi-planet species. If all goes according to plan, the Starship is being developed and has a proposed launch date of 2022. Not only is it beneficial to scientists in the long run, it will allow humans to travel to space as tourists at a cost but much cheaper than what it is now. SpaceX plans to launch space tourists into orbit on a spacecraft called the Crew Dragon. The main mission is for space adventure. Four passengers will be sent into space on a five-day mission to gather information and data. This mission is set to forge a path for possible future space travel to be made possible to all who desire, as well as advancing our knowledge of space. Through its revolutionary space technology, SpaceX has the opportunity to set up a base in mars. SpaceX Starship will also contribute NASA's long-term goal of human development on Planet Mars. SpaceX will use the Starship to transport humans and cargo to mars. They are currently building an interplanetary

spacecraft that will be able to transport up to 100 humans, as well as excess amounts of cargo to and from planet Mars.

Ultimately, one opportunity that will absolutely change the future is the establishment of a base on Mars. This will allow scientists to learn about the geological elements of Mars more in depth and find a way to grow life on Mars so it's habitable for humans. However, in order to do that SpaceX needs to fix or replace its rockets centre boosters. Recently, the centre booster has been troubling the rockets from landing. **I say, partner up with NASA and find a way to fix/replace the** centre booster for better success in rocket landing. Partnering up with NASA will allow SpaceX to perform its project more efficiently due to more funding and resources. NASA can also help SpaceX with any other technical issues and achieve its goals at a faster rate. As this carries on, then SpaceX can focus on establishing a base on Mars. Even so, SpaceX will encounter many threats such as technological threats. In order for SpaceX to make a Mars landing possible they would need to build a huge spaceship that is capable of taking 100 astronauts to the red planet and building such a large ship would require a lot of funding. They would also need a lot of expensive equipment that at the moment doesn't even exist yet. As mentioned, partnering up with NASA will be beneficial because it will provide funds and resources to eliminate any technological threats. **Anyhow**, establishing a base on Mars will extend **our** knowledge and will allow us to perform experiments on growing life on Mars. If SpaceX is successful in this mission, it will start a revolution. Making humans multi-planet species will not only be a revolution, yet it will be the biggest accomplishment achieved by men. Turning humans into a multi-planet species can be very beneficial. **As we all know**, over-population plays a part in global warming and it can be catastrophic. Taking a certain amount of human population to Mars

will release the stress from the Earth. Earth will no longer be in danger and it will also save millions of lives. As the Earth is warming up and CO2 levels are rising, it is negatively affecting the human respiratory system killing millions. Removing people from Earth and placing them in Mars will simply abolish the threat.

Detailed Proposal

The Main Idea

We propose that SpaceX invests and collaborates with other companies to further expand their business and space exploration. Adding space chambers into their rockets and space shuttles will make for better comfort and relaxation for astronauts. A new engine will provide rockets with a safer and faster method of transportation, and collaborating with other rocket and space exploration companies will expand the business and provide new opportunities.

Sleep Chambers

SpaceX must invest in cryosleep space chambers to allow for much easier space travel on passengers. At the current pace it will take around 7 months to get to mars. There are many negatives to this amount of time needed. Firstly, the passengers may go insane from the isolation from the rest of the world. Even though the passengers will experience isolation before the real thing, there is no telling what will happen when people can't just escape isolation when they want to. **A statement from Nasa.gov states** "NASA has learned that behavioral issues among groups of people crammed in a small space over a long time, no matter how well trained they are, are inevitable". A way to counteract this would be to invest in special space cryosleep chambers. NASA is already developing this and if SpaceX engineers could copy their schematics or make their own it will help the mental health of all passengers. Yet, it would also allow scientists to proceed longer trips in space through cryosleep. Rayne states that NASA and SpaceWorks Enterprises are now making a stasis chamber that may cause an longer state of torpor, or metabolic inactivity medically brought on by bringing down a passengers body temperature to the brink of mild hypothermia, which could cause for astronauts to sleep for at

least two weeks on end during bigger missions. So this is just not a sci-fi idea but it has huge space companies trying to put it into practice today.

A New Engine

Benefits of a new established engine that could cut in half the amount of time needed to get to a location in space. We suggest that SpaceX creates an engine that could allow for at least a 3 month travel period. This would allow for any errors to be diminished greatly. This is because there is simply less time for errors to happen either machine side or person side. Space travel simply needs to get faster in general because it also is going to take over 81,000 years to travel to the nearest star system at our current speed of travel (**Williams**). If the human race wants to escape our sun's destruction, starting to upgrade our current travel even only by half is a great start. To fund the immense costs it would take to create this type of engine we suggest that SpaceX teams up with famous social media influencers/ celebrities to create awareness for the project. People could donate to the project by buying merchandise from the SpaceX website or by donating. What is missing right now is the hype around space travel. The space race made each country super nationalistic and everyone wanted to get to the moon first. Just by sparking up interest by people's favorite celebrity or influencer could have the entire world trying to get to Mars first. Most people off the street have no idea that we even plan on going to mars or that it is in the works but creating hype could speed up the process a lot since people want to see it happen.

Collaboration

A SpaceX/NASA collaboration could be very beneficial to space travel and space exploration. NASA's budget per year is 22.6 billion dollars (**Dunbar**) combined with SpaceX's net worth of

20 billion dollars (Loudenback) and Elon Musk's net worth of 36.5 billion dollars (Loudenback), could potentially make a breakthrough in space travel history if these companies were to put their efforts together and collaborate on a space mission. A collaboration would create an extreme amount of interest worldwide, gathering extra investors and internet attention, building the brands and a reputation for space travel. In addition to combining funds, technology, minds, and efforts of NASA and SpaceX, a special new engine would be easier to make and design. SpaceX's lack of a giant staff base could be helped with NASA's current staff and SpaceX's revolutionary ideas could help for NASA's current state of stagnant innovation. Both teams work together, balancing out each other's strengths and weaknesses to evolve space exploration.

To conclude, we believe these three main ideas can take space travel to the next level. Sleep chambers, a new engine and combining efforts with NASA would create the ultimate space travel and exploration unit and mission needed for a revolutionary space travel breakthrough, changing and advancing space history forever.

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