SPACE X- JOURNEY OF A START UP TO UNICORN

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ABSTRACT
Space X is one of biggest contributor to the revolution of space exploration, opening up the sector to entrepreneurship, reusable launch vehicle technology with the vision to colonize Mars. Founded in 2002, this company has come a long way from facing consecutive failure in initial years to becoming the highly recognized aerospace companies. This paper explains the unique characteristics of Space X and provides the insights of the twenty of its history.

Keywords- Space exploration, Entrepreneurship, Reusable launch vehicle technology, colonize, aerospace, insights

INTRODUCTION
Space X is an American private aerospace company that manufactures rockets, crew- cargo capsules, engines, guidance and control software etc. headquartered in Hawthorne, California. It was founded in 6 May 2002 by Elon Musk. Space X stands for Space exploration Technologies corporation. The basic goal for starting Space X according to Musk was to make Space travel easier, cheaper and accessible for all. Elon Musk is a revolutionary. His ultimate objective is to make habitation of humans possible in Mars and protect humanity from an ultimate end. Elon Musk owns 54% equity and 78% voting rights of SpaceX making him the major shareholder of Space X. [www.spacex.com]

How it is different:[1, 4]

- **Idea and concept**- Space X is based on a unique concept of space exploration. Elon Musk ultimate goal for starting space x was colonisation in Mars. By 2024,Space X plans to send crew to Mars. Thus, it covered a field that provided much to explore. Space x rightly proved that ideas are not restricted within any boundaries.
- **Private company**- Aerospace industry faces less
  competition compared to other fields. Moreover, most of the aerospace companies go public in order to secure large amount of funding. But
  Space X is a private company;thus, it gets edge over others. Public company are subject to government bureaucracy, interference and stock listing. In such cases shareholders personal interest can hinder long term ambitions of the company. In 2012,Space X dragon capsule became the first privately funded space craft to dock with ISS. In 2018,Space X made 21 successful launches making a global record in aerospace industry.
- **Rapidly reusable launch system**- Space x has broken traditional stereotypes of launching one time use rockets. It has started a wholly new concept of reusable launch system. Number of rockets designed by spacex launch are reusable. Falcon 9 is first stage reusable. Falcon heavy's core, side boosters were reusable and Starship was fully reusable. [5]

- **Reducing cost of space travel**- As earlier explained with the help of manufacturing reusable launch system, Space X has considerably reduced the cost of production. Earlier cost of carrying 1kg to space was US$ 18,500, SpaceX rocket Falcon9 which was used to access International Space Station (ISS) reduced the cost to $2720 per kg. Space X can launch a rocket for $90 million compared to $380 million charged by its rival. [5]
- **Network**–Since 2002 Space X has been in the path of constant development. Throughout this journey it has created strong network in aerospace market due to its technological innovations and out of box concepts. NASA, National Reconnaissance office, the Pentagon spy satellite arm etc. arethe regular clients of Space X. In 2008, NASA gave $1.6 billion contract to Space X to deliver cargo to International Space Station. In 2014, NASA awarded a $ 2.6 billion contract to Space X to transport two NASA's astronauts to Space.[2]

RESEARCH ETHODOLOGU: The study is based on the secondary data. The main objective of the study was to analyse and study the journey of a start up since its inception. Secondary data was collected from the online journals, Space X reports and the studies done by authors like Elon Musk.

HISTORY:

- **2002- 2006**
  Initial years were really challenging for Space X. During initial years Space X primarily kept its focus on Falcon 1. Before getting NASA contracts and funds, Space X designed Falcon 9, rocket engines Merlin, Kestrel, Draco completely by its private funds. Although the company received early blow when first launch of Falcon 1 on 24 March 2006 was a failure due to fuel leak and fire. Space X received its first NASA contract in the same year worth $ 396 million to develop spacecraft for supplying cargo to International Space station (ISS). Space X valuation was comparatively lower between 2002- 2006.In December 2002, price per share was $1 and Space X was able to raise $12.1 million. In March 2005 price per share was $2 and Space X raised $22.2 million. [2,3]
- **2007- 2010**
  Space X faced two other unsuccessful launches of Falcon 1 on 2006 and 2007.On 3 August 2008 Space X was finally rewarded for its untiring efforts when Falcon 1 made its first successful launch. Falcon 1 became first privately funded and liquid fuelled rocket to reach orbit. Falcon had its fifth and last launch on 14 July 2009 which became another achievement for the company. Falcon 1 made its commercial flight and placed Malaysian satellite Razak Sat into lower Earth orbit. In August 2008, Space X received US $ 20 million investment from Founders Fund. Same year it also received commercial resupply services contract to make 12 cargo transport missions to International Space Station worth US $ 1.6 billion. Falcon 1 was succeeded by Falcon 9. Space X started focusing in reusable launch systems. In 2010, Space X ‘s Dragon cargo became first space craft to be successfully launched to orbit and recovered back. In 2010, Falcon9 was successfully launched to LEO orbit. In March 2007, price per share was $ 3 and Space X raised $31.5 million. Its value increased to $ 7.5 per share and total raised capital to $50.6 million by 2010.Number of employees in Space X were 500 in 2008 which increased to 1100 in 2010. [6]
- **2011 – 2015**
  This period proved to be a period of constant development for Space X. By 2015, per share price went to $ 77.46 and company raised $1.06 billion. This period added many medals to the

achievements of Space X. In 2012, Space X sent Dragon space craft to International Space Station and became first private company to do so. In the same year, NASA provided US $ 440 million for the further enhancement of Dragon. In 2013, Space X became the first private company to send satellite to geosynchronous orbit. In 2014, Space X got its biggest success in reusable launch system when Falcon 9's first orbital rocket booster returned from space. NASA provided US $ 2.6 billion fund to Space X to develop systems to transport US crews to ISS.

Year 2015 proved to be a successful year, United States Air Force chose Falcon 9 for National security space launch and Falcon 9 became first spacecraft to demonstrate vertical take offs and landing in the same year, NASA extended the contract of Commercial Resupply services providing 20 resupply missions. Earlier the number of missions were 12. Number of employees in 2013 were 3800 that grew to 5000 by 2015.[6,10]

- **2016- 2021**

  This period is considered to be golden years for Space X. Space X launched two new project – Star Link and Star Ship. Star Link is a successful satellite internet constellation project which made Space X the largest satellite operator in the world. Meanwhile Space X announced its another spacecraft named Star ship which will succeed Falcon 9 and Dragon for interplanetary missions, orbital resupply. Star ship is still in process and planned to be fully reusable. In 2016, Space X landed the first stage of CRS- 8 and in 2017 successfully re launched and landed the first stage of an orbital rocket. In 2018, company made 100 launches worth US $ 12 billion for commercial as well as government customers. Same year, it also became the first private company to launch spacecraft to heliocentric orbit. In 2020, Space X transported two NASA astronauts Doug Hurley and Bob Behnken to International Space Station. In 2020, Space X became third biggest Unicorn valued at US $ 46 billion. In 2021, it broke another record by placing 143 satellites by a single rocket Falcon 9. In 2021 Space X was worth US $ 74 billion and in the path of achieving its global ambitions. In the year 2021, the number of employees grew to 8000 and price per share was US $ 419.99. By the end of 2021, Space X mark capitalization reached $74 billion and the revenue for the year was $1.6 billion.[8,9]

FUTURE PROSPECTS

The Star ship vehicle can be another step towards red planet habitation which is expected to carry 100 metric tonnes to the orbit. It will be a fully reusable low-cost satellite delivery, thus offering the cost reliefs in space travel. Elon Musk is expected to create a trend of space tourism which will lead to a huge economic change. SpaceX will develop its cargo transport facilities to Earth's orbit and beyond. Lunar mission is a prospective commercial travel target and will be used for launching vehicles or a linking point between the Earth and other celestial bodies. The ultimate vision of SpaceX to make humans an interplanetary species seemed vague during its formation. But this vision can be ultimate change for human lives. [5,7,10]

CONCLUSION

Space X has shown remarkable progress in valuation since its formation. The number of successful launches surpasses the unsuccessful ones. There have been speculations about the company to go public in the past. The valuation has reached to peaks due to investors interest in the futuristic projects focusing on cutting edge and moon-shot project. The future goals of Space X are promising to ensure the success of the company.

LIMITATIONS AND SCOPE OF THE STUDY: The secondary data collected for the study was very limited due to shortage of time. A lot can be done on the topic. Lot more related secondary can add value to the future study. Primary data can be used for further data analysis and structural equation models can be further developed on the basis of certain parameters and constructs. There is a wide scope for the future study.

References

1. Max Vozoff and John Couluris. "SpaceX Products-Advancing the Use of Space," AIAA 2008-7836. *AIAA SPACE 2008 Conference & Exposition*. September 2008.
2. The SpaceX EffectVidya Sagar ReddyNew Space 2018 6:2, 125-134
3. History of SpaceX Nellie English 16 June 2020; Under lucky stars
4. Muegge, S., & Reid, E. 2019. Elon Musk and SpaceX: A Case Study of Entrepreneuring as Emancipation. Technology Innovation Management Review, 9(8): 18-29. http://doi.org/10.22215/timreview/1258
5. Elon Musk and SpaceX: A study of entrepreneuring as emancipationMuegge, Steven; Reid, Ewan.ISPIM Conference Proceedings; Manchester, (2019)
6. SpaceX — Space Exploration Technologies Corporations Nathan Hernandez "The little Book of big companies"
7. Young, A. (2015). Game Changer: SpaceX. In: The Twenty-First Century Commercial Space Imperative. SpringerBriefs in Space Development. Springer, Cham. https://doi.org/10.1007/978-3-319-18929-1_2
8. SpaceX Report Erika Horne, Shah Shafi, Justin Burke, and Zach Prettitore
9. Derek Webber, Space tourism: Its history, future and importance,ActaAstronautica,Volume 92, Issue 2,2013,Pages 138-143,ISSN 0094-5765,https://doi.org/10.1016/j.actaastro.2012.04.038.(https://www.sciencedirect.com/science/article/pii/S0094576512001531)
10. Jonathan C. McDowell 2020 *ApJL* 892 L36The Astrophysical Journal Letters, Volume 892, Number 2

