ENT 610: Managing Innovation and IP for Entreprenuers

Assignment
Topic : SpaceX - Cheap and Reusable Rockets

1. Where did the curiosity begin? Give a rough timeline, trigger, incident, a trend that might have caused the curiosity to begin.
   The curiosity began in 2001 when Elon Musk conceptualized to grow plants in a greenhouse on mars. After failing to purchase cheap rockets form Russians, he decided to his own company to build cheap and affordable rockets.[1]

2. What was the core technology involved in building the initial prototypes? If more than one technology is involved, pick one of the most important technologies. Was this technology influenced by any major technology trend? If so, which one?
   The SpaceX team developed a new series of rocket engines called 'Merlin', which are to best rocket engines built till date. Merlin engines used refined petroleum and liquid oxygen as propellants in a gas generator power pump. Merlin was not influenced by any technology trend.[2]

3. What were the initial prototypes? What was the learning from the initial experiments?
   No prototyping was done for SpaceX's initial rockets, the falcon 1 because they were traditional rockets. For the falcon 9 two prototypes were built. The first of them was 'Grasshopper', low-altitude low-velocity test and the second was F9R Dev1. These tests led into a series of booster stages which was vital for vertical landing of falcon 9.[3]

[1] https://en.wikipedia.org/wiki/SpaceX
[2] https://en.wikipedia.org/wiki/SpaceX_Merlin
[3] https://en.wikipedia.org/wiki/Falcon_9_prototypes

4. At what stage of the technology lifecycle was this technology when it was adopted for initial prototypes? Why?
   When in 2011 the first prototype of reusable rockets falcon 9 was made, the reusable rocket technology was not new. It was tried in 1981 but was not adopted by all. So we can say that the technology was in innovators stage as it was still not mastered back then.[4]

5. How and when did the idea author(s) validate the idea with potential customers?
   In early 2002 when Elon was building the core spaceX team, he had done some amount of work on idea validation and customer discovery. He had found out that if they could drastically reduce the cost, they could open a whole new market for commercial and research payloads.[5]

6. When did the idea author(s) get (a) initial investment, (b) mentoring, and (c) initial media publicity? Please mention the investment amount if known, the names of mentors if known and the name of the media (Newspaper, Magazine, YouTube channel, etc.) in each case.
   Elon Musk himself was the first investor of spacex when the company was started in 2002. By 2008 Elon had invested US$100 million. Although there were no mentors, there was one guy who played prominent role in the initial developments of spacex, Tom Muller a rocket engineer. He was key in building 'merlin' engines. SpaceX got significant media publicity in 2008 when Falcon 1 was successfully launched. This was substantially cheaper rocket compared to others at the time.[6]

7. When did the product/service reach customers? What kind of partnership - say a distribution channel - did it use to reach the customer?
   The first commercial launch of spacex was falcon 1, in 14 July 2009 it carried the Malaysian satellite. SpaceX used direct distribution.[7]

8. How was the Intellectual Property (IP) protected by the innovators?
   SpaceX uses 'trade secrets' to protext its rocket technology. Development technology of Merlin engines is one of the most important trade secret of spacex.

[4] https://en.wikipedia.org/wiki/Reusable_launch_system
[5] Elon Musk by Ashlee Vance page no. 112
[6] https://en.wikipedia.org/wiki/History_of_SpaceX
[7] https://en.wikipedia.org/wiki/Falcon_1

9. Was there any major failure in this journey? If so, how was it handled by the innovator/team?
   There have been a lot of setbacks in the journey of spacex. In 2008, all the three first falcon 1 rockets had failed and the company was going bankrupt but for the success of the fourth launch. Other major failures came in 2015-16 when a series of falcon 9 reusable rockets failed due to various reasons. During such hard times, Elon did not give up. In 2008, he had invested all he had for the fourth attempt of falcon 1. The team had great determination an was of never give up nature.[8]

THANK YOU

[8] https://timeline.com/spacex-musk-rocket-failures-c22975218fbe
https://www.cnbc.com/2017/09/29/elon-musk-9-years-ago-spacex-nearly-failed-itself-out-of-existe
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