

Astropreneurship

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Abstract

Nowadays, the space industry has evolved from a governmental structure to a rather public-private cooperative structure in a quite competitive way. The pioneers of the industry have, in a way, changed the frontiers of the space. In this study, both dimensions that affect the nature of space entrepreneurship or, in other terms, astropreneurship and also differences in regard to the definition of investment amongst entrepreneurs due to the unique characteristics of the space industry have been investigated within the framework of industrial and consumer markets. Various processes, innovations, new ideas and outcomes of entrepreneurial activities are regarded as the indispensable elements of the overarching process of industry information in numerous regions and economies. Space offers a number of opportunities for commoditization and monetization. In this regard, the space policies of governments tend to have a prominent role on this novel public procurement.

Keywords: Space flight, Space entrepreneurship, astropreneurship

1.Introduction

Identifying the elements vis-à-vis corporate sustainability in terms of both austerity as well as execution is of vital importance. The prevalence depends on factors like cost and risk perception. The incubation of an idea for a new venture proceeds not merely from experience in the design of marketing of a product or service in an existing organization but also from knowledge of local markets and competitive conditions for new products and services. In this regard, the crucial role of entrepreneurship in successful economies has been widely accepted. Today, entrepreneurship is deemed to be a pivotal dynamic of change not only in the society but also in economy. Entrepreneurship dynamism is the key to innovation and growth. In that respect, existing public policies are also required to support new ventures (Ishikawa, 1999; Bahmani-Oskooee, Galindo, and Méndez, 2009).

Daft (2000) defines entrepreneurship as a process of starting a business, organizing the necessary resources, relevant risks and rewards. The space industry has been the focus of this framework. There is relatively less competition compared to other sectors due to the market entry barriers. And yet, the potential competitors tend to be financially powerful together with abundant corporate resources. As an emerging business, space entrepreneurship has been designed as a dimension of focus in the present study in view of high transformation and rivalry. This issue touches upon various issues such as communication, risk-taking, technological skills, finding necessary funding and many others. The present study attempts to extend that knowledge base for entrepreneurs who are willing to take part in this up-and-coming business of the future in four parts: entrepreneurship, space entrepreneurship, space tourism, and lastly the stakeholder and social responsibility in the space industry.

2. Entrepreneurship

Various definitions of the term “entrepreneurship” can be found literature. Schumpeter describes the term “entrepreneur” as a person that makes innovations and takes risks according to the economic theory in the 20th century. Being the creative and innovative person of development, an entrepreneur is regarded as a person who has high self-esteem and knowledge about his job, takes risks, cares for details, and finds new opportunities. Thanks to the development of entrepreneurship theory, the term has rather broadened itself. The French word “entrepreneur” is literally translated as “between-taker” or “go-between” (Elenurm & Heil, 2015: 314). Having a strong vision, an entrepreneur takes the risk, creates something, sees the opportunities adding value to scarce resources, struggles with goodwill, and eventually leads others to follow this vision. In general, entrepreneurs are grouped under two headings: opportunity entrepreneurs and creative entrepreneurs (Yurtsever, 2003: 3).

Schumpeter has made significant contributions to the entrepreneurship theory in that he sees an entrepreneur as an individual with the necessary desire as well as ability to commercialize an innovative idea. This ultimately leads to the concept of “creative destruction” across markets and industries. In this respect, creative destruction tends to sustain dynamic and developing industries. According to Schumpeter, entrepreneurship is regarded as a factor that helps obtain dynamism – continuity- of capitalism. Schumpeter determines two fundamental processes in the economy: circular flow and tendency towards equilibrium.

In the circular flow, theory is a fundamental force that bears immanent change and growth successively. Change is made possible through innovation and invention. The notion of production entails the combination of materials and forces. (Schumpeter, 1934:66).

The Importance of Entrepreneurship and SME's

The global market is changing not only constantly but also quite rapidly. Globalization has a rather increasing effect on entrepreneurial behavior. Large companies cannot be assumed to dominate the industry for a long time. Moreover, the ever-changing economy tends to provide numerous opportunities for new businesses. Hence, companies have to cut business costs by outsourcing work to smaller businesses or freelancers and sell off extraneous operations in order to survive. Globalization, by its nature, promotes competition. For that reason, large companies cannot always achieve their economies of scale which could eventually lead to the undesired loss of competitive advantage. Small companies, on the other hand, have the advantage of flexibility and quick response time to changes. What's more, the internet offers a critical advantage to start new businesses rather quickly and inexpensively.

In the economic theory, the concept of entrepreneurship has a rather unique place as regards the distribution of income and rising competition in the market. The small business sector that promotes entrepreneurship is only possible through innovation and job creation, which in turn will contribute to the economy. Entrepreneurship identifies the creation of the innovation process and gaining competitive advantage through finding and using opportunities (Bahmani-Oskooee, Galindo & Méndez, 2009). That is to say, this term contains the idea of mobilizing resources in pursuit of opportunities.

Research so far indicates that the fundamental decisions tend to vary in terms of becoming an entrepreneur. Many individuals need to be supported, informed, advised and guided. Hisrich et al (2005: 75) indicate different systems of support such as friends and family, professional contacts, customers and industrial organizations. Small businesses do not have the necessary market power to dominate customers and competitors. Therefore, market positioning appears to be less relevant. And yet, the environment in which small businesses operate do tend to influence them. The opportunities in the environment are often of crucial importance for these small businesses. Shepherd and Wiklund (2005:7) shed light on some concepts such as the social capital and human capital, the motivation of managers in small businesses, the marketing and technological knowledge of staff, the access to financial capital to pursue the opportunities, as well as the development and performance of small businesses and the influence of these issues on entrepreneurial actions.

While theory suggests that management has discretion in manipulating resources in order to build competitive advantage, resource-based research has focused on the characteristics of resources, paying less attention to the relationship between those resources and the way firms are organized. In explaining performance, entrepreneurship scholars have focused on a firm's entrepreneurial strategic orientation (EO), leaving its interrelationship with internal characteristics aside. We argue that EO captures an important aspect of the way a firm is organized. Our findings suggest that knowledge-based resources (applicable to discovery and exploitation of opportunities) are positively related to firm performance and that EO enhances this relationship.

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3. Astropreneurship

Vernile (2018: 4) was the first person to use the term “astropreneur”. The meaning of “astro-” as a prefix is related to “stars or celestial bodies” that are beyond Earth's atmosphere. The definition of “-preneur” as a suffix is “taker” pertaining to a person who sets up and runs a business. The Commercial Orbital Transportation Service (COTS) program, cargo as well as crew transfer capabilities together with developmental programs presented by NASA ensure a supportive and innovative ecosystem for the space industry in-between destinations. It is true to say that space telecommunication seems to be gaining importance as a field of commercial business. Dynamism of the market is regarded as a challenging issue as new initiatives in the space industry contains Information and Communications Technology (ICT) companies, start-ups and new ventures; differing market solutions like integrated services, lesser prices and delivery durations, lesser complexity or developed performance, private investment from various financial resources, new implications in space industry, financial resources for research and developmental expenditure. New Space ecosystem also offers public information for stakeholders. The trends are investigated under six headings: 1 - Public procurement and support programs that define the prevailing status for current actors as public actors, including broadcast agencies worldwide; 2 - Private space sector investment which refers to the resources as well as financial mechanisms of private investments; 3 - Centers for "astropreneurship" with new ventures examined in the sector as well as public initiatives support; 4 - Brand-new target markets for emerging private actors and sectors as well as advertisements; 5 - The legal regime that assesses the legal and regulatory framework of the current field from a business perspective. 6 - Selected achievement stories (SpaceX, Planet, PLD Space, and D-Orbit) that encourage private actors. Due to an investment breakthrough in the emergence of private actors in the sector, there is an increasing need for business-oriented leadership. There are many new companies in the space industry that are actually non-space, successful ICT organizations like Google and Facebook. What's more, these companies are keen to extend their involvement as well as rely on cross-fertilization between Information and Communications Technology and space apps. In this regard, there are numerous brand-new practices and methods of space companies such as organizational optimization, procurement rationalization as well as vertical integration, miniaturization, confirmed technologies re-use, economies of scale, automated production line as well as digitization, standardized architectures, COTS or optional risk reduction approaches (for example, viasubstitutes or on-orbit servicing). Innovative approaches in the industry aim to meet existing or potential new customers' needs by offering them new solutions like integration/customization flexibility, availability (i.e. delivery duration reduction), decomplexification or lower prices. There seems to be a prominent difference between the US and Europe. In terms of space start-ups, investments realized were approximately worth \$1.5 billion annually from 2010 to 2015. And total European governmental expenses, on the other hand, reached €6.56 billion in 2015. These figures shed light on the intensity of rivalry between the U.S. and European terms of space systems as well as launch services. The success of existing trends depends is essentially connected to two complementary components: business achievements as well as public sponsorship. More research is conducted on New Space in the U.S.A. compared to Europe. Space agencies' model of transformation contains operational perspectives like program administration and supply components, strategic issues such as industrial policy as well as governance.

Space entrepreneurship differentiates from other industries due to its complex and interrelated structure. The resource requirements are often high and, naturally, there is a broad spectrum of beneficiaries. The space industry used to be merely dominated by the government. In 1957, Sputnik, the first artificial satellite, was launched. And yet today, the industry structure is composed of a few private companies while they are still primarily dependent on government contracts. In that respect, most of them are associated with military and defense. Larger contractors have so far reached a certain level of success thanks to the increase in the number of applications in the commercial field such as remote sensing and communication. In recent years, entrepreneurs have started to capture more achievements in the space industry, and mainly through miniaturization, the cost of the capital for space projects has fallen a great deal. The concept of entrepreneurship is often examined at three distinctive levels: macroscopic, mesoscopic and microscopic. Recommendations, in general, include reducing the risk of the entrepreneurial activity and encouraging the space start-up incubators.

The future expectations for both the society's sake and world's wellbeing seem to be supporting entrepreneurs in a substantial manner (Wang, 2014: 36). The entry to the industry as an aerospace entrepreneur is challenging in terms of resource allocation and technology companies due to the high necessity of financial and specialized human resources. And yet, there are also some opportunities for start-ups - physical space, grants, investment

capital, aerospace infrastructure, production facilities as well as leading entrepreneurs as mentors to name a few. Entrepreneurial space environment requires collaboration of powerful actors, i.e., government, industry and academia. In this regard, eSpace center provides support with mentor-venture relationships (<http://www.espacecenter.org/sub2.php>).

Generally speaking, the entrance of new ventures tends to increase competition as well as technological and innovative developments. Entrepreneurial development tends to be influenced by poor cultural perceptions, perceived technical risks and general lack of awareness, all of which may negatively impact the growth of the commercial space sector. The micro view focuses on the difficulties and how the entrepreneur turns them into benefits and how the opportunities are utilized. Meso view, on the other hand, examines the facilitators to initiate a venture, whereas Macro view mainly concentrates on the cultural, governmental and competitive characteristics of space industry (Wang, 2014: 28).

Amardeep S (2017) focuses on the idea of using space-tech beyond research missions. That is to say, the space industry offers various strategic advantages such as security threat monitoring, natural resource management, availability of communications and quick disaster response. All in all, companies and entrepreneurs that operate in space ultimately aim to reduce their business expenditure and manage to be simultaneously effective both in space industries and in the technological products on Earth in terms of consumer electronics, smart production, cloud computing, as well as machine learning. The efficacy of space engineering may ultimately result ineffective as well as lucrative solutions in terms of Earth apps. The commercialization of space fosters certain improvements for both businesses and entrepreneurs. Some examples are provided below:

- SpaceX's target is to increase the safety of space travel ten-fold and lower the costs ten-fold by using the rocket stages.
- Planet Labs benefits from items from consumer electronics such as cell phones in order to decrease both the volume as well as the cost of manufacturing with the aim of launching 10 times more satellites.
- OneWeb plans to build a manufacturing plant to produce large amounts of cost-effective constellations of nanosatellites of up to 600 communication satellites.
- Insect Research Systems applies a compact, highly effective mass spectrometer to create commodity bed error detectors for hotels and airlines from Rosetta Comet Lander.
- Orbital Systems provides water efficiency for household through the use of water recycling technology created for Mars missions (Amardeep, 2017, <https://www.entrepreneur.com/article/301034>).

It is a well-known fact that entrepreneurs are bound to take risks. However, there seems to be much higher market entry barriers in this sector. Even though some institutions and governments have provided support and resources to space incubator, more resources are needed due to the higher potential risks. This structure fosters innovative activities in terms of manufacturing, supplies, launch services, earth observation, GPS (Global Positioning System) as well as communication. These space activities are often directed by nationwide scientific institutions such as National Aeronautics and Space Administration (NASA), as well as Indian Space Research Organization (ISRO), and so on.

Entrepreneurs like Elon Musk, Jeff Bezos, and Sir Richard Branson as well as New Space organizations such as SpaceX, Blue Origin, Virgin Galactic, Planet Labs as well as Team Indus have so far been successful in commercializing the space. Thus, there has also been a paradigm shift associated with these initiatives since previously, governments used to be the only entities to manage and conduct such activities in space (Amardeep S, 2017, <https://www.entrepreneur.com/article/301034>).

Tchalakov (2015: 43) emphasizes the asymmetric significance of human agents in the earliest stages of the emergence and development of actor-networks, and the problem of shifts in already balanced actor networks, which in turn indicates possible existence of their third state differing from the emerging and stabilized ones in already stabilized actor-networks. There is a historic significance with SpaceX's Dragon capsule, which was launched to carry cargo to the International Space Station (ISS) on May 24, 2012 as the first commercial vehicle and come back on May 31, 2012 to the Pacific Ocean. This journey through space had four milestones in that the space capsule was not only launched into orbit successfully but also brought back to Earth: the United States of America, Russia, China, and SpaceX. Anderson (2013: 266) also highlights this shift of the industrial domination from governments over to the public private partnerships.

Bolden(2009: 1) accentuates the development of the industry since the launch of a Soviet Soyuz spacecraft, Apollo program abandonment of the U.S.A. and the well-known aerospace companies such as Rockwell, Boeing, Grumman, and Lockheed. COTS is a program organized by NASA that offers support for organizations in order to fly cargo as well as potentially crew to the ISS along with future Low Earth orbit (LEO) targets. COTS also aims to improve jobs, design, and research. NASA provides financial support to new ventures for commercial cargoes and crew transportation with COTS initiative in regards to the logistics necessities of the International Space Station (ISS) in the post-space shuttle era. In 2006, the American companies Rocket plane Kistler (RpK) together with Space Exploration Technologies have gathered funds worth \$485M from NASA for cargo as well as LEO human transportation services.

Since then, unfunded agreements with five companies have eventually been signed giving prominence to the accessibility of low Earth orbit (LEO) (Stone, Lindenmoyer, French, Musk, Gump, Kathuria, & Pickens, 2008: 192). NASA promotes the display of COTS to LEO through for-profit businesses. In 2006, NASA invested \$500M and shared it with SpaceX and (RpK). In 2007, NASA cancelled the deal with RpK which could not meet their certain mechanical and economic expectations. In 2008, NASA had an additional deal of \$170M with Orbital Sciences Corporation (OSC). The present paper seeks to address the COTS appeal of SpaceX and OSC in terms of promoting trustworthy as well as cost-efficient commercial transportation in order to contribute to LEO marketplace (Stone, D., Lindenmoyer, A., French, G., Musk, E., Gump, D., Kathuria, C., & Pickens, T. 2008: 192).

NASA has been allocating large sums of money on means of transportation some of which so far seem to have been failures despite their scientific successes. In that regard, the Constellation Program had to be cancelled as it was too pricey and burdensome. And yet in time, the investments and efforts put into have yielded convenience for the actual transformation of the organization as well as the U.S. space program by utilizing the innovatory as well as cost-efficacy of business entrepreneurs. Some cases of projects that they may engage in such as solar power satellites, space taxis as well as space elevators are also further examined (Pelton, 2010:78).

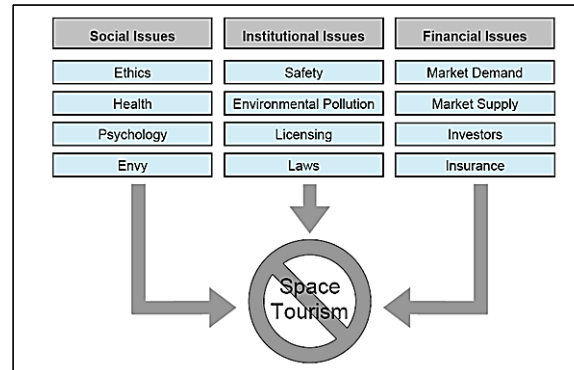
Generated a privately-held cargo transportation system for ISS in 2005, Commercial Orbital Transportation Services managed to meet a critical NASA requirement and indicated the possibility of crew transport. Moreover, COTS evoked a higher level of rivalry in the aerospace sector trying to lower expenses for space access. It, in a way, indicated that LEO could one day turn into the domain of the business sector more. Thus, NASA can channel its energy and limited assets into deep-space exploration. This study elucidates COTS providing essential data on its birth, regime with a focus on elements which assisted as well as burdened it during its lifespan of 8 years. It also reviews the concepts fundamental to its achievements (Lambright, 2015:23).

SpaceX is a pioneer company that provides customer experience in space. They aim to reuse space vehicles in order to reduce the harmful effects on the environment and the cost of space-launch. The company has 2 rockets named Falcon 9 and Falcon Heavy as well as a space craft called Dragon. Entering the space market first, the company has changed the paradigm with a series of historic milestones such as the first spacecraft from low Earth orbit (LEO) to return in 2010, transport cargo on May 2012 from the international space station - and regularly carry cargo since then. Lastly, in 2008, advanced Falcon 1 reached the Earth's orbit as a privately-built liquid-fuel rocket for the first time. Following that, in 2009, Falcon 1 Flight 5 sent a commercial satellite to Earth's orbit as a first privately-built liquid-fuel rocket for the first time. Afterwards, Dragon re-entered and returned from low Earth orbit in 2010. The Grasshopper was accomplished with a 744m flight, hover, and landing in 2013. In addition, Falcon 9 managed to reach Geosynchronous Transfer Orbit (GTO), and landed in the Atlantic Ocean. Thereupon, Falcon 9 carried 11 communications satellites to orbit. Coming back in 2015, the first stage arrived at Landing Zone 1 - the first orbital class rocket landing. Falcon 9 rocket set to launch Dragon to the ISS. In 2016, the first stage came back to arrive on the "Of Course I Still Love You" drone ship. On March 30, 2017, Dragon resupply mission succeeded in becoming the first commercial reflight to and from the ISS and also the first reflight of an orbital class rocket in 2017 (www.spacex.com/about).

The demand for Suborbital Space Tourism is forecast to increase in years to come (Otto, 2009: 47). A research conducted amongst 3000 Japanese people shows that the effect of prices on orbital tourism tend to alter the potential demand. It is possible that the growth of tourism services in the field of commercial space will also have a considerable contribution to this brand-new concept in the foreseeable future (Collins, Iwasaki, Kanayama & Okazaki, 1994: 578).

As costs are decreasing gradually, the increasing demand so far is most promising concerning the prospects of “space tourism”. And yet, high launching costs seem to lower the level of profitability. Improvements in reusable launch vehicles (RLVs) can ultimately give rise to an increase in demand for the tourism services in low Earth orbit (Collins, Iwasaki, Kanayama and Okazaki, 1994: 578). Goehlich (2014: 17) explains the term “space tourism” as a conception of paying consumers travelling to and outside of the Earth’s atmosphere. The research accentuates certain ethical, institutional, financial and environmental aspects of reusable launch vehicles (RLVs). Moreover, pollution caused by space tourism is also discussed in comparison to other forms of emissions. Goehlich, (2014:17) presents a framework for the key characteristics of space tourism. Entrepreneurs recognize and comply with these threats and opportunities in space industry in order to achieve their goals.

Figure 1. Possible hurdles and opposing forces to space tourism



Source: Goehlich, (2014:17)

Virgin Galactic aims to provide more access to this novel form of tourism in terms of brand-new kinds of customers, private individuals as well as newly established venture-backed businesses. For the realization of this goal, they offer regular and reasonable journeys on both orbital and suborbital routes with Space Ship Two, which is a reusable suborbital spacecraft. Corporate sustainability is afforded through a revenue stream of more than 650 purchased flights on SpaceshipTwo. The number of astronauts is doubled. The improvement of Launcher One, orbital launch vehicle for smaller satellites, provides satellite operators as well as producers in order to take their assets to space in a faster as well as reasonable fashion. The Space Ship Two suborbital program together with the Launcher One orbital program aim for the prevalence of space tourism (Pomerantz and Isakowitz, 2013). The study of Otto (2009:26) on the suborbital space tourism industry shows that there only exists 8 companies that seem to be in competition with one another, namely Virgin Galactic, Space Adventures, Benson Space Company, Space Access Society, Space Adventures, Rocket plane Limited, Starchaser Industries as well as Blue Origin.

The ultimate objective of space tourism is to turn it into a passenger service to space. In this regard, suborbital spacecraft are tested and improved. Open innovation activities are pursued by NASA on their website known as Innovative Partnerships Program for the benefit of citizens in terms of catching up with the latest improvements in space technology (Bolden, 2009: 4).

Generally speaking, the concept of space tourism tends to depend on various elements. With this in mind, the drives and decision-making processes of the customers have been surveyed amongst British residents in Southern England. Their perceptions of the kind of space travel (orbital/suborbital), the kind of launch as well as the model of the spacecraft, the positioning of spaceports, necessary trainings, time period, insurance, physical condition as well as prestige of the operating company turned out to be the aspects of utmost importance in an industry in which companies like Virgin Galactic, Airbus as well as EADS Astrium operate (Reddy, Nica, and Wilkes, 2012:1093).

Reddy, V. (2018:40) pays particular attention to the effects of change on the global aviation industry with regard to space tourism or commercial space travel. Two private travelers paid in order to travel around the Moon in late 2018 on SpaceX and over 1000 people for the suborbital journey with Virgin Galactic. With the participation of new players like India and China, space tourism will ultimately evolve into a potential negotiation strategy for mechanisms like Brexit in the UK as well as the European Space Agency. In the emerging era of space activities, space business offers brand-new areas and niche markets as regards tourism. Space commercialization revenues were thought to go up to \$200B on a yearly basis by 2000.

Organizations that are included in this field are IBM, RCA, McDonnell Douglas as well as Society Expeditions, together with countries such as the U.S., the U.S.S.R., West Germany, and Japan (Goodrich, 1987: 40). Space tourism refers to the idea of purchasers putting up the money for a journey in space. And yet, there are certain aspects to deal with such as the social aspect (for instance, "Is space tourism ethical?"), the institutional aspect (for example, "Does space tourism contribute to global warming more than other greenhouse gases?"), and the economic aspect (for instance, "Are there prospective entrepreneurs who would like to invest in space tourism?") (Goehlich, 2014:17).

There are three key perspectives to the commercial space tourism industry: 1) benefits it offers to various stockholders, 2) its feasibility 3) PR solutions for barriers it faces.

Once these issues are overcome, it is expected to not only offer considerable financial benefits but also maintain equilibrium between local and federal policy makers (Gibson, 2012).

4. The Stakeholder and Social Responsibility in the Space Industry

NASA is an organization that is authorized with The National Aeronautics and Space Administration regulations to activate a broad variety of "other transactions" which are usually referred to as Space Act Agreements (SAAs). NASA acts upon the institution's targets in line with the U.S.A. commercial and non-profit partners. Additionally, quarterly summary reports are systematically prepared in order to provide transparency (<https://www.nasa.gov/partnerships/about.html>). NASA Space Act Agreements promote an entrepreneurial ecosystem that ensures transparency, agility and innovativeness in partnerships. The space industry offers entrepreneurs many opportunities in which demands and improvements go hand in hand. Equipment and parts for spaceships, spacesuits, refueling stations, space shoes or solutions for health problems are some of the key elements that tend to attract entrepreneurs (Bolden, 2009: 6).

The potential threats in the industry from a microscopic view of entrepreneurship are as follows: technical risks, quick prototyping, differentiation in the industry, as well as obtaining financial resources and mentorship. For aerospace companies such as Boeing or Lockheed Martin, these threats are essentially the "bottom line" important aspects to be considered during the decision-making processes. In addition, new ventures tend to create a sense of synergy in the market. Entrepreneurship Working Group has examined the drives of space-entrepreneurs and listed them as follows: developing services for under-developed countries and distant communities, obtaining economic development, improving dual implementation technology, utilizing off-earth resources to have a better life on the Blue Marble, providing a platform for inspiration and the sharing of ideas, profiting financially, the strategic preventions against challenges which ultimately are used in determining short term targets (Wang, 2014: 34).

Goehlich (2009:25-26) explores the outsourcing strategies in Europe, the U.S. as well as Japan. There are certain governmental organizations such as European Space Agency (ESA) for Europe, National Aeronautics and Space Administration (NASA) for the USA as well as Japan Aerospace Exploration Agency (JAXA) for Japan, all of which outsource rockets, satellites, and manned missions. What's more, JAXA is also privatized and outsources some of its maintenance activities and commercial launcher operations to private companies. Many launch service providers tend to make investments in modern or advanced launch vehicles like Delta IV. In addition to that, Anglo-Saxon countries tend to target maximum shareholder value. Japan has a rather different shareholder approach vis-à-vis Europe.

5. Conclusion

ISRO, ESA as well as NASA are some examples of the space agencies of governments around the world. The commercial space and space transportation industries are stimulated through various programs and funds. In this regard, the funding of the industry is fundamentally supported by governments together with organizations as contractors of public programs. For example, NASA awarded SpaceX \$1.6B for Commercial Resupply Services (CRS) – a series of contracts, and \$2.6B for Commercial Crew Transportation Capability (CCtCap) contracts and additionally American astronauts (www.spacex.com/about).

SpaceX offers competitive pricing for its Falcon 9 as well as Falcon Heavy and has some special offers. Moreover, it provides crew transportation assistance to commercial consumers looking for ways to send astronauts beyond low Earth orbit. Established in 2002, it has contributed to space technology beyond imagination with (www.spacex.com/about).

Evaluating the new trends in the industry, the companies certain sectors such as production, launch service providers as well as satellite operators ascertain that there is a strong sense of rivalry. What's more, the market in Europe is rather fragmented and shows lower demand (Vernile, 2018: xxx).

Researchers claim that the pursuit of opportunities is the most significant component of entrepreneurship. Entrepreneurs can utilize formal network structures including establishing contacts with support agencies or through membership of trade associations. Relationships with government agencies can also facilitate legitimacy and status (Shepherd and Wiklund, 2005:47).

Entrepreneurs consider to devise a model that can ultimately realize their vision. Wiklund and Shepherd (2003: 1313) accentuate the significance of knowledge-based resources in terms of corporate performance and entrepreneurial intention.

Space industry in the United States of America is not only innovation-oriented but also globalized (Cornell, A. (2011), 1123). New companies pay particular attention to attuning their products to the ever-changing conditions. Since the commercialization of space the industry, there has been a mix of emerging industrial and consumer markets so far. The developments in space telecommunications have, in a way, have triggered the idea of commercial space business (Kreisel and Lee, 2008: 255). In general, entrepreneurs tend to have various distinguishing backgrounds and demographic characteristics. The performance implications based on the knowledge of a small business in terms of resources differentiate from discovery and exploitation of opportunities. In this regard, the space industry offers a high level of potential. As a matter of fact, the space industry has evolved from the satellite industry and hence is expected to go through further changes in the future. Although some new ventures have managed to achieve a certain level of market and financial success, they have not actually made a big change in the industry as yet (Kreisel and Lee, 2008: 254). The collaboration of private and public institutions is the backbone of the space the industry with regard to future technological advancements in order to attain a higher level of both commercial and social benefits.

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