



Space Tourism: A new way of tourism not so distant in time or space

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Master in Management

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“It is enough a slight commitment to venture beyond the Earth - in what following Columbus we could call ‘the company of the stars’ - so it will provide a marked human presence in other worlds, the pleasure to participate in the Cosmos” (Sagan, 2014)

1. Introduction

I will begin this project by briefly developing the concept of tourism. I will provide information to observe and understand the magnitude of this sector at a global level. Later I'll explain why I chose a theme so unique and innovative, as the idea and the objectives of this project arose.

In this way, I will initially try to make a small reflection of the concept, importance and evolution of this sector worldwide and then explain how space tourism emerged, the projects that currently exist and recognize the different positive and negative aspects that entails betting on this type of tourism.

- *Project justification and objectives*

This idea arose from the Final Degree Work when I investigated about astronomical tourism. In those moments I found information about some new projects with the purpose of offering trips out of the terrestrial atmosphere.

In this way, I found several companies that wanted to dedicate their time and money to these types of trips and were investigating and creating new projects to be able to realize them in the future.

Until a while ago, space exploration was reserved only for the protagonists of science fiction movies or professional astronauts. But little by little it becomes a concrete possibility of tourist exploitation and at the same time, a challenge for tourism professionals.

There are some companies that are trying to create the necessary infrastructure, train people to make those trips, and this work tries to show the first steps of this type of tourism in the commercialization of these new services.

The purpose of this research is based on several objectives:



Provide information and knowledge about the most important aspects about a type of innovative tourism and unknown by the majority.



Investigate which are the main companies exploiting this idea and how it's the final product.



Discover the current situation of space tourism, making an internal and external analysis.



Finally, find out if this type of tourism is viable.

Therefore, I found it very interesting to deepen in a type of tourism so little known since it's the objective of this project to discover if it's currently viable or if not, under what conditions would be viable space tourism and to provide essential knowledge about the key elements of space tourism.

- *Methodology*

To elaborate this final work, I have begun with a bibliographic review that, identifying some of the key elements of the phenomenon, allowed us to approach space tourism with greater guarantees. In this way, for the appropriate elaboration of this work it is necessary to deepen into different theoretical factors that influence this type of tourism.

At the beginning, I will try to approach the tourism environment in general terms and, subsequently, we will carry out an analysis on what is considered space tourism, its evolution and typology. Then I will expose the different existing initiatives which are betting on an innovative tourism and I will try to explain the characteristics of the service they want to offer.

In the last phase, to recognize the positive and negative factors of space tourism, I will discuss the advantages and disadvantages to later elaborate a SWOT analysis. This will serve to know the current situation in which we can find space tourism in general, analyzing its internal and external characteristics.

2. Theoretical considerations on Tourism

According to the World Tourism Organization (2016), an ever-increasing number of destinations worldwide have opened to, and invested in tourism, turning it into a key driver of socio-economic progress through the creation of jobs and enterprises, export revenues, and infrastructure development. Over the past six decades, tourism has experienced continued expansion and diversification to become one of the largest and fastest-growing economic sectors in the world. Many new destinations have emerged in addition to the traditional favourites of Europe and North America. Tourism has boasted virtually uninterrupted growth over time, despite occasional shocks, demonstrating the sector's strength and resilience. International tourist arrivals have increased from 25 million globally in 1950 to 278 million in 1980, 674 million in 2000, and 1186 million in 2015.

This data shows that global tourism sector continues to grow strongly and appears as a key driver to the global economy. World Tourism is closely related to development, this dynamic has made tourism a key sector for the development of society. In addition to the creation of jobs that this sector entails, it generates resources for heritage protection, revitalizes local custom, etc.

Therefore, tourism brings positive aspects but there also negative points. Mass tourism can sometimes provoke a feeling of rejection (by not respecting sacred places), offer a type of precarious employment, create environmental impact and sometimes even create loss of identity of the destination. But despite all negative aspects that tourism entails, we must try to reduce these factors and try to raise the positive aspects so that the tourism remains a key sector in the world economy.

One way to try to improve those negative aspects is diversification. The diversification of tourism with seasonally adjusted, sustainable, and innovative services could reduce some of the negative factors.

To start, it would be very interesting to know a little about tourism as a concept and how it emerged and developed over the years. In this way, I will begin by giving some definitions of tourism and later we will see some of its evolution.

- *But what does the concept of Tourism mean?*

Tourism is a social, cultural, and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (which may be either tourists or excursionists; residents or non-residents) and tourism has to do with their activities, some of which imply tourism expenditure. (United Nations World Tourism Organization, 2008)

This definition of the United Nations World Tourism Organizations perfectly shows the meaning of this concept. Tourism has several types of purposes whether leisure or work and another important requirement is that the place where it takes place is a different place than usual. In this way, tourism is about traveling to places unusual for travelers and in addition that trip should be done in less than a year.

In the following table we can see the different reasons why tourists are interested in visiting a destination.

Table 1. What move the tourist to visit a destination?

Aspects	Reason	Type of tourism
Rest Leisure	Need to relax	Holiday Tourism
Cultural	Know different places	Cultural Tourism
	Prestige and personal status	
New experiences	Expectations of adventures	Specialized Tourism
More information	Scientific interest	

Source: Adapted from Segittur, 2017¹

¹ Segittur (2017). *Turismo*. [pdf] Available at: <<http://www.segittur.es/opencms/export/sites/segitur/.content/galerias/descargas/proyectos/Industria-del-turismo.pdf>>

In the previous table we see that there are several reasons why someone wants to visit a destination. The tourist can travel for the need to relax, to forget about stress and in that case, we will talk about holiday tourism. In another case, a tourist can try to know and understand the different cultures, and, in this case, we talk about cultural tourism. Also, some people try to demonstrate their economic capabilities by going to the other side of the world just to make other see their status. Another group of tourists is motivated to travel to other destinations, to live new adventures and to get out of the daily routine. In this case, this type of tourism is specialized because those people want to experience new adventures. Finally, another reason for the tourist to travel to other destinations is to discover new or more information. So, this scientific interest is what makes the traveler move.

Tourism is a social, economic and a cultural phenomenon and for many years has experienced a spectacular evolution worldwide. During the last years, we have been able to observe a variation in the preferences of the tourists when choosing a destination. There are several factors that have influenced this change. In the following paragraphs I will explain why and how tourists have evolved.

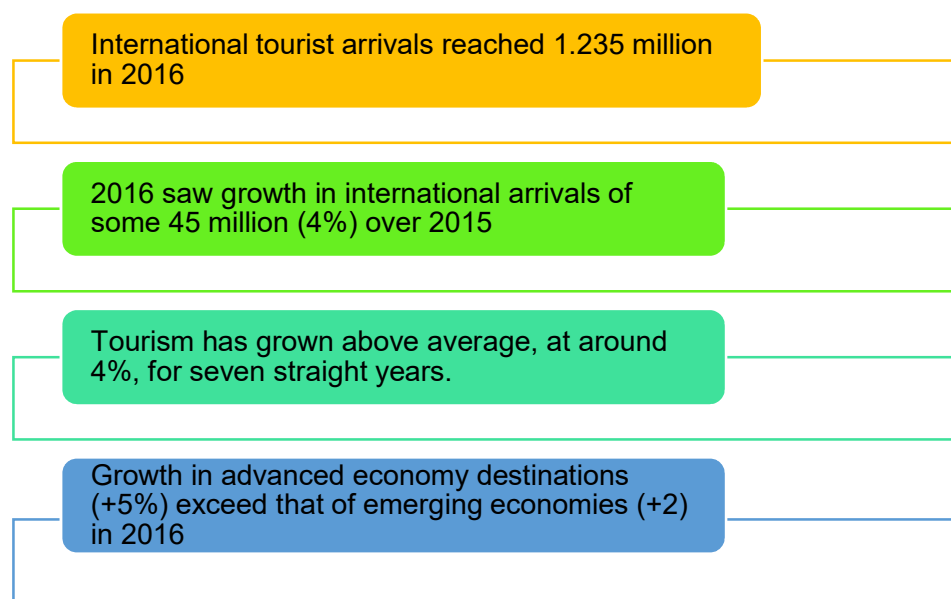
Currently there are changes in trends in tourism demand, as tourists increasingly want to participate actively and be the protagonist of multitude of experiences. In this way, experiential tourists obtain more personal satisfaction by being involved in all the processes of choice and the planning of their activities. In this way, tourism has undergone a change, in which tourists themselves want to participate in a less crowded leisure activity. It is about looking for unique experiences in which the tourist can interact.

Under these tourist dynamics, traveling in deep space, is a phenomenon that can take on an interesting role in view of the need for tourists to de-standardize and search for authenticity. Space tourism becomes increasingly recognized worldwide as it attracts a type of tourism that seeks new and unique adventures.

According Annual Report UNWTO (2016), tourism is a sector which benefits in so many ways and influence a range of other sectors. It is a sector that grows continuously, as we can see in Figure 1. This data show as that nowadays worldwide we have more than 1.2 billion international tourists and in 2030 they predicted that will reach at 1.8 billion.

Therefore, we can say that tourism offers spectacular socio-economic benefits and that will provide opportunities to other sectors. Another interesting data from this report is that we can observe that in developed countries tourism grows more than in emerging countries. However, we can say that tourism is a sector of hope, because offers so many opportunities, economic and social benefits and finally a better future for all of us.

Figure 1: Tourism in numbers

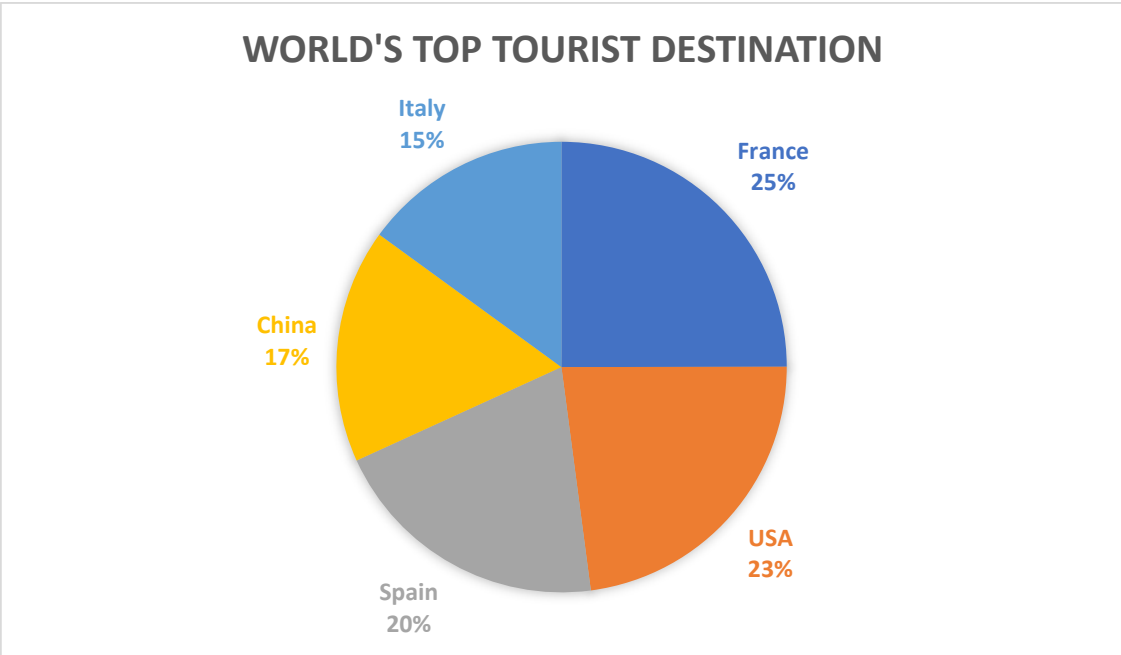


Source: Adapted from Annual Report UNWTO, 2016²

As we can see in the chart below, Spain is in third place in the world in tourists received during 2015. In front of Spain, it is first France and second the United States. Undoubtedly, Spain is in a great position worldwide. We can also mention the great importance that this sector has in the Spanish economy. According to EuropaPress (2017), the tourism sector accounts for 16% for the Spanish Gross Domestic Product. Therefore, tourism is one of the engines of growth in Spain. We must keep in mind that all the times and continue to develop in this sector to continue growing.

² World Tourism Organization (2016). *Tourism Highlights*. [online] Available at: <<http://www.e-unwto.org/doi/pdf/10.18111/9789284418145>>

Figure 2: World's top tourist destinations / International tourist arrivals 2015



Source: Adapted from Annual Report UNTWO, 2016³

³ World Tourism Organization (2016). *Tourism Highlights*. [online] Available at: <<http://www.e-unwto.org/doi/pdf/10.18111/9789284418145>>

3. Space tourism

There are different possible definitions of the concept of space tourism. We can understand space tourism as those “commercial activities offering customers a direct experience of the space environment” (Salt, 2018), via sub-orbital and orbital flights and finally deep-space flights by private companies.

While the subject itself shows the power and importance of imagination, and by extension futures thinking in general. Tourism and the study of tourism has become explicitly such a multi-dimensional field where globalization directly confronts locality and identity. However, it is a field in which future defies history, futurism confronts tradition, unprecedented wealth co-exists with abject poverty, and imagination bends reality. For these reasons the study of tourism begs insights from many disciplines and illustrates many of the challenges for planning and policy. (Cole, 2015)

- *When Space Tourism emerged?*

The exploration of the cosmos has been always in the imagination of all. The humanity always needed to explore the unknown and travel to new exciting places. This is the guide for companies like SpaceX, Virgin Galactic, Blue Origin, etc. to discover and offer new opportunities for the tourists to experience space for adventure and recreational activities.

“Space travel emerged in the conjunction between the human craving to fly in space and reach out to the stars, and the modern innovative space technologies driven by military and political interests. A ‘space race’ between the US and the Soviet Union emerged, marked by such major events as Yuri Gagarin’s first orbital flight in 1961, and the American 1969 Apollo 11 landing on the Moon, which was the first time a human set foot on another celestial body” (Cohen, 2017)

All those events made huge expectations in the humanity, that someday it will be possible to make space travels. But, to accomplish this “mission” seems to be very distant (remote) in time or space, because after the Apollo programme nobody tried to explore outside the terrestrial orbit. Another important aspect are the failures that organizations like Nasa suffered trying to send rockets into space and companies like Virgin Galactic also crashed in 2014.

“In 1969, we were able to go to the moon, and the space shuttle could get to low Earth orbit. Then the space shuttle was retired. However, that trend line is down to

zero. What many people do not appreciate is that technology does not automatically improve; it only improves if a lot of strong engineering talent is applied to the problem. There are many examples in history where civilizations have reached a certain technology level, fallen well below that, and then recovered only millennia later.” (Musk, 2017)

As we have seen, space exploration has experienced their highs and lows for many years. Currently, these private companies do not only think of making trips to the Moon or Mars, but entrepreneurs like Elon Musk wants to colonize the red planet and others see the opportunity to create space hotels where tourists can stay longer. Therefore, they are trying to find numerous ways to reach a total tourist use of this new form of tourism.

But when and how did you create this idea to sell and create this type of service?

Space tourism is a type of tourism of recent development that began to gain strength when the American billionaire Dennis Tito took off, with 60 years old, aboard the Russian spacecraft Soyuz with two astronauts of the same nationality on April 30, 2001. (Livingston, 2002) From this first trip, the doors of a multi-million-dollar business were opened in the minds of the world's great entrepreneurs.

But Dennis Tito was not the only one who travelled to space paying an exorbitant amount of money. Four other people were able to pay that amount of money: The South African Mark Shuttleworth, Greg Olsen, and Charles Simonyi. As wealthy business men, they could afford the 20-35\$ million to make that trip. So, this type of tourism is offered but only for some people capable to pay for it.

Another example of commercialization is Space X. As a space tourism agency, it will take two people to the moon this year. They will be able to travel around the Moon. This is very important since it gives the human being the opportunity to return to deep space for the first time in 45 years. (El Confidencial, 2017)

Although this type of tourism is unrecognized since it is not currently a product offered to the masses, there are multiple researchers who have tried to publicize this type of tourism.

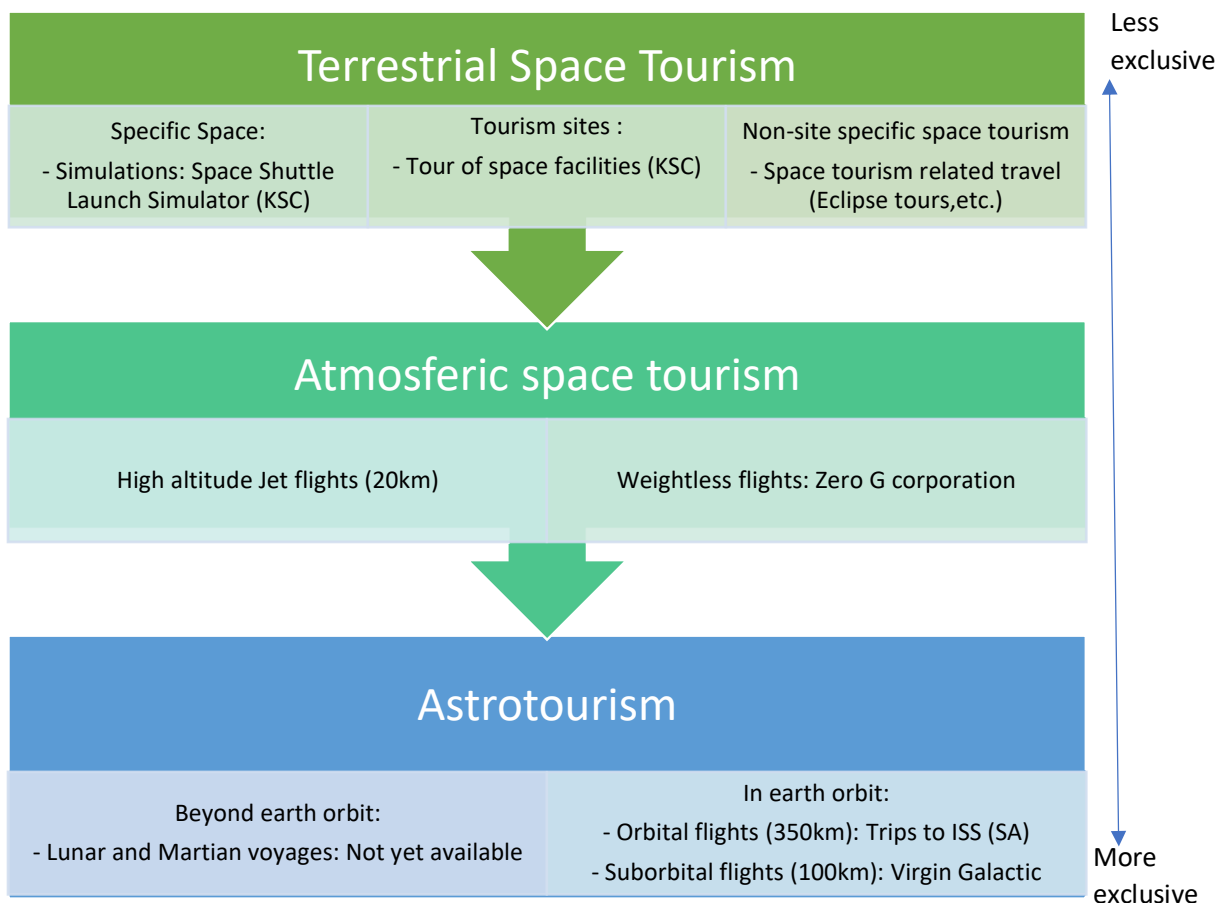
“Therefore, the main problem for the commercial space tourism industry is its limited ability to attract the private investment needed to lower cost of access to space as well as to mobilize public and private sector support to increase the capacity to accommodate commercial passengers in the space.” (Reddy et al, 2012)

Despite all these events, companies like SpaceX, Virgin Galactic, Mars one, etc. are trying to increase again those expectations to travel beyond the unknown at a lower price.

Next, for a better understanding of the different types of space travel, I will create a small outline with the different typologies related to space tourism. We could say that for example tourism to venues such as NASA, Kennedy Space Center, etc., it is also about space tourism but in this case terrestrial space tourism. In this way, I see it necessary to make a brief explanation of the different possibilities of space tourism.

- *Typology of space tourism*

Figure 3: Opportunities in space tourism



Source: Adapted from Cater, 2009⁴

⁴ Cater, C. (2009). Steps to Space; opportunities for astrotourism. *El Sevier*, [e-journal] 31(6), pp. 838-845. <http://dx.doi:10.1016/j.tourman.2009.09.001>

In this figure, I indicate all the forms or types of space tourism that exist today. We started with the Terrestrial Space Tourism. In this type of tourism, we can consider the trips that are made to the Kennedy Space Tourism, simulators and include the tours that are made with astronomical motif (eclipse, passage of a comet, etc.).

The second group, Atmosphere Space Tourism, in this case tourists travel at high altitude in jets and in weightless flights to experience the sensation of zero gravity.

Finally, the last group is Astrotourism. Currently, trips beyond Earth orbit cannot be made. Therefore, these services aren't offered but as you will see in the following pages, the company Space X is trying to create the infrastructure to be able to offer soon this type of trips to the Moon and Mars. Within the tourism in the Earth orbit we can make a division between trips in the orbit (350km) which are the trips offered by Space Adventures to the International Space Tourism and the suborbital trips (100km) offered by the company Virgin Galactic.

As you can see in the right part of the figure, I indicated by an arrow how exclusive these trips are from least to most. As you can understand, a trip to the Kennedy Space Center is less exclusive (cheaper) than trips for example to the International Space Station.

In the following section, I will try to describe briefly the different private and governmental initiatives that try to send humans into space.

- *Exclusive tourism*

The product of tourism is not a tangible good but an experience. It is a highly competitive environment and tourist's awareness of different places is limited. It is necessary for a tourism destination to have a strong brand and an appealing image that differentiates it from the other places. (Gartner, 1986)

Exclusive tourism experiences create lasting memories through interactive experiences. Travellers actively participate. They like to feel as if they have been given a highly unique, customised, personal tourism experience. Nevertheless, uniqueness means something different to everyone. What is unique to one person is not always unique to another. This means exclusive experiences are based purely on emotion. (Ministry of Foreign Affairs, 2018)

These space trips are very expensive so it's an exclusive type of tourism since the price ranges from 200,000 dollars. Currently the cost of the space trips is very high, but the price is expected to drop because the more trips will be organised, the lower the costs and therefore lower the price as well. More companies are signing up for this technological career to enter in this expensive niche.

There are many people who have already booked a seat in Aurora Station (deposit of \$80.000), in Blue Origin and Virgin Galactic, in this way although at present it's a very high price, many people think that the price matches the experience they will get from this amazing trip.

But this exclusive type of tourism will not prevent that for example, the private foundation Mars One wants to make a reality show to be able to afford their project. This may seem a little exorbitant, but this company wants that after choosing the last 40 aspirants, that people choose from their homes the final 4 astronauts (televoting). The funds will help the company to pay the mission to the red planet. (Griffin, 2015)

Another way to travel to space is being sponsored. An example is on October 14, 2013, Felix Baumgartner broke the world records for the highest altitude of a manned balloon flight, parachute jump from the highest altitude, and greatest free fall velocity. This was a collaboration with Red Bull (the energy drinks brand) who paid and covered this moment.

Therefore, even if it is a very expensive type of tourism, some try to find a way to afford these projects (be it through sponsorship, tv reality-show, etc.).

4. Current projects

4.1 Initiatives

To see it at a glance, I think it is necessary to make a simple division to be able to differentiate the different organizations that try to send humans to space. In this way we can differentiate between private and governmental companies and the type of the trip that tourists or scientists will make.

Table 2: Type of organizations

Organization	Type of organization	Who will travel	Where
NASA	Governmental	Scientists	Mars
Mars One	Private	People selected	Mars
Virgin Galactic	Private	Tourists	Earth Orbit
SpaceX	Private	Tourists	Mars
Blue Origin	Private	Tourists	Earth Orbit
Orion Space Hotel	Private	Tourists	Earth Orbit

Source: Adapted from Nasa, 2017⁵; Mars One, 2016⁶; Virgin Galactic, 2018⁷; SpaceX, 2018⁸; Blue Origin, 2018⁹ and Orion Span, 2018¹⁰

In this section, I will try to make a brief explanation about the different projects that are currently under development to travel to space. Thus, as can be seen in the previous figure, there are three companies that are interested in offering trips to orbit (Virgin Galactic, Blue Origin and Orion Space). The governmental organization NASA wants to send scientists to Mars and the private foundation Mars One wants through a selection to choose the astronauts who will colonize the red planet. But, only one company is interested in offer tourist trips to Mars: SpaceX.

⁵ NASA (2017). *What is NASA?* [online] Available at: <<https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-nasa-k4.html>>

⁶ Mars-One (2016). *Mars One presents an updated mission roadmap.* [online] Available at: <<https://www.mars-one.com/news/press-releases/mars-one-presents-an-updated-mission-roadmap>>

⁷ Virgin Galactic (2018). *Who we are.* [online] Available at: <<https://www.virgingalactic.com/who-we-are/>>

⁸ SpaceX (2018). *About SpaceX.* [online] Available at: <<http://www.spacex.com/>>

⁹ Blue Origin (2018). *New Shepard.* [online] Available at: <<https://www.blueorigin.com/new-shepard>>

¹⁰ Orion Span (2018). *Space as a service.* [online] Available at: <<https://www.orionspan.com/space-as-a-service>>

- NASA

Nasa stands for National Aeronautics and Space Administration. This organization started in 1958 as part of the US government. They try to explore and discover all the matters about science and innovation technology related with space. (NASA, 2017.)

We all know this organization because it was what allowed to a human to reach the Moon. In addition to all the mission that NASA has scheduled for the following years, one of them is the mission to Mars. That means that they are currently sending different instruments to know the red planet inside and out. For example, they have sent the InSight vehicle to discover what it is below the surface of the planet. It is a geophysical instrument that will measure seismology, temperature, etc. Also, they will send in August of 2020 and arrive in February of 2021 a Rover to be able to discover the possibility of habitability of the planet. (NASA, 2017.)

This organization intends to send humans in the year 2030. Therefore, they are currently trying to discover all the intricacies of the planet and then be able to send humans to explore Mars. It must be mentioned that being a government organization they will not send tourists but will send scientists to know everything necessary on the planet.

- Mars One

The mission of these company is to establish a human settlement on Mars. This mission became well known a couple of years ago as they made a public appeal to people who wanted to participate to colonize Mars. "More than 202.586 people signed up for the casting to be one of the chosen ones for the one-way trip to the Red Planet. Subsequently, a total of 660 candidates managed to reach the second phase and finally 100 people were selected for this great event worldwide. Mars One is a private and television project as it seeks to finance itself by converting the stay on Mars into a reality show." (Europa Press, 2015)

Investors from around the globe could be part of the Mars One's mission to Mars and to literally own a piece of this historic venture. On their website www.mars-one.com people can donate one or monthly a sum of money from 2\$ to 200\$ per month.

Figure 4: Mars-One Roadmap



Source: Adapted from Mars-One, 2016¹¹

The status of Mars One mission is that they still must overcome many challenges to make this trip. Therefore, there is no close date for the realization of this mission. They don't have the precise technology to successfully carry out the trip to Mars and they also need more money to continue investigating how to make this trip safely. They are trying to discover the technological issues of their vehicle: Mars Transit Vehicle. In this way, this private company is looking for more investors to reach its goal: colonize Mars.

¹¹ Mars-One (2016). *Mars One presents an updated mission roadmap*. [online] Available at: <<https://www.mars-one.com/news/press-releases/mars-one-presents-an-updated-mission-roadmap>>

In the Figure 4, “Mars-One Roadmap”, we can observe the chronology of the mission that the company wants to carry out in the coming years. We can see that by the year 2031 they would send the first team to colonize Mars. But the delays in several components of this mission has delayed the timeline. Therefore, it is unknown if they will be able to achieve these objectives within the stipulated time.

- Virgin Galactic

“Virgin Galactic is a commercial space line for Earth. Their objective is make space accessible, inspire future generations and make it possible to see the beautiful planet we call home from a new perspective.” (Virgin Galactic, 2018)

This private company offers tourists the opportunity to enjoy a unique experience such as being able to observe the land from an excellent location. In the next photo we can see an amazing view of the Earth and Moon, is what a tourist who travels with Virgin Galactic’s ship will be able to enjoy.

“The cost for individuals to fly on a manned suborbital spaceflight was initially projected at about US\$200 000 with over 200 private persons having made an advance payment to fly on SpaceShipTwo in the case of Virgin Galactic. This is expected subsequently to drop to about US\$ 50 000 with roughly 16 000 passengers interested to fly in 2021, according to the ‘Space Tourism Market Study’ conducted in 2002 by FUTRON, a US-based space consultancy firm”. (Gálvez & Naja-Corbin, 2017)

All the efforts of these new companies lie on trying to make a space tourism market. They want these trips to enable These trips to space could enable routine programs with less costs for the company and therefore less price for the final tourist.

Besides being able to enjoy the spectacular images of the Earth, astronauts will leave their seats to also experience the weightlessness. Currently 700 people have paid to be able to make this trip in SpaceShipTwo. These astronauts are from more than 50 different countries, with an age between less than 10 years and more than 90 years. The cost of a ticket to have an excellent view of the planet is 250.000\$ according to The Sun. (The Sun, 2017)

- SpaceX

This company is founded by the great business man Elon Musk, he has a very large trajectory in the business field and he have a dream: TO COLONIZE MARS.

But firstly, who is Elon Musk? Elon Musk is a South African- born American entrepreneur and businessperson who founded X.com in 1999 (which later became PayPal), SpaceX in 2002 and Tesla Motors in 2003. Musk founded Space Exploration Technologies Corporation, or SpaceX, in 2002 with the intention of building spacecraft for commercial space travel. By 2008, SpaceX was well established, and Nasa awarded the company the contract to handle cargo transport for the International Space Station- with plans for astronaut transport in the future- in a move to replace NASA's own space shuttle missions. (Biography. Com, 2018)

To understand better how this company has revolutionized the aerospace career I will do a brief timeline:

Figure 5: Timeline

- ✓ FALCON 1:
 - In September 2008 SpaceX became the first company to launch a privately developed liquid fuelled rocket to orbit.
 - Retired after the fifth flight to be succeeded by Falcon 9.
 - This rocket costed 90 million dollar and it had 5 launches.
- ✓ FALCON 9:
 - First flew in June 2010. Retired in 2013
 - The project costed 300 million dollar and the cost per launch was between 54-59.5 million dollars.
- ✓ FALCON V1.1:
 - The first launch was in September 2013.
 - Attempted 3 landings but none landed.
 - Cost per launch 56.5- 61.2 million dollar.
- ✓ FALCON 9 FULL THRUST (FT):
 - First launch in December 2015
 - First version to successfully land, both on land and sea.
 - Cost per Launch 62 million dollar.
 - It made 24 launches and it didn't failed once.
- ✓ FALCON HEAVY:
 - The most powerful rocket currently in operation.
 - It launched the 6th of February in 2018.
 - Is SpaceX reusable heavy lift vehicle.
 - The first launch land it the two boosters on land at LZ-1 and the core booster on the drone ship OCISLY.
 - The cost per launch is 90 million dollars.

Source: Adapted from SpaceX,¹² 2018

¹² SpaceX (2018). *About SpaceX*. [online] Available at: <<http://www.spacex.com/>

Figure 6: The two boosters landing



Source: Libertad digital¹³

In the figure 6 we can see how the Falcon Heavy's side boosters returned and landed successfully. The Falcon Heavy send cherry red Tesla roadster to the Space.

This company accomplished to land its rockets back on earth to reuse them. These means that in the future the costs of the trips can be cut out dramatically. But it also must be mentioned that it wasn't a total success since the Falcon Heavy's main core didn't successfully return.

But why is this achievement so important?

It is the first time that such a powerful rocket arrives outside Earth's orbit and boosters also return to Earth and can be reused in other projects. It should also be mentioned that this attempt to collect three rockets is so that soon they can create a rocket with all those engines so that it has more power to reach. They had this idea with the philosophy of using relatively many smaller engines so that a single engine failure has minimal impact on the mission.

Elon Musk and his team are trying to create a bigger rocket than Falcon Heavy to realize their dream of colonizing Mars. This rocket it will be called BFR (big f*cking rocket)

¹³ Libertad Digital (2018). "El cohete del Falcon Heavy que no logró aterrizar se quedó sin combustible". [online] Available at: <<https://www.libertaddigital.com/ciencia-tecnologia/ciencia/2018-02-14/el-cohete-del-falcon-heavy-que-no-logro-aterrizar-se-quedo-sin-combustible-1276613894/>>

But in addition to trying to inhabit the red planet, Elon Musk also wants to make an impact on trips from land to land. In a presentation, he explained that in addition to using the BFR rocket to reach Mars, he also wants to be able to take humans from one point to another on the planet in 30 minutes. He plans to send people in “megashuttles” with over 100 people on board for 200,000\$. (Musk, 2017)

In the following table we can see how he wants to transport humans at a speed and time that are spectacularly reduced. But, data on how much this type of trip would cost is not yet on the table.

Table 3. BFR, land to land project

Route	Commercial Airline	Time Via BFR
London to Hong Kong	11 hours and 50 minutes	34 minutes
New York to Paris	7 hours and 20 minutes	30 minutes
Los Angeles to London	10 hours and 30 minutes	32 minutes
Sydney to Singapore	8 hours and 20 minutes	31 minutes
Bangkok to Dubai	6 hours and 25 minutes	27 minutes

Source: Adapted from SpaceX, 2017¹⁴

- Blue Origin

“Blue Origin's goal is to lower the cost of spaceflight to enable markets for exploration. Blue Origin is outwardly ambitious and outspoken about its long-term commitment to spaceflight. In 2011, Blue Origin conducted a test-flight of a vehicle prototype for safely sending and returning three passengers into suborbital space.” (NASA Office of the Chief Technologist, 2014)

According Leanners Magazine (2013), the founder and CEO of Amazon, Jeff Bezos, has been able to interpret better than anyone the changes that the Internet has been gradually introducing in the social and buying habits of consumers, to the point of turning your company into the undisputed reference of electronic commerce, a market still in its infancy, which will undoubtedly continue to play a large part of this century. Jeff Bezos himself founded Blue Origin in 2000, a company that aims to be a revolution in aerospace tourism.

¹⁴ SpaceX (2017). *Making life multiplanetary.* [pdf] Available at: <http://www.spacex.com/sites/spacex/files/making_life_multiplanetary_transcript_2017.pdf>

The objective of this company is to develop a new rocket called New Glenn. This rocket is reusable and will launch people to low Earth orbit and beyond. They want to build all the infrastructure needed to send into the space tourists, provide an innovative trip and an important key factor is to be affordable. An important milestone achieved by this company is that with the rocket New Shepard, which is a reusable, they have managed to reach the space five times and return untouched in the land. This company wants to offer in the future orbital trips and trips to the Moon with technology already used and always under the eyes and help of Nasa. (Bretton, 2017)

Therefore, as we have seen in the previous sections, there are the companies that are betting in a type of tourism currently little known to the masses but in the not distant future could be a reality.

- Orion Span Hotel

Aurora Station will be the first luxury space Hotel in orbit 200 miles above the Earth's surface. This station will have luxurious accommodations for 6 people. Two of them will be the crewmember (ex-astronauts) and 4 guests. This Space Station will be launched in 2021 but will start to receive tourists in 2022. This authentic astronaut experience will take 12 days and the tourists will enjoy different experiences like zero gravity, watch the aurora borealis from above, grow food in space, etc. The price of this unique adventure will start at \$9.5 million/ person. (Orion Span, 2018)

The tourists will have to perform a strict training for 3 months to be able to make this trip. They will take online courses and on-site training in Houston. In this way they will travel prepared to be able to endure both physically and mentally such a demanding trip. At the end of this training they'll receive the Orion Span Astronaut Certificate from the company. Currently the company is requesting an advance of \$8000/person refundable. Their plan is to expand the Station as the demands grow and also to sell "space condos" and the owners can live in vacation or sublease their modules. (Lunsford, 2018)

Therefore, their mission is to build and sustain human communities in Space accessible to all of us.

In the short term it is not accessible to all of us since the price of the trip is very high, but as it has been observed previously, the bigger the station and more stays can offer, cheaper will be in the future.

In this way, not only there are companies that want to send tourists into space with a short trip to the earth horizon, go to the Moon or Mars, this company wants to make a hotel where guests can enjoy living like an astronaut of the ISS for twelve days.

Also, they want to sell small “condos” (price is not determined) so the owners can live there during vacation and they could rent those condos, who knows if it can be a Space Airbnb someday.

As we can see there are several companies with the aim of continuing to develop to offer services such as space travel and inhabit a new planet. The current investment by private companies in this innovative sector and the investment by the United States government make this type of tourism not only an illusion but a possible service in a short-term.

4.2 Definition of the service

- Business characteristics

As I mentioned before, these companies are focusing on developing themselves technologically, constantly innovating to offer a unique service to tourists. This service requires new capabilities but also existing capabilities to offer trips at “low” price and at “low” costs. The intention of these companies is: to find the way in which this trip is profitable for them.

For example, in the case of BFR (SpaceX), in the travels of Earth-to-Earth, they ask if the expense in this type of trip will not be greater than the income. But their intention is that for example when a commercial plane makes a one-way trip from Spain to Australia in 19 hours and 42 minutes, this company could make the same trip more than 25 times in the same time.

Developing these new products and services, the goal is to open new markets for space experiences and industrial activity. These private companies are trying to push the technological boundaries to offer different types of services not only for the tourists. This technology it can be used also for the military and communication.

For example, the rocket Falcon 9 of SpaceX, sent on February 22 the first Spanish spy satellite in orbit. This satellite has many purposes of use: intelligence applications, cartography, border control, assessment of natural disasters, urban planning and territory planning, environmental observation, and other scientific purposes. (El español, 2018)

Another example of the use of these rockets is the sending of 10 Iridium satellites to improve communications on Earth. Iridium enables real time connections between people, organizations, and assets to and from anywhere. (SpaceX, 2017)

In this way, these innovations towards the aerospace career aren't only used to send humans to space but are also used for different types of business. As you can see in the previous examples, SpaceX has contracts with several private and public companies to send military and communication satellites. This service offered provides the money to be able to finance the research to offer trips to Mars accessible to everyone.

Figure 7: Visit Mars posters



Source: SpaceX¹⁵

Speaking of future trends, we must consider the budget since creating this type of service from zero is a huge expense for companies and depend on current technological advances. They must keep in mind that every minute advance more not only in technology but in many other subjects. These companies have the need to take advantage of the latest technology as they must constantly find solutions. It is very complex process because as we already know this type of service aren't yet commercially available.

In this way, numerous factors must be considered so this unique type of trip can be carried out. It should be noted that is currently unknown how the trip offered to the final customer

¹⁵ SpaceX (2018). *About SpaceX*. [online] Available at: <<http://www.spacex.com/>>

will be. We don't know how the final product offered by these companies will be. But depending on the service offered for example, it will not be the same to send people to see the horizon of the Earth or send them to Mars.

Therefore, these packages will be different. As I mentioned above for the stay at the Aurora Station the price will include in addition to stay, training, activities, etc. But we still have no knowledge what SpaceX Will include in the price mentioned above to go to Mars all the necessary services or some services will be optional.

In this way, I think it is necessary to mention some of the services that this company should include in the package:

- Medical and psychological analyses
- Training in Earth
- Learn to use the launchpad
- Safety training
- Air, meals, and life support
- Emergency services (Earth, Space and Mars)

As there is still no information on how the packages will be offered, I will make a brief explanation of what they should include in these trips to Mars.

The space package to Mars should include the training program, the psychological and physical analyses before and after the trip, safety training, the trip to the red planet, the stay during different stages of the trip (during the trip to Mars, the stay in the planet and the return) and medical services on Earth and Mars. This package should also include all meals during the trip and a custom space suit (which the tourist can keep after the trip). This product

This complex product includes all kinds of activities, from filling out the form to going back to earth. Although some companies can offer these trips, we must bear in mind that processes should be previously established for all customers and also offer it at a reduced price in order to convert it into mass tourism in the future.

As I mentioned before, there are companies that want to offer orbital trips in a short term, SpaceX wants to take tourists to the red planet and Orion Span wants to create a hotel in

space within a few years. Therefore, there are many people interested in creating a new type of industry from scratch.

The future of Space Tourism we could say that is hopeful and realistic since the technology to get offer commercial orbital flights already exists although for flights a little longer even more progress should be achieved. Now the requirements, the characteristics of the product aren't yet established.

We know briefly how the product offered by Orion Span will be. People who will pay \$9.5 million/ per person will have to complete a previous training of 3 months. With this training Orion Span wants to offer a certificate that recognizes that a person is physically and mentally prepared for 12 days in space. These trainings will be held in Houston (Texas) and these exercises will try to explain the operation of spacecraft systems, perform training to physically endure the trip and also includes weightlessness practice. When arriving at the "space condos" these space travellers can perform various activities (grow vegetation in space, etc.) and they will be able to share their experience with their family and friends since the space station will be equipped with the fastest wireless internet access. (Orion Span, 2018)

Virgin Galactic will offer 2 days of flight preparation and the astronauts will meet with the crew also. They will climb at 50,000ft above the Earth to provide to customers to experience the unique sense of zero gravity and they will be able to see the Earth Orbit. With the SpaceShipTwo they will experience the ultimate flight, it's an opportunity to go with a rocket into space with up to 5 friends, since this vehicle can carry 6 passengers and two crew members. (Virgin Galactic, 2018)

The training for this adventure will provide the customer bonding and training onsite at the spaceport. The trip will be intense and the more preparation the astronaut can have the better will be. The members from Virgin Galactic will provide tips to try to make them more comfortable when they will pass the most of G-forces. So, they will simulate the trip to show to the customers what they must to expect from this unique experience. They must be prepared to familiarize astronauts with the environment and they have to learn the basic emergency system.

Like Orion Span you can share the experience with your friends, since during the whole flight they will be recording.

Blue Origin will offer similar product to Virgin Galactic. The difference between these two companies is that Blue Origin uses a capsule and Virgin Galactic uses a rocket. But let's talk about Blue Origin and what they want to offer to their customers.

The New Shepard capsule is 530 cubic feet and it has a capacity of six astronauts. We don't know if like Virgin Galactic they will send the capsule with crew members. They designed a huge window to provide a spectacular view for the astronauts. The capsule will be carry out 100 km above Earth, so they will be into sub-orbital space for 4 minutes. (Virgin Galactic, 2018)

So, how I mentioned before, they will offer a similar product to Virgin Galactic. The customers will experience zero gravity and they will also have an intensive training (2 days) to learn the basics about safety system on board, how they will have to move in zero gravity and they will also do a mission simulation.

In one hand, the services offered by companies such as Virgin Galactic, Blue Origin and Orion Span are more defined since these products are going to be offered to astrotourists in a short term.

On the other hand, the service offered by the company SpaceX is still unknown as it is more complex. This company is still evolving its rockets, planning how to build infrastructure on Mars (location, what type of construction, materials and so on), what activities will offer the customer in the tour packages, etc. In this way, we can only speculate on how the service offered will be. Hopefully soon we can discover what the final product will be like.

- Viability: price and time

In the next figure we can observe the differences between the services that each company will offer. For example, Mars one offers their seats to volunteers worldwide. "From the initial 202,586 applicants, only 100 hopefuls have been selected to proceed to the next round of the Mars One Astronaut Selection Process. These candidates are one step closer to becoming the first humans on Mars. There are 50 men and 50 women who successfully passed the second round. The candidates come from all around the world, namely 39 from the Americas, 31 from Europe, 16 from Asia, 7 from Africa, and 7 from Oceania." (Mars-One, 2015)

The objective of this company is to raise money to explore Mars, so they don't sell the seats for this adventure. Although, this trip is only a one-way to Mars, this company was clear with their purpose: to explore and try to colonize Mars.

On the opposite side, we have three companies that try to create a market with the trips to space. Virgin Galactic wants to offer suborbital flights to be able to experience microgravity and to see the limb of Earth. Also, we must mention that the price for the flight will be 250000\$.

The last company interested in this new opportunity is Orion Span. This company will offer to their customers trips to their own Space Station. The price of this service is very expensive: \$9.500.000.

But, another important aspect is time. What does this mean? Most trips to space involve hours of training to be able to stand the G-forces, weightlessness, training on the ship, safety training, etc. In this way, it is necessary to think that in addition to the time of the trip, it is also necessary to count the time of preparation for the trip.

For example, the passengers of Virgin Galactic will have a three-day training to spend a few minutes in space. But, the longest trip would be to Mars. Only the way from Earth to Mars will be about three-six months, since the Earth and Mars are constantly moving. In this way, we should also consider the training that should be done prior to the trip, although we don't know how long it will take place. But this is only a speculation, since there is still no information on how long it will take to travel to Mars. In the next figure, we can observe the different companies, where they want to send tourists, which vehicle they want to use and finally at what price they want to sell the service.

At this moment, the most expensive trip offered is going to the Aurora Station Hotel and it is surprising that the cheapest price is the one that SpaceX wants to offer since it is a much longer trip than the rest.

Table 4: Price for each type of trip

OPERATOR	TRIP TO	VEHICLE	PRICE (US\$)
MARS ONE (Non-profit foundation)	MARS	MARS TRANSIT VEHICLE	FREE (The astronauts were selected from the volunteers)
VIRGIN GALACTIC	SUBORBITAL	SPACESHIP TWO	250000
SPACE X	MARS EARTH-TO- EARTH	BFR	200000 NOT DETERMINED YET
BLUE ORIGIN	MOON ORBITAL	NEW SHEPARD	NOT DETERMINED YET NOT DETERMINED YET
ORION SPAN	ORBITAL- HOTEL	AURORA STATION	9.500.000

Source: Adapted from Mars-One¹⁶, 2016; Virgin Galactic¹⁷, 2018; SpaceX¹⁸, 2017 and Bretton,¹⁹ 2017

- Distribution agents

I find it interesting to also mention distribution agents. As these services are innovative and unique in the current tourism market, there aren't many distributors agents or agencies that sell to these special clients. Generally, the companies themselves are responsible for offering the service. Being an exclusive type of tourism not suitable for the masses currently, you cannot go to any agency to try to hire these unique products. Thus, in most of these

¹⁶ Mars-One (2016). *Mars One presents an updated mission roadmap*. [online] Available at: <<https://www.mars-one.com/news/press-releases/mars-one-presents-an-updated-mission-roadmap>>

¹⁷ Virgin Galactic (2018). *Who we are*. [online] Available at: <<https://www.virgingalactic.com/who-we-are/>>

¹⁸ SpaceX (2018). *About SpaceX*. [online] Available at: <<http://www.spacex.com/>>

¹⁹ Bretton, A. (2017). *Blue Origin before the house Subcommittee on Space Hearing on Private Sector Lunar Exploration*. [pdf] Available at: <<https://iisc.im/wp-content/uploads/2017/10/HHRG-115-SY16-Wstate-AlexanderB-20170907.pdf>>

offered services there are no intermediaries and therefore the distribution channel is direct. To reach all customers, the channel where these services are distributed are on the Internet. But there is one space agency that offer trips or try to find a company that can offer you the service you need.

This specialized agency is Space Adventure. This agency arranged the trip of Dennis Tito in 2001. Is a full-service space tourism agency which provided already for seven clients an experience of a lifetime. They provided their expertise to private astronauts to go to space and live like a real astronaut. They have opened space to private citizens. They offer a large range of services for these exclusive tourists. They offer training to travel to space, stay at the ISS, zero gravity flights, spacewalk, etc. (Space Adventures, 2018)

None of these services have a fixed price, so if you are interested in acquiring one of these experiences, you must contact them to make a budget according to different requirements, timing, etc. This company has taken advantage of an almost empty market niche, since there aren't many travel agencies specialized in offering this service to clients worldwide. As I mentioned before, they offer their services over the Internet, but if you want to hire a service it is necessary to contact them since it is impossible to buy it directly from the webpage.

But this specialized agency in space tourism is the only one that currently offers these services. They try to find companies that can take tourists to the space according to the needs of the client, so the service that they offer is unique according to the client needs and therefore the price also varies according to the services purchased.

An example of direct distribution is Orion Span. On their website (<https://www.orionspan.com/>), they have a reservation section. In this section we can make an online deposit of \$80.000 to be able to enter the waiting list. On their website they offer all the information related with all the services offered to the clients and indicate that this price is all-inclusive, from the launch to the Aurora Station (\$9.500.000). In addition, this company not only admits its own reserves but also offers the possibility of giving this trip to another person as a gift. You only must indicate the name to whom you want to offer it.

On the contrary, the companies Blue Origin, Space X and Virgin Galactic still don't sell their services. Therefore, we don't know if the services offered will be all included in the price and

how the final product will be offered. In this way, we also don't know if the services will be offered directly by them or there will be some intermediary company in charge.

- Advantages and Disadvantages

In this section I would like to make a concise explanation of the advantages that are being created betting on this type of tourism and the disadvantages that could have. Space tourism it can be the way to get big achievements for us, we can take advantage for the better scientific understanding and the technological development. So, to have a global vision of the advantages that we could have, I will mention some:

- Space tourism could increase the global economy, since this new market could create thousands or millions of jobs. Create the necessary technology to travel to space or other planets, means hiring skilled people. This technology it can be also not only in this market but could be used for other industries.
- There aren't many companies that offer these services or intermediaries that try to find a solution to a type of tourism that is unknown to society. Therefore, there is a great opportunity for new entrepreneurs to innovate and bet on this tourism.
- At this moment, this is an exclusive type of tourism, but the more companies fight for having their sit in this industry, cheaper will be in the future for tourists. This means that they will need to charge less to customers. So, in future this can be a large potential market.
- The Earth is overpopulated, this means that there will come a time when there will not be enough resources for all the inhabitants. In this way, it could offer a solution for several problems. In addition to getting data from outer space, scientists cold learn more about different atmospheres and could better predict natural disasters and could also colonize other planets like Mars. In this way, they could also help the inhabitants of the earth.
- This space exploration will allow us to learn more about the universe. We are a tiny part of the universe. This could facilitate the discovery of things we cannot even imagine.

It should be noted that there are some negative points for the creation of space tourism. And these are some of them:

- The missions to the space means to run a great risk. In addition to the risk of death, humans must adapt to unknown conditions and an unknown environment. Undoubtedly, it is different from the trip offered by the company Virgin Galactic, where customers will enjoy a few minutes in space and then return and the trip that SpaceX wants to offer to Mars. So far no one has stepped on the red planet, therefore the conditions and the risk that this environment could cause on the human beings are still unknown. Therefore, the risk to which a person is subjected on a trip of such importance is very high.
- Another one is all the money needed to develop all the infrastructure, technology, spacecrafts, etc. This money can be used for another important purposes worldwide.

For these main negative aspects, many people may think that it is a waste of time and money. You might think that these resources can be invested in other sectors of our society like education or child poverty. Despite these factors, we all must try to reduce or improve the quality of life of all of us. But although there are negative factors or negative ideas on this matter, there are also many positive aspects that society could acquire. Besides boosting the economy, hiring qualified personnel, developing technology, or betting on innovation, space exploration means discovering more about our universe and mainly about our own home.

- SWOT Analysis

Considering all these positive and negative aspects of space tourism, in the next section I will try to create a SWOT analysis. This analysis will help us to have an overview of the different opportunities that they should take advantage of and try to reduce the threats, always bearing in mind the weaknesses and strengths.

Strengths:

- Uniqueness
- Use of reusable rockets (less cost = less final price)
- Skilled workforce
- Reasonable price
- High degree of self-reliance

- Currently isn't so much competition

Weaknesses:

- Although they use reusable rockets, the cost is still high
- High investment: investment can lead to a drastic failure
- Lack of experience
- Spaceships in an advanced construction stage, but not entirely complete
- These companies still don't have the reliability of the clients (safety, reliability)
- Technological complexity

Opportunities

- Increasing demand in space tourism: new market
- It could offer various products: sub-orbital trips, orbital, stay in Earth orbit, etc.
- Easy contracts with governments: cheaper satellite delivery
- Research and innovation development
- Advancement of Humanity

Threats:

- Competitors new products and innovation
- Lacking interest of people due to safety/reliability issue
- Accessible of upper class people
- Government regulation
- Slow growth of the market

I will start with the internal analysis. In the internal study, the objective is to find the weaknesses and strengths that the organization has: the first to correct them and the second to promote them.

The first strength is uniqueness. As we know, space tourism services aren't currently offered. In this way, we can say that this product is unique and special for tourists, since only

astronauts have been able to travel to space. Space tourism is a recent phenomenon in which the greatest attraction is the uniqueness of the experience. Another factor that I have considered as strength is the rockets used to make possible these trips. The companies mentioned above want to use reusable rockets to lower the cost and therefore the final price to the customer.

One of the advantages is all the members that make part of these projects since it involves the hiring of skilled workforce. Given the great complexity involved in developing technology to send humans into space, this is an important strength. In the section on the merge of space tourism, it was possible to verify that few could, throughout history, pay to go to the International Space Station. On those occasions they had to pay many millions of dollars to live that experience. Virgin Galactic and Blue Origin will offer their services for a much more affordable price.

Another strength is the great degree of self-sufficiency on the part of these companies. In all the cases described above, each company oversees developing its own reusable rockets, in this way it depends on itself and doesn't require help. Being a market in development, there is not much competition. There aren't many companies that can economically afford to invest in all the infrastructure and technology necessary to offer this type of tourism to the masses, therefore there aren't many companies in this sector.

The second point of internal analysis is the weaknesses. In this section we will see the negative aspects of this type of tourism that can be reduced to achieve the objectives of space tourism.

In this way I will begin with the first weakness. As discussed in this paper, companies like Blue Origin and Virgin Galactic will use re-usable rockets to send humans into space. Even if the cost goes down considerably, this cost is still too high, which cases the price to be too high. Therefore, this type of tourism cannot be offered to mass tourism.

Another aspect to keep in mind is the great investment involved in researching and betting on this tourism. It's not surprising that these companies are run by big businessmen. Jeff Bezos (founder and CEO of Amazon) and Elon Musk (co-founder of PayPal, Tesla Motors, Hyperloop, etc.) invested large sums of money to develop technology to take tourists into space. But that large investment can lead to a drastic failure, because now it is unknown if these companies will succeed.

As these services are not yet offered for tourists, we can say that there is a lack of experience. In this way, all the aspects related to this type of tourism are unknown and these companies must be flexible so that they can adapt to the needs of tourists. Undoubtedly, experience is not synonymous with success but is a great factor. In addition, they should encourage more market studies to find out which tourist profile each of their projects is aimed at. During the elaboration of the work, I have been able to verify that there aren't many studies on the subject and in this way, it would be necessary to investigate more about this innovative sector.

As I mentioned earlier, companies are in continuous development. For example, SpaceX is still in the process of building its BFR ship, therefore it hasn't yet been possible to prove if they could make the trip with that rocket. As the subject of security in this matter is so important, companies make numerous attempts before being able to offer these services to tourists.

This brings me to the next weakness. All companies interested in providing these services to tourists still don't have their confidence. The safety factor is a very important aspect that can be key for a person to access to space travel. The only way to create trust for companies, will be in the practice of these trips. Therefore, companies should try to reduce this weakness through multiple trips before offering it to tourists.

The last weakness of this internal analysis is the technological complexity that exists to create the necessary infrastructure to send humans into space. As noted above, companies must invest a lot of money to develop the necessary technology. From the reusable rockets to the orbital hotel that Orion Span wants to create, that is a great challenge for the scientific community.

Next, I will explain the factors of the external analysis of the SWOT analysis. The opportunities are the positive external possibilities from which you can take advantage. In this way I will start with the first opportunity.

There is increasingly expectation about this new form of tourism. There is a growing demand for tourism and therefore a new market. Currently we can consider space tourism as the trips that are made to astronomical observation centres, travel to the ISS (very expensive), atmospheric trips to experience zero gravity, etc. But companies as mentioned above are trying to create a market for a new type of tourism. Private companies that are investing and

researching to discover the tourists a unique adventure. In this way, we can affirm that they are building a new market to offer space and Mars trips.

But not only opens a new market of space travel, but they are diversifying products. For example, in addition to trips around the Earth orbit, the range of possibilities is open, and you could stay in space hotels, make trips to Mars and why not to the Moon. Therefore, no attempt will be made to offer only one type of service. These companies are interested in creating different products or services to meet the needs of tourists.

As I commented previously in the section Business characteristics, the development of space tourism not only opens possibilities for this sector but can be used for other sectors also. In the case of the company SpaceX has a contract with NASA to send their space probes, military satellites, etc. In this way, it can be appraised to improve the life of the terrestrials as well, since some of these satellites improve the global telecommunications system.

Another opportunity would be the research and development of innovation. As I mentioned in the strengths, these projects involve the hiring of highly skilled personnel. In this way, human capital is used to try to discover new ways of using technology. Undoubtedly, innovation increases through competition and that there are different companies that are trying to create rockets and infrastructure shows the benefit that entails for the scientific community. As I commented earlier, the technology is not used only for space tourism, but it is transferred to other applications.

Finally, the last opportunity would be to advance as humanity. As innovation is essential for the realization of these trips, this is also an opportunity for all of us. We could advance in different areas: health, nutrition, psychology, security, etc. In the International Space Station new drugs, food and technology are being investigated. This could be an example for generations that travel to space and beyond. Besides being able to enjoy unique views, scientists can use it to try to explore and investigate unexplored lands, new ways of life, different atmospheres, etc. Therefore, we are facing a great opportunity to discover more about ourselves and the environment that surround us.

The last section of the external analysis is the threats. The companies in this sector should consider these negative factors to try to reduce them. The first threat would be the new products and innovation of its competitors. The biggest threat is the innovation, since for example if a company can reduce to the maximum the consumption of fuels or use

sustainable fuel, it would have an enormous advantage over others. Innovation is a great positive factor, but we can also consider it negative since between them it would be a key factor.

Another threat to this type of tourism is the final price of these trips. As I have been commenting, the cost is high and therefore the final price offered to the customer is also high. In this way we can say that this type of tourism is only accessible to upper class people. The cost should go progressively if travel can be made constantly. Therefore, we still must wait for this kind of tourism to be offered to the masses.

Currently, space travel is not regulated by governments. In this way, there aren't limitations, requirements, legal bases for these companies. For example, in terms of security there are no basic regulations to offer these services to customers. Therefore, we can observe a legal vacuum, where governments should regulate these trips and these companies. "This situation needs to be improved, if the opportunity for a new golden age of space exploration is not to be lost. Also, national legislation, including standards and regulations, must consider this new reality." (Genta, 2014)

Nowadays, these services aren't offered to tourists, therefore the space tourism market grows slowly. In addition, they are still developing technology and are creating the infrastructure to offer these services. As this type of tourism depends on many factors, it is very difficult to know when exactly the services can be offered. In this way, we can only speculate on what will be the characteristics of the final product and when the trip can be offered.

6. Conclusions

After conducting a literature review of the key factors of a type of tourism unknown to the masses and an internal and external analysis to determine the attributes on the subject, I can highlight the following conclusions:

The needs of tourists change continuously. Increasingly, tourists want to live unique experiences that previously could only imagine or seen in science fiction movies. Companies like Blue Origin, Virgin Galactic, Orion Span and SpaceX could take advantage of a unique opportunity: fill a currently empty market niche.

Now, the space tourism offer is very scarce or almost nonexistent, since the prices to realize this type of trip are very high. It is an exclusive type of tourism since the only tourists that can travel to space have to pay a large amount of money. But this is the main goal of these companies: lower the cost by reusing the rockets and therefore lower the final price.

In addition, SpaceX is creating the infrastructure to send tourists to Mars, uses reusable rockets to send communication and military satellites. In this way, the scientific research can benefit the development of other sectors worldwide.

As I have pointed out before, there are different proposals from many companies. Blue Origin and Virgin Galactic want to offer 1-day trip to experience zero gravity and see the earth from space. Orion Span wants to offer accommodation within a couple of years for 12 days in space and SpaceX wants to offer trips to Mars. Therefore, we can observe all the opportunities that entails betting on this type of tourism.

One of the objectives of this work was to know if this type of trip is viable or not. In the case of Virgin Galactic, Blue Origin and Orion Span we can affirm that is technologically viable, since the trip can be done with existing technology, but they are not yet available to customers. But the trip that SpaceX wants to offer we still do not know if it will be possible since for example they have not yet created the rocket with which they will travel to Mars. Although over the last few years they have had a spectacular evolution in the aerospace race, we still do not know how the services will be offered to tourists and if they will be able to offer the trip to the red planet.

Another aspect that must be considered is time. In experiences like those offered by Virgin Galactic and Blue Origin, you must train 1-day or 2-days before the trip that will only last a few minutes. For the trip of Orion Span to the orbital hotel it will train for three months before the trip (12 days) and finally it is unknown how long they will have to train for such a long and demanding trip to Mars. In the case of the trip to the red planet, we must also bear in mind that only in the outward journey it will take between 3-6 months since the planets are in constant movement

Another important factor for the realization of these trips is the risk to which the tourist is subjected. In the case of Mars, no one has traveled to this planet, therefore it is unknown what physical and mental problems could appear. For example, it is unknown what kind of repercussion the Sun radiation will have since the atmosphere of Mars is much finer than that of the Earth. As it has been observed in the last question of the form, it is a determining factor and in the case of existing risk they would not travel.

We must also comment on all the positive effects that this type of innovative tourism can offer to the society. As it has been observed in the SWOT analysis, there are multiple opportunities for entrepreneurs since the space tourism market is still in development. This is a time of uncertainty as many aspects of how the service will be offered is still unknown. But as we have seen in the analysis, space tourism could serve for scientific development, boost the economy, hire qualified personnel, etc.

Many data are still unknown about what the final service will be like, so it is elementary to create a well organized and structured tourism strategy to take advantage of this new resource. Finally, we observe a market full of opportunities that creates great long-term expectations for travel agents.

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