PART 1: How space tourism is an important opportunity for the application of Rockets

a)

Space exploration is considered a main opportunity for rockets. It can be defined as physical exploration of outer space, both by human spaceflights and by robotic spacecraft (ScienceDaily, 2019). Space Tourism, defined as the travel to space of passengers for recreational purposes (Dunk, 2017), has become a lucrative subsector of the space economy, which as a whole is estimated at $900bn by 2030 and it is predicted that space tourism will account for 5% ($4 Billion) by 2030 (UBS (Investment Bank)). Thanks to the ambitious plans of groups such as SpaceX and Blue Origin as well as others, the prediction of $4 billion increased by $1 Billion since initial predictions in 2019. This rapidly growing space tourism economy is a microcosm for the growth of space exploration. The growth has allowed for new developments to be funded. In 2017, a Swedish based company called Rocket Labs launched a battery powered, 3-D printed rocket from New Zealand's remote Mahia Peninsula (Reuters, 2017). This idea has since been adopted by other companies and expanded upon, for example Relativity Space, an american start up, have begun work on manufacturing the world's largest fleet of 3D printed rockets. Ellis, the founder of Relativity Space, declared that 3D printing was vital to the success of space exploration (Johnson, 2021). Able to build a rocket in 60 days at a lower cost thanks to the development of 3D printing it is clear to see the importance space tourism and space exploration have for the development of rockets.

b)

As previously stated, space has been the main focus of multiple enterprises and individuals (Reisinger, 2019). This interest has led to multiple technological developments on the field shifting it into new directions. Not too long ago the main concerns within the industry were high economic costs; however, due to new technological developments such as: 3D printed rockets (Reuters, 2017) and returning space machinery developed by SpaceX(Reisinger, 2019), new firms are entering a growing market (Reuters, 2017). In our current capitalist society most firms are driven by profit maximization, therefore trying to provide a service in demand at the lowest cost (Tragakes, 2020). Due to the technological developments discussed, costs for rocket construction are at their lowest leaving a gap for profit to industries capable of providing a service that solely requires the already developed technology in the area, transport.

Furthermore, as rockets gain popularity and become more asequible to build, people are starting to grow wary of the possible damage that this technology will cause to our atmosphere. Studies demonstrate that the number of launchings has increased and that each passenger in a rocket has a much greater ecological footprint than other transports, as it approximately produces 100 to 150 times more tonnes of carbon per traveler than airplanes(Gammon, 2021). In addition, this carbon is released directly in the atmosphere at a higher temperature having greater effects that could possibly destroy the o-zone layer.(Gammon, 2021) It's very likely that this issue will force governments to intervene in order to protect natural resources like acquiring permits. (UK government)

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PART 2:

a)

Inter-GalacticTours was a tourism agency specialized on taking comercial rocket flights to the International Space Station Satellite (ISSS), selling the “astronaut experience” to a worldwide public. In order to diminish costs the firm employed 3D printed machinery that could return to platforms set on bodies of water near industrial areas and fuel administration machines with a computerized volume counter. Due to a series of unidentified events there are currently 20 stranded passengers in space. It is presumed that the counter got damaged on the previous tour and didn’t undergo an inspection before the launch.

This situation has caused Inter-GalacticTours to come under immense social pressure as well as becoming the focus of worldwide media. As a result, firms within the industry are being requested to organize a rescue mission. Furthermore, the company is being prosecuted and investigated by the legal branch of the local government which has started an investigation on the industry, discovering concerning environmental effects in the areas of the mediterranean sea where the rockets landed.

Moreover, recent studies conclude that the level of space junk, waste of precious metals and fossil fuels has increased. These environmental costs are gaining relevance as our planet's resource depletion and the Ozone layer are getting more damaged than expected

b)

Inter-GalacticTours could not ensure the safety of its passengers as throughout the experience therefore, it breached section 1.2) Avoid harm, as 20 of its clients are stranded without resources to reach ISSS. As a result, this event has highlighted a flaw of the company, it did not have any protocols in place for a rescue in order to ensure safety. Consequently, the firm also broke section 1.1 of the ACM code of ethics as the space tourism operations turned out to have more environmental effects in the mediterranean sea and the o-zone layer than expected. This represents a great opportunity cost for society as it might have lost the quality of common access resources such as the atmosphere. Moreover, people have also lost faith in space tourism as the media propagated the news of the unsuccessful space excursion.

The company also disrupted section 2.1 of the ACM code as it did not ensure that the products were fully operable. In particular, the company did not ensure that the fossil fuel providers and their measuring devices underwent an inspection breaching section 2.4) Accept and provide appropriate review. These faults are purely on the company as the clients could not have done anything in order to avoid such an outcome.