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SPACE TOURISM IN MALAYSIA: A STRATEGIC MOVE TO BOOST THE SPACE INDUSTRY?

Ahmad Ammar Ahmad Termizi¹

¹*Space Industry Development Division, The National Space Agency, Malaysia*

ABSTRACT

The move to bring space tourism into Malaysia is not something new to the country. The idea has caught the attention of the mass media way before the successful return of our Angkasawan Negara. The hype of this idea is not of the interest of this paper. This paper is more fascinated to understand the relationship between space tourism and space industry. Thus, this paper aims to study the possible implications of space tourism to the development of space industry in Malaysia. The study is basically undertaken based on papers written locally and internationally in regards to the topic. Analyses are made thereupon to deduce all possible implications and hence leading to the final conclusion. This paper will suggest the right stand that Malaysia should take in dealing with space tourism proposals.

Keywords: Space industry, Space tourism, Space strategy, Space policy, Sub-orbital flight, Orbital flight, Angkasawan.

Contribution/ Originality

This study is one of very few studies which have investigated the relationship between space tourism and space industry especially in Malaysian climate. This study will be a useful reference for policy maker in Malaysia and other relevant countries in dealing with space tourism proposals with respect to space industry development.

1. INTRODUCTION

Malaysia has been involving significantly in space sector since the early nineties with the launch of Malaysian own satellites, although there were other involvements before such as the utilization of ground station. In fact, Malaysia is seen as one the leaders in space sector particularly in the Southeast Asia Region. As of now, there are more than five satellites have been launched into orbit since 1996. These include privately own satellites and government own satellites. Besides, Malaysia also has space-related assets such as ground stations to track rockets

and satellites as well as soon to operate assembly, integration and testing laboratory. Despite all these achievements, space industry is yet to be recognized as a contributor to the national economy. More needs to be done in order for space industry to be more significant to this nation. Many efforts have been done including the efforts to bring space tourism into Malaysia.

Tourism is one of the industries that have brought significant wealth to this country. According to the [World Travel & Tourism Council \(2013\)](#), the total contribution of travel and tourism industry to the GDP is MYR146.4bn (15.6% of GDP). This is not surprising as this country is blessed with beautiful beaches, unique flora and fauna and rich culture, which made it being on a wish list for every avid tourist. Nevertheless, this traditional industry has a potential to be further expanded with the investment in technology. This is where space tourism could come into play. In fact, Malaysia has taken a giant leap by making announcement to open a spaceport that was initially planned to be developed in Malacca but later changed to Bernam Jaya, Selangor.

2. SPACE INDUSTRY

Although there are arguments on the definition of space industry and the boundary of this industry, it is generally accepted as the economic sector providing goods and services related to space ([Schrogl, 2010](#)). This could include satellites services and applications, launch services and space tourism. In order to better understand the space industry, it is categorized into 2 segments i.e. upstream space industry and downstream space industry. According to ([South East England Development Agency \(SEEDA\), 2009](#)), upstream segment is the provision of technology and downstream segment is the exploitation of technology. Examples of upstream space industry are launch vehicles services, satellite construction and testing and space tourism. On the other hand, examples of downstream space industry are space applications like GPS navigation, earth observation and satellites broadcasting.

3. SPACE TOURISM

Space tourism is the term used to mean ordinary members of the public travelling a return trip to space using private vehicles. There are two types of space travel. The first type is sub-orbital flights which involve flights travelling 100km and above in altitude. This flight will get at least 5 minutes of weightlessness and ability to view the curvature of the earth and the dark star filled sky. Examples of companies that have embarked in this type of flight are Virgin Galactic and Space Adventure. They have set their target to have their first flight as early as 2014. The second type of space travel is orbital flights. This involves flights to higher altitudes such as to the International Space Station which is located about 400 km above the earth surface. So far, only Soyuz spacecraft has successfully going to ISS and return. However, Bigelow Aerospace is

designing a better spacecraft to provide the same or better capability that would serve the purposes of science and space tourism ([Woo, 2013](#)).

Many efforts are concentrated on sub-orbital flight of space travel as it is easier and less expensive than getting to orbit. However, in terms of technical know-how, it is not a problem. Many have the capability to make passenger launch vehicles and orbiting hotel accommodation, however, cost is the big issue. As market demand for space tourism getting bigger, there will be a massive reduction in cost hence making space tourism more viable ([Space Future, n.d.](#)).

4. SPACE TOURISM DEVELOPMENT IN MALAYSIA AND GLOBALLY

The apparent move to introduce space tourism into Malaysia has started since the year 1999 with a public lecture organized by the Perak state government in Universiti Sains Malaysia, with space tourism as the focus ([Zahari et al., 2007](#)). This event kicked off the whole effort to promote space tourism in Malaysia. It was masterminded by Norul Ridzuan Zakaria, the one who established the Malaysian Institute of Aero and Space Studies (IKAM) to promote space tourism in Malaysia. There are significant amount of space tourism development activities have been conducted to date. For instance, there are 17 space tourism development activities have been recorded between 1996 and 2006. This includes public lectures, meeting with government agencies, the establishment of Spaceport Malaysia and many others ([Zahari et al., 2007](#)). All these activities portray the efforts to realize space tourism in Malaysia.

The move to develop space tourism is not only happening in Malaysia but globally. Many organizations have been investing massively in space tourism projects lately. One of the key players of commercial space tourism is Virgin Galactic. They managed to get more than 700 people to buy SpaceShip Two tickets. The number of passenger-to-be of SpaceShip Two is very significant as it overtakes the number of human ever taken to space since 1960s. The price tag of USD 250,000 did not deter people to spend their money and fulfill their excitement to be in space to experience microgravity and witness the majestic planet earth from their own naked eyes. Besides, other companies that are venturing into space tourism, specifically commercial space flight, are XCOR Aerospace, Blue Origin, Armadillo and a few others. All these companies are seriously developing their own space planes making space tourism more competitive hence benefits customers. In addition, competition will bring the best out of these companies' thus cheaper space flight tickets, better services and many other improvements could be expected.



Figure-1. Illustration of Virgin Galactic SpaceShipTwo in space

Reference: <http://www.aerospaceguide.net/spaceship/spaceshiptwo.jpg>



Figure-2. A model of XCOR Lynx Suborbital Spacecraft

Reference: http://www.parabolicarc.com/wp-content/uploads/2012/05/lynx_model_above.jpg

Besides the development of space tourism through propulsion powered vehicles, there is also effort to develop space tourism through helium-powered balloons. The company by the name of zero2infinity is pioneering and championing this effort. Its product, Bloon, that has been tested and is commercially available today. It can accommodate four passengers per flight and can go up to 36 km above the ground. Although technically speaking this altitude is not yet considered as space, it does bring the experience of seeing the earth from space and microgravity environment. Therefore, it claimed to be part of space tourism but using green technology.



Figure-3. Illustration of Bloon in space

Reference: <http://images.gizmag.com/hero/bloon.jpg>

Other development worth to be mentioned in this paper is the efforts by non-governmental organization such as Space Tourism Society (STS). Today, STS has 15 chapters all around the world including Malaysia. This global effort aims to introduce many new industries to realize space tourism. Among these new industries are travel and tourism industry, resort industry and entertainment industries ([Anon, 2014](#)).

5. ANTICIPATED CONTRIBUTION OF SPACE TOURISM TO SPACE INDUSTRY

There are many papers published in journals and presented in conferences discussing the about the impact and potential contribution of space tourism to space industry. This section will discuss about some of the significant potential contribution of space tourism.

5.1. Technology Transfer

Technology limitation is one of the factors that could hinder the development of an industry. The same goes to space industry, which is always perceived as a high technology industry. This limitation happens due to knowledge gap as well as the sanctions imposed on technology transfer especially from the western bloc ([Sadeh, 2013](#)). However, technology transfer could be materialized through the realization of space tourism. Technology transfer is the process by which technology is passed from one field of application to another. The components of technology transfer are;

- i) know-what (description of knowledge);
- ii) know-who (network of key individual);
- iii) know-why (theoretical basis); and
- iv) know-how (practical use).

If at least one of the technology components was transferred, the technology transfer process is considered to be successful. ([International Space University, 1999](#)). Understanding the definition of technology transfer would prepare us to better understand the impact of space tourism to space industry.

Space tourism needs a good ecosystem or supply chain in order to support its sustainability. We can clearly see this in the automotive industry. Once a multinational car company wants to start producing car locally, they will need supports from local company in its supply chain. This is crucial in order for the company to reduce the cost of production and maintenance to the minimal level hence optimizing its profit. This in turn will create new players or upgrading the existing industry players. Subsequently, by hook or by crook, the technology transfer has to happen whether from the main player, which is the space tourism player or by any capable local or foreign expert. This will complete the ecosystem to ensure sustainable business environment.

5.2. Economic Impact

Space tourism has been foreseen as a major contributor to space industry in future in terms of money-making. Space tourism could represent a market niche on the order of several million dollars annually. ([International Space University, 1999](#)). In fact, many reports have acknowledged the emergence of space tourism as a major commercial activity in space. For instance, Keidanren, the largest economic and business organization in Japan, stated that space tourism initiatives by Japanese Rocket Society is the only activity that is considered to have promise for commercialization of space activities . In addition, NASA and US Space Transportation Association (STA) reported that they acknowledge the possibility of space tourism to start soon and could grow into the largest activity in space. ([Collins, 1999](#)). Space tourism could add to the chronology of transportation technology innovation that has brought major waves of economic growth. Another aspect that space tourism could lift the economy of a nation is through the opening of new territories for business activities. This is indeed what happening in the globalization era where any businesses that managed to penetrate foreign market will be more successful than businesses that remain local. These two possible contributions of space tourism in terms of economic growth to space industry would be something to be considered seriously in any decision making.

5.3. Local Space Industry Player

Venturing into space tourism will attract foreign industry players into a country. If they decide to come to a potential country, they will not only bringing the technology but the expertise, human resource and networking. This will only benefit the local industry players if they capitalize the present of these foreign players' capabilities. This could be done through cooperation, technology transfer or government arrangement. Aerospace is a good example where government agency played an effective role to match-making local player with the foreign players hence producing a win-win situation for both parties. The foreign players could expand their investment in a new territory while the local players could get their foot in the door hence reap some portion of the cake.

Furthermore, with the beginning of space tourism, public will start to appreciate the impact of space industry to their lives. In other words, they will recognize the importance of space industry. This could happen as space tourism could boost the country's image globally, attracting tourists, create jobs for the locals hence grow the local economy. In return, it will increase the public support for any space program in the future.

6. A STRATEGIC MOVE TO BOOST SPACE INDUSTRY?

The previous section had discussed a few impacts that space tourism could pose to space industry. Based on these inputs, analysis has to be undertaken to arrive to the best stand for

Malaysia to make in current situation. Whether or not it is a strategic move really depends on Malaysia's current situation and capability. Although many find this idea of space tourism in Malaysia is too futuristic but many professional work has been done that make it possible to set up space tourism anywhere in the world. That is why this discussion is important as government has started receiving proposals on space tourism.

Looking at the benefits of space tourism to development of space industry such as technology transfer, economic growth and development of local space industry player, it seems to be ideal for Malaysia to accept any proposals on bringing space tourism into this country. Bear in mind, our focus in this analysis is on space industry. Therefore, any benefits should be towards the development local space industry, not anything less than that.

If Malaysia were to approve such proposal, they should be ready that not all the foreseen benefits will materialize. For instance, in terms of technology transfer, not all companies are willing to share their technological capabilities. This is evident happening in many strategic sector such as space and particularly the launching technology. On the other hand, other space technology such as satellite development and construction has many organizations willing to share the technology. Malaysian satellites such TiungSAT and RazakSAT are a result of technology transfer program. Therefore, upon receiving any proposals, government has to make sure that there are organizations that are willing to transfer technologies as least in certain aspect. In terms of economic impact, this paper believes that space tourism could contribute significantly to the local space industry. Studies by many quarters are indeed making this projection very reliable. Finally, in terms of local space industry player, any proposal should be considered seriously if it could promise helping the creation and the development of local space industry player. This is paramount as for any industry to be sustainable, government has to make sure local industry players are created and developed. This is very important as foreign industry players may come and go due to economic, political or other reasons. Only local industry player will stay on to contribute to the industry or in this case space industry.

Furthermore, limited government interference especially in terms of funding is needed to allow space tourism to grow exponentially hence space industry follows. This is the lesson learned from the current situation of space industry where it is predominantly funded by government. This is the case worldwide including in one of the biggest pool of space industry players, the United States. Taxpayers globally have paid almost \$ 1 trillion for civilian space activities and approximately one-half of this amounts being spent on human space flight ([Collins, 1999](#)). Based on this model, space tourism could not grow much as compared to many profitable commercial initiatives such as civil aviation, with annual turnover of hundreds of billions. It is understandable as commercial activities are highly motivated by profit generation and money will be spent strictly, which is good for the space tourism hence space industry.

Therefore, venturing into space tourism is a strategic move to boost Malaysia's space industry provided foreign company and expert could promise the realization of technology transfer and local space industry player development as well as government has to ensure that it has minimum interference especially in terms of funding.

7. CONCLUSION

In conclusion, space tourism could bring many benefits to the development of space industry in terms of technology transfer, economic impact as well as development of local space industry. Therefore, this paper highly recommends that Malaysia should consider seriously any proposal on space tourism provided foreign company and expert could promise the realization of technology transfer and local space industry player development as well as government has to ensure that it has minimum interference especially in terms of funding. This will in turn boost the development of local space industry.

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