Asgardia Project: An Intersection between Space Tourism and Smart City

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The Asgardia Project:
An Intersection between Space Tourism and Smart City

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Abstract
Space tourism is predicted to be the next best thing. Some private companies, such as Virgin Galactic and SpaceX, are in race to send billionaires outer space either for leisure or business purposes. The Asgardia project which was founded in 2016 has become an international sensation. In 2019, the Asgardia gathered over 1,000,000 populations from more than 200 countries of which slightly over 18,000 registered members have accepted its constituents. This research aims to investigate sustainability factors which motivate people to travel or migrate outer space. While studies about sustainable and smart cities are getting more spotlight in recent years, very few studies in this topic made a radical leap by closely examining a radical model of smart city concept, such as Asgardia. We took a random sampling of 307 members of the Asgardia community. We employed SEM analysis in order to test the hypotheses. The results of this study reveal that there are three factors which are appealing to space tourism enthusiasts, namely Smart Economy, Smart Governance and Smart Mobility. This study is expected to add novelty in the smart city literature as well as filling in the gap in the current conceptualization of smart city. Moreover, the findings are expected to be a valuable insight for business practitioners of smart city and space tourism.

Key words: *Smart City, Space Tourism, Asgardia*

JEL Classification O18

1. INTRODUCTION

Cities are places where economic activities and innovations take place though at the same time, they are also places where inequality is seen to be higher. If this issue is not properly managed, the negative effects of urbanization will soon outweigh its benefits (Monzon, 2015). Moreover, many cities around the world face a dilemma due to rapid population growth: on one hand are the overexploitation of resources, insufficient numbers of services, and an increase in pollution level. On the other hand, sustainability is the goal that must be achieved in order to overcome these challenges (Bifulco et al., 2016).

According to WHO (2014), the world's urban or city population will be doubled by 2050; by 2030, six out of every ten people will live in the city; and by 2050, it will be seven out of every ten people. It means that the number of urban citizens is growing by nearly 60 million people each year. Moreover, cities' inability to provide adequate fresh natural resources, cleaner energy, the capacity to move people efficiently from one location to another,

a greater sense of safety and security have become problems for citizens around the world (IEC, 2018).

It is important to take into account various creative factors in the governance and management of the urban areas. This process turns out to be a more complex conceptualization of the so-called "smart city" (Schaffers, 2011). In the last twenty years, the concept of smart city has become more popular in scientific literature as well as the international policies (Albino, Berardi, and Dangelico, 2015). In smart cities, human and social capital as well as conventional and modern communication infrastructures are combined to create a sustainable economic condition and development. At the end of the tunnel is a higher quality of life by careful use of available resources (Caragliu, Bo and Nijkamp, 2009). There is no standard framework for framing a smart city, nor a one-size-fits-all definition of it (O'Grady and O'Hare, 2012).

As the world becomes ever more modern, cities need to be more intelligent. Major urbanization requires new and innovative ways to manage complexity of urban living, such as fresh approaches to overcrowding, carbon consumption, inadequate utilization of capital and environmental disasters. In this context, smart cities are only a solution for future urban living, but also as a crucial strategy for addressing poverty and inequality, unemployment and energy management (EUP, 2014).

Some perfect examples of ongoing Smart "Sci-fi" City projects in the world are Neom Smart City of Saudi Arabia and Meikarta Smart City of Indonesia which boast to be an independent area and a hub of trade, a center of innovation and creativity. Smart cities typically deliver a healthy lifestyle to their people, combined with excellent economic opportunities that will thrive in comparison with most other cities around the world. Among all the world's smart city initiatives, the Asgardia is the first – if not the only – project that pushes the current goals of smart cities. Therefore, we think that it is important to research smart cities in the context of Asgardia.

The Asgardia was founded by Igor Ashurbeyli, a Russian scientist and businessman. The man is also a chairman of UNESCO's Science of Space Committee and the founder of the Aerospace International Research Centre in Vienna (Earth Sky, 2016). The Asgardia Smart City Project was first unveiled on 12 October 2016 at a press conference in Paris, encouraging 100,000 applications so that it can be registered as a nation (The Guardian, 2016). As of 11 July 2018, Asgardia Smart City residents have numbered 261,417, making it 171st in the world in terms of population (Asgardia Space, 2016). Asgardia officially launched the first Asgardia-1 satellite, which includes 0.5 terabytes of data belonging to its people, as well as digital images of the flag, arm coat and constitution of the space nation (CNN Style, 2017).

Asgardia is the fulfillment of the old vision of mankind, which has always tried to break free and escape from the imperfect earth (Asgardia Space, 2016). Each culture and society in the past had stories of people who traveled to places alien to humanity. In this regard, culture – which is a set of beliefs, values and practices adopted by a group of people – is crucial to understanding human behavior (Chairy and Syahrivar, 2019; Gyulavári and Malota, 2018, 2019). For instance, why some people are willing to risk their comfort at home and leave the earth. In addition, Asgardia will be the first smart city and a nation to position itself in space, directly on the orbit of earth. It seeks to open up access to space technologies, to protect the earth from extraterritorial objects or threats, and to safely research about the space (The Guardian, 2016).

A revolutionary smart city concept in the sky that promotes clean and renewable energy, provides more economic opportunities and leads to improved quality of life may be far away in the future. Many people may consider it as a topic of science fiction, as it is literally a city of experimentation (Santis et al., 2014). People can be skeptical to innovative ideas that

sound science-fiction, while some can exhibit a negative behavior towards it (Lewandowsky et al., 2016). Likewise, Asgardia is not an exception to public skepticism.

2. LITERATURE REVIEW

Smart city is an *"instrumented, interconnected, and intelligent city*" (Harrison et. al, 2010; Albino, Berardi, and Dangelico, 2015). Instrumented refers to collecting and incorporating real-world data live through the use of sensors, meters, appliances, personal devices and other related sensors. Interconnected means incorporating the data into a computerized network that allows the data to be shared through all city services. Finally, intelligent means the use of several complex simulations, modeling, optimization and visualization to make a better strategic decision.

Giffinger et al., (2007) argues that a city can be called a "Smart City" if the city has the following six characteristics: Smart Economy (Competitiveness), Smart People (Social and Human Capital), Smart Governance (Participation), Smart Mobility (Transport and ICT), Smart Environment (Natural Resources), and Smart Living (Quality of Life).

Smart Economy refers to factors around economic competitiveness, such as innovation, entrepreneurship, productivity and flexibility of labor market, and trademarks (Albino et al., 2015). Smart economy of industry 4.0 involves smart grid components, innovation networks, high-tech manufacturing, high-level comfort, a healthy climate, sustainable development and international competitiveness (Galperina, Girenko, and Mazurenko, 2016). Based on the work of Giffinger et al. (2007) some elements of Smart Economy are innovative spirit, entrepreneurship, productivity, flexibility of labor market, international embeddedness, and ability to transform.

Smart People applies to people who have a higher education degree and a culture of life-long learning (Harrison et. al, 2010). Smart people may also refer to residents who have at least secondary education, knowledge of at least 3 foreign languages, a culture life-long learning, and strong computer skills (Lombard et. al, 2012). Based on the work of Giffinger et al. (2007), some elements of Smart People are level of qualification, affinity to life-long learning, social and ethnic plurality, flexibility, creativity, cosmopolitanism / open mindedness, and participation in public life.

Smart governance includes aspects of political engagement, institutional operation and programs for its people (Caragliu, Bo and Nijkamp, 2009). Scholl and Scholl (2014) argue that smart governance has two characteristics: First, it involves openness and accountability in government decision-making and actions, knowledge sharing, cooperation and involvement of stakeholders, services through integrated and smart technology, and enhanced government operations. Second, local government facilitates innovation, economic growth, sustainability and livability. Based on the work of Giffinger et al. (2007), some elements of Smart Governance are participation in decision-making through the use of technology, technology-based public and social services, transparent governance through technology, and the incorporation of technology into political strategies and perspective.

Smart Mobility refers to the local and international transport in a city, as well as the fairness of its information and communication technology infrastructures (Giffinger et al., 2007). Smart Mobility may also refer to the use of innovative and sustainable modes of transport, typically high-tech and environmentally friendly public transportation (Alonso, Aletà, and Ruiz, 2016). Based on the work of Giffinger et al. (2007), some elements of Smart Mobility are local accessibility, international accessibility, availability of ICT and infrastructure, and sustainable, innovative and safe transport systems.

Smart Environment ensures the city should be desirable and protect its own ecosystem (EUP, 2014). A smart environment requires the Internet of Things (IoT) to run smoothly. Cited from Psannis, Xinogalos and Sifaleras (2014; p.476), IoT could be described as *a dynamic*

global network infrastructure with self-configuration capabilities based on standard and interoperable communication protocols where physical and virtual 'things' having identities, physical attributes and virtual personalities and using intelligent interfaces. Based on the work of Giffinger et al. (2007), some elements of Smart Environment are the attractiveness of the natural environment, pollution level, environmental protection, and sustainable resource management.

Smart Living means improved quality of life, education system, public services, accommodation, and healthcare system (Monzon, 2015). According to Anez and Romera (2015), Smart Living is the wise management of infrastructure, public services and spaces using ICT-enabled technology, with a specific focus on increasing user efficiency and accessibility and what they really need. Based on the work of Giffinger et al. (2007), some elements of Smart Living are cultural facilities, health condition, individual safety, housing quality, education facilities, touristic attractiveness, and social cohesion.

Migration Decision is a process in which people try to consider certain factors which make them interested and eventually decide to migrate to the country of destination (Brezis, 2016). Based on the work of Jong (2010), the indicators of Migration Decision are the propensity to migrate, motivation to migrate and decision to migrate.

3. RESEARCH METHODOLOGY

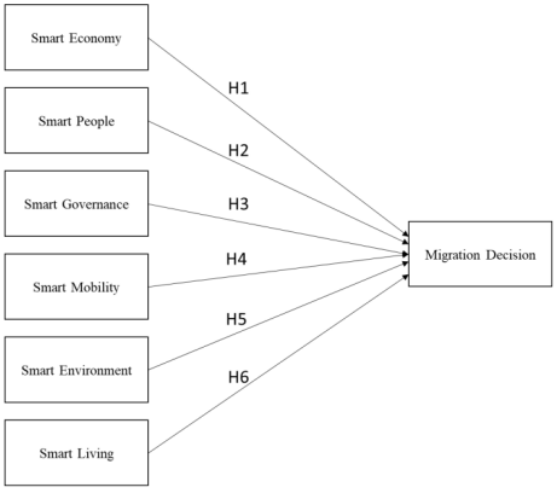

Figure 1. Theoretical Framework

Source: Adapted from Giffinger et al. (2007) and Jong (2010)

The hypotheses are as follows:

H1: Smart Economy has a positive effect on Migration Decision to the Asgardia.
H2: Smart People has a positive effect on Migration Decision to the Asgardia.
H3: Smart Governance has a positive effect on Migration Decision to the Asgardia.
H4: Smart Mobility has a positive effect on Migration Decision to the Asgardia.
H5: Smart Environment has a positive effect on Migration Decision to the Asgardia.
H6: Smart Living has a positive effect on Migration Decision to the Asgardia.

The population of this study are those who have registered and become members of the Asgardia community. This information can be found in the Asgardia's official website. In this

study, we employed random sampling. We disseminated a 42-item online questionnaire to our respondents via Asgardia official website and social media. In this research, we managed to gather 307 valid respondents who were considered capable of representing a predetermined population. Table 1 presents the respondent profile:

Table 1. Respondent Profile

		Numbers	Percent
Gender	Male	207	67.43
	Female	96	31.27
	Others	4	1.30
Generation	Generation X	122	39.74
	Generation Y	178	57.98
	Generation Z	7	2.28
Occupation	Public Servant	42	13.68
	Private Employee	49	15.96
	Entrepreneur	31	10.10
	Professional	80	26.06
	Student	69	22.48
	Housewife	15	4.89
	Retired	15	4.89
	Unemployed	6	1.95
Education	Bachelor Degree	155	50.49
	Master Degree	102	33.22
	Doctoral Degree	16	5.21
	Others	34	11.07
District in the Asgardia	English	127	41.37
	Turkish	51	16.61
	Russian	26	8.47
	Chinese	21	6.84
	Others	82	26.71
Status	Approved Members	247	80.46
	Parliament Candidates	45	14.66
	Government Members	10	3.26
	Waiting List	5	1.63

The measurement scales of Smart Economy (6 items; Cronbach's alpha 0.842), Smart People (7 items; Cronbach's alpha 0.851), Smart Governance (4 items; Cronbach's alpha 0.786), Smart Mobility (4 items; Cronbach's alpha 0.716), Smart Environment (4 items; Cronbach's alpha 0.765) and Smart Living (7 items; Cronbach's alpha 0.823) were adapted from the work of Giffinger et al. (2007). Meanwhile, the measurement scale of Migration Decision (10 items; Cronbach's alpha 0.894) was adapted from the work of Jong (2010).

In order to test the hypotheses, we employed Structural Equation Modelling (SEM) via SPSS and AMOS software. We used the work of Schreiber et al. (2006) as a guideline for assessing the fitness of the proposed model.

4. ANALYSIS

During the Exploratory Factor Analysis (EFA), we eliminated some items with small coefficients as well as communalities (less than 0.5). The final SEM model is presented in Figure 2:

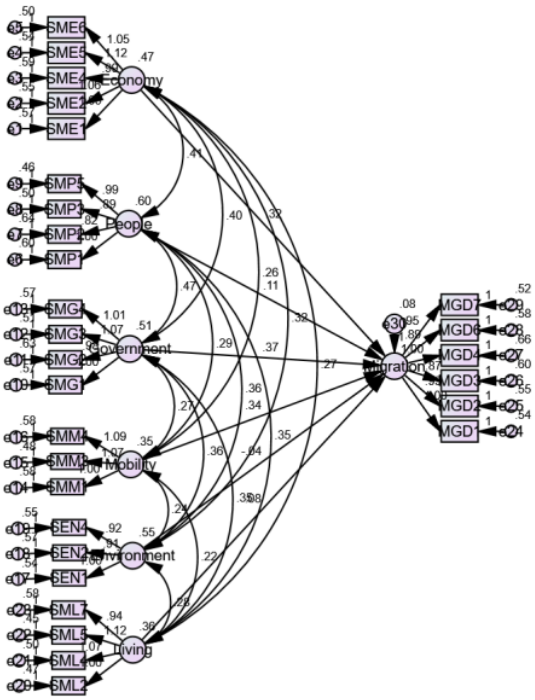

Figure 2. SEM Model

Table 2 presents the recommended thresholds for SEM Model based on Schreiber et al. (2006). Some indicators, such as GFI, AGFI and NFI, have values below the recommended thresholds. Meanwhile, RMSEA, SRM, TLI and CFI have values above the recommended thresholds. Our final judgement for the model is that the model has a good fit.

Table 2. Model Fit

	Recommended Threshold	Result	Note
Root Mean Square Error of Approximation (RMSEA)	< 0.07	0.019	Excellent Fit
SRMR	< 0.08	0.0352	Excellent Fit
GFI	> 0.95	0.921	Modest Fit
AGFI	> 0.95	0.903	Modest Fit
NFI	> 0.95	0.898	Poor Fit
TLI	> 0.95	0.987	Excellent Fit
CFI	> 0.95	0.988	Excellent Fit

Based on Table 3, H1 which states that Smart Economy has a positive effect on Migration Decision is accepted and the nature of the influence is positive; H2 which states that Smart People has a positive effect on Migration Decision is not supported; H3 which states that Smart Governance has a positive effect on Migration Decision is accepted and the nature of the

influence is positive; H4 which states that Smart Mobility has a positive effect on Migration Decision is accepted and the nature of the influence is positive. H5 which states that Smart Environment has a positive effect on Migration Decision is not supported. H6 which states that Smart Living has a positive effect on Migrating Decision is not supported.

Table 3. Path Analysis of Original Model

Hypotheses	Relation	Estimate	C.R.	P	Result
H1	Smart Economy → Migrating Decision	0.324	2.737	0.006	Significant
H2	Smart People → Migrating Decision	0.107	0.926	0.335	Not Significant
H3	Smart Governance → Migrating Decision	0.367	1.992	0.046	Significant
H4	Smart Mobility → Migrating Decision	0.337	3.353	0.000	Significant
H5	Smart Environment → Migrating Decision	-0.038	-0.514	0.607	Not Significant
H6	Smart Living → Migrating Decision	0.077	0.559	0.576	Not Significant

We attempted to refine the model by excluding the non-significant variables (Smart People, Smart Environment and Smart Living) from the model in order to achieve a better model fit. The trimmed model has the following model fit summary: RMSEA 0.07 (≤0.07), SRMR 0.0297 (<0.07), GFI 0.955 (>0.95), AGFI 0.941 (<0.95), NFI 0.942 (<0.95), TLI 0.999 (>0.95) and CFI 0.999 (>0.95). Overall, the trimmed only slightly improve the original model. Table 4 presents the path analysis:

Table 4. Path Analysis of Trimmed Model

Hypotheses	Relation	Estimate	C.R.	P	Result
H1	Smart Economy → Migrating Decision	0.327	2.800	0.005	Significant
H3	Smart Governance → Migrating Decision	0.482	4.135	0.000	Significant
H4	Smart Mobility → Migrating Decision	0.358	3.665	0.000	Significant

5. CONCLUSION

This research aims to understand factors motivating people to migrate outer space, particularly to Asgardia. We hoped that the results of this research can be used as a platform for a more in-depth discussion on each motivating factor thereby creating a better understanding of why people were in quest of seeking a better life outside the earth. The results of this research suggests that the members of the Asgardia community are strongly motivated by Smart Economy, Smart Governance, and Smart Mobility in their migrating decisions. Meanwhile, Smart Governance has the highest total effect towards Migration Decision among Asgardian respondents. We conclude that the recent political and social upheavals affecting not only developing but also developed nations, and the changing trend toward a more autocratic (and less welcoming to minorities) model of governance (as in the case of the United States, Turkey,

Saudi Arabia, etc.) have led Asgardians to pursue a better form of governance that instill more transparency and more participation in politics from the public through better system and technology.

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