

Proposed Framework on Public and Private Partnership for Smart Cities Growth in Malaysia

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Abstract

To enable the growth of smart cities in Malaysia, it is important to understand the workflow and interaction between the different departments and teams within the government's institutions. Part of the issue identified is collaboration. Private sectors comprise of both large corporation and SME's, therefore it is important to understand both systems and define an appropriate approach for each of them accordingly. Few articles and internet sources were reviewed by the researchers on the public and private partnership from different countries. The proposed framework derived from reviews of past literatures via online searches for the duration of six months. The stakeholders comprise of universities, government institutions and private companies (public, and private sectors). It is critical for Smart Cities growth to incorporate healthy relationship between the public and private partnership that includes incorporating all stakeholders. The result indicated that the public and private partnership includes government with the stakeholders. It is critical for Smart Cities growth to incorporate healthy relationship between the public and private partnership. The proposed framework might be a blueprint for Public and Private Partnership engagement with the stakeholders towards the growth of Malaysia smart cities.

Keywords: — growth, stakeholder, smart cities, public partnership, private partnership.

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I. INTRODUCTION

Statistics experts had projected that around 90% of Malaysians will live in urban area in 2050 [1] thus it is important to put efforts and develop cities as mentioned by [2] as they provide a functional landscape for economic production to take place using modern infrastructure. Different authors define smart cities in several ways such as [3] who recognized smart city as smart sustainable city which is innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of the present and future generations with respect to economic, social and environmental aspects.

In addition to that, it is important to understand

the smart city system that consists of six main key components called building blocks of Smart People, Smart City Economy, Smart Mobility, Smart Environment, Smart living, and Smart governance where there is a strong connection between the six blocks and that's what contribute to the function of the smart city [4]. Several large cities worldwide had adopted the smart city concept such as Amsterdam, Barcelona, San Francisco, Tokyo, Beijing, Singapore and Kuala Lumpur [5].

Malaysian smart city concept has started with the greater KL, Putrajaya, Smart Selangor, and Johor Bahru with the objective of construction, planning and managing services to boost urbanization, informatization, and industrialization [6]. However, Malaysian smart cities are still behind in term of development since Malaysia deliberately

avoided the pitfalls of being an early adopter. However, now, it must expand and advance its smart cities to develop its economy to meet 2020 objectives.

Fully functional smart cities will help boost economic growth as expert links advanced digital transformation including IoT with economic growth. Additional inputs from the world bank analyst stated that Malaysia cannot achieve this economic goal without developing its smart cities [1]. Most smart cities are facing major problems related to financing, governance, stakeholder engagement, technology and policy [7].

Part of the issue is that projects are often managed as standalone even within the same government department. Moreover, a stronger relationship between public and private sector in the form of partnership is key to help smart cities access both the right financial & technical resources. Private sectors comprise of both large corporation and SME's, therefore it is important to understand both systems and define an appropriate approach for each of them accordingly.

This research will be focusing on the problem of governance and stakeholder engagement for the Malaysian smart cities; thus, the objective of the study is to find a comprehensive framework solution for the blueprint for smart cities growth and development in Malaysia. This can be achieved by examining Johor Bahru, Greater KL, Cyberjaya governance and stakeholder engagement issues. Which ranks first among the 2017's top 20 global city performance index for safety, mobility, productivity and health [8]. To enable the growth of smart cities in Malaysia, it is important to understand the work flow and interaction between the different departments and teams within the government's institutions.

II. REVIEW OF THE LITERATURE

In the last decades, definitions describing characteristics of future cities has been enhanced to better fit the concept promoted mainly by stakeholders. Time has played an important role for terms and definition to change based on the ideas

fostered by political entities, universities, civil communities and business environment

A. Smart Cities Definitions

Experts from different areas had suggested that smart cities are defined as below: A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of the present and future generations with respect to economic, social and environmental aspects [3]. While, others described smart city as a well performing built on the (smart) combination of endowments and activities of self – decisive, independent and aware citizens or as the product of Digital City combined with the Internet of Thing [9].

B. Stakeholders in Smart Cities

Stakeholders are important players in smart cities around the world. Based on definitions from different authors stakeholders can take different forms such as person, groups, organizations, institutions, and societies. Importantly, there is a need to differentiate between groups with moral, legal or with a presumed claim on the organization. Groups also should have the ability to influence the organization in terms of process, direction, behavior, and results. There is also another type of stakeholders the ones with no power influence on the organization but still important in a way [10].

The implementation of smart city requests to put efforts on strategies and mainly focus on the projects development thus to let the smart cities provide an integrated solution to the urban challenges through the involvement of the stakeholders at both levels (Strategies and project implementation) [11].

- Authors had identified that smart city has been identified as knowledge base system as a result the model that have been used is the triple helix models. Four stakeholders' groups have been recognized as: universities, private companies and governmental institutions

(local level, and large scale) in addition to that, some authors described civil society is part of these groups. Knowledge stakeholders are known as university stakeholders and research center in the city [11].

Moreover, government entities were identified as two scales of governance and mostly important in generating the definition of smart cities. In the other hand, international entities identified as one type of governmental institutions and considered a role key to help develop smart cities at international level, thus smart cities are having more weight and allows the coordination by the upper governance level. The local government are importantly and considered as the key governance for smart cities since it highlights the role of municipalities as basis of the smart city strategies and initiatives. Private companies are considered an important pillar in the model of smart city stakeholder [12].

- **Universities**

There is a crucial need for smart cities to have the support of universities, campuses, citizen and students to conduct and support the growth of regional economies. Thus, many authors had mentioned that education must be a focal point in a city to become a smart city as people can also be part of the instrumentation [13]. The Malaysian universities had already started the initiative of investigating and get involved into the smart cities. Several studies and research were already published covering many areas of smart cities such as smart lighting [14] energy harvesting [15] energy-efficient [16] routing scheme for smart city application, these research were mainly conducted by multiple universities such as Universiti Kebangsaan Malaysia, Universiti Teknologi Petronas, and Universiti Teknologi Mara[17].

- **Governments Institution**

Mainly represented by government agencies. Worldwide cities infrastructure projects are mainly financed from public funds in forms of own source revenue and intergovernmental transfers. The other source of funding is the intergovernmental transfers which is the grants provided by higher

level government to launch a specific city project. [18]. Moreover, the local government at city scale are represented by municipalities which are considered as the base of smart cities strategies and initiative [11].

- **Private Companies**

Smart cities represent a huge business opportunity for companies with a big potential of worlds urban market. For a good and effective partnership, companies must adapt to the needs of the citizens and help the cities to deliver a better-quality life through new business models. In addition to the market for smart cities is widely open to all sort of companies either initially involved in the smart cities or in the stage to be involved and get affected by the urban ecosystems and find the way to do business [19].

In addition to that, most of the large technology companies identify big opportunities and leading the development of smart city projects with plans over different domains such as environment, security, quality of life and mobility [20].

C. Related Theories for Smart Cities

In this study, four selected theories are discussed and based on the outcomes, a theoretical framework forwarded and elaborated in detail. Below is a summary of these theories:

- **Stakeholder Theory**

Stakeholder theory was created to allow managers to classify stakeholders' importance in terms of the relative absence or presence of power, legitimacy, and urgency and develop how managers prioritize stakeholders' claims [21].

- **Expectancy Theory: Vroom's**

The Expectancy Theory of motivation developed by Victor Vroom Pursue to predict and explain the task-related effort expended by a person. The three key terms in the theory are: Expectancy, Instrumentality and Valence [22].

D. Growth Measurement in Smart Cities:

The measurement of smart city growth is based mainly on identifying key factors and indicators of smart city system. Moreover, different authors [23]

and [24] characterize city performance measurement based overall on their dimension from a multi-dimension and a holistic perspective because actual cities plays an important role in the global economy since cities are known to be a hub of connectivity, creativity and innovation combined with social and economic progress, culture, diversity and environment.

It also includes other dimensions that are indirectly related to their tangible or intangible resources. In addition to that, city performance measurement had faced a fundamental transformation according to the changing vision and role with regards to the economic growth. Moreover, traditional variable measurement such as gross domestic product (GDP), the unemployment rate and the inflation rate are also taken into considerations as intermediate variables [25].

III. RESEARCH METHODOLOGY

Theoretical framework which is developed on solid theories. The researcher uses the theoretical framework to understand the relationship between the variable of the theory and foresee the relationship among them [26]. Thus, the framework (Fig1) developed in this study is based on four theories of Stakeholders, and Expectancy.

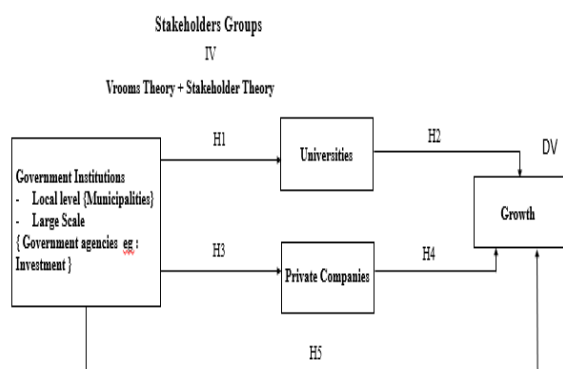


Figure1: Developed Framework for the Impact of Private and Public Partnership Development on Smart Cities Growth.

A mix method will be applied for this research based on survey: interviews and questionnaires distributed on the main stakeholders recognized as indirect variables to test and validate the developed hypothesis and come up with a blue print that will

outline guidelines for smart cities growth in Malaysia.

IV. RESULTS AND DISCUSSION

This research is at an early stage where at this moment only developed relationships hypothesis were formulated as proposition for empirical testing purpose. Based on the framework, a total of nine hypothesis were established between government, stakeholders and growth and examined carefully.

A. Relationship between Government and Universities (H1)

Community including students and employees' expectations are increasing with a limited resource, and thus the goal of the educational leaders and government is to meet this expectation. In the 21st century, the importance of education system towards community success is critical, moreover, the education industry is becoming more challenging in terms of relationship with constituencies. As a results expert's projects new trends in education system with significant change to all education segments along with its founders. Because of this transformation, the educational institution that can adapt and respond effectively to these changes are considered successful returns on the government education investment and will benefit from government favourable treatment and funding. The study program will be tailored based on the importance of the foundation skills then later moving towards a developed and more specific specialized competencies in which it falls under the students strengths and work opportunities as well as continuously providing updated training to keep up with dynamic market changes [13]. Thus, from the above information's, there is a not strong influence relationship between government and universities.

B. Relationship between Universities & Growth (H2)

The believe that the educational system is being one of the sustainable foundations for economic growth and recovery is widely spread among governmental leaders all over the world. The idea is that the educational system outcomes is going to shift from metrics where the assessment is based on the performance of individuals institution towards

the measurement of efficiency of the whole system to contribute for economic growth [13]. Moreover, authors had considered the existence of four pillars called as cultural sustainability supporting the cultural identity and facilitating the introduction of new values to support socio-economic transformations. Thus, will be mainly achieved through what is identified as urban sustainability having the four vectors of economic, social, environment and cultural. Thus, the measurement of the urban sustainability is kind of complex and mainly based on the assessment of the city dimension “performance “ with regards to other indices as it identified by the authors education is found as one of the general indicator for social sub-dimension as below [25]. Thus, from the above information’s, there is a not strong influence relationship between universities and growth

C. Relationship between Government Institutions and Private Companies (H3)

Smart cities represent a huge business opportunity for companies with a big potential of worlds urban market. Government follow long term strategic infrastructure investment projects to achieve the target of better citizen quality life and cities development transformation. These initiatives of investment require capabilities and capacities in the local market from government and private sector. Moreover, additional help can be provided from International development organization where they can play an important role in supporting cities and infrastructure investors specially in allocating the risk and returns from the transaction counter parties. This organization comprises of development finance institutions, multilateral development banks and donors in which they provide debt and equity finance, funding and financing mechanism initially integrated with a technical assistance to support economic and social development in developing countries [18]. It is important to have a good and appropriate policy making to help the implementation and development of private firms in Malaysia [26]. The government encourage and promote information communication technologies identified as a driver for economic growth. Thus, the initiative of establishing a Malaysian Silicon Valley was founded by the Malaysian Prime Minister Mahathir bin Mohamad and launched in

1997 the township of Cyberjaya located 50 kilometers south of Kuala Lumpur known as a form of a multimedia super corridor not only for ICT companies but also for investors and government agencies.

In 2018, a collaboration between both countries Malaysia and China was under a form of Chinese investing in Malaysian smart cities. China’s AliBaba had introduced a cloud-based AI platform City Brain in coordination with Malaysian Digital Economy Corporation (MDEC) and Kuala Lumpur City Hall (DBKL). This new platform of solution could improve traffic in KL surrounding area. Malaysian smart cities are being developed in pieces and seems that there is a lack of coordination between its components, in other terms, government and property developer must work in collaboration to achieve a truly Malaysian smart city [27].

Thus, from the above information’s, there is a significant influence relationship between Government and developers. In addition to that, the public and private sectors need to collaborate to focus on IoT, ICT and other digital solutions. Thus, from the above information’s, there is a significant influence between government institutions and private sector [28].

D. Relationship between Private Sector and Growth (H4)

At a global scale, the forecast for smart cities market size will be \$2.75 trillion by 2025[29]. It is a huge opportunity for developers to innovate and produce new products that answers smart city’s needs. The Information communication technology had been identified as driver to improve city performance since the city connectivity is only possible by the integration of ICT at different level in the urban settings and thus the ICT is important to stimulate innovation along with a nature of social, environment and economic relationships.

Moreover, the ICT encourage the creation of the public-private partnership. This interaction is tightening with the community participation to help entrepreneurship grow and enhance the network corporation and formation. In this context, cities’ vitality and economic growth is the

reflection of individuals. The set of indicators shows that innovative services, network, urban proactivity, governance and integration of infrastructure have all ICT in commons with a goal of solving resident issues. Moreover, the ICT produces a huge amount of data in the city, that's why it is important to look to Big Data and Open Data in which it is compatible with the sustainability, intelligence and creativity [25].

Overall, innovation plays an important role in creating new business model for urban development and helping creating opportunities for smart cities growth. In Barcelona, an innovation centre has been created based on the city Mayor, this will be the equivalent of a "Smart City Laboratory" defined as a great example of public-private cooperation.

Service management is taking care of the city infrastructure and expertise as daily business. Thus, the city is transforming towards an urban laboratory where trail field test is performed at the last stage in order to validate the new product and services within the urban impact in Barcelona.

Furthermore, the objective of the innovation centre is to create a long -term economic growth and opportunities for jobs via a high technology innovation entrepreneurship [30]. Moreover, authors, public and private entities and institutions had described that the measurement of creativity indices enable the enhancement of the strategies and policies in cities of the European Union based on the 2020 strategy [25]. Thus, from the above information's, there is a significant influence between private sectors and growth.

E. Relationship between Government Institutions and Growth (H5)

Based on the announcement from the organization for Economic Co-operation and Development (OECD) regarding the support of the expected economic growth rate the world need to spend about 3.5% GDP on the infrastructure through 2030 with a total of \$71 trillion with an average of \$3.3 trillion per year [18]. Additional spending from government will be mainly on the investment for vital infrastructure assets as it is

expected that municipalities will grow and get more crowded.

Over the last years the investment on the infrastructure was limited specially in the basic ones such as water, power and sanitation. After the financial crises, late 2000s, several infrastructure projects were heavily part of the spending program that developed nations had started in order boost the economic recovery [18]. Furthermore, a study has determined that there are six roles of city governments in which they are needed to engage with city challenges in most effective way through decisions and choices taken through a mix of theses six different roles.

These roles are strategist and advocate, director and regulator, connector and protector, innovator and investor, steward and solution enabler. Each of these must be developed at mature level [31]. In the other hand, public governance is identified as regimes of laws, juridical and administrative rules and that controls and helps government activity for the production and delivery of public goods and services. Thus, government is involved to implement the process along with other legislative bodies to communicate information based on agreed standards and rules and thus to achieve goals and objectives.

Moreover, the government policies can be changed into economic opportunities such as the example of Kuala Lumpur where the Malaysian government has identified the greater Kuala Lumpur and one of the twelve National Key Economic Areas of the Economic Transformation Program (ETP) having the objective of changing the capital city and the surrounding municipalities in a lively and high quality livable cities [17]. Thus, from the above information's, there is a significant influence between government Institutions and growth.

V. CONCLUSION

The proposed framework will be tested to come out with a finalize blueprint for Public and Private Partnership engagement with the stakeholders towards the growth of Malaysia smart cities. At this stage only developed hypotheses from framework

were developed as Relationship between Government Entities and Universities (H1), Relationship Between Universities and Growth (H2), Relationship between Government Entities and Private Companies (H3), Relationship between Private Companies & Growth (H4), Relationship between Government Entities and Growth (H5). Overall, most of the hypothesis are having a significant influence only the hypothesis. Later stage will be to test the framework using mixed method “Quantitative & Qualitative) by going through questionnaires and interviews.

The study will be focusing on Johor Bharu, Greater KL and Cyberjaya city stakeholders and government institutions. At the end of this study, the growth of smart cities will be beneficial for the Malaysian economic development to meet 2025 objectives as it will open more opportunities for work, investments and projects development by enhancing the quality of life for Malaysian citizen.

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REFERENCES

1. SEANToday, “The link between smart cities and Malaysia’s economic growth,” <https://www.aseantoday.com/2018/03/the-link-between-smart-cities-and-malaysias-economic-growth/>, 2018.
2. A. Caragliu, C. Del Bo, and P. Nijkamp, “Smart cities in Europe,” *Journal of Urban Technology*, vol. 18, pp.65-82, 2011.
3. R. Lea, “Smart Cities: An Overview of the Technology Trends Driving Smart Cities,” *IEEE*, vol. 3, pp.1-16, 2017.
4. B. Dahiya, and T.M. Vind Kumar, “Smart Economy in Smart Cities,” Springer, pp.2-76, 2017.
5. J . Woetzel, J. Remes, B. Boland, L.V Katrina, S. Suveer, G. Means, J. Law, J. Cadena and V. Von der Tan, “Smart cities: Digital Solutions for a More Liveable Future,” Mckinsey global institute. pp.1-18, 2018.
6. N,S Kassim, “Smart City Initiative,” pp.1-34, 2016.
7. T. Maddox, “The 5 major roadblocks to smart city infrastructure,” <https://www.techrepublic.com/article/the-5-major-roadblocks-to-smart-city-infrastructure/>, 2017.
8. Infotechlead, “Top 20 smart cities revealed by Intel and JuniperResearch,” <https://www.infotechlead.com/iot/top-20-smart-cities-revealed-intel-juniper-research-53602>, 2018.
9. A. Cocchia, “Smart and Digital City: A Systematic Literature Review,” Smart City. Springer International Publishing Switzerland, pp.1-32, 2014.
10. A. Ståhlbröst, B. Kareborn, B. Eriksson, and C. Ihlström, “Stakeholders in Smart City Living Lab Processes,” *Proceedings of the 21st Americas Conference on Information Systems (AMCIS 2015)*. Puerto Rico, pp.1-11, 2015.
11. V. Fernandez-Anez, J. Fernández-Güell, and R. Giffinger, “Smart City implementation and discourses: An integrated conceptual model The case of Vienna,” *Cities*, vol.78, pp.4-16, 2018.
12. V. Fernandez-anez, “Smart Cities Definition : Discourses and Stakeholders Transport Research Centre,” *TRANSyT* . Universidad Politécnica de Madrid, Spain. pp.1-16, 2015.
13. L. Zhuhadar, E. Thrasher, S. Marklin, and P.O de Pablos, “The next wave of innovation—Review of smart cities intelligent operation systems,” *Computers in Human Behavior*, vol. 66, pp.273-281, 2017.
14. Y.M. Yusoff, R. Rosli, M.U. Kamaluddin, and M. Samad, “Towards smart street lighting system in Malaysia,” In *Proceedings of IEEE Symposium on Wireless Technology and Applications (ISWTA)*. Kuching Malaysia, pp. 301-305, 2013.
15. W.A .Jabbar, M. Ismail, and R .Nordin, “Evaluation of energy consumption in multipath OLSR routing in smart city applications,” In *Proceedings of 11th Malaysia International Conference on Communications*. Kuala Lumpur, Malaysia. pp. 401-406, 2013.
16. K. Ashraf, M.H.M. Khir, J.O.Dennis, and Z. Baharudin, “Frequency dependence of quality factor in vibration energy harvesting,” In *Proceedings of IEEE Regional Symposium on Micro and Nano Electronics*, Langkawi, Malaysia. pp. 151-154, 2013.
17. K.A Yau, S.L Lau, M.C Quan Lin, and M.S Rahman, “Towards a smart city: the case of greater Kuala Lumpur in Malaysia,”

- International Conference on Frontiers of Communications, Networks and Applications (ICFCNA 2014 - Malaysia), 2014.
18. M. Flynn, A. Kishore Rao, J. Honer, and D. Gashi, "Smart Cities Funding and Financing in Developing Economies Assisting developing cities to finance their infrastructure gap through private sector participation approaches," Deloitte, pp.1-52, 2018.
 19. B. Cahan, "Making Cities Smarter than Their Bankers," Artificial Intelligence and Smarter Living- The Conquest of Complexity. pp.1-8, 2011.
 20. S. Mahajan, "CRE developers: Get smart on smart city initiatives," <https://www2.deloitte.com/us/en/pages/financial-services/articles/commercial-real-estate-smart-cities.html>, 2018.
 21. C.K Lafreniere, S.Deshpande, H.Bjornlund, and M,G Hunter, "Extending stakeholder theory to promote resource management initiatives to key stakeholders: A case study of water transfers in Alberta, Canada," Journal of Environmental Management, vol.129, pp.81-91, 2013.
 22. R. Baumhof, T. Decker, H. Röder, and K. Menrad, "An expectancy theory approach: What motivates and differentiates German house owners in the context of energy efficient refurbishment measures? ," Energy and Buildings, vol 152. pp.483-491, 2017.
 23. P. Girard, L.F .Baycan, T. Nijkamp, "Sustainable City and Creativity: Promoting Creative Urban Initiatives," Ashgate: Farnham, UK, 2011.
 24. Networked Society City Index, "Cities Play Key Role in SustainableDevelopment", www.ericsson.com/assets/local/networked-society/reports/city-index/2016-networked-society-city-index.pdf, 2016.
 25. M. Rodrigues, and M. Franco, "Measuring the performance in creative cities: Proposal of a multidimensional model". Sustainability (Switzerland), vol. 10, pp.1-21, 2018.
 26. A. Zainal, and D. Bhattasali, "Economic Growth and Development in Malaysia: Policy Making and Leadership," Commission on Growth and Development, vol.27, pp.1-60, 2008.
 27. export.gov,"Malaysia Smart Cities," <https://www.export.gov/article?id=Malaysia-Smart-Cities>. 2018.
 28. D. Muse, "Malaysia's public and private sectors need to collaborate," <https://www.cio.com/article/3300117/malaysia-s-public-and-private-sectors-need-to-collaborate.html> ,2018.
 29. [29] Grand view research, "Smart cities market size," <https://www.grandviewresearch.com/press-release/global-smart-cities-market>, 2018.
 30. S. Zygiaris, "Smart City Reference Model: Assisting Planners to Conceptualize the Building of Smart City Innovation Ecosystems," Journal of the Knowledge Economy, vol.4, pp.217-231, 2013.
 31. R. Dubbeldeman, and S. Ward, "Smart City ", Deloitte. pp.1-86, 2015.