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FROM SMART CITY TO SMART NATION

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Introduction

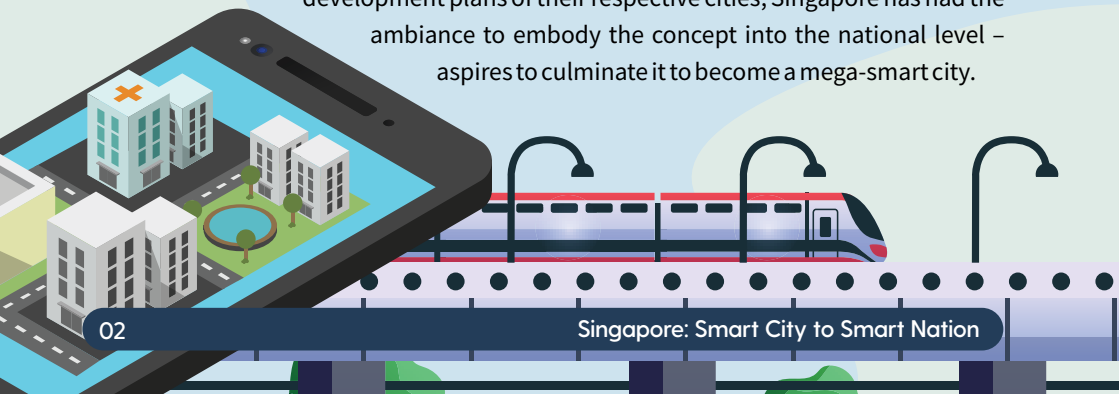
A new stage of urbanization, which is the development of smart cities, has increasingly taken place among the recent discourses on the issue of development of urban areas. According to a new report from IHS Technology, it is predicted that there will be a total of 88 smart cities all around the world by 2025. Asia-Pacific as the region will presumably take the lead in that particular.[1]

Singapore is ranked as the smartest city in the world, according to IMD Smart City Index 2019. The rank is based on the citizens' perception of the efforts and impacts to embody the 'smart city' concept in the country through the integration of 'economic and technological aspects' with 'humane dimensions[2] Thus, this case study will analyze the strengths and opportunities the 'Smart Nation' initiative could bring about to Singapore as the country's 'smart city' flagship initiative. This initiative aspires to make Singapore – as a city-state – becoming the world's first smart nation by 2025.[3] Moreover, the aspiration is likely to be attained, given the advancement of cutting-edge technology in Singapore and the high quality of human resources. This case study will also examine the lessons that could be taken on the initiative for the implementation of smart city projects in Indonesia.

What is the 'Smart Nation' Initiative?

Established in 2014, Singapore's 'Smart Nation' initiative is driven by the ambition to harness technology as a tool for Singapore to be a global city. Additionally, the vision also aims to support the knowledge-based economy and improve the lives of all individuals through interconnectedness as the utilization of smart devices and sensors.[4] Initially, the initiative emerged during the Singaporean government's digitalization tool of public service delivery, which was embodied through the 'e-government' programs.[5] The main e-government programs or initiatives include the Civil Service Computerisation Programme (the 1980s), IT 2000 Strategic Plan (1992), iGov 2010 (2006), Smart Nation Initiative (2014), and e-Gov Masterplan (2015).[6] However, the Smart Nation initiative is perceived as the most comprehensive plan as it aims to bring about 'digital transformation' to all aspects of Singapore's urban life.[7] In order to implement its programs, Smart Nation initiative launched a Smart Nation Programme Office (SNPO) as an institutionalized body of the initiative.[8] The initiative has maintained its focus on five main domains: home and environment, transport, public-sector services, health and enabled aging, and business productivity

The complexities of the current policy issues, such as demographic transitions (aging population), are the main reasons why Singapore has highly embraced the Smart Nation initiative in the first place – aside from due to the imposition of the 'developmental policy' throughout its post-industrialized era. There have been a few projects undergone by the government, in which the picture below demonstrates some of them. Additionally, the concept of Smart Nation is also heavily relied on how the nation starts to establish smart cities. The concept of 'smart city' per se has gained much more significance on the global scale as it seeks to achieve a sustainable urban future.[9] Although federal governments of most countries in the world have integrated the concept into the development plans of their respective cities, Singapore has had the ambiance to embody the concept into the national level – aspires to culminate it to become a mega-smart city.



SMART NATIONS PROJECT

Beeline

An open, cloud-based smart mobility platform offering data-driven shuttle bus service for commuters. With Beeline, commuters can activate (or"crowd-start")direct,private express bus routes catering to their personal travel needs, especially during peak periods. Commuters book seats on the bus routes in advance, via a mobile app

Beeline bus routes are adaptive: new routes are activated based on commuters' demand and existing routes may evolve over time. There are currently 13 private bus operators on Beeline, more than 200 drivers and 300 Beeline routes running

Parking.sg

A mobile application that lets users pay for short-term parking charges through their mobile devices their mobile devices at all existing coupon-based public car parks. The app serves as an alternative mode of patment instead of paper parking coupons

Useful app features include an advance alert 10 minutes before a parking session expires, and the ability to extend the parking duration remotely.

Moments of Life

A Smart Nation initiative that supports families with children aged six and below, this service bundles useful services and information on a single, on-stop digital platform. Users can register a child's birth, apply for the Baby Bonus, find preschool facilities using geolocation technology, access a child's upcoming medical appointments, and more

The Moments of Life app also provieds parents-to-be and caregivers with up-to-date information on applicable government schemes and benefits parenting tips and event listings based on their specified interests.

The app was developed based on insights gathered through citizen engagment sessions to identify and better understand parents' challenged and needs

WOGAA
Whole-of-Government Application Analytics

Jointly developed by GovTech and SNDGO this platform provides a set common metrics and measurements that enables public agencies to monitor the performance of their websites and digital services in real-time, conveniently and cost effectively. A central dashboard shows the overall health status of government websites and digital services. An analytic tool can also be embedded within agencies' websites and digital services for performance tracking

WOGAA monitors the performances of Government websites, but will not track personal data. Instead, the insights derived help agencies improve public service delivery, set their web strategies and provide information for policy making

myResponder

Developed by the Singapore Civil Defence Force (SCDF) in collaboration with GovTech, myResponder is a means to crowdsource for lifesavers.

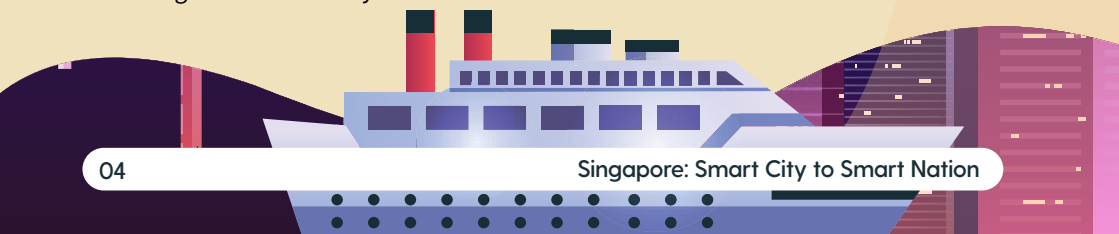
Whenever the SCDF is notified of a medical emergency and assess it to be a case of cardiac arrest, it sends out a message to community first responders (CFRDs) registered on the app who are within 400 metres of the patient. Currently there are more than 41,000 registered CFRs on the app.

The app also provides alerts on minor fires, namely rubbish chute fires that acount for approximately 50% of fires in residental estates. CFRs that are in the area can help to put out these small fires and take geo-tagged photos of the extent of the damange

The projects being carried out within the framework of the initiative has three policy objectives: igniting economic development, addressing urban-municipal issues, and catalyzing community development. So far, the initiative has heavily focused on the development of digital economy and big data as the key components of growth or "enablers," such as through investments in R&D, start-up accelerators, joint laboratories, enhanced cybersecurity protection, talent and capacity-building, open data platforms, and regulatory reforms. On the other hand, the resettlement of urban-municipal issues could be seen in Singapore's efforts to try out policy initiatives focusing on the domains of health and enabled aging, home, and environment, and transport in districts (e.g., in Jurong Lake District), as well as OneService app in the national level, to report any municipal problems experienced by the citizens.[10]

Why Has the Initiative Been Deemed as Successful?

Throughout the past five years since the initial establishment of the Smart Nation initiative, it has demonstrated much progress as Singapore was officially ranked as the world's smartest city in 2019. The city-state has been fairly successful in achieving the three main objectives of the initiative, which is demonstrated by the enhancement and acceleration of smart mobility, safety, healthcare, and smart administrative services through its projects.[11] Since this initiative aims to serve the citizens better, their perception is thus, valuable. To achieve the goals of the projects, the utilization of the available resources has been mainly dependent upon data insofar – on its way to foster a knowledge-based economy.



Discover the Smart City index ranking

1	Singapore	AAA
2	Zunrich	AAA
3	Oslo	AA
4	Geneva	AA
5	Copenhagen	AA
6	Auckland	A
7	Taipe City	A
8	Helsinki	A
9	Bilbao	A
10	Dusseldorf	A
11	Amsterdam	A
12	San Fransisco	A
13	Vancouver	A
14	Sydney	A
15	Toronto	A
16	Montral	A
17	Vienna	BBB
18	Bologna	BBB
19	Prague	BBB
20	London	BBB
21	Madrid	BBB
22	Milan	BBB
23	Lyon	BBB
24	Melbourne	BBB
25	Stockholm	BBB
26	Hanover	BBB

27	Brisbane	BBB
28	Gothenburg	BBB
29	The Hague	BBB
30	Dublin	BBB
31	Washington D.C.	BBB
32	Boston	BBB
33	Denver	BBB
34	Seattle	BBB
35	Los Angeles	BBB
36	Rotterdam	BBB
37	Hong Kong	BBB
38	New York	BBB
39	Berlin	BBB
40	Zhuhai	BB
41	Tianjin	BB
42	Chongqing	BB
43	Shenzhen	BB
44	Hangzhou	BB
45	Dubai	BB
46	Tel Aviv	BB
47	Seoul	BB
48	Barcelona	BB
49	Zaragoza	BB
50	Busan	BB
51	Paris	BB
52	Brimingham	BB

53	Chicago	BB
54	Philadelphia	BB
55	Nanjing	B
56	Abu Dhabi	B
57	Guangzhou	B
58	Chengdu	B
59	Shanghai	B
60	Beijing	B
61	Warsaw	B
62	Tokyo	B
63	Osaka	B
64	Brussels	B
65	Ho Chi Minh City	CCC
66	Hanoi	CCC
67	Hyderabad	CCC
68	New Delhi	CCC
69	Krakow	CCC
70	Kuala Lumpur	CCC
71	Riyadh	CCC
72	Moscow	CCC
73	St.Peternsbrug	CCC
74	Ankara	CCC
75	Bangkok	CCC
76	Lisbon	CCC
77	Rome	CCC
78	Mumbai	CC

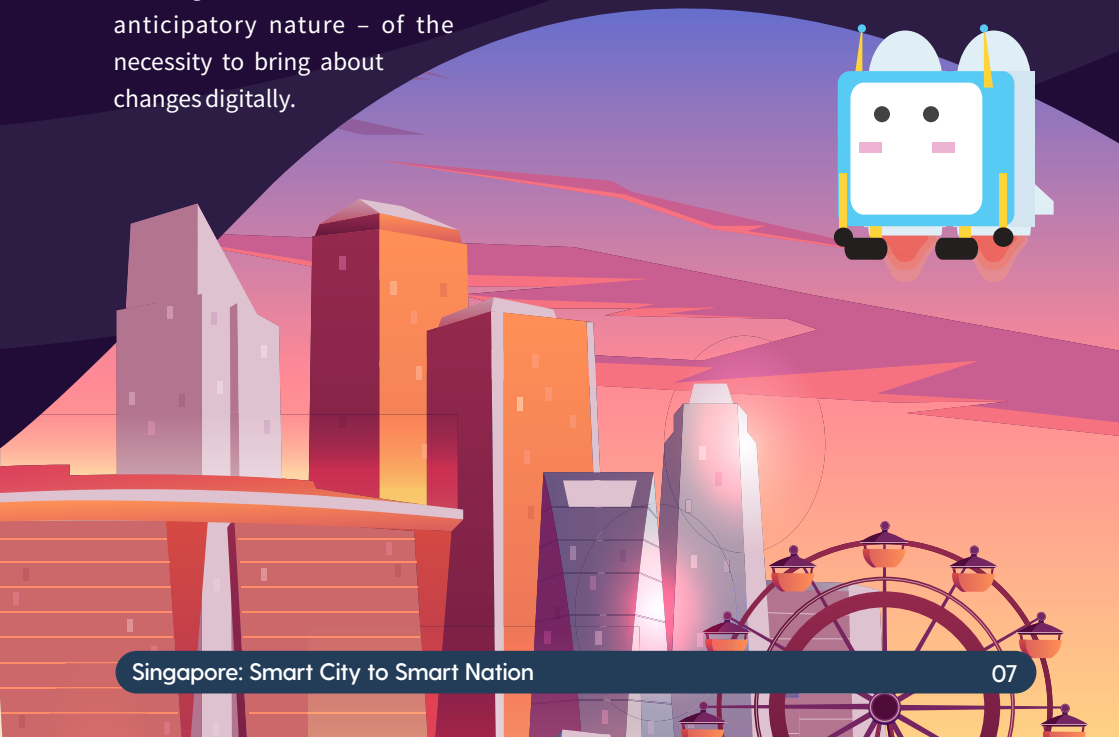
79	Bengaluru	CC
80	Makassar	CC
81	Jakarta	CC
82	Medan	CC
83	Budapest	CC
84	Bratislava	CC
85	Bucharest	CC
86	Santiago	CC
87	Buenos Aires	CC
88	Mexico City	CC
89	Sofia	CC
90	Sao Paulo	CC
91	Medellin	C
92	Kiev	C
93	Cape Town	C
94	Manila	C
95	Athens	C
96	Rio de Janeiro	C
97	Abuja	D
98	Bogota	D
99	Cairo	D
100	Nairobi	D
101	Rabat	D
102	Lagos	D

Overall Ranking City Overall Rating

As data becomes an integral part of Singapore's economic opportunity leverage, it is therefore imperative to open up an opportunity for policy co-creation to take place. The cross-sectoral approach within the policy co-creation itself has enabled the involvement of non-state actors to enact policies by referring to the available technologically-enabled open data platform (e.g., through data.gov.sg).[12] Moreover, aside from the formulation of policies, cross-sectoral cooperation is also shown by some programs, which are joint research and joint pilot trials. The joint researches are collaborations between academicians and public institutions. Meanwhile, the later are some pilot trials of new technologies between governmental institutions, start-ups, and regulators.

Theigh involvement of various stakeholders in co-creating the regulations has indisputably fostered transparency and accountability throughout the formulation processes. Not only industries and businesses that are involved, but also citizens at the individual level (e.g., through the "one service" and “eCitizen Ideas” apps). As the success relies upon the perception of the citizens upon the utilization of new technologies that could improve their quality of life, this policy co-creation plays an important role in enhancing the likelihood of the projects' success due to the 'citizen-centric' approach. On the other hand, given that the average literacy rate in Singapore was 97.3% in 2018 alone, the participation of Singaporean citizens would be unquestionably invaluable in the policy co-creation. According to Mayangsari and Novani (2015), policy co-creation or multi-stakeholder analysis aims to systematically gather and analyze qualitative information to decide the interests that should be taken into consideration when implementing a policy or program. After collecting ideas, the influence of each stakeholder in the initiative was taken into account following the necessities of the policy or program. On the other hand, relation management capability (to maintain relationships) and knowledge management capability (to acquire, store, and disseminate knowledge resulting from the interactions between the stakeholders and the project) should also be taken into consideration to smoothen the policy co-creation process. According to Mayne, stakeholders do play a prominent role throughout the development of smart city projects as the performance evaluators of the program's objectives and corresponding outcomes from first-hand experience. Singapore itself has implemented a program called 'Smart Nation Co-creating with Our People Everywhere' (SCOPE), which aims to co-create digital solutions with citizens through a series of consultations and feedback. This program has been proven successful in improving Smart Nation's policies and products through outreach to citizens, which has also garnered useful feedbacks.[13]

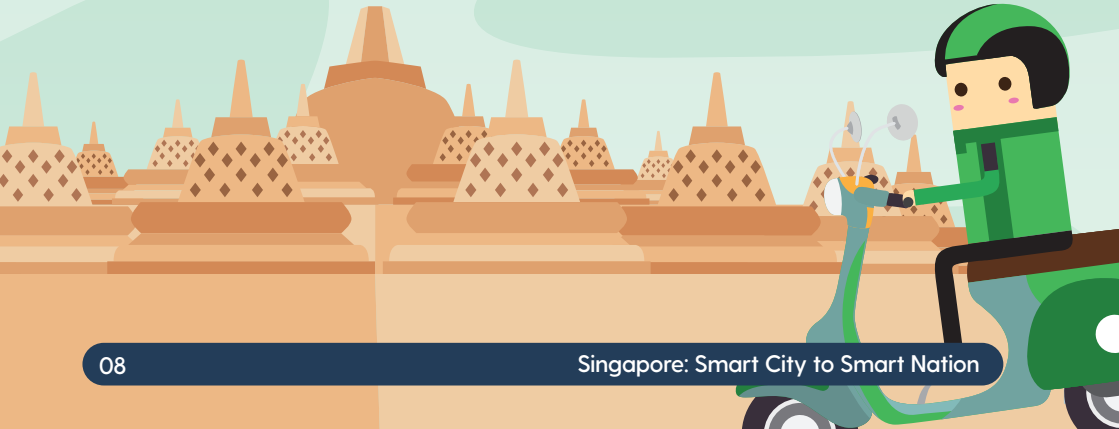
The foundation for IT human resources or "soft infrastructure" was also strongly established in the earlier IT Masterplans. The significance of teaching computer-based skills education was raised to develop individuals' IT skills for future employment amidst the development of the digital economy sector.[14] Meanwhile, in terms of technological advancement, Singapore has unquestionably been a frontrunner, especially in computing infrastructure development. According to the World Economic Forum, Singapore was officially ranked as the most network-ready country in the world.[15] It is demonstrated by Singapore's extensive IT infrastructure development, the continuous provision of efficient integrated electronic services, and investments in the development of IT capabilities both of users and service providers. Singapore has remarkably become Asia's technology capital, in which 80 out of the 100 global tech firms are currently residing in Singapore. During the first half of 2019 alone, there had been a total of US$5.99 billion of capital invested in Singapore's tech firms.[16] Aside from being technologically prepared, Singapore's dynamic governance, which could be defined as *"a governance system's ability to remain relevant and effective by continuing to change, innovate and adapt to new and emerging needs in a changing environment"*[17] has also contributed to evolving the Smart Nation initiative due to its anticipatory nature – of the necessity to bring about changes digitally.

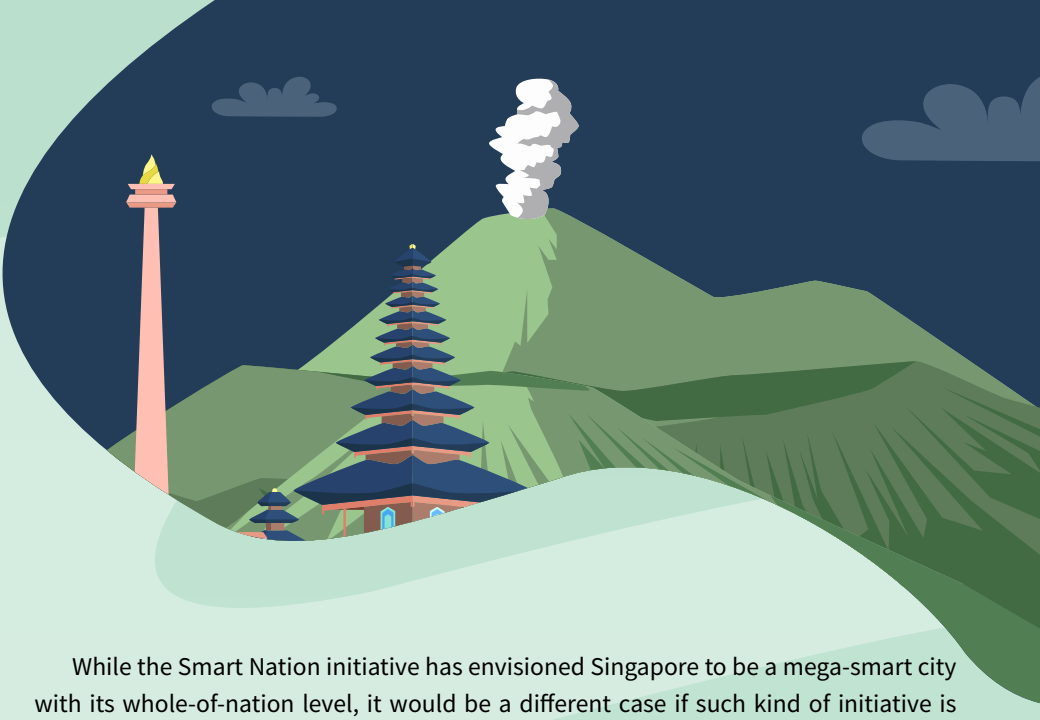


What Could Indonesia Learn?

While the Smart Nation initiative has envisioned Singapore to be a mega-smart city with its whole-of-nation level, it would be a different case if such kind of initiative is implemented in Indonesia. From Singapore's case, smart cities are successful if the adoption of new technologies could fulfill the citizens' necessities through the improvement of their quality of life.[18] Therefore, in the Indonesia case, it means more works to do. The country is home to 514 districts/cities, in which Smart Nation initiative can be differently standardized – given the varied resources' availability and infrastructure development. Additionally, while Indonesia still needs to concentrate more on the advancement of its non-physical infrastructures, such as network, device, and application. Both types of infrastructures are inseparable and should go hand in hand to facilitate the vast amount of the Internet of Things (IoT) as the underlying forces of smart cities' applications.[19]

On the other hand, the emerging sector of the digital economy in Indonesia demands the nation to start developing soft technological infrastructures to facilitate their business activities.[20] Currently, Indonesia has relied upon sharing economy as one of its primary digital economy sector's implementation like Singapore, where the frequent use of public assets is highly encouraged. On-demand services, such as Go-Jek and Grab, have profoundly contributed to the economic prosperity of the citizens, as well as having fostered financial inclusivity. Henceforth, Indonesia's 'smart city' masterplans should concentrate on the increase of the efficiency of the digital economy sector as Indonesia's contemporary economic force.





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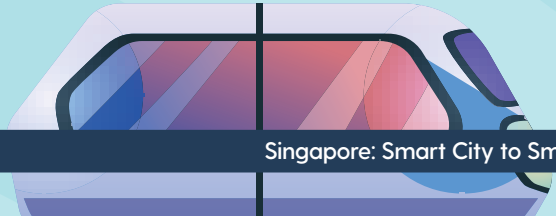
Regarding Indonesia's "100 Smart Cities" project, it is thus essential for the government to pioneering the co-creation of policies within its initiative to be able to meet the demands and priorities of the citizens. The digital literacy of individuals should also be enhanced in the first place to be able to increase their critical capabilities on the utilization of the adopted technologies. Reflecting from Singapore, where the quality of human resources has had on its peak, Indonesia should work more on improving its quality of human resources, especially in terms of digitalization preparedness. Public perception of the success of the adopted technologies in enhancing their quality of life could determine how the implementation of the 'smart city' concept is deemed as successful as what the IMD Smart City Index has characterized.



References

[1]IHS Markit. (2014). Smart Cities to Rise Fourfold in Number from 2013 to 2025. [online] Available at: https://news.ihsmarkit.com/press-release/design-supply-chain-media/smart-cities-rise-fourfold-number-2013-2025 [Accessed 11 Nov. 2019].

[2]IMD Business School. (2019). IMD Smart City Index 2019. [online] Available at: https://www.imd.org/research-knowledge/reports/imd-smart-city-index-2019/ [Accessed 5 Dec. 2019].

[3]Singapore Management University. (2016). Singapore's Vision of a Smart Nation. [online] Available at: https://cmp.smu.edu.sg/ami/article/20161108/singapore's-vision-smart-nation [Accessed 11 Nov. 2019].

[4]Lee, H. (2014). Smart Nation: Better Living, More Opportunities, Stronger Communities (Prime Minister Lee Hsien Loong's speech).

[5]Tan, C., and Pan, S. (2003). Managing e-transformation in the public sector: an e-government study of the Inland Revenue Authority of Singapore (IRAS). European Journal of Information Systems, 12(4), pp.269-281.

[6]Soh, C., Neo, B., and Markus, M. (1993). IT2000: A critical appraisal of Singapore's state-wide strategic planning process for information technology. The Journal of Strategic Information Systems, 2(4), pp.351-372.

[7]Fai, L. (2017). Government to call for S$2.4b of ICT tenders this year for Smart Nation projects. [online] Channel News Asia. Available at: https://www.channelnewsasia.com/news/singapore/government-to-call-for-s-2-4b-of-ict-tenders-this-year-for-smart-8879506 [Accessed 11 Nov. 2019].

[8]Jie, W. (2019). Singapore's Smart Nation Initiative – A Policy and Organisational Perspective. Singapore: Lee Kuan Yew School of Public Policy.

[9]Albino, V., Berardi, U., and Dangelico, R. (2015). Smart Cities: Definitions, Dimensions, Performance, and Initiatives. Journal of Urban Technology, 22(1), pp.3-21.

[10] Ibid.,

[11] Delacharlerie, C. (2019). What makes Singapore a Smart Nation and the smartest city in the world?. [online] Innovation is Everywhere. Available at: https://www.innovationiseverywhere.com/why-is-singapore-the-smartest-city-in-the-world/ [Accessed 5 Dec. 2019].

[12]Woo, J. (2018). Technology and Governance in Singapore's Smart Nation Initiative. Massachusetts: Ash Center for Democratic Governance and Innovation.

[13]https://www.smartnation.sg/docs/default-source/press-release-materials/media-factsheet---smart-nation-co-creating-with-our-people-everywhere-(scope).pdf

[14] Ibid.,

World Economic Forum. (2016). The countries best prepared for the new digital economy. [online] Available at: https://www.weforum.org/agenda/2016/07/countries-best-prepared-for-the-new-digital-economy/ [Accessed 11 Nov. 2019].

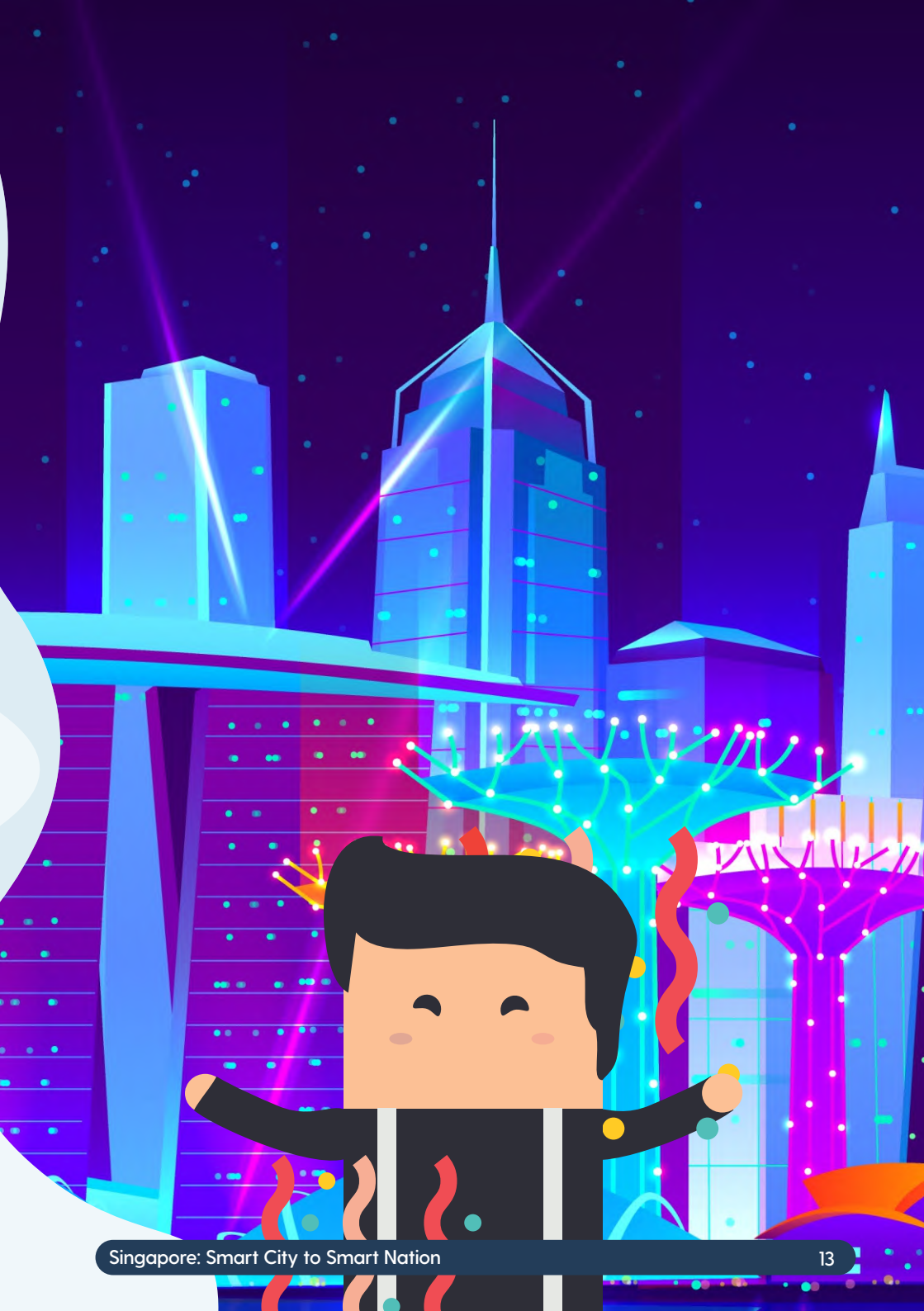
[15] The Straits Times. (2019). Singapore took 25% of US$6b in SE Asia tech investments in 1st half of 2019: Report. [online] Available at: https://www.straitstimes.com/business/economy/singapore-took-25-of-us6b-in-se-asia-tech-investments-in-1st-half-of-2019-report [Accessed 11 Nov. 2019].

[16]Jeannie Chua, "The e-Transformation Journey of Singapore," In "National Strategies to Harness Information Technology, Innovation, Technology, and Knowledge Management," N.K. Hanna and P.T. Knight (eds.), 2012 Springer Science Business Media, LLC. p64.

[17]The Conversation. (2019). Smart cities: the world best do not just adopt new technology, and they make it work for people. [online] Available at: https://theconversation.com/smart-cities-worlds-best-dont-just-adopt-new-technology-they-make-it-work-for-people-124939 [Accessed 5 Dec. 2019].

[18]Kementerian Komunikasi dan Informatika RI. (2015). Infrastruktur TIK Penting dan Dibutuhkan Masyarakat. [online] Available at: https://kominfo.go.id/index.php/content/detail/6335/Infrastruktur+TIK+Penting+dan+Dibutuhkan+Masyarakat/0/berita_satker [Accessed 11 Nov. 2019].

[19]Gatra.com. (2019). Menkominfo: Infrastruktur Teknologi RI di Bawah Malaysia | Teknologi. [online] Available at: https://www.gatra.com/detail/news/442366/teknologi/menkominfo-infrastruktur-teknologi-ri-di-bawah-malaysia [Accessed 11 Nov. 2019].



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