Aide-Mémoire

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All You Need to Know About Smart Cities

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The world in this technological era is developing expeditiously in a steady and advanced pace. At the same time, the world is also facing other types of growth such as population, infrastructure and demands, all of which bring along the destruction to the planet. But that does not mean that we have to stop this growth. Cities, people, and environment need to continue to grow alongside each other. But how does that make sense? By virtue of disruptive technology, specifically in the fourth industrial revolution, where we see the most impressive and exceptional technology by far in human history, this is no longer a challenge to development. The solution that it offers is the construction of 'Smart Cities'. Even so, cities need to develop their surrounding environment in order to catch up with changing needs and priorities of the populations. By infusing smart solutions into the built-in living environment, the cities will become more productive, creating livable environment where people and business can thrive. Smart cities, not only are they innovative at the foundation but also sustainable and inclusive in practice. But, how are smart cities defined, and how do we distinguish smart cities from the normal ones? Equally noteworthy, why are they important and what kind of plan and vison has the Royal Government of Cambodia been putting in place for smart cities projects in the Kingdom?

Smart City Conception and Definition: What makes a City Smart?

The concept of Smart City dated back to as long as late 1990s in the Smart Growth movement, which campaigned for new urban development policies to curb the increasing impacts of urban growth (Harrison & Donnely, 2011). The term 'Smart City' later became a catchy phrase in early 2009 used to describe sustainable urban development. Because of different conditions and contexts into which smart city technologies are diffused, there is no conclusive definition for a smart city, including its describing attributes. Smart city projects in Latin America focus on security, local government and mobility while those in Europe emphasize on efficiency of public services and inclusive society (Neirotti et al., 2014). However, what people have been generally referring to as a smart city is the city whose system is sophisticated and able to sense and act independently. It is this system that a great volume of real-time data is processed and integrated. After all, for a smart city to achieve such highly developed system, it must incorporate information and communication technologies (ICT) to enhance the quality and performance of services in the city such as energy, transportation and daily utilities (Technopedia, n.d.). The ultimate purpose of constructing a smart city is to enhance the quality of living of the general citizens by seizing the benefits from the existing modern technologies.

Various papers and articles identify a smart city as a city having the ability to connect to a wide variety of technologies (digital and electronic) in order to interact with its communities, one whose government system is embedded with information and communication technologies (commonly known as e-government) and one that integrates the ICT into people's daily lives encompassing their living and working environment without borders. A smart city is made up of various smart components that are digitally interconnected, including digital government, smart environment, smart parking, smart buildings, smart health, smart streetlights

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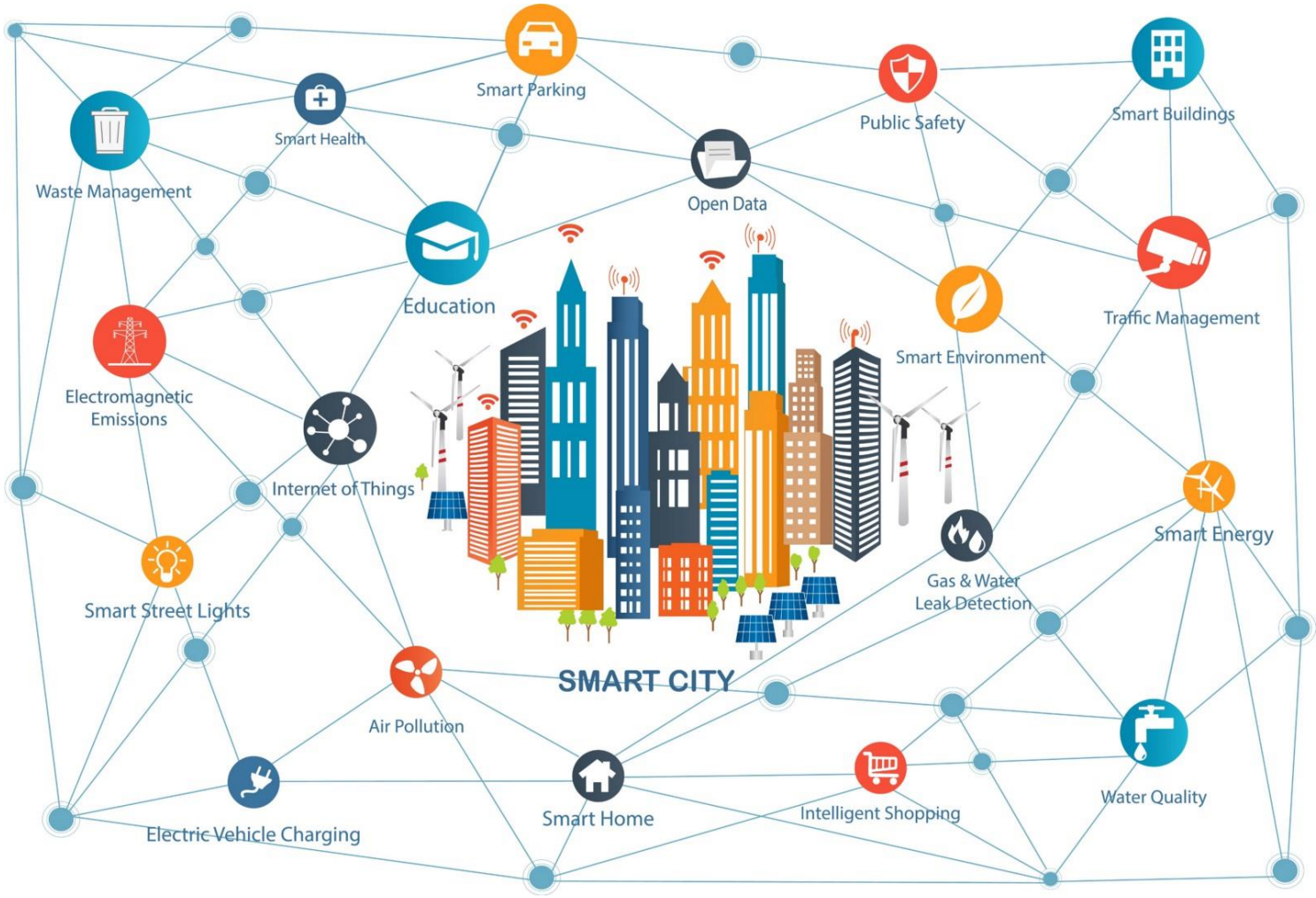
and other smart and digital constituents. Simply put it this way, a smart city is the one that can fit on your palm and you can manage your daily activities and lifestyle with just one click away. Nonetheless, optimization of the ICT alone does not really make a city smart yet. Robert G. Hollands argued, in a widely cited article, that a real smart city should use ICT to reinforce democratic debate and policies of sustainable urban development. If based on this conception, to create a smart city, three components are needed: people, data, and technology; all of which need to interact closely with one another (Deloitte, 2015).



Source: Dreams Time – Smart Cities and Wireless Communication Network

Why do we need Smart Cities?

According to a report by World Bank, 72 percent of 750 cities under the study achieved tremendous economic growth between 2005 and 2012, which outpaced their respective national economies (Eggers & Skowron, 2018). It is projected that by 2025, the world's top 600 cities will make up about 60 percent of global gross domestic products.

Those rapidly growing cities are facing formidable challenges, in terms of sustainability, resilience, physical security and growth. Smart city is expected to offer ways to tackle the challenges and provide sustainability, resilience and development. But what exactly does a smart city do to represent a solution?

First and foremost, the operation of smart cities is believed to help minimize the resource usage, reduce consumption and save the costs. Based on the United Nations Environment Programme (UNEP), urban population throughout the world consumes 75% of the world resources, generates

50-80% of the world's greenhouse gas emissions, and produces half of global waste (Murray, 2015). What is surprising about this is that these cities only occupy 3% of the world's surface. Then, what is the role of smart cities here? Technology deployment enables the government workers to distribute and keep track of the energy and resources efficiently. They can detect whether there is illegal use of water supply or leakages; thus, making a more substantial reduction in water losses. In addition, sensory technology manages the energy usage and reduces unnecessary energy consumption. The lights and other electronic devices will automatically turn themselves off when there is no people around or no longer in use.

Second, smart city enables a smarter decision-making for the people as well as the government. For example, the sensor technology that is installed into the parking lot can monitor and send real-time update to the users whether there is an available space for parking for their selected area. Thus, the drivers can make better and prompt decision. At the same time, the government can also collect data on the street from the smart cameras to facilitate the waste management process. The official in-charge can monitor and access to waste tonnage per district and resolve complaints as well as tracking the waste-collecting trucks whether it goes past some areas or could not collect trash in some areas so that the officials can send them back for recollection. Third, the businesses operate in the smart cities also stand to reap the gains in a sustainable and innovative way. The most apparent sector that is bound to benefit from this is the tech and IoT enterprises, without which the operation throughout the smart cities will be faced with great obstacles. Coinciding with this, those enterprises will also thrive to develop new technologies and update the old ones to meet the increasing demands from the people and ease the development of smart cities. As the companies expand, more jobs and opportunities will come along the way and contribute to economic growth in a broader sense.

Last but not least, the government can seize this opportunity to better monitor the system within, and deliver the services to citizens, resulting in increased transparency and better performance. This is what people usually refer to as e-governance. There are certain services that citizens can access to online such as filing and resolving complaints, which is much easier, faster and cheaper compared the offline methods. Furthermore, the government can also manage the number of staffs through cross-department information sharing since the organizational structure in each department and ministry is too complex for them to manage without the technological support. Moreover, since users' data are transparent and open in smart cities, the government can collect the data and map out the behaviors and demands of the citizens though their daily activities so that the policy-makers can develop policies that better meet the needs and demands of the public.

Dark Side of the Smart Cities

One of the most difficult issues that smart cities must address is the security and privacy protection. Because smart cities require open and transparent data, protecting such immense and complex data from attacks or malicious activities is an inevitable challenge. More importantly, not only does it stores the users' data but also other sensitive government data. Due to the nature of the integrated data and information management across systems and devices, an attack in one area can cause a huge cascade attack on the whole system infrastructure and communication. If the attackers obtain the information and use them in an offensive way, it would lead to a catastrophe one could not have imagined. A case like this was reported in 2018 for a cyberattack on public computer systems in Atlanta, a city well-known for its investment in smart applications. The attack had led to the shutdown of various city's functions, some of which

had lasted for months (Unal, 2019). For cyber attackers, smart cities are dream places to harness their activities. Another major issue that needs to be considered is the breach of users' privacy. All activities of the users are recorded and monitored in smart cities through the smart cameras into the big database. The users no longer feel secured because they can be watched for every action, including their location, what they eat or buy and even what they text to the others. Furthermore, the worst-case scenario is that they are not aware of how their data is being monitored, used, sold or done with, thus creating an ambiguity of a combination between a non-private life, if not unsecured, and a convenient one.

Another concern brought by smart city is the uneven development. Smart cities are known for its extensive expense on technologies. As a result, it takes huge resources, technically and financially, to build a smart city. While a big amount of money is allocated to the building of a smart city, the other areas which is also desperate about their development will have to wait. The tradeoff that the government has to make with limited budget will be very likely to create development gap in the country itself. Finally, energy security is also an important issue that shall not be overlooked since whether a smart city is able to function smoothly depends very much on electricity supply to its constituents. What if there is an electricity cutoff? The smart cities will no longer be smart.

Trend towards Smart Cities

Despite all odds, there has been increased interests in and proliferation of the implementation of smart city programs, both in developed and developing countries, spanning from European continent to the American, from the Asian to the Middle East and the African for ensuring future sustainability and efficiency of the cities. According to a research on smart cities market, it was projected that the smart cities market value will grow from $442.89 billion (2017) to $1,226.68 billion by 2023 at an annual growth rate of 18.22% (Mordor Intelligence, n.d.). Likewise, the worldwide spending on the development of smart cities is expected to rise to $34.35 billion by 2020. Among the global smart cities market, Asia-Pacific will foresee the fastest and highest growth rate, most of which come from China and India with roughly 500 and 750 smart cities projects respectively. In Southeast Asia, Singapore, despite lack of natural resources, is a fast-growing economy and a successful development model, especially for building smart cities. According to the Smart City Index, Singapore is ranked first among the countries adopting smart cities technology based on four criteria, which include mobility, healthcare, public safety and productivity, in a bid to deliver better services and improve the quality of life[1].

This trend also attracts Cambodia and the regional grouping as well. The ASEAN Smart Cities Network (ASCN) was founded at the 32nd ASEAN Summit in April 2018 as a platform where cities from all ASEAN members work collaboratively toward building a smart and sustainable urban development. Cambodia's most populous city and provinces, namely Phnom Penh, Siem Reap, and Battambang are among the 26 pilot cities to be funded for the smart city project under this framework. With a strong drive and motivation to push the country into the technological sphere, the Kingdom of Cambodia also partners with Japan to attract investment for the development of smart cities, including urban management and the application of IT into the urban spaces. This cooperation would support fast implementation and transformation of the three cities in the Kingdom chosen to be the smart cities model under the ASCN. Beside the partnership with Japan,

[1] The Smart City Index: The Cities Leading the Way in Smart City Technology. Retrieved from: http://www.ecardshack.com/c/smart-city-index/.

Cambodia also extend the arms to Hong Kong-based institution, Smart City Consortium, to boost the capacity to embrace smart cities technology. However, the government visions for smart cities had been put into places since 2016, in a joint-project with South Korea to turn Sihanoukville into a smart city. In this connection, Phnom Penh Master Plan 2035 was introduced to support the urban development in Phnom Penh and was developed upon a smart city concept to ensure sustainable and economic development while, at the same time, accommodating the increased urbanization, in which 8 million people are expected to be living in urban areas by 2030.

Nevertheless, the construction for smart cities requires joint efforts from all relevant stakeholders, including not only the government but also private enterprises, scientists and the public. The success of a smart city is neither a top-down nor a bottom-up approach, but it requires both. While the government develops policies focusing on the smart city programs and pours resources into the policy implementation, the enterprises and scientists must ramp up their efforts to invent and update the technologies to match up with the government efforts. The public, apart from utilizing the super-advanced technologies and services, plays vital roles in participating in the governance and management of the smart cities, known as ‘electronic participation’.

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