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RIO DE JANEIRO'S SMART CITY:

A Hurdling Journey

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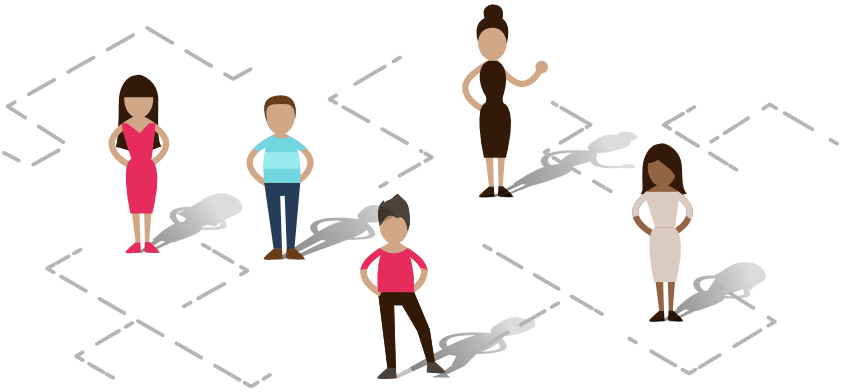
Introduction

In 2013, Rio de Janeiro, one of the biggest cities in Brazil, won the World Smart City Award from the Smart City Expo World Congress. Two pillars of Rio's Smart City initiatives, Centro Integrado de Comando e Controle (CICC) or Integrated Centers of Command and Control, and the Centro das Operac¸o˜es do Rio (COR) or Rio Operations Center played key role on this accolade. CICC stands as the center for Rio's five emergency lines (there is no unitary call system), traffic monitoring, and as a security planning and operations headquarters; while COR is in charge for First Responder Coordination and Emergency Alert Notification and Urban Mapping Project. However, this commendation is still contested by many, mainly because it does not resemble completely the plethora of smart city aspect and interpretations. There are three main aspects of smart city that still stand as hurdles in the pursuit of Rio's smart city vision, namely active citizenship, development agenda issues, and infrastructure.

Active Citizenship

The basic definition of smart city can be understood as the implementation and effective integration of new technologies in cities which have the potential to improve quality of life, boost economic growth, mitigate the negative effects of climate change, and even foster more active citizenship (Allwinkle and Cruickshank, 2011). This definition indicates that the smart combination of technology and self-decisive activities will increase city's performance in a forward-looking



way in economy, people, governance, mobility, environment, living, as well as independency (Giffinger et al., 2007).Accessibility to technology by self-decisive citizens will foster more active citizenship and that is what resembles smart city in social context.

In the case of Rio, these definitions simply do not apply, particularly in the establishment of active citizenship. It is very apparent that CICC and COR do not provide any platform for the citizens to participate in any level of decision making and governance. These two bodies also do not seem to utilize the advancement in technology to increase public awareness, as CICC does not even have a website. Citizen awareness on how the city landscape will change drastically in the wake of two major sporting events, the Olympics and World Cup, is important because it reshapes their day-to-day life, particularly from the infrastructure development. The suite of new transportation lines, hotel stimulus packages, stadium projects, security measures, and every other projects associated with the 2016 Olympics had no input from or discussion with civil society actors, neighborhood associations, ormember of municipal chambers (Gaffney and Robertson, 2016). The only form of participation that citizen can enjoy is watching Olympic City construction on their smartphones (Amorim et. al., 2014).

The lack of utilization of technology on active citizenship turns Rio's citizen to

the most mainstream activism, the social media. Facebook and Twitter are commonly used to address issues on urban landscape, where it was shifting during World Cup and Olympic Games. “Clicktivism” might be useful in mobilizing people on urban landscape issues but at the same time, CICC with its advance security technology had the authority and power to easily block it. During the protests of 2013–2014, police forces allegedly shut down cellular service to disrupt activist networks, and 'coincidentally', CICC members mainly consisted of police forces (Gaffney and Robertson, 2016).

The disruption on 2013-2014 protest was claimed to be a part of proactive and preventive measurement from the government to repel “natural disasters.” In this context,natural disasters are not only defined as flood or landslide, but also protest. The former is a relatively difficult natural occurrence to cope with, but the latter definition might be contested, especially in political terms. It is arguable that protest is natural in definition, but in the context of Rio, it can be highly political. This definition to some extent might indicate the smart city technology is used to consolidate political power. From this definition it can be seen that technological advancement on Rio's Smart City initiatives are not meant to increase public awareness or more active citizenship but more as social surveillance.

Issues in Development Pattern

Development issues are arising in Brazil and they do not exclude the process of transforming Rio de Janeiro into a smart city. Seeing it as one of the biggest cities in Brazil, long before its Olympics agenda the city itself has become the second most important contributor to the country's Gross Domestic Product (GDP) producing almost 11 per cent of the country total (Xavier and Malgahaes, 2003). The vastly growing city paired with such development agenda gives rooms

for politicization within the governance and rooms for those to enter. It is not surprising, seeing that between 1997 and 2010 the royalty revenues of counties in Rio de Janeiro rose 34%, up from R$97 million to the speed at which investments were being announced and the deadlines set for some sports venues. Interestingly, this is not an exception for Rio's Smart City project.

Partnering with IBM, Rio de Janeiro empowers younger social capitals through innovations which gave job opportunities for young and creative minds, collaborating with UNICEF Centro de Promocao de Saude (Wakefield, 2013). According to the grand plan, it was seen that IBM's vision of an ideal city is one whose smartness is founded upon an efficiently integrated system of system, where there is rearticulating of a long-standing trope in which the complex city is simplified into a finite number of separate systems that relate to each other (Gaffney and Robertson, 2016). In which being perceived as IBM, a company providing technological mechanism for the sake of effective governance of the government of Rio de Janeiro, making it easier for them to account problems and issues, letting the city to react autonomously and accordingly using the kind of language provided by IBM. The public might see the involvement and project being done by IBM in a different way. In a corporate sense it could be seen that the systems currently being sold to municipalities and the public under the rubric of "smart cities", have nothing to do with public interest at all.The interests among actors in the smart city project are the repurposing of existing technologies which might not match the originally intended functions (Greenfield, 2013).

Without full consideration of the city'scapability, the government of Rio accepted the challenge of becoming a smart city, where it can adopt new information and communication technologies. However, declaring themselves as a smart cityhas been backed withvery little accountability (Holland, 2008). According to Gaffney and Robertson (2016), the interests of IBM are in line with

what the city's executives have in mind, who have embarked on radical overhaul of the urban facilitycatalyzed by sports mega events. The federal, state, and city governments have pointed to the establishment of smart city centers as an important legacy of Rio's public spending for the World Cup. From this argument, it is presumable that there is significant negligence of society's involvement in the smart city project, if the sole reason behind this ambitious project is centered on the executive's ambition on sport mega events.While on the other hand,in order to make the Smart City blueprint works, the government needs their citizensto be involved in the process of improving the quality of life through smart cities (Schereiner, 2016).

IBM's involvement in the establishment of Rio de Janeiro's smart city does not end in mere transfers of technology.Rather, it is a multidimensional development project which also contributestowardsits socio-economic human development, since Rio is a city with a high level of economic gapbetween the rich and the poor.Besides geographical challenges, Rio's development must also consider the possibilities of bothnatural and man-made disasters. If not, then Rio de Janeiro would only be seen as another project which allows the company to use the urbanization data to predict the movement of people into the cities.This is important to consider since there is a possibility in the future that 75% of the world's population would migrate into cities (United Nations, 2014), and that this smart city project could be the business ambition of IBM to raise its annual revenue to $150 billion (Singer, 2012).

Infrastructure Limitation

Information and technology infrastructure is one of the key elements that contribute toward the implementation of E-Governance and smart city. A more integrated and well-connected IT infrastructure will allow a city to establish better e-governance system and network of smart city for its citizens. Although Rio de Janeiro is seen as one of the most well-known cities in Brazil and the world as well, we see that the

problem of infrastructure retains the government of Rio from implementing a solid e-governance system. In this writing, we identify three infrastructure problems in regard to Rio's information and technology system.

1. **Limited Internet Network Coverage**

Regardless of the fact that the number of mobile phone and computer users among Rio citizens show improvement annually, the digital divide between those who live in urban and rural area of Rio is still apparent.In rural area of Rio, the unavailability of modest and affordable internet service is limiting the local society to access the online world (Pedrozo, 2013).

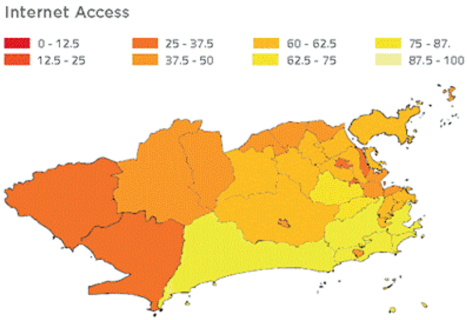


Figure 1 - Inequality of internet penetration in Rio de Janeiro, adapted from Schreiner (2016)

Furthermore, despite the incoming of major funds for two major global sporting events, 2014 World Cup and 2016 Rio Olympics, it is not subsequently translated into well-targeted IT infrastructure development plan around the city of Rio. A Research by Schreiner (2016) discovers that populations in upper-middle and wealthier area, marked by yellow color on the map, tend to have better internet coverage than Rio's lower income residence area as well as the favelas.

2. **Cybersecurity**

The act of cybercrime may result in financial loss and

municipal/national security breach (Lobato&Kenkel, 2015). In Rio de Janeiro, cybersecurity remains a problem that still disturbs its internet system.

For instance, a report from Tiger Security - A private security consultant hired to oversee the 2014 World Cup –highlighted that in Rio and other Brazilian cities, many government officials' emails, personal information and several websites were being hacked by anonymous parties. Those data were used by hackers to manipulate ticketing system, create false information as well as spread online scamming. This situation does not only happen once. Furthermore, during the 2016 Olympics in Rio, numerous sensitive and private data about athletes' personal information and performance, which was supposedly to be only accessed by authorized parties, was also being stolen by hackers (Duchon 2016, BBC 2016).

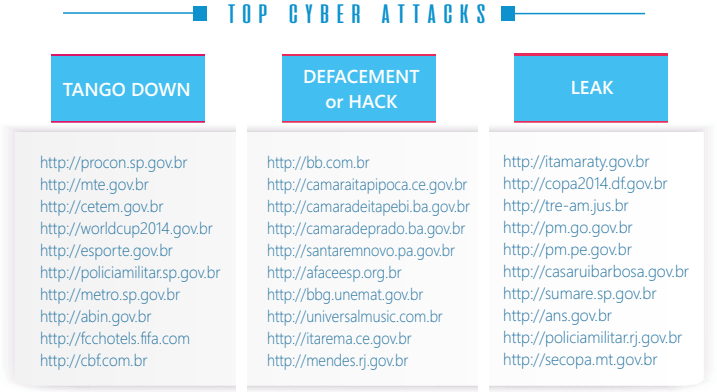


Figure 2 - List of Brazilian government's websites being hacked during the 2014 FIFA World Cup, adapted from Tiger Security Report (2014)

Those two occasions show that the government of Rio de Janeiro has not yet safeguardedits cyber world from the threat of hackers and other online criminals. Hence, if Rio's government insists on fully digitalizing its service and citizen's data in the near time without being accompanied by

efforts to improve their cyber security, it is perturbing that there will be a massive hacking crisis that eventually will put Rio citizen's security at stake.

3. **Limited Coverage of Government's Online Service**

Partially due to limited coverage of the internet in Rio, it makes several government's services become ineffective. For instance, Rio's CICC (Integrated Command and Control Center), which aimed to enhance security awareness through online surveillance, is focusing to only cover the city area of Rio de Janeiro and leave the peripheral area untouched (Gaffney &Robertson 2016, p. 8). As a matter of fact, and ironically, many criminal activities in Rio are now shifting to the rural side of the city. Hence, this limitation makes government's online service does not provide major impact to the security of the society in Rio de Janeiro.

Lessons Learned for Indonesia

1. **Increasing Compatibility between The E-governance System and The Characteristics of The Society**

The smart city system in Rio de Janeiro is built majorly through partnership between the government and IBM, and thus, excluding the participation of Rio citizen. As a consequence, some of the systems do not necessarily present an answer that is needed to overcomeproblems within the society. This results in a less effective and less impactful smart city system. Hence, it can be learned here that the participation of citizen is highly recommended during the development of smart city system. Besides stimulating the practice of democracy, an active participation from the citizen will also improve the effectivity of the smart city system. As a democratic country, Indonesia's government shall also put this concern on top of the list when it comes to the smart city development agenda. As Indonesia has more

people, ensuring public participation may indeed pose further implications. However, smart city is not smart until the people actually takes care of the city through such innovative system.

2. **The importance of Web 2.0 technology implementation within e-governance system**

In case of Rio de Janeiro, the smart city application, such as the CICC, is built upon hierarchical, top-down structure, which disables citizens' active participation to contribute in the development of the website's content. Therefore, it is suggested that smart city applications or websites will be better if they are being developed through web 2.0 technology, which enable all of the users to contribute in the content development within the websites, and thus, enriching the data, information, and knowledge that can be accessed by everyone.

Conclusion

Even though Rio is gaining commendation as one of the best Smart City in the world, Rio's Smart City initiatives do not resemble the three aspects on how Smart City resembles. It does not foster the growth of public awareness, social activism, or more active citizenship. At the same time, it increases surveillance and control on its citizens, and repels them should it be categorized as "natural disaster." Rio's development pattern on Smart City is also an issue on its own. The Smart City initiative in Rio is targeted exclusively for economic growth without taking care of other smart city aspect such as the increase of life quality or human development index. Lastly, Rio's smart city infrastructure performance is also in contested terrains. Limited government service using technology, network coverage, and cybersecurity threats are common themes on infrastructure discourse at Rio's Smart City initiatives.

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