

FIJI EMBASSY TOKYO

Briefing Note 10/2019



THE REVOLUTION OF SMART CITIES

Introduction

The speed and growth of urbanization in Asia Pacific is unprecedented. According to the projections by the United Nations, between 1980 and 2010, the regions cities grew by around one billion people and by 2014, 55 percent of the worldwide population were living in Asia and the Pacific. The growth will continue, and this rapid urbanization will lead to many development challenges since 65 percent of the SDG's will need to be met by the cities alone.¹ Thus, this brief will explore how cities will be managed, how to overcome challenges and broaden the knowledge and international best practices which should be implemented focusing on future, urban finance, governance and capacity development, smart urban data and technologies, and urban/territorial planning.

Background

Smart City generally refers to the integration of traditional infrastructure and use of ICT and other new digital technologies. It can refer to the automation of routine functions. It also requires capabilities and capacities to be able to monitor, understand, analyze and plan a city to improve efficiency, quality of lives for its citizens in real time.

Smart city initiatives refer to a new kind of tool which addresses problems and is subject to the same requirements as good governance and strong institutions as in any other urban infrastructure system. It is forecasted that the technologies used in high- and middle-income countries will become more influential thus it is important to reduce the gap in terms of digital divide and make cities more livable and sustainable.

Smart city applications connect a city's infrastructure, people, businesses, and government in order to maximize the use of resources. Challenges in obtaining finance from

risk-averse banks for smart city initiatives, uncertain return on investment, complexities due to the involvement of stakeholders from multiple sectors, long timelines for project implementation and the social benefits which are difficult to quantify are some deterrent factors affecting development of smart cities.

Challenges

❖ Technical Capacity and skill gaps to implement and run smart systems.

Municipalities often lack skilled personnel to inform decision making about the adoption and management of smart technologies which can result in outsourcing of smart systems planning, implementation, and management to private sector entities.

❖ Financing Mechanism

Financing smart cities often requires both government and private sector involvement and investment to implement good business/revenue models to ensure the priorities of city residents are reflected in investment decisions.

❖ Data Limitations and Smart opportunities

Data gathered through sensor or through social media and communication applications should help and formulate better policies and improve management of urban systems. The data can be turned into objective information for data analysis.

How to Model Smart Cities

To make a valid case for investors and banks, revenue models should be established for the financial sustainability of a smart city application. In projects with longer timelines, new revenue streams need to be identified. Digital strategies and technology that helps

parking management and traffic ticketing is popular and well-supported by many government administrators, as it helps the city to generate revenue. For instance, India lacks data on the number of streetlights, and this knowledge gap means cities do not know how much energy could be saved from the implementation of better streetlight technology.

Knowledge partners are key stakeholders who provide expertise and efficiency to deliver smart city projects. In the case of Fiji, it could be ADB.

To engage citizens, cities should create awareness about the Smart City Challenge, consult citizens to get feedback, and then ensure this feedback is prioritized and informs the Smart City strategies. Questions cities can ask citizens could include what benefits they want from a smart city, and what areas they are interested in.

Technologies could help to eliminate the geographical distance and accumulate social venture capital by harvesting the power of the people. It is also the government's task to create an enabling environment where technology assists to reach the smaller and rural regions.

For example, in transport and mobility, the government could develop policies to roll out sensors and collect data securely. On the other hand, the private sector could influence behavior and consumption patterns through the market.

Another example is when trash cans can have sensors that indicate when they are full, and trash collectors follow a specific route based on this information or alternatively, a smartphone application is developed (or a SMS service) to report a full trash can, and trash collectors can accommodate their routes based on this information.

Smart City Evolution

1. Technology

A necessary precondition for smart development, technology to collect, store and analyze data, and deliver. For example, sensors for data collection, centralized data storage and analytics system and smart surveillance cameras.

2. Institutions

Government institutions need to be properly designed to support smart city development and have the necessary staff and financial capabilities. For example, Chief Digital Officer to drive smart initiatives across city departments and capacity development.

3. Digitization

The conversion of analogue and paper-based processes to digital for improved efficiency and cost effectiveness. For Example, online information systems, e-payments, Apps. and digital records

4. Integration

Analyzing data from a range of areas (e.g. land use, innovation, water, housing, energy, health, sanitation) and developing cross-sector solutions to challenges. For example, centralized data repository and comprehensive city master planning.

5. Community

Supporting an engaged community of citizens and private partners for continuous feedback and contribution to smart development. For example, feedback mechanisms, business partnerships including PPPs and two-way communications where citizens can notify city of problems.

Smart City Initiatives

Singapore - Waste

Battery operated sensors detect if a bin is filled and communicate this to improve productivity by preventing unneeded trips made to empty bins.

Singapore – Safety

Under the PoICam initiative, over 60,000 cameras have been installed, some with facial recognition software to detect and deter crime.

Estonia - Energy

Smart-metering to allow end users to monitor consumption, compare billing packages and choose how much energy comes from renewable sources.

A Case Study of Yokohama – Urban Development Planning to Implementation

Yokohama saw its population increasing from 2 million in 1969 to 3 million in 1986. The challenges caused by urbanization urgently required infrastructure development.

Thus, Yokohama developed a Y-PORT Project which considered the support from the central government, the technological capacities of firms in the city and know how and technologies of the City of Yokohama.

They believed it was essential to provide not simple products but solutions through combining technologies and knowhow of the public and private sectors.

They also started building relationships with different cities and sharing information on best practices and solutions. They also identified areas which required immediate attention.

In Yokohama, solid waste management (waste separation) was one of the activities which started as a pilot project and included data collection, awareness in the community through the various CSO's and schools, and development of a Trainers Training Manual for 3R (Reduce, Recycle and Reuse) communication.

Under the basic legal framework of solid waste management in Japan which stipulates laws, regulations and roles of central and local government were reviewed to include the following recycling laws (1995-2012)ⁱⁱ:

1. Container and Packaging Recycling Act
2. Home Appliances Recycling Act
3. Construction Materials Recycling Act
4. Food Wastes Recycling Act
5. End of Life Vehicles Recycling Act
6. Small Home Appliance Recycling Act

In addition, the classification of waste (general waste and industrial waste) from households and by business activities were identified and classified. The jurisdiction in terms of municipality's responsibility included city, town and villages. The business operators had the

responsibility to dispose appropriately wastes produced by own business activities.

Furthermore, it is important to understand the role of government in terms of basic policy formulation, setting of managements standards, facility standards and emergency measures.

In the case of general waste in Yokohama, prefectural government usually handle the general waste management facilities, installation and issue transfer permits. On the other hand, the Municipalities, manage the general waste management plans in accordance with management standards to ensure that waste within the region have necessary business permits.

Regarding industrial waste, the prefectures issue the permit and supervise the business operators to ensure there is observance of industrial waste management standards.

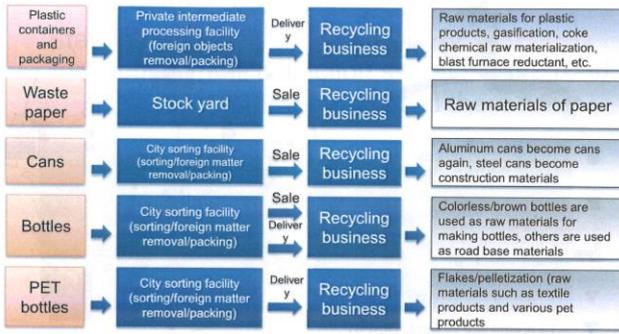
The Structure of Garbage Collection in Yokohama:

| Types of Garbage | Who Collects It? | Who bears the Cost? |
|---|--|---|
| Burnable Garbage | Directly managed by the City of Yokohama | Tax |
| Plastic containers and packaging cans/bottles/PET bottles | Consignment (private business operators) | Tax |
| Oversized waste | Consignment (private business operators) | Emitters (discharge after disposal an advanced application) |

There are authorized collection sites which usually accommodates for 10-30 households per site.

The flow of treatment of main sorted collection items is shown below:

Flow of treatment of main sorted collection items 4



The Resource Selection Center which is administered by the waste recycling public corporation then sells them to recycling companies. For instance, in the city of Yokohama, sales generated by recycling aluminum happens to earn approximately 155,000 yen for 1 ton, whereas transparent bottle inclusive of brown bottle earn about 160 yen for 1 ton.

The recycling company converts the waste into a resource which could be later used to create the same product or new products.

Conclusion

In conclusion, it could be said that the trend in recycle markets is likely to be towards requiring higher quality materials, involving the private sector in collection and treatment can help reduce costs and reduce the management burden. If involving the private sector,

minimum collection and treatment standards should be set and a robust reporting system of data and waste collection and treatment should be put in place.

The collection and publication of key waste data of each municipality (e.g. kg/inhabitant and fraction collected, recovery and recycling rates) is also significantly important to invite private sector investment in this area.

Cities should strategically utilize all actors to enable and promote smart city projects. In addition, smart city champions can be other cities as well, who can teach and share best practices with other cities.

Fiji Embassy, Tokyo

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ⁱ UN-Habitat and ESCAP, The State of Asian and Pacific Cities 2015 (UN-Habitat and ESCAP, 2015).

ⁱⁱ Y-PORT Center, Yokohama Urban Smart Solution, Retrieved from <https://www.city.yokohama.lg.jp/lang/overseas/yport/yport/yportcenter.html>