Multi-Functional Smart Lampposts Advisory Ad Hoc Committee

12 November 2019 | 4th Meeting

Personal Data Privacy Implications of 5G Technology

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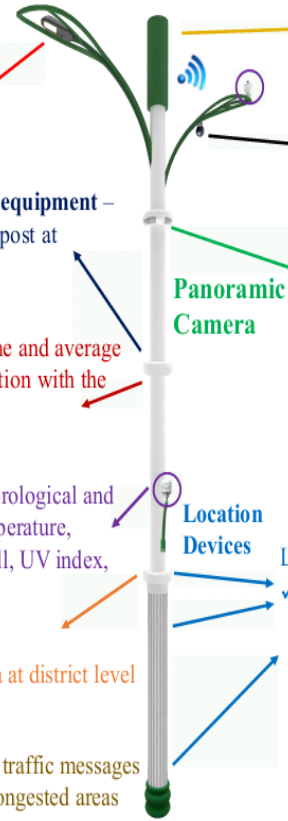
Smart Lamppost Features and Applications - Overview



HyD:

✓ **LED lighting** – to adopt energy saving equipment and smart management for carbon emission reduction

OGCIO :

✓ **Wi-Fi access point and related network equipment** – to install free Wi-Fi service on smart lamppost at suitable locations

TD:

✓ **Bluetooth detector** – to detect journey time and average vehicular speed for sharing traffic information with the public

HKO:

✓ **Meteorological sensors** – to collect meteorological and related data at district level, including temperature, humidity, wind speed and direction, rainfall, UV index, etc.

EPD:

Air quality sensor – to collect air quality data at district level

TC:

To advise the tourist trade/agents to make use traffic messages or alerts to help them plan routes that avoid congested areas

4G / 5G – to facilitate mobile network operators to install base stations

TD:

✓ **Thermal detector & Surveillance camera** – to collect real-time traffic data, including vehicular speed, vehicle types and traffic flow, and to monitor traffic conditions

Panoramic Camera

TD:

✓ **Panoramic camera with Artificial Intelligence** – to collect real-time traffic data for sharing to the public as well as traffic monitoring

EPD :

✓ **Panoramic camera with Artificial Intelligence** – to collect illegal dumping data

Location Devices

LandsD :

✓ **Bluetooth Beacon, Radio Frequency Identification (RFID) tag and Geo-QR Code** – to provide accurate positioning services to support the development of related applications by the Government and the industry, such as providing information of public facilities to the public and visitors

In the Smart Lamppost, provision is made for mobile network operators to install 5G base stations to facilitate the future development of fifth generation (5G) mobile network services in Hong Kong and to offer free Wi-Fi services.

What is 5G?

- 5th generation of cellular network technology, said to be 10 to 20 times faster than 4G
- Low latency (i.e. no time lag or difference between sending and receiving signal)
- 5G technology will contribute greatly to our data-driven economy.
- Internet of Things will become more pervasive and successful
- Enabling newer applications and technologies, such as virtual reality (VR), augmented reality (AR), telemedicine and autonomous vehicles.
- The potential for new business models and novel services could be limitless.

Negative Impacts on Data Privacy

- Ubiquitous connection
- Location privacy
- Multi-vendor environment
- Security issue of mass-connectivity

Ubiquitous connection

- Vision of 5G: “always available” -- constant connectivity anytime, anywhere
- Can be achieved by an omnipresent of IoT devices, e.g. smart lampposts, smart home appliances, connected cars…
- Improve handiness for service users, and large amounts of performance data could improve service quality

Ubiquitous connection

- However: continuous tracking and monitoring of individuals via the enormous amount of personal data generated
- More stringent measures needed to protect people's anonymity and information, keeping personal data from falling into the wrong hands

Location privacy

- May be readily compromised in 5G networks
- “Anytime, anywhere” & personalised services: constant tracking of location data; highly precise logging of geo-locations
- More cell towers (5G signals on shorter range; higher frequencies and shorter wavelengths)
- Tracking via cell towers much more precise

Source: https://martechtoday.com/location-data-accuracy-leads-stronger-personalization-210112

Multi-vendor environment

- Various entities are involved in the provision of 5G services
- May include mobile network operators, cloud service providers and third party application developers
- Network itself built with multiple types of networks, utilising different access technologies

Multi-vendor environment

- Hardware infrastructure and the network architecture are described as a “multi-vendor environment” by industry experts
- Personal data could be routed to various data users/processors, making it difficult to track, ensure consent obtained, and maintain security

Security issue of mass-connectivity

- Due to the sheer number of devices, entities, and technologies in 5G networks, an increased amount of personal data (including sensitive data) would be transmitted
- IoT device developers may be tempted to compromise security of IoT devices for lower costs, higher innovative functionalities and shorter time to market
- The mismatch between volume or sensitivity of data and data security measures indicates a higher risk of unauthorised access and security breaches.

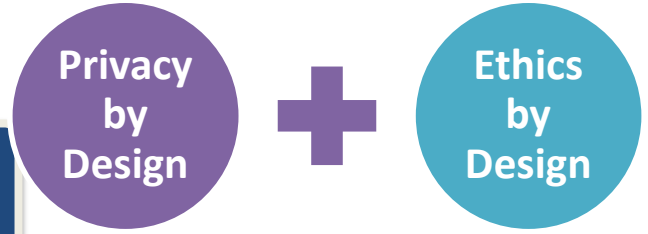
Getting It Right

Technology always evolving, so should the policies and practices to ensure compliance with the laws and regulations

Developers of 5G must get it right, not only complying with the PDPO, but also to follow good data protection practices and data ethics, such as data minimisation, transparency, fairness, explainability, purpose specification and informed consent.

5G service providers should adopt “Privacy by Design” and “Privacy by Default”: privacy protection from the get-go; not as an afterthought

Data Ethics - Implementation



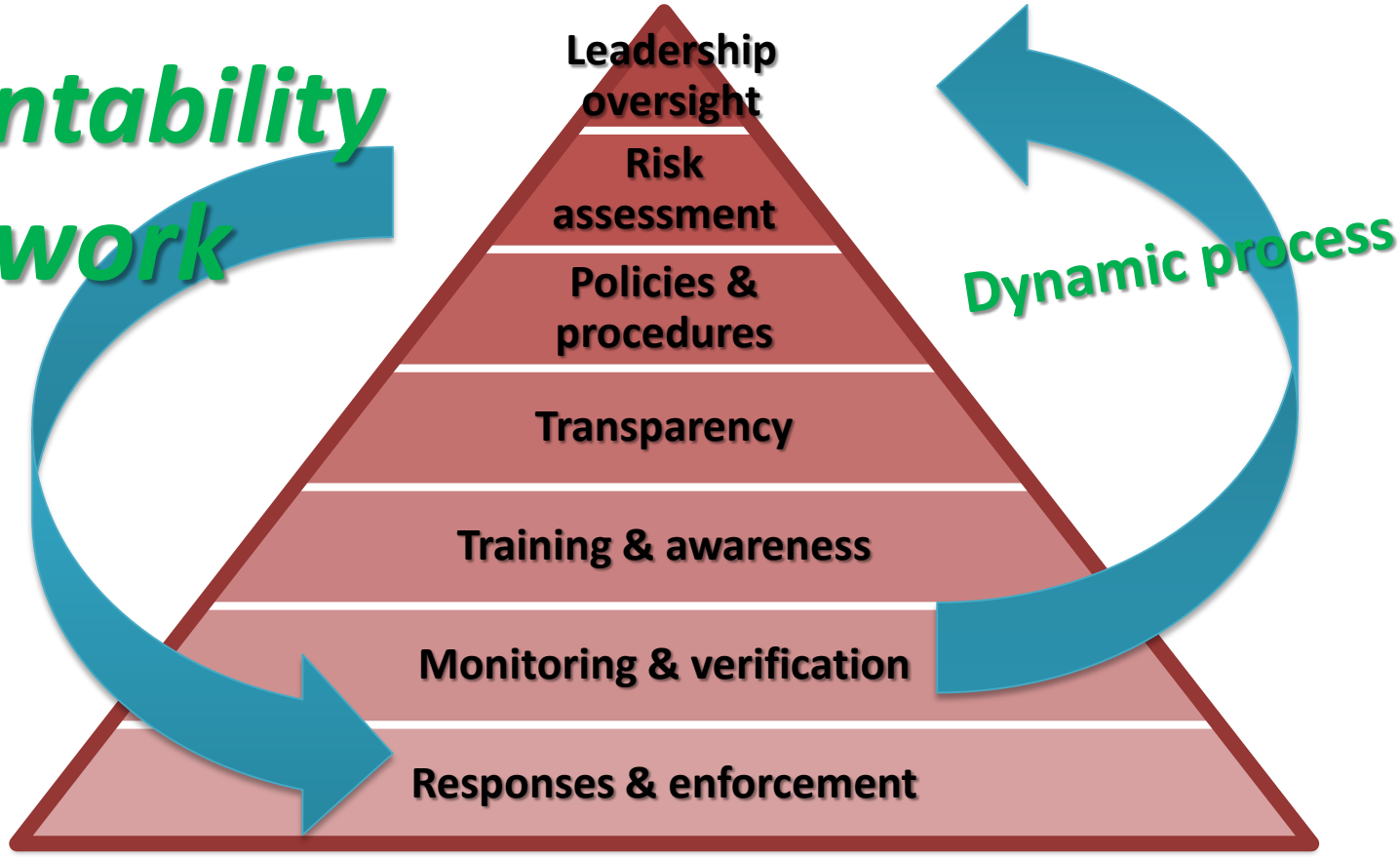
Step 1: Analyse the business objective and purpose of the data processing activity

Step 2: Assess the nature, source, accuracy and governance of the data

Step 3: Conduct impact assessment, i.e. risks and benefits to the individuals, the society and the organisation itself

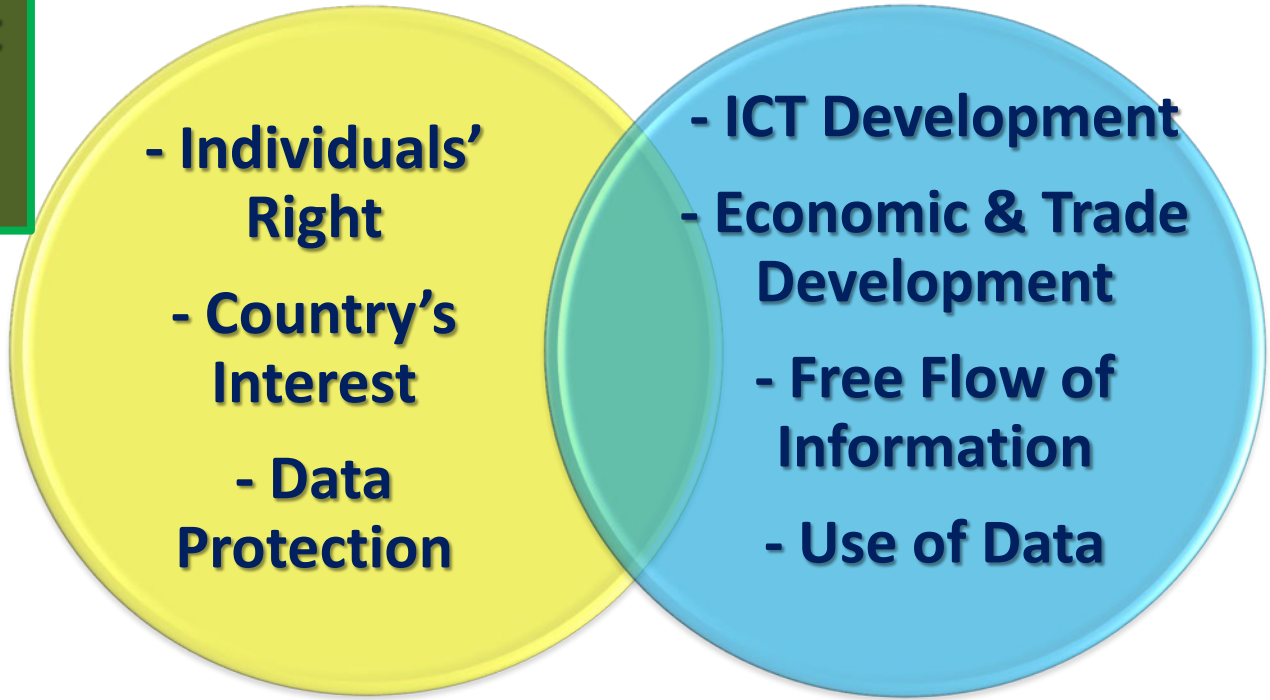
Step 4: Balance between expected benefits and the mitigated risks to all stakeholders

Accountability framework



Data protection laws should facilitate, but not constrain innovation

A Balancing Exercise



Promoting Hong Kong as a Smart City

Hong Kong is transforming to a Smarter Digital City – increasing level of digital adoption by Hong Kong residents; 30% of residents and 44% of corporates consider Hong Kong to be a Smart City.

Source: Google Smarter Digital City 3.0 Research

Hong Kong ranking the 13th out of 129 economies in a benchmark innovation ranking in 2019, moving up one spot from last year and strengthening its position as one of global innovation leaders

Source: Global Innovation Index 2019,WIPO

Hong Kong's **Unique** *and* **Irreplaceable Attributes**

- **Free flow of information**
- **Protection of Privacy as a fundamental human right**
- **Comprehensive legal regime for personal data privacy**
- **English as one of the official languages**
- **Regional data hub in the Greater Bay Area**

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