

Standardisation Needs for the Smart City: The Singapore Experience



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Smart Nation Platform Solutions Group



Smart Nation Journey

International Recognition



Smart Nation, May 1st, 2017



SNDGG is overseen by a Ministerial Committee



Senior Minister
TEO CHEE HEAN

Chairman



Minister
DR VIVIAN BALAKRISHNAN

Member

Minister-in-charge of
the Smart Nation
Initiative



Minister
S ISWARAN

Member

Minister-in-charge of
Cybersecurity



Minister
CHAN CHUN SING

Member

Minister in-charge of
Public Service

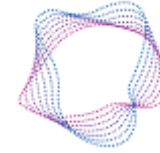


Senior Minister of State
DR JANIL PUTHUCHEARY

Member

Minister-in-charge of
GovTech

Government Technology Agency



GOVTECH
SINGAPORE

Vision: Digital to the core, and serves with heart

Mission: Engineering Digital Government, Making Lives Better

Products

Infrastructure

- WOG hosting infrastructure & networks

Products and Capabilities

- Products and services for whole of Government
- Digital Services, Sensors & IoT, Data Science & AI, Cybersecurity, Infrastructure capabilities

Strategic National Projects

- Implement Strategic National Projects

Services

Agency IT

- CIO & technology officers in 60 government agencies

Governance

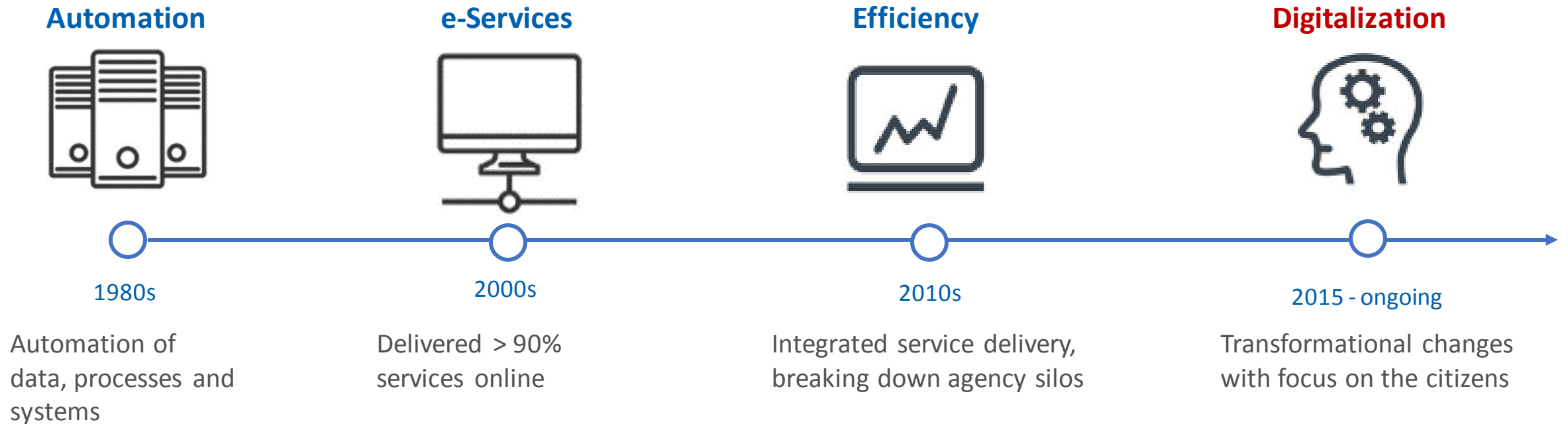
Governance

- Sets ICT policies covering whole of Government

Cyber Security

- Chief Information Security Officer for Government sector

Singapore Government's Digitalisation Journey



GovTech's Evolution

From

- Outsourcing
- Services
- Agency centric
- Silo infrastructure
- Agency vendor
- External capability
- Enterprise IT



To

- Co-sourcing
- Products and services
- Citizen centric
- Platforms
- Agency partner
- Internal capability
- ICT and smart systems

3 Plans To Drive Smart Nation Forward

DIGITAL ECONOMY FRAMEWORK



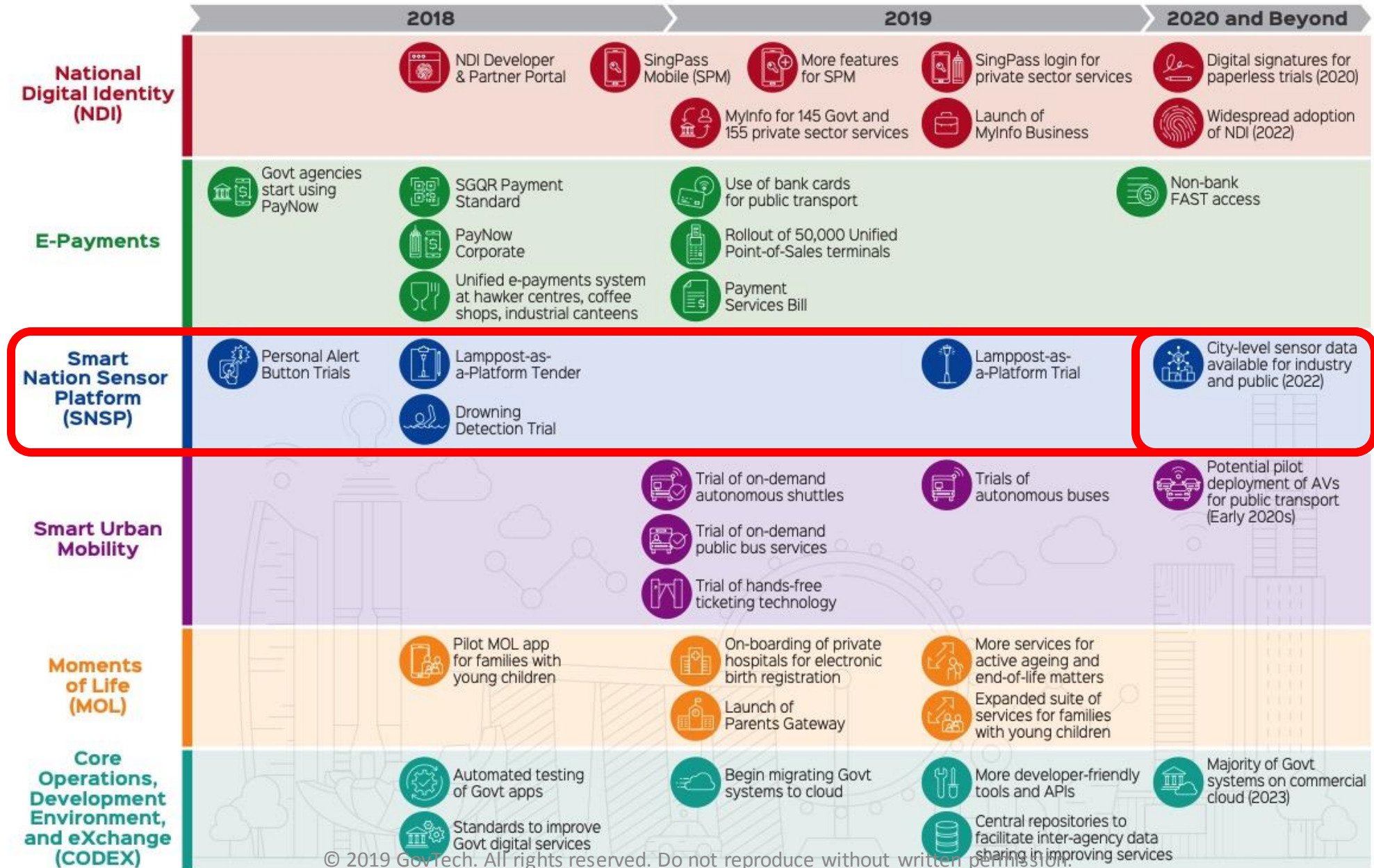
DIGITAL GOVERNMENT BLUEPRINT



DIGITAL READINESS BLUEPRINT

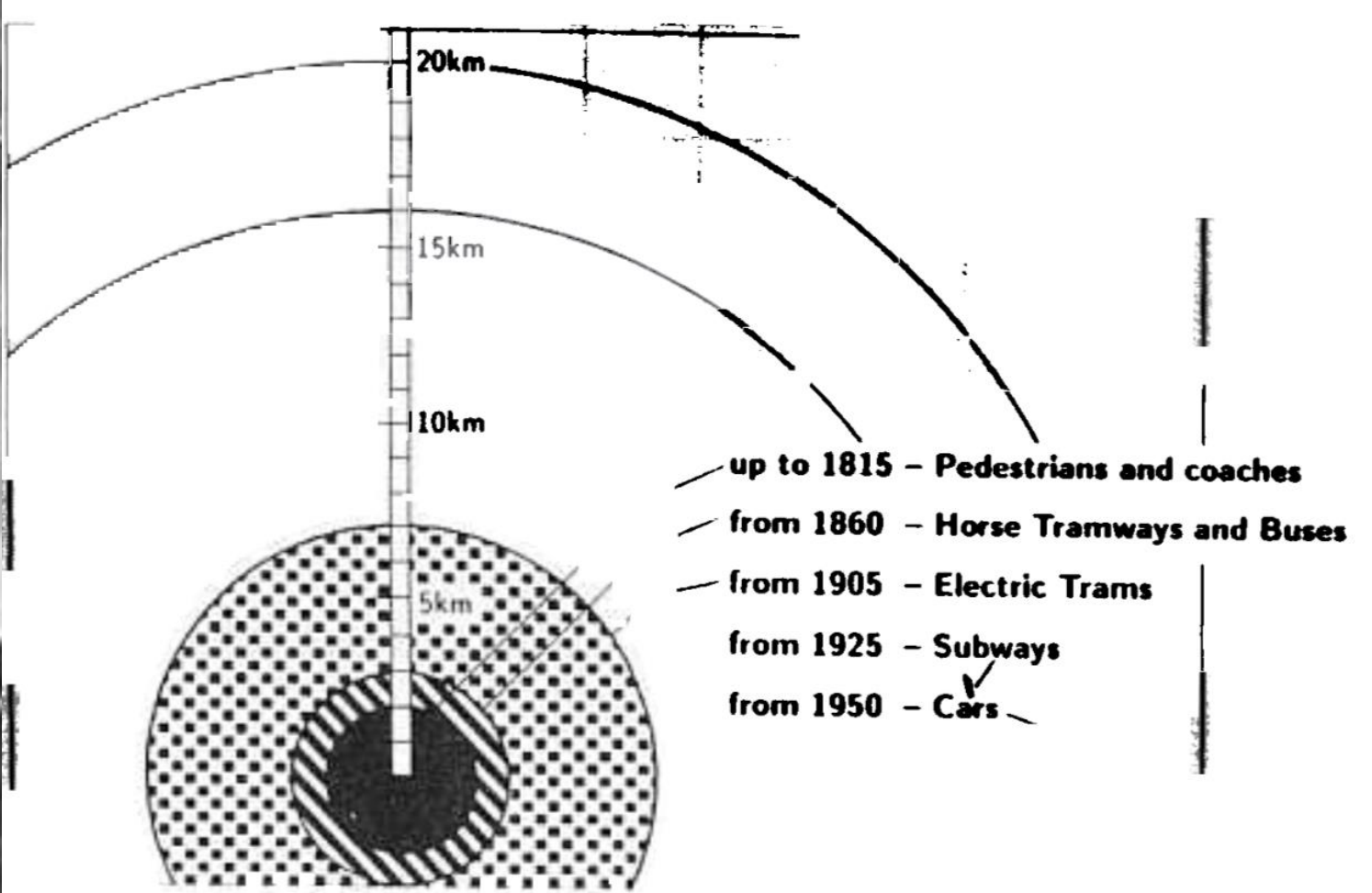


KEY MILESTONES FOR STRATEGIC NATIONAL PROJECTS





This isn't the first time we've gone driverless. The first was in 1853 at the Cooper Union Foundation building in New York.



“Anthropological invariants in travel behavior” by Cesare Marchetti, 1974

“The UMOT Project” by Yacov Zahavi, 1979

Sensor Characteristics

Passive vs Active

- Photographic, electro-optic radiometers, microwave; visible, infra-red, thermal imaging
- Radar, lidar

Location

- Above ground, below ground, air, sea level, below sea level

Static vs Mobile

- Stationary
- Controlled, autonomous

Common sensor types

- Temperature, proximity, pressure, water quality, chemical, gas, infra-red, level, image, motion detection, accelerometer, gyroscope, humidity, optical

How may we deliver the full
potential and promises of IOT,
for a city?

What is business-as- usual?

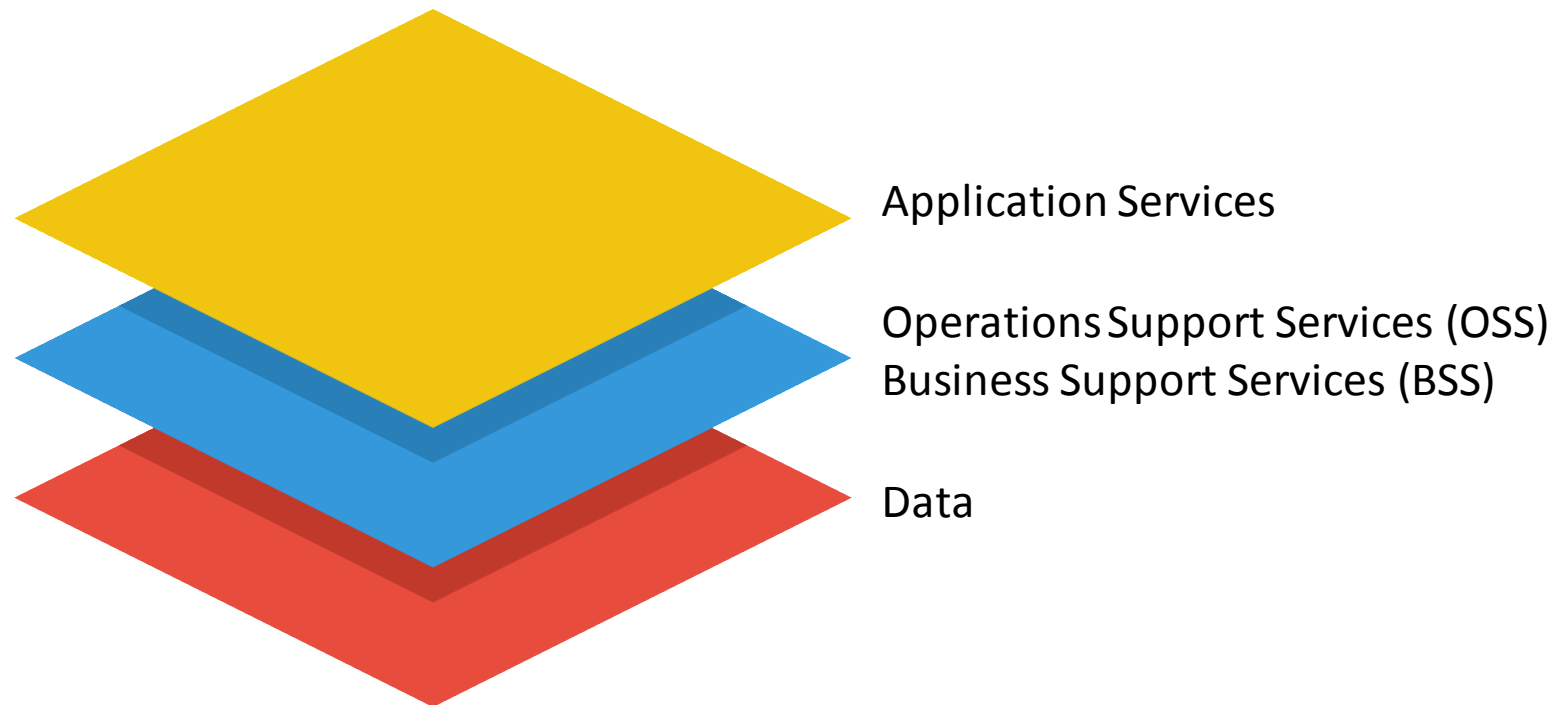
To deliver city-level data availability for industry and public by 2022, Smart Nation Platform Solutions must be able to demonstrate ability to:

- Standardise, collect and aggregate IOT data at scale
- Guarantee the data comes from authenticated and authorized sources
- Secure the platform end-to-end
- Create immutable records
- Show relevant and sustainable use cases

If we want a conversation with
the city infrastructure, how may
we do it?

Under the hood of the Smart Nation Sensor Platform

SNSP Layers

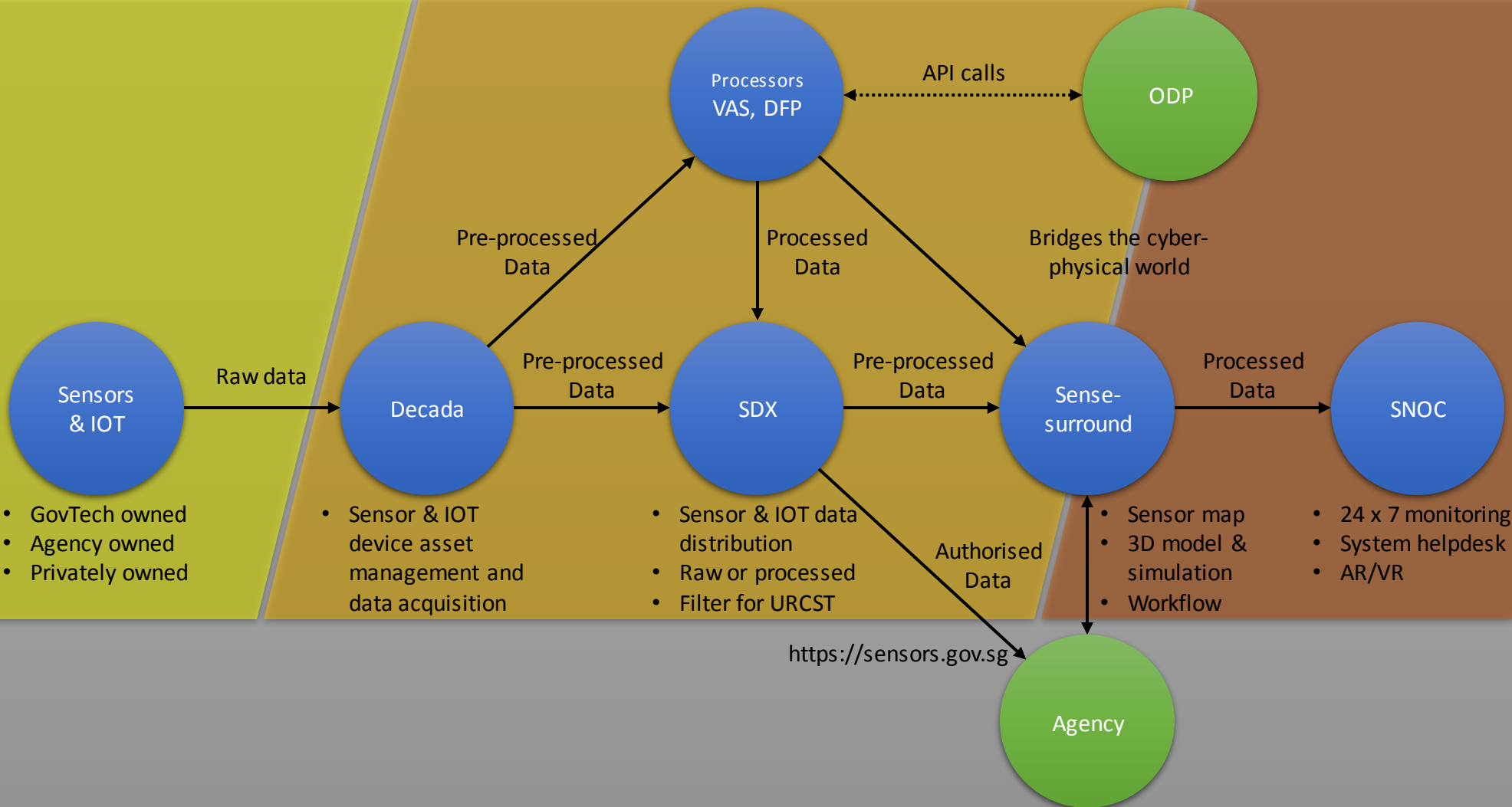


Application Services

SENSE

CONTEXTUALISE

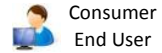
ACT



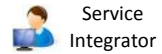
WOG Communications

Operations Service Support (OSS) & Business Service Support (BSS) for the API Economy

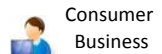
SNSP Cloud Service Consumers



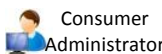
Consumer End User



Service Integrator



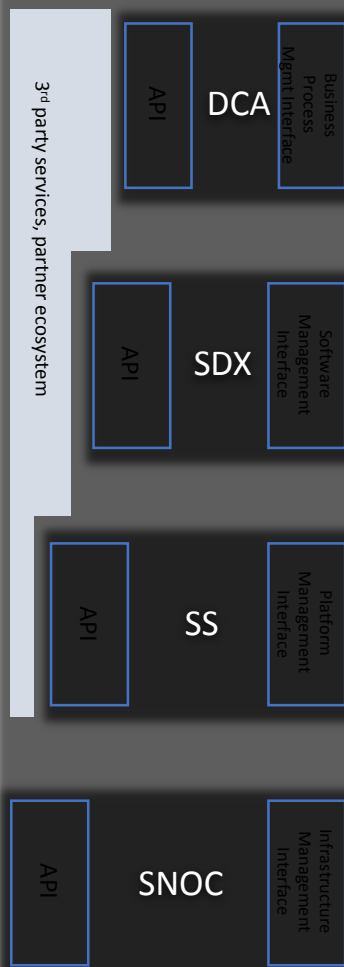
Consumer Business Manager



Consumer Administrator

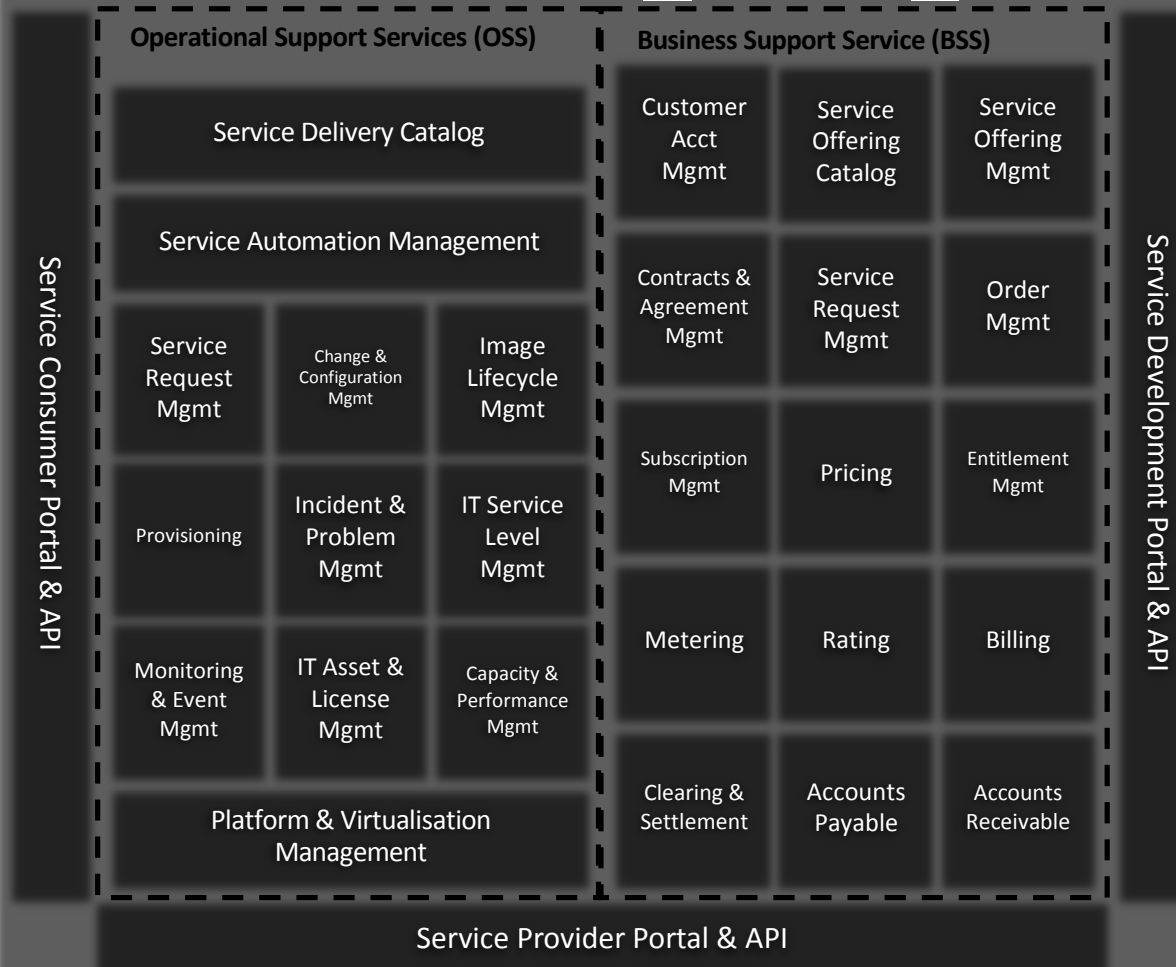
SNSP Cloud Service Integration Tools & SDK

SNSP Cloud Services



Smart Nation Sensor Platform

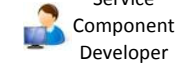
SNSP Cloud Services Management



- Deployment Architect
- Transition Manager
- Operations Manager
- Security & Risk Manager
- Big Data Manager
- Customer Care

GovTech Global Data Centers

SNSP Cloud Service Creators



Service Component Developer



Suite Manager



Offering Manager

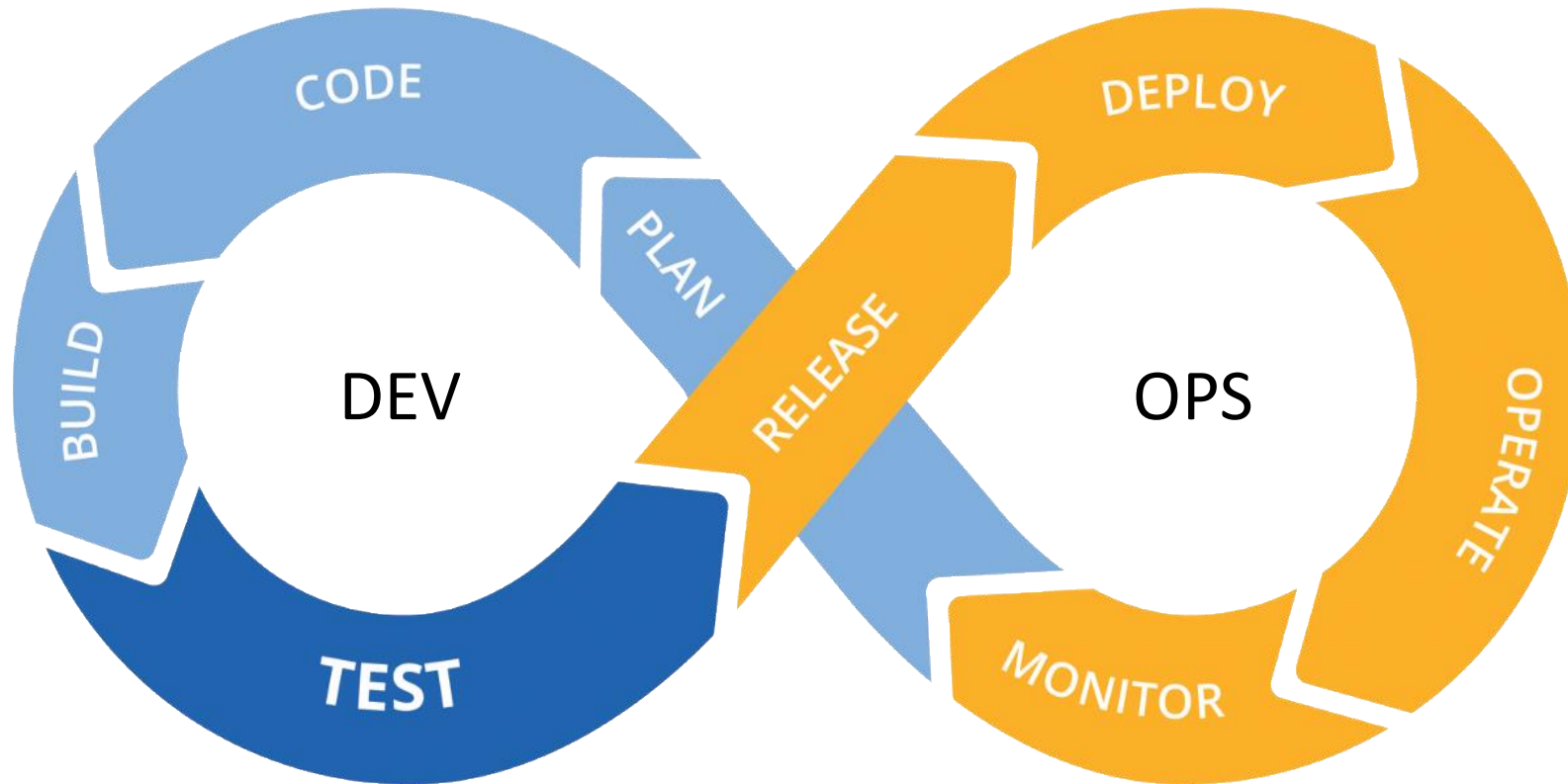
Service Management Development Tools

Software Development Tools

Service Image Creation Tools

Sandbox (Demo), Staging Environment

Potential Threats to Platform

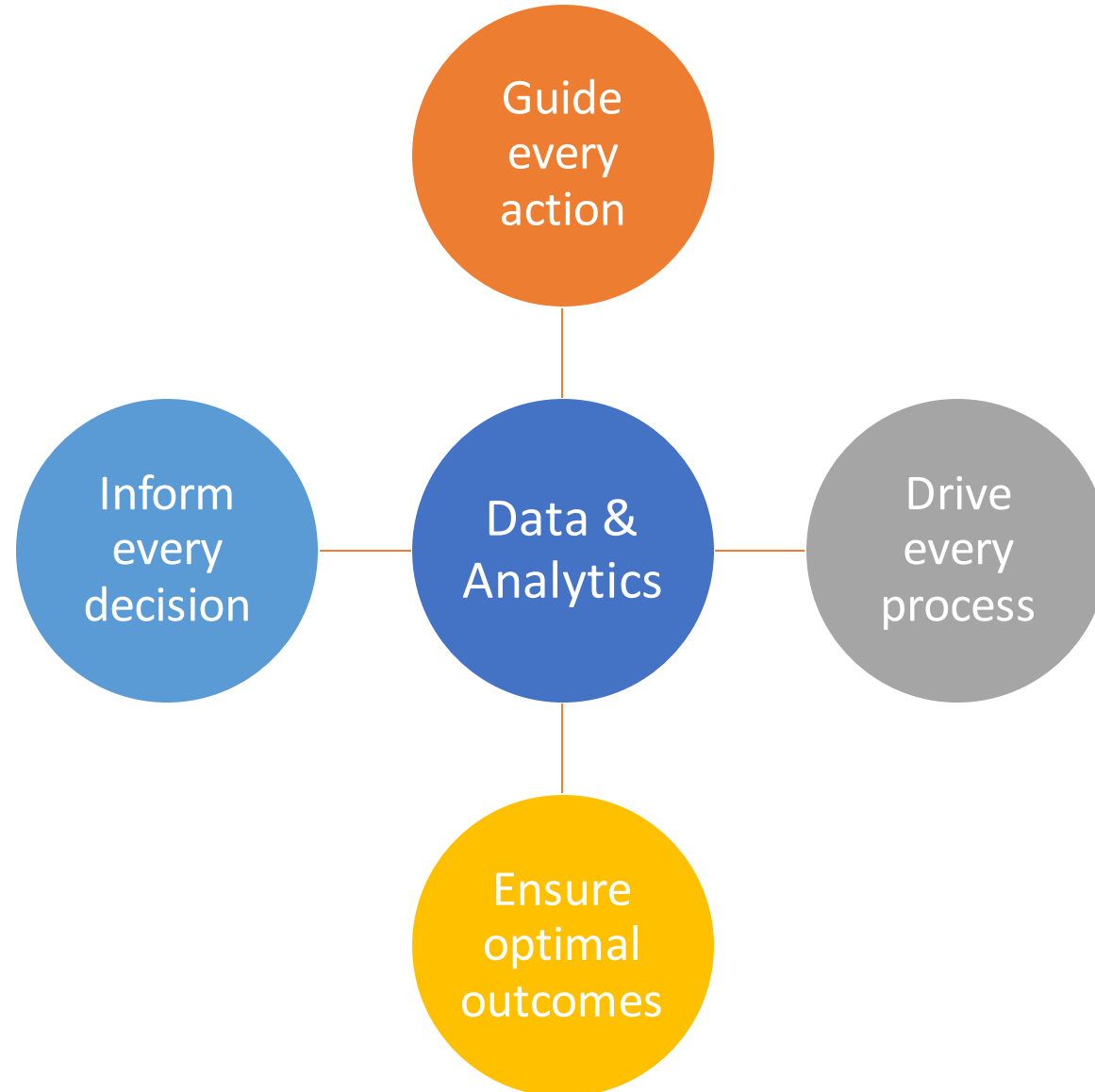


External: Targeted by hackers for bragging rights

Internal: Open source malware injected during CI/CD cycle

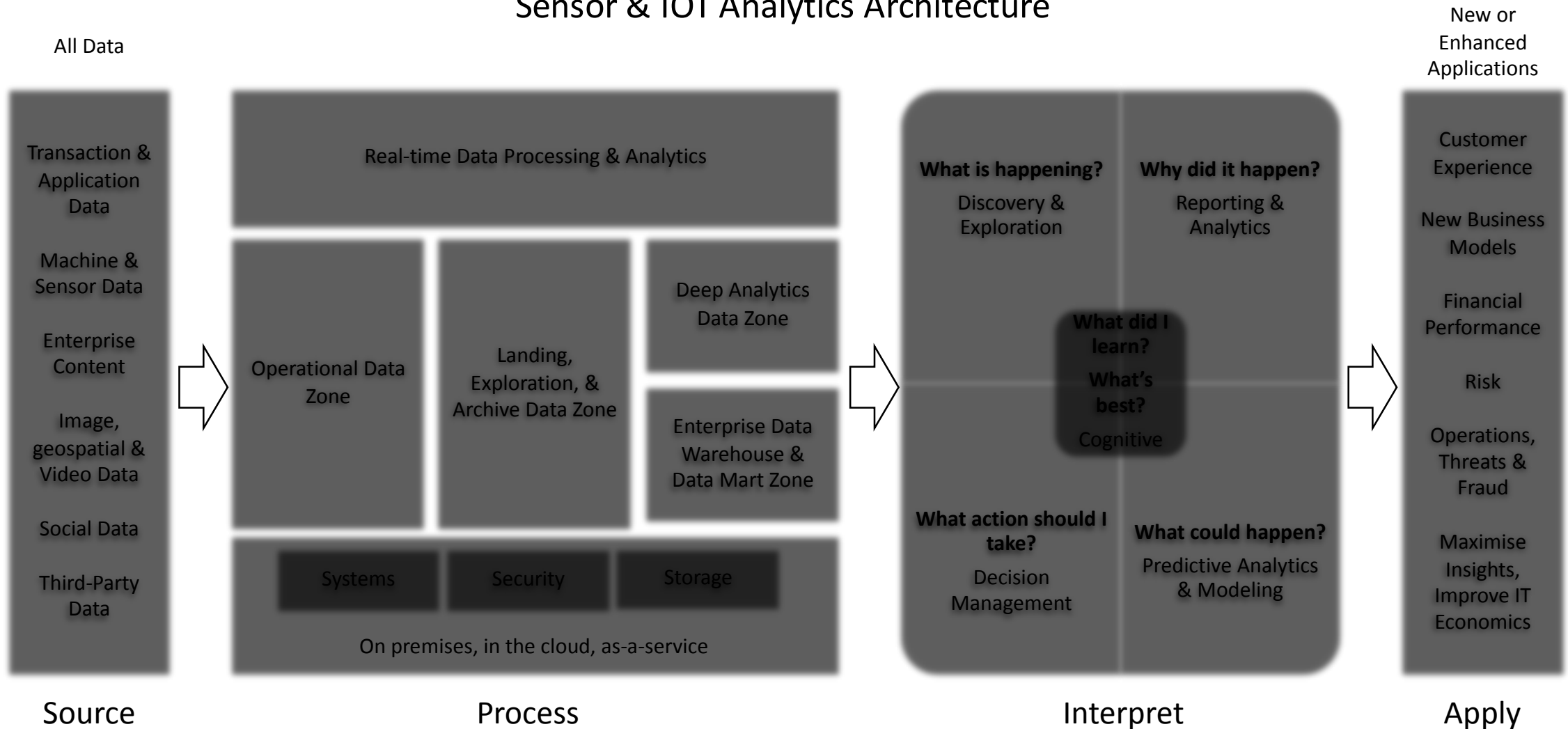
IOT Data Standards

IOT Data

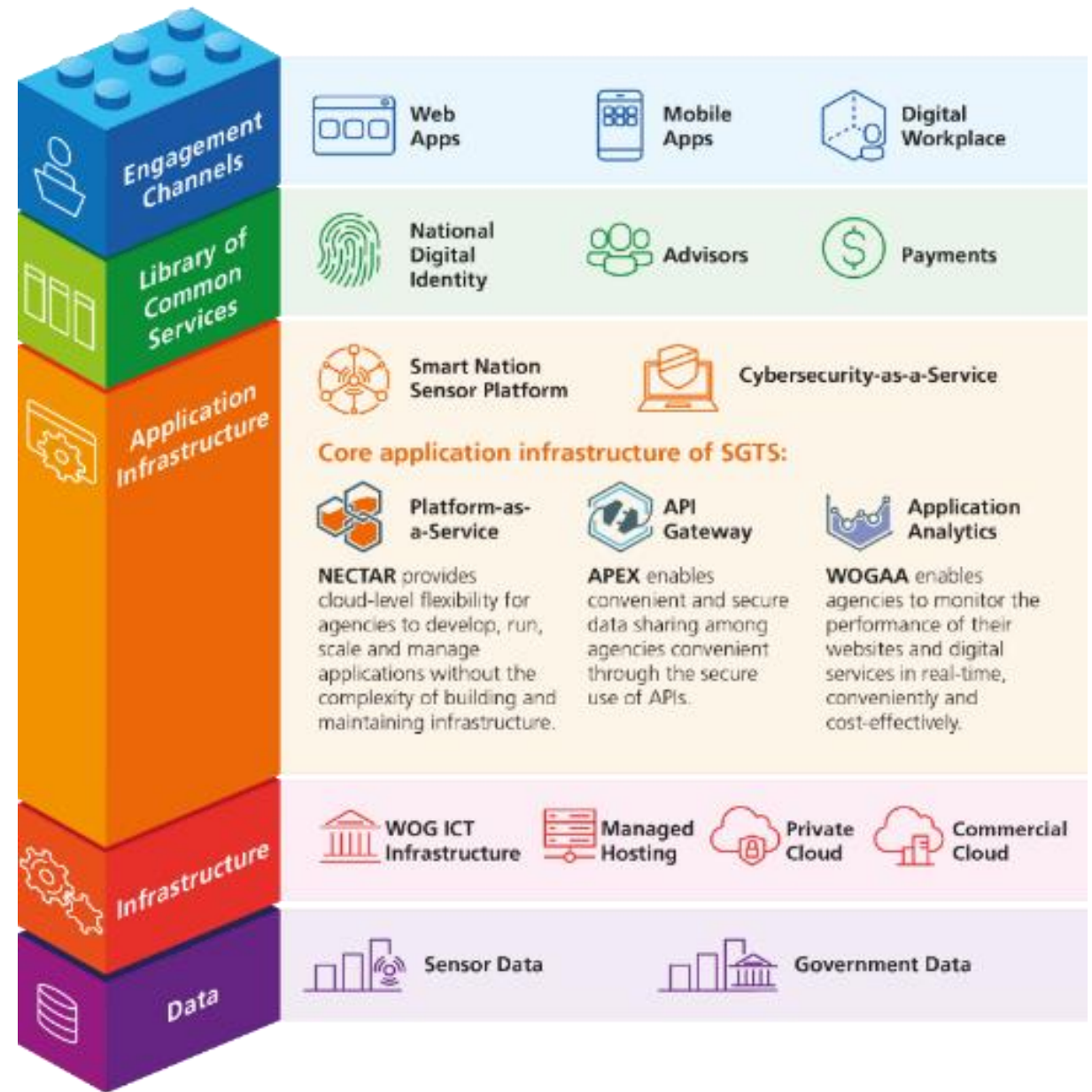


How can we make sense of the data we collect?

Sensor & IOT Analytics Architecture



Singapore Government Technology Stack: A Platform Approach





Boston Dynamics

Next Generation ERP system: ERP2

Global Navigation Satellite Systems-Based Congestion Charging

Traffic Data Collection



Traffic Info Dissemination



OBU



+



Location Data







Context



50HA district



28,000 tech jobs



University in a residential area



Integrated multi-modal transport (trains, buses-on-demand, AEVs, PMDs)











Desired Outcomes



Showcase Singapore's vision of Smart Nation.



Design living lab and sandbox environment; test bed for innovative use cases.



Sustainability use of energy and water.



Establish a reference digital architecture for future smart districts in Singapore.



Consolidation of fragmented data into a single platform to allow for new possibilities.



Using district data for future planning and new businesses.

Use Cases



Identify & Access management



Shared Facilities management



Last Mile Logistics



Parking



Autonomous electric transport



Footfall



Unified threat management

What's Under The Hood For Smart District Open Digital Platform?



| | | | | | | | | |
|--------------------------|--------------------------|---|---------------------------------------|---|--------------------------------|------------------|-----------------|------------|
| Applications | Command & Control Centre | Robotics | Helpline / Emergency | Environment | Smart Building | Smart Utilities | Smart Transport | Et Al |
| Open Digital Platform | Industrial Automation | Video Analytics | Data Analytics | Sensors & IOT | Multi-protocol & Data Exchange | Cybersecurity | BIM & GIS | Biometrics |
| Multi-Cloud | Local Edge | Distributed Edge | Hybrid Cloud | | | | | |
| High-Performance Network | Wired - Optical Fibre | Wireless Long Range Licensed – 5G, NB-IOT | Wireless Long Range Unlicensed – LoRa | Wireless Short Range Unlicensed – WiFi, Bluetooth, ZigBee | Smart Network Fabric | | | |
| District Infrastructure | Power Grid | District Chiller | Buildings | Civil Infrastructure | Traffic | Smart Lamp Posts | Sensors | Et Al |



Can W3C WOT standards and implementations make IOT data more secure and interoperable?

If W3C has Singapore as a WOT sandbox, how may you play?

Thank You

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