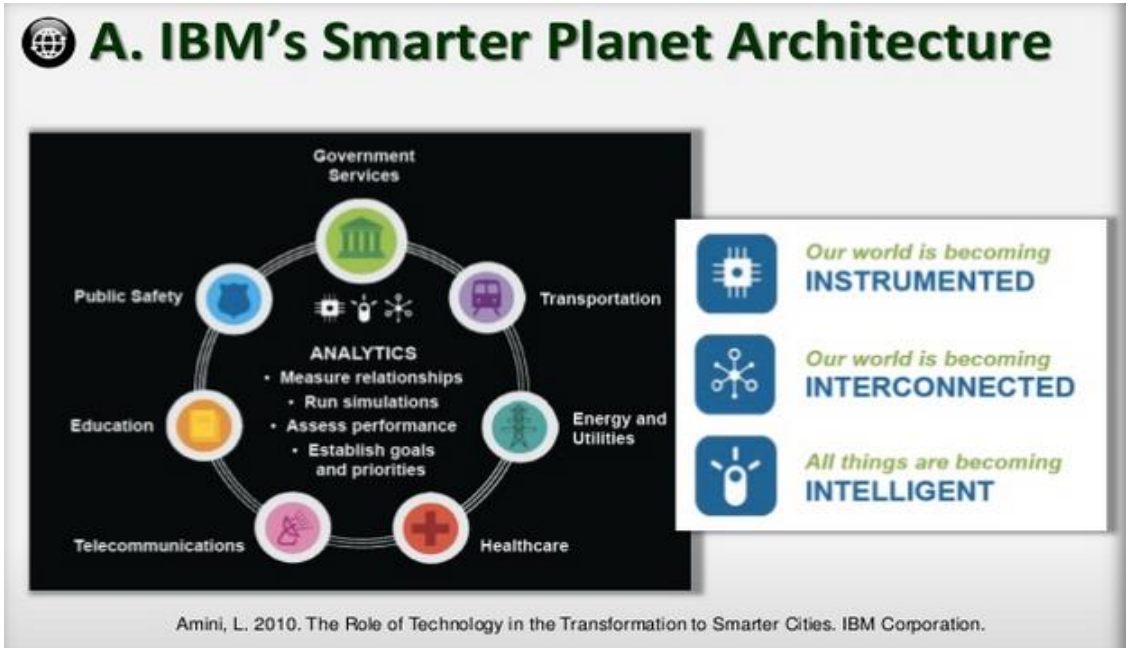
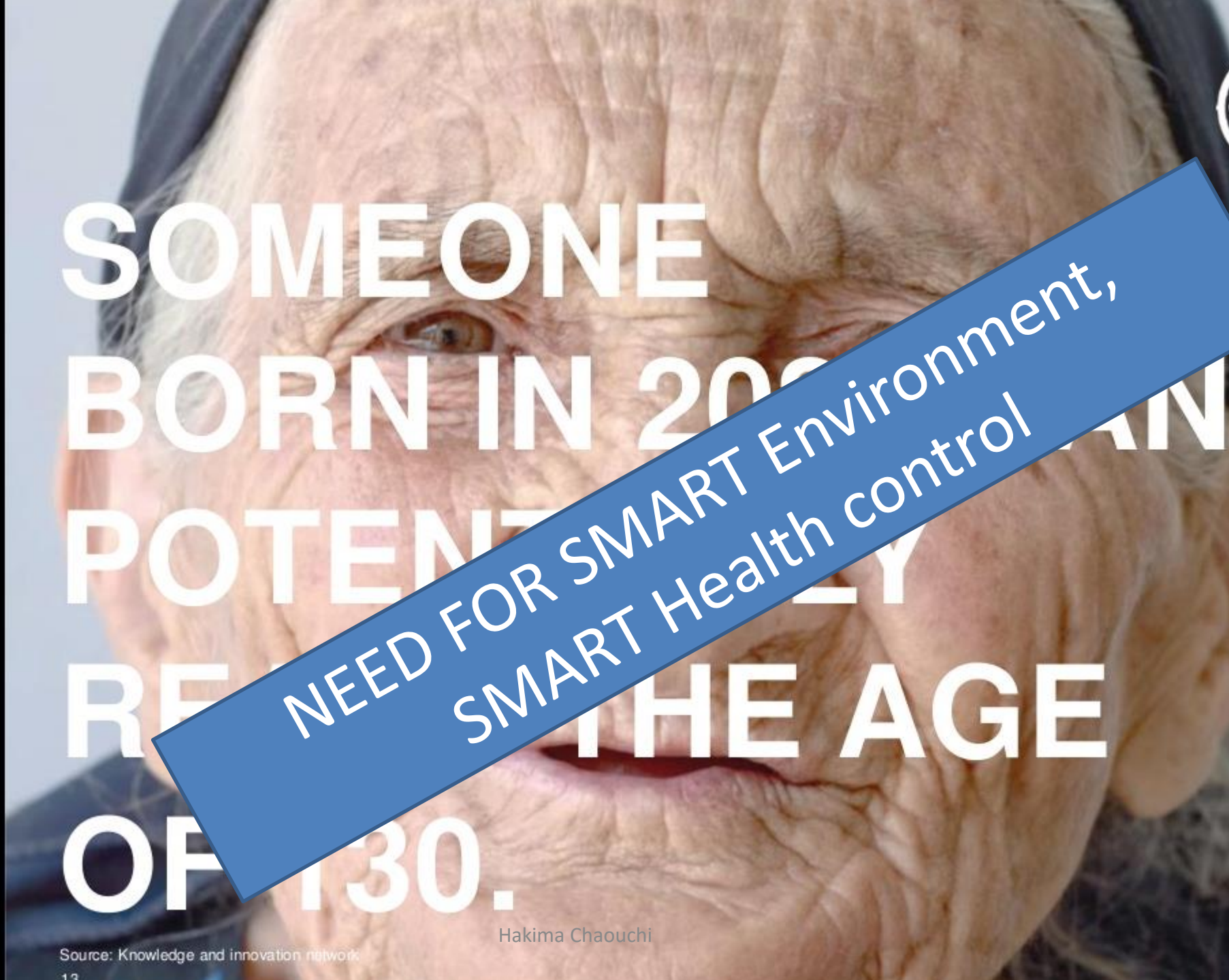
The World Economic crisis in 2008 pushed the smart cities concept



Where should we be in 2030?


NATURAL
RESOURCES
BEING
ENERGY
AND IS RISING
NEED For SMART ENERGY
CONSUMPTION



NEED FOR SMART Environment, SMART Health control

NEED FOR SMART MOBILITY, SMART CITIES

Hakima Chaouchi


PLAN CLIMAT ENERGIE
ÉVOLUTIONS ET INNOVATIONS ACTIVES POUR LES 15 ET
PARIS 2050
POUR UNE VILLE DURABLE OUVERTE ET CONNECTÉE
MAIRIE DE PARIS
VINCENT CALLEBAUT ARCHITECTURES
SETEC BATIMENT
PARIS HISTORIQUE - 1 / MOUNTAIN TOWERS
PARIS FUTUR - 7 / MANGROVE TO
- 5 / FARMSCRAPERS TOWERS
PARIS SMART CITY 2050
PARIS PERIPHERIQUE - 6 / HONEYCOMB TOWERS
PARIS MODERNE - 3 / PHOTOSYNTHESIS TOWERS
PARIS HISTORIQUE - 2 / ANTISMOG TOWERS
PARIS MODERNE - 4 / BAMBOO NEST TOWERS
Smart City is not about Fast Internet

Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities

The long way from cities urbanization to Smart cities

Prof. Hakima Chaouchi

Institut Mines Telecom/Telecom Sud Paris

Technologist and Innovator

French Government Research Ministry innovation strategy Adviser

ITU-T Focus Group On Data Processing and Management Framework

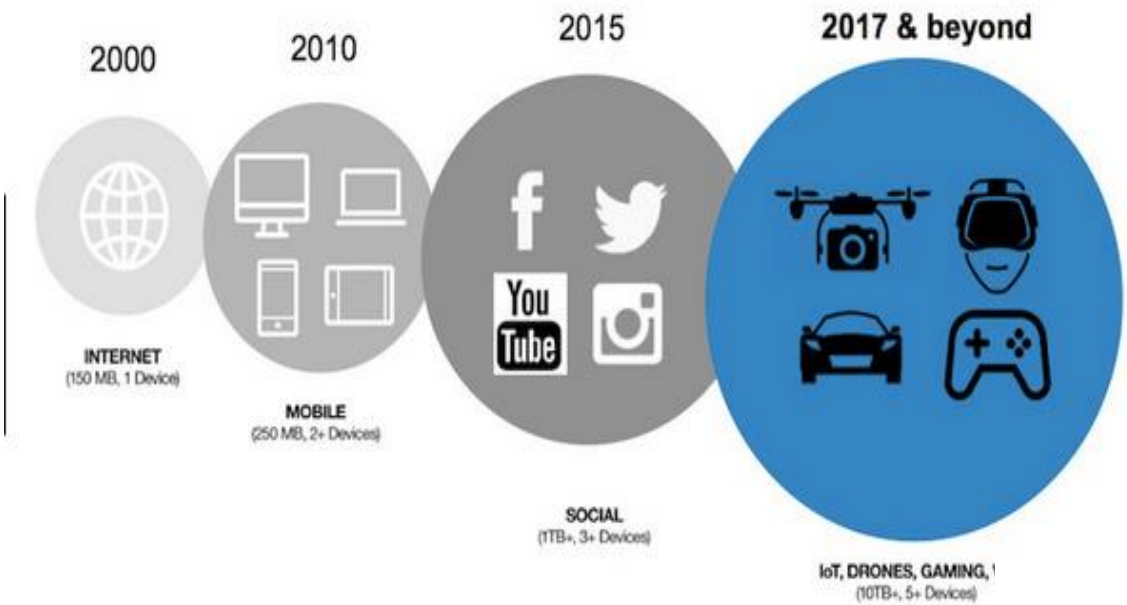
FG-DPM Workshop

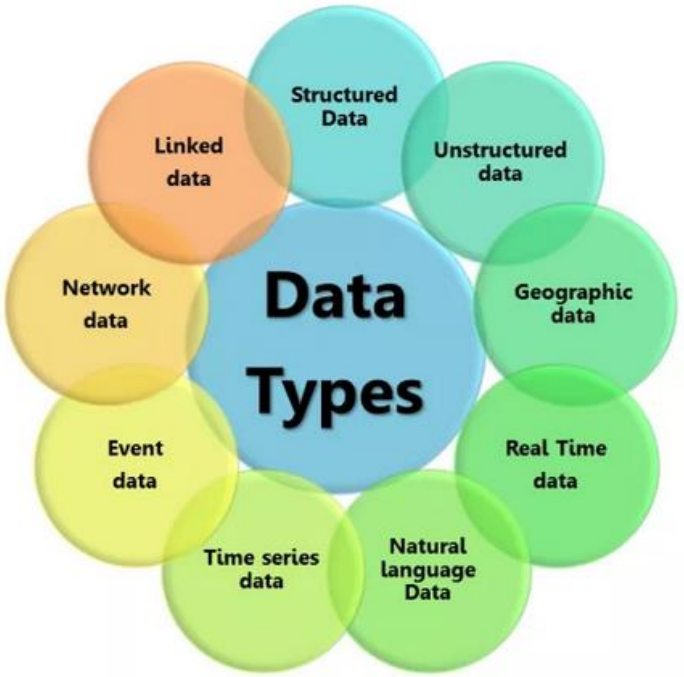
July 19th 2019, Geneva

Some DPM Framework challenges

- Data quality and verification
- Data Trust
- Data processing and management scalability and accuracy
- Data sharing and Interoperability
- Data commercialisation
- Sustainability, long term development of smart cities sustainable IoT deployement
- IoT devices Heterogeneity control and User experience continuity[1] of service
- Governance balance and innovation

THE NATURE OF DATA IS SHIFTING

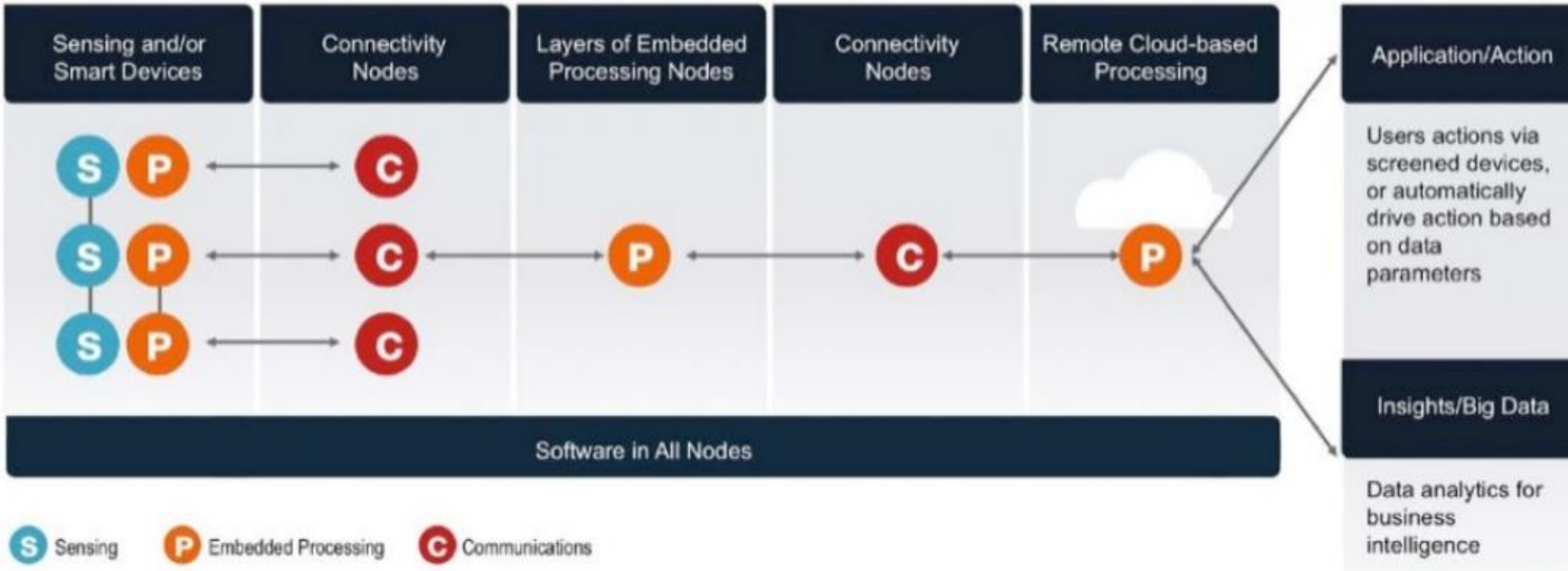




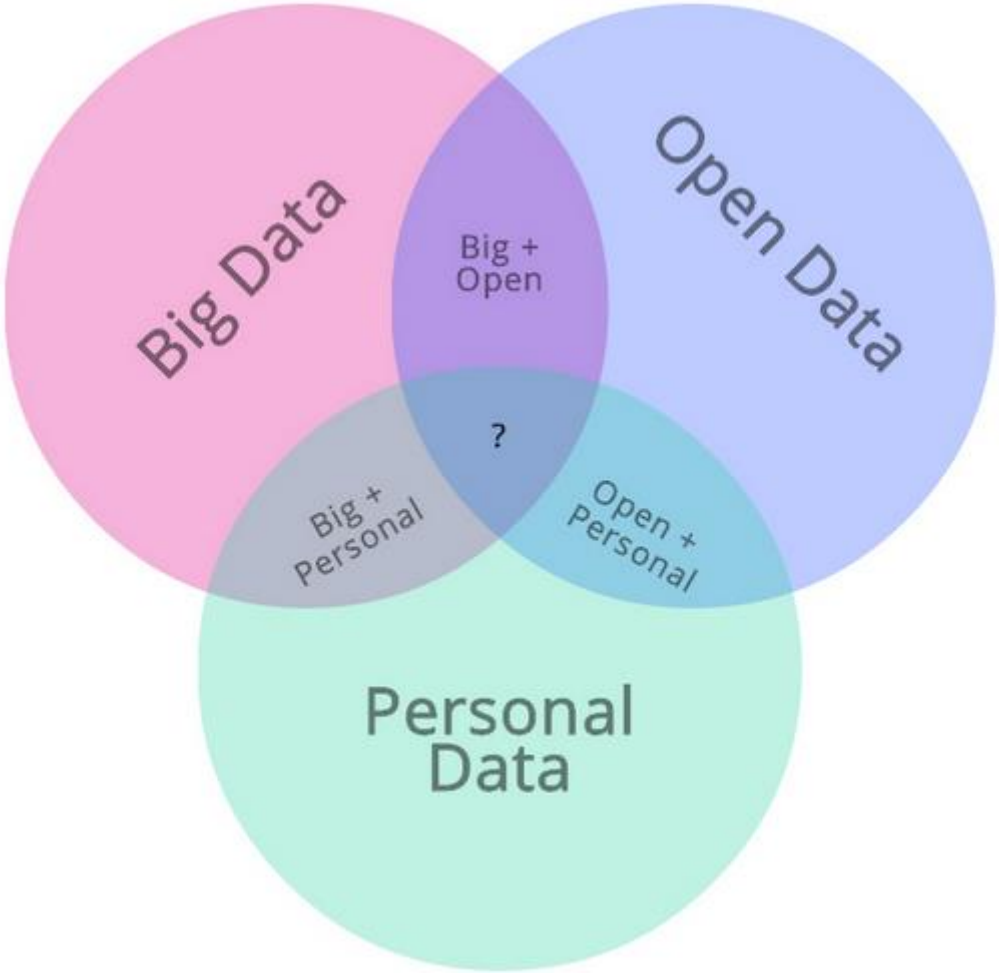
Data: Cloud, BigData, Data Mining & Services

Ref: siliconangle.com

IoT Cloud based approach: An industrial choice

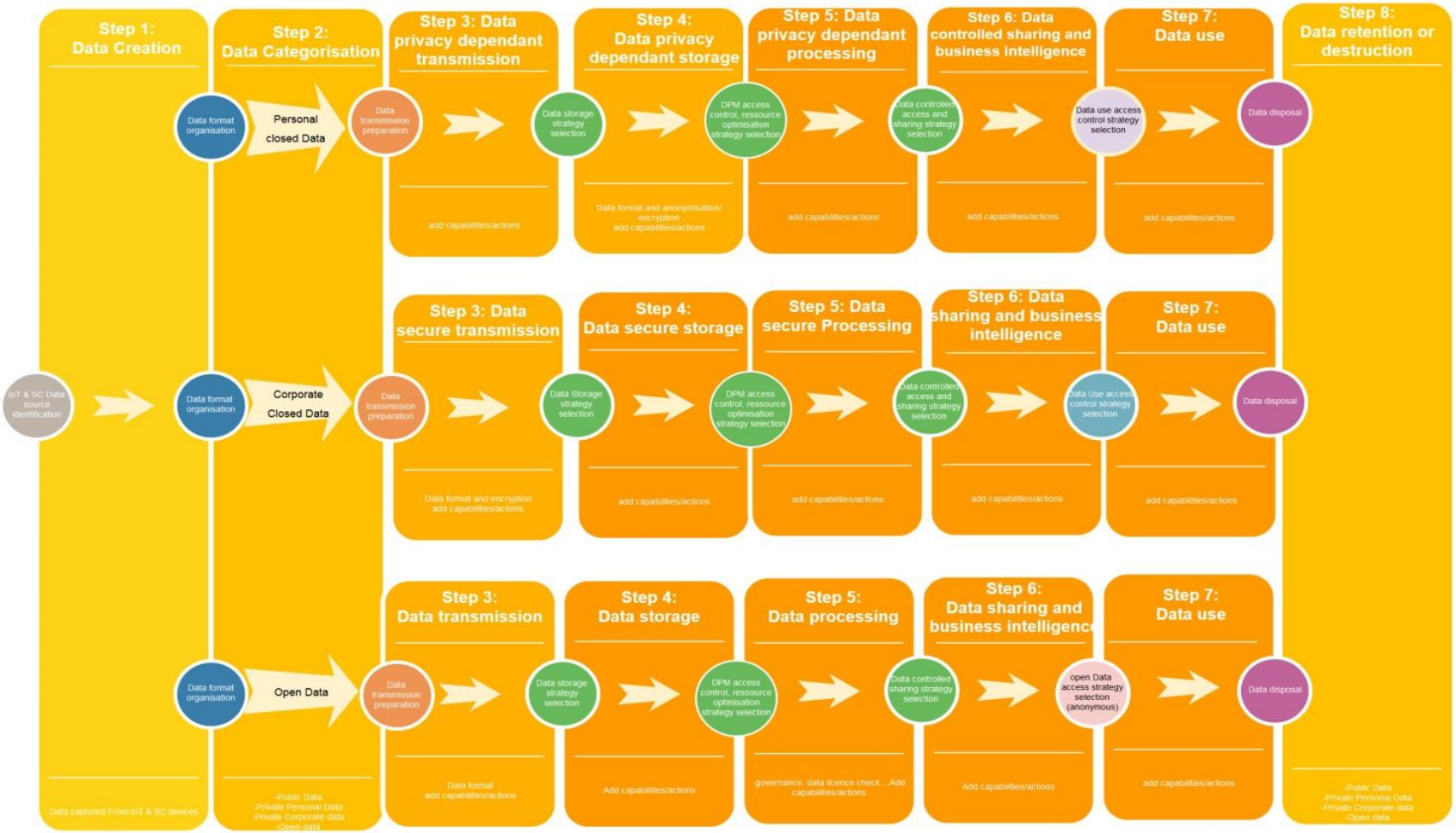


FG-DPM: Data Category



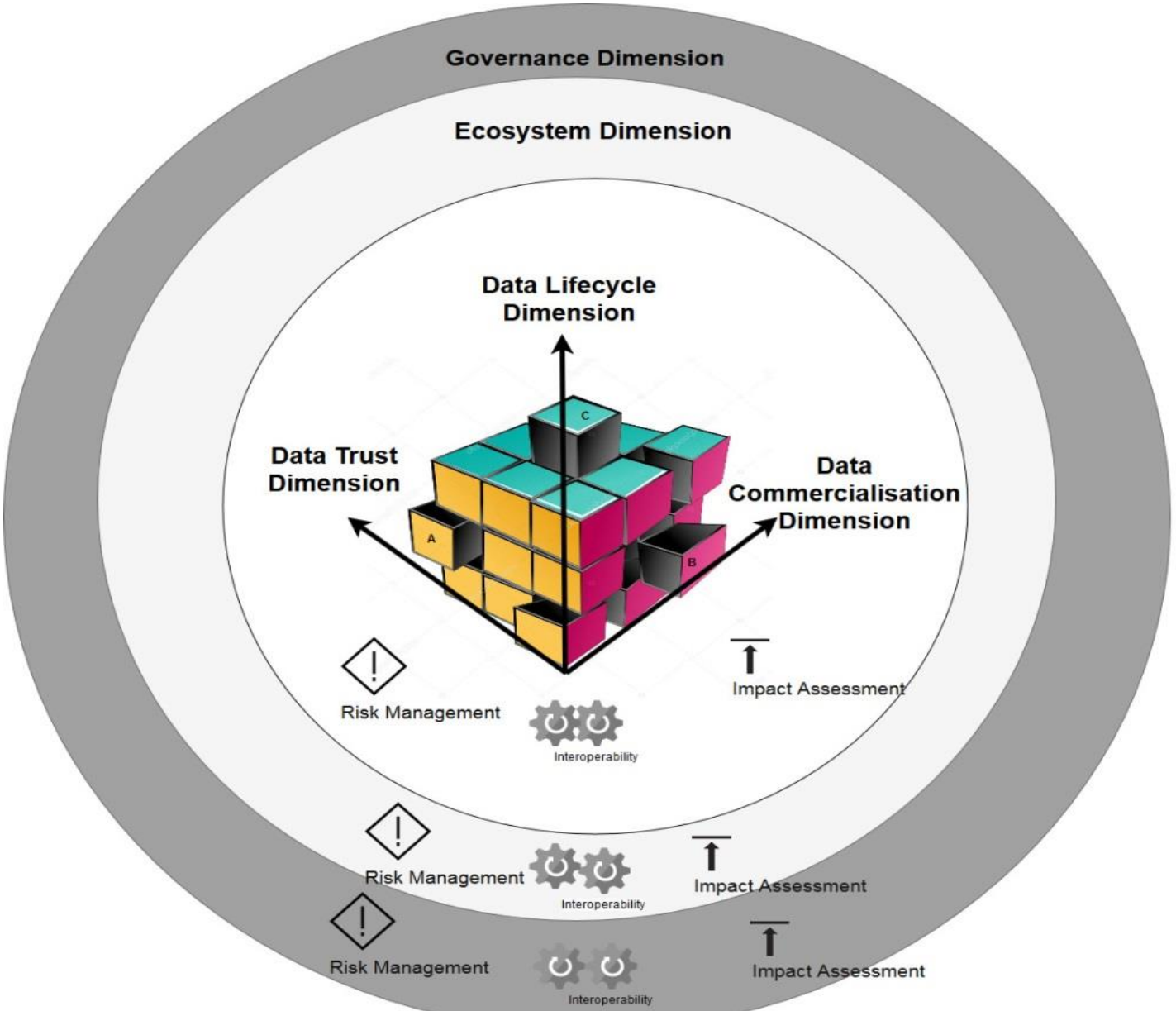
Source:
ITU-T
FGDPM
D2.1

Data lifecycle example



Data Processing and Management Framework

Source:
ITU-T
FGDPM
D2.1



Source:
ITU-T
FGDPM
D2.1

DPM Dimensions

- **The Data lifecycle** dimension concerns the processing and management activities conducted on data from its creation to its use and disposal.

- **The Data trust dimension** includes various actions taken to safeguard the security, privacy and quality of data and enhance trust for it by also including ethical requirements.

- **The Data commercialisation dimension** includes all activities regarding the monetization and commercialization of data.

- **The Ecosystem Dimension** includes all factors and mechanisms that directly or indirectly impact DPM activities.

- **The Governance dimension** will cover all the policy related aspects that will be applied on each dimension.

DPM Data Lifecycle capabilities examples

Dimension Capabilities	Capability description
Data source identification	The process of identifying the IoT data source type (sensor actuators, ..), its location and eventually its owner.
Data categorization	The process of identifying the related security, privacy, trust and governance level of the data which can be private, close, open or public.
Data creation	The process of an IoT device to generates data when it is available. For example a sensor monitoring environment phenomena generates data either when the phenomena changes (event data), or on a regular monitoring basis (Time Series data).
Data acquisition/retrieval/capture	The process used by IoT application that runs a logic of requesting the data from the sensors and proceeds with the data acquisition.
Data collection	The process used by IoT application to run business logic might need to collect data from different sources that might be the sensors or the databases where datasets are stored.
Data masking	The process of making the data not possible to link with its owner. Techniques as anonymization and pseudonymisation are possible to enable the privacy of data during its lifecycle.
Data organization	The process of enriching the data during its structuring with contextual information following a common Metadata model.
Data transmission	The process to move data from one location to another. Require communication technologies between diferent entities as the sensor devices to the gateway, the gateway to the cloud or the servers…etc.
Data storage	The process to accumulate data for future processing and use. The duration of storage depends on the application and the security, privacy and governance rules.
Data securing	The process to control the access to the data, to ensure its confidentiality and integrity.
Data validation	The process to check the quality, the correctness and trustworthiness of data.
Data cleaning	The process of removing wrong data by using for instance Data anomaly detection, remove useless data for the application.
Data filtering	The process of removing duplicate data.

Source:
ITU-T
FGDPM
D2.1

Data Trust Dimension capabilities examples

Dimension Capabilities	Capability description
Data Confidentiality	Ensures that information is not made available or disclosed to unauthorized individuals, entities, or processes.
Data Integrity	Ensures the accuracy and completeness of data over its entire life cycle.
Data Availability	Ensures accessibility and usability upon demand by an authorized entity
Data Unlinkability	Ensures that a user may make multiple uses of resources or services without others being able to link these uses together
Data Transparency	Ensures that an adequate level of clarity of the processes in privacy-relevant data processing is reached so that the collection, processing and use of the information can be understood and reconstructed at any time.
Data Intervenability	Ensures that users, data controller, data processors and supervisory authorities can intervene in all privacy-relevant data processing

Source: ITU-T FGDPM D2.1

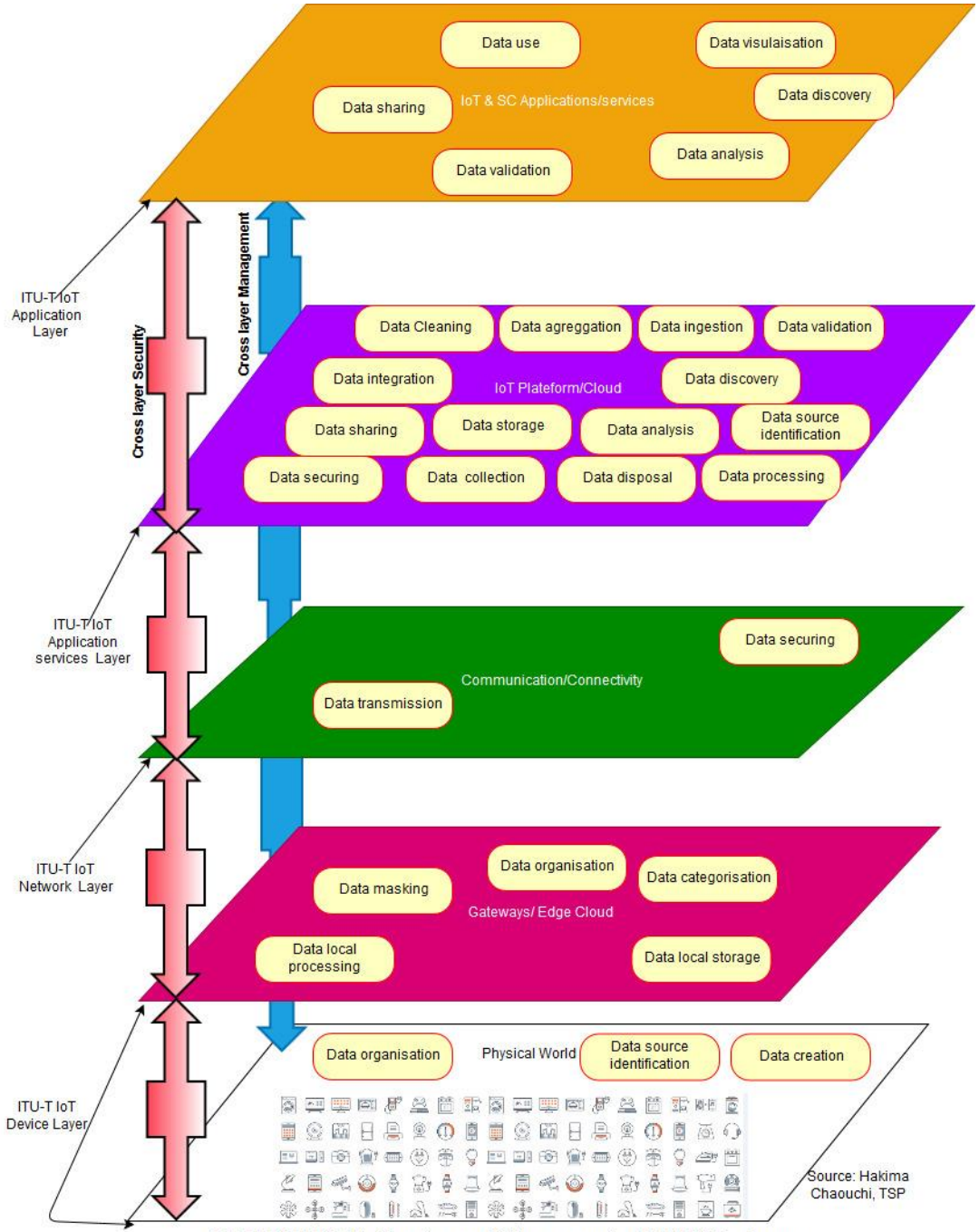
Data commercialisation capabilités examples

Source:
ITU-T
FGDPM
D2.1

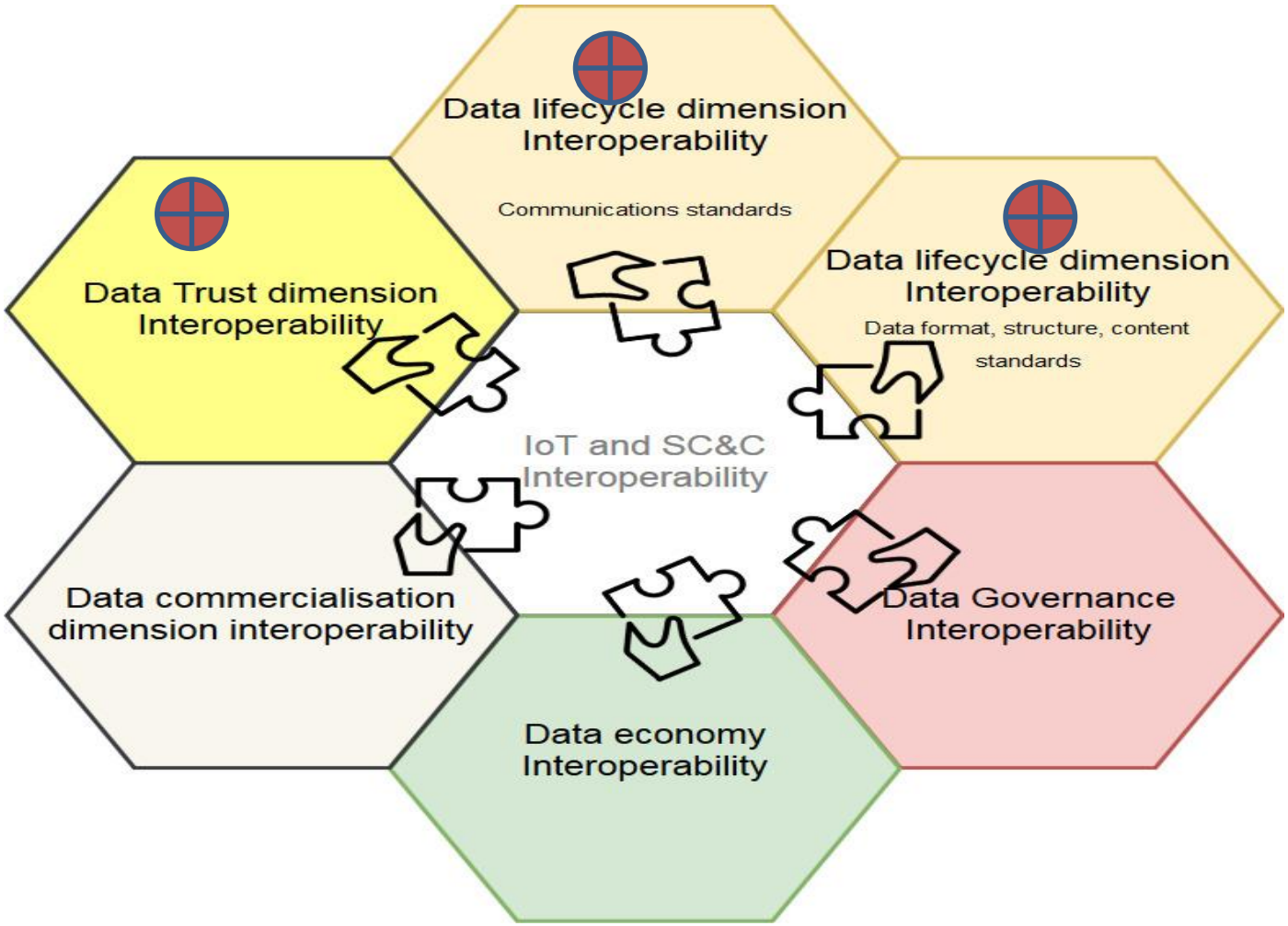
Dimension Capabilities	Capability description
Data Monetization	The process of generating incoming money flow with and out of data and data-derived information products and services.
Data Valuation	The process of estimating the worth of data from a data consumer perspective. Note: Contextualizing data to identify applicable use case(s) and to determine an appropriate valuation method are significant issues in data valuation.
Data Pricing	The process of determining price of data by an organization for selling it as a product / service.
Data Licensing	The process of determining data related terms and conditions for the legally binding agreement between the data licensor and the data licensee.
Data Distribution Channel	The channel through which data will be sold (distributed) by a seller to the buyer(s).
Data Marketing	The process of determining and conducting activities to create awareness for data and to incentivize its usage.
Data Sales	The process of conducting activities to fulfill a data sales order, including the receiving, processing and delivering the order.

DPM capabilities mapping Example to ITU-T IoT reference architecture

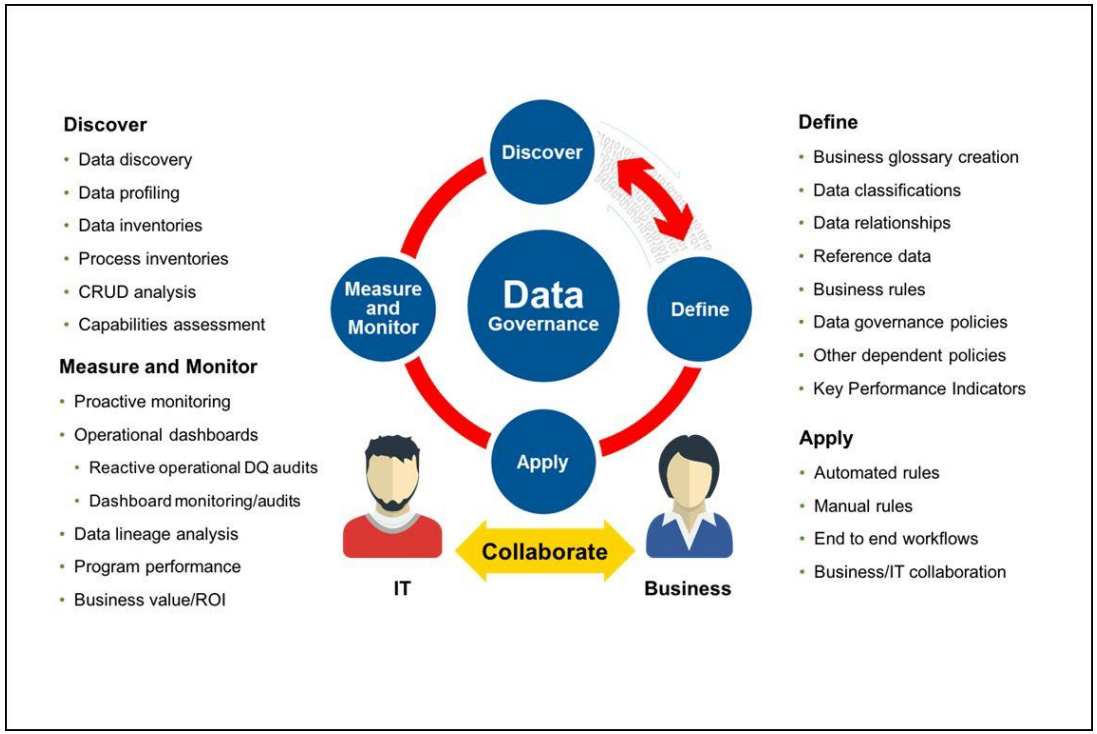
Source:
ITU-T
FGDPM
D2.1



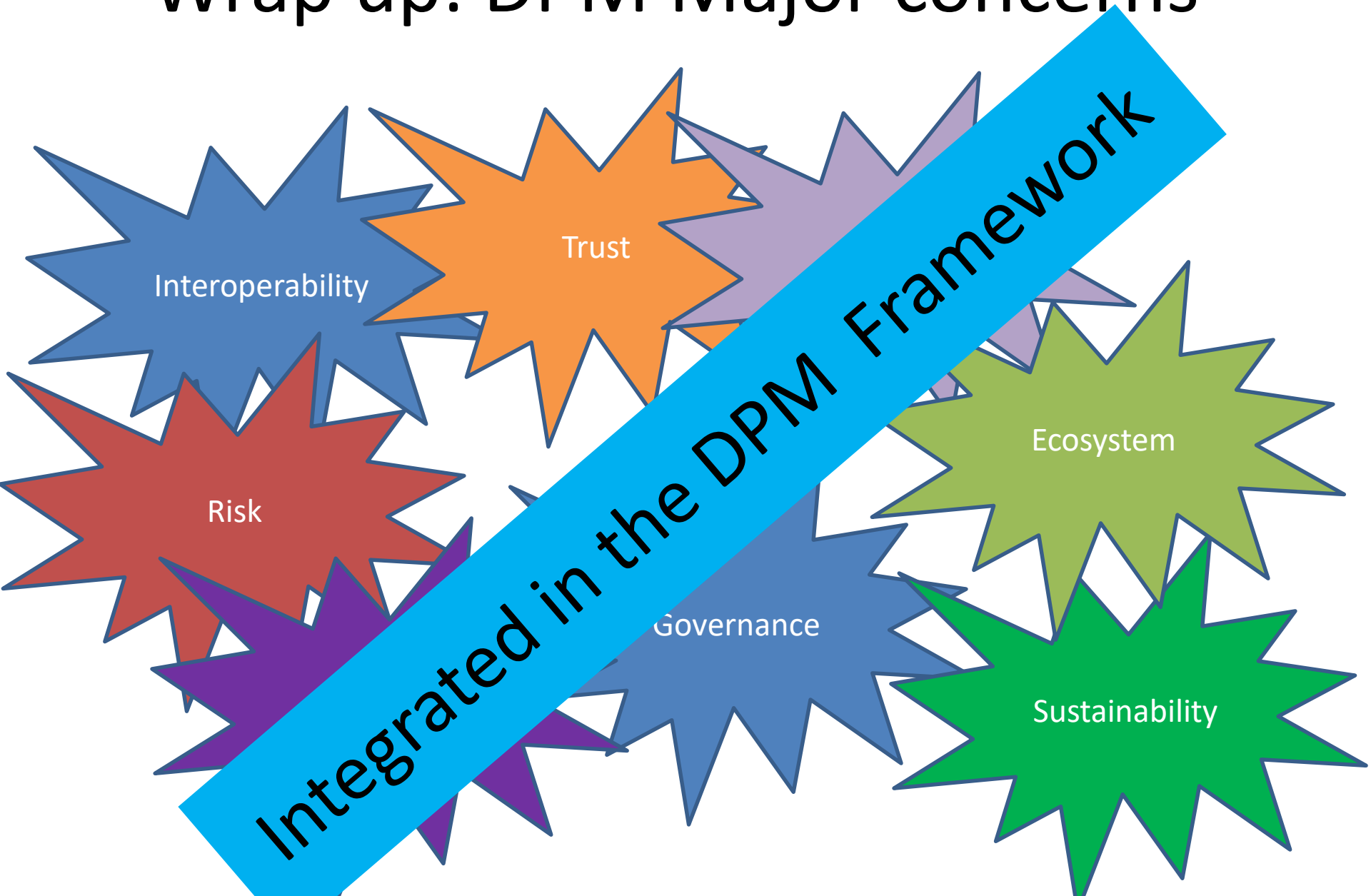
FG-DPM DPM datalifecycle capabilities mapped on IoT ITU-T reference architecture


Data lifecycle dimension Interoperability
Communications standards
Data Trust dimension Interoperability
Data lifecycle dimension Interoperability
Data format, structure, content standards
IoT and SC&C Interoperability
Data commercialisation dimension interoperability
Data Governance Interoperability
Data economy Interoperability

How to Secure the collected Data ? Sensed data, voice data, …



Wrap up: DPM Major concerns



International Telecommunication Union

ITU-T Technical Specification

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(19 July 2019)

ITU-T Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities

Technical Specification D2.1

Data processing and management framework for IoT and smart cities and communities

Technical Specification D2.1

Data Processing and Management Framework for IoT and Smart Cities and Communities

Table of Contents