Remarks on security, privacy and trust for smart sustainable cities and Internet of Things

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WHAT IS A SMART CITY?

Smart City: effective integration of physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future for its citizens

WHAT IS A SMART SUSTAINABLE CITY?

Smart Sustainable City: A smart sustainable city (SSC) is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects.

WHY DO WE CARE WHAT A SMART CITY IS?

- ‘Smart City’ is not simply a label, it is a policy objective
- Policy objectives need to be defined so that they can be monitored and accounted for
- What is part of the list of relevant objectives and what is not?

DATA IS THE DNA OF A SMART CITY

- Smart and innovative cities generate and depend on massive amounts of data
- Data are produced, analyzed and stored for many applications, including street lighting, air quality, energy monitoring, traffic regulation and smart buildings.
- Problems with the data create significant risks but higher quality data means greater efficiency and relevance in the service.
- The role of data in improving efficiency and increasing the collective and individual relevance of services means that it is a large and fast growing business.
- As data moves from being infrastructure focused to linking consumer data with infrastructure and service delivery, the nature of the risks and the political discourse changes.

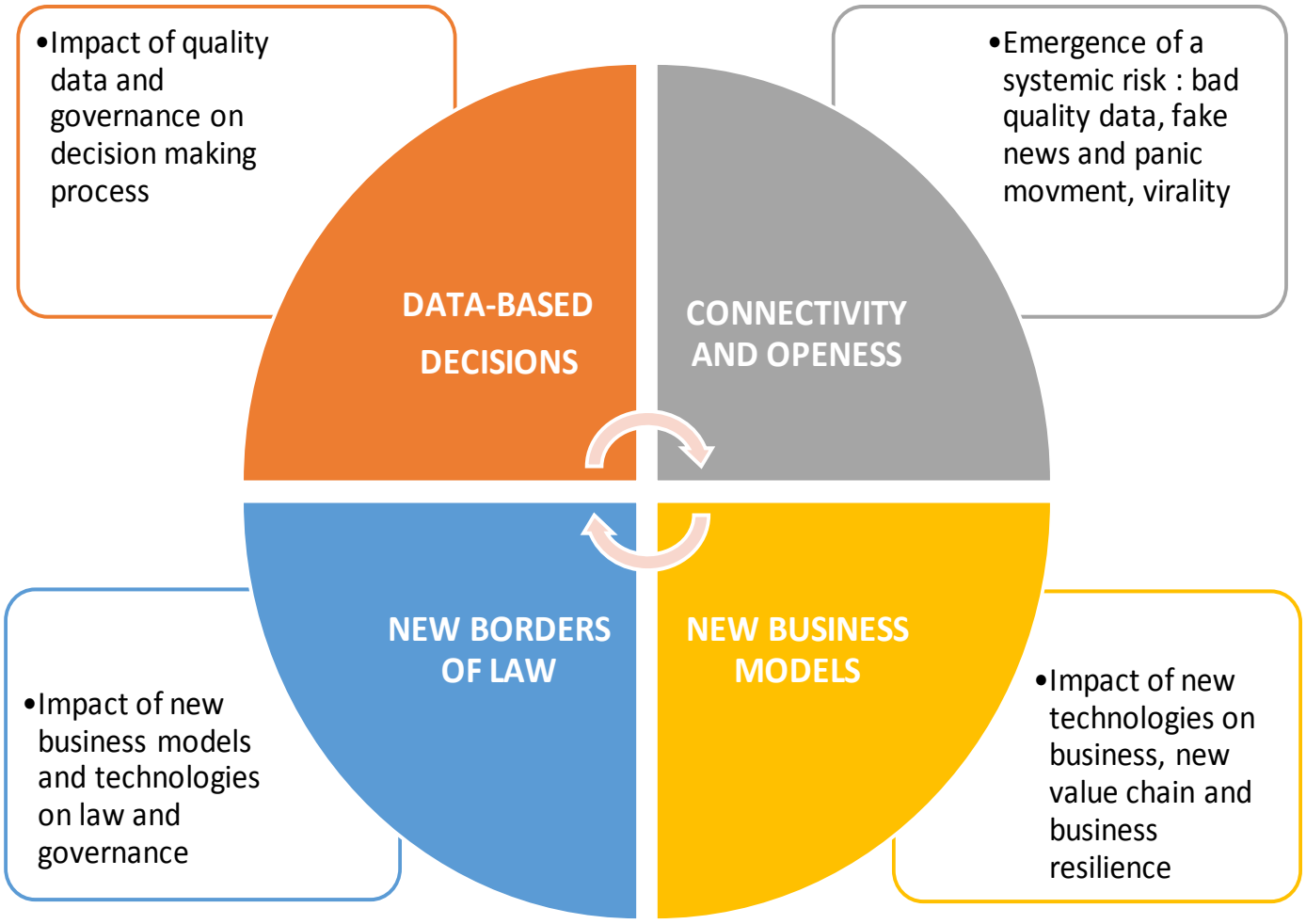
SMART CITY GOVERNANCE

- Governance: *how power is distributed and shared, how policies are formulated, priorities set and stakeholders made accountable*

- Strategic vs operational governance
- Heterogeneity – of data sources, of stakeholders and of purposes
- Fluidity – evolution of technology and business models is fast

Things may evolve but we are already aware of several important elements

SMART CITY GOVERNANCE



DATA SECURITY

- Identification and mapping of threats to:
  - Confidentiality
  - Integrity
  - Availability
- Physical threats
- Reputational threats
- Continuous and full life cycle protection
- Compartmentalisation, particularly between critical and non-critical services
- Security by design
- Disaster recovery plans

- Minimum agreed standards and practices

DATA PRIVACY

- Prevailing approach is user focused and consumer driven
- Highly fragmented national approaches but an increasing extra territorial influence for major jurisdictions, e.g. European Union and USA.
- Effective approach to classifying data sensitivity

DATA PRIVACY

Common base elements of data privacy (ISO 29100):

i) consent and choice,
ii) purpose,
iii) collection limitation,
iv) data minimization,
v) use limitation,
vi) accuracy and quality,
vii) openness/transparency/notice/,
viii) individual participation and access,
ix) accountability,
x) security

DATA QUALITY

- Basic elements:
  - Authenticity
  - Reliability
  - Integrity
  - Usability
- Eliminate ‘ROT’ (redundant, obsolete, trivial) data where possible
- Poor data quality is contagious

DATA TRUST

- The degree to which a user or other stakeholder has confidence that a product or system will behave as intended (ISO/IEC)

- Fundamentally related to interdependency and interoperability

DATA RISK

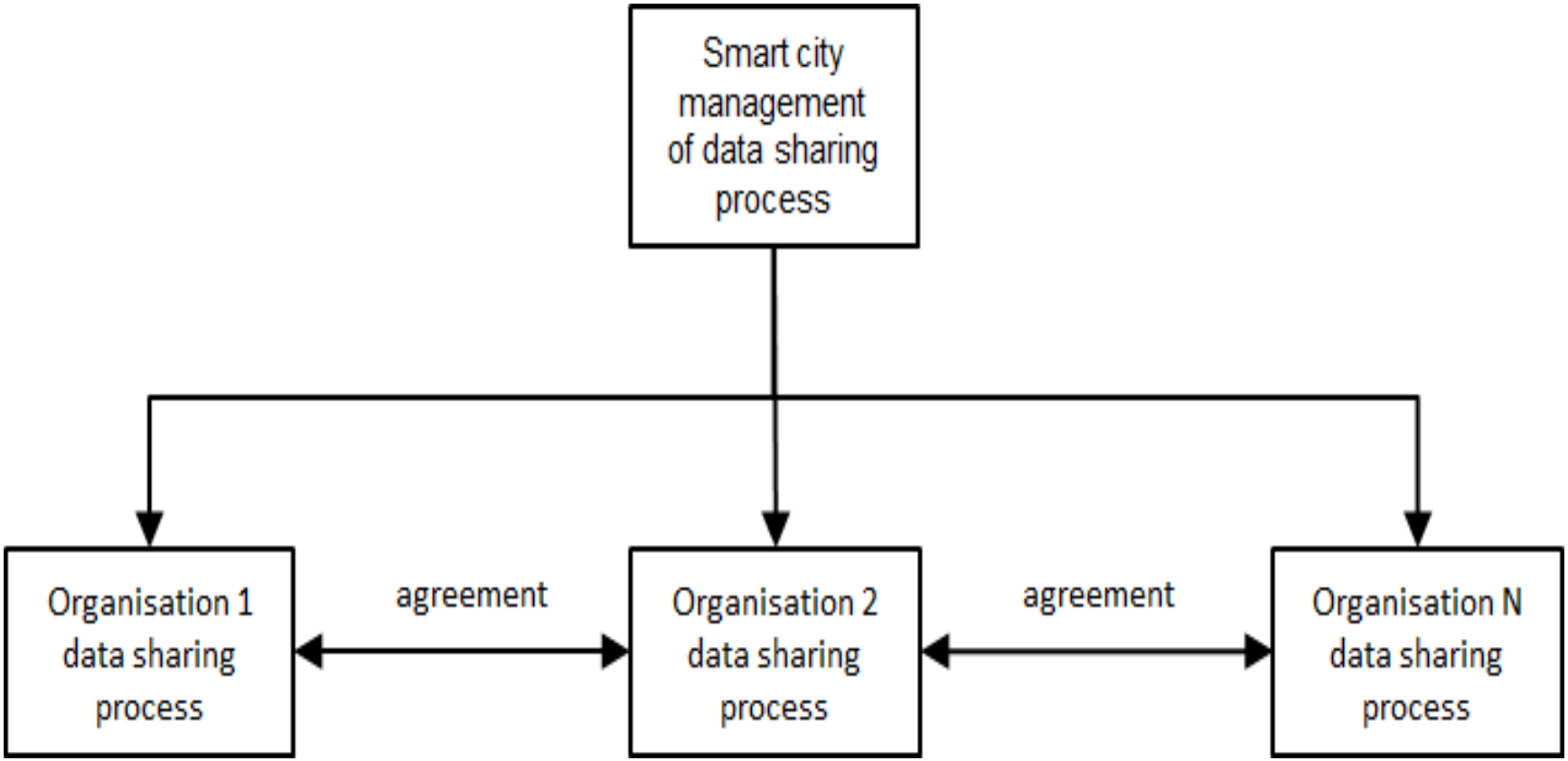
- What risks and what risk tolerance?
- Needs to be a dynamic or adaptive approach.
- Internal and external risk
- Systemic risk and resilience
- Whose liability? Expected and unexpected loss.

DATA GOVERNANCE

Exclusively private solutions to governance are sub-optimal for a variety of reasons, including

- The essence of the technology and systems are that they benefit from having some core common standards that support interoperability
- Technology providers, service providers and users are frequently in very different places and contexts and there is a need for a common forum or forums to interact
- There is a complex interaction between public and private concerns

DATA GOVERNANCE



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