International Telecommunication Union

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

**Technical Specification D0.1
Data Processing and Management for IoT and Smart Cities and Communities: Vocabulary**

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# FOREWORD

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The procedures for establishment of focus groups are defined in Recommendation ITU-T A.7. ITU-T Study Group 20 set up the ITU-T Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities (FG-DPM) at its meeting in March 2017. ITU-T Study Group 20 is the parent group of FG-DPM.

Deliverables of focus groups can take the form of technical reports, specifications, etc., and aim to provide material for consideration by the parent group in its standardization activities. Deliverables of focus groups are not ITU-T Recommendations.

# Technical Specification D0.1

# Data Processing and Management for IoT and Smart Cities and Communities: Vocabulary

**Summary**

The terms and definitions related to Data Processing and Management (DPM) are important for deploying Internet of things (IoT) and Smart Cities and Communities (SC&C).

This Technical Specification provides a set of core terms and associated definitions to reflect basic concepts used for DPM to support IoT and SC&C.

The terms and definitions contained in this document are widely and consistently used in the different FG-DPM deliverables developed by the Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities (FG-DPM).

**Keywords**
Data processing and management (DPM), Concepts, Terms, Definitions, Vocabulary

**Technical Specification D0.1**

# Data Processing and Management for IoT and Smart Cities and Communities: Vocabulary

**Table of Content**

# 1    Scope

This technical specification provides a set of core terms and associated definitions to reflect the basic concepts used in data processing and management (DPM) for IoT and SC&C. The document aims to encourage a mutual and consistent understanding of, and a coherent approach to, the activities relating to DPM, and the use of uniform terminology. It includes terms and definitions for DPM in IoT and SC&C which have been widely used in the ITU-T FG DPM deliverables, including terms already defined in relevant standards development organizations (SDOs).

This document is intended to be relevant for:

- people engaged in DPM activities,
- people involved in DPM activities of ISO, IEC, ITU-T and other international standards bodies,
- developers of national or sector-specific standards, guides, procedures and codes of practice relating to DPM.

# 2    References
None

# 3    Definitions

## 3.1    Terms defined elsewhere
This Technical Specification uses the following terms defined elsewhere:

**3.1.1    application** [b-ITU-T Y.2091]: A structured set of capabilities which provide value added functionality supported by one or more services, which may be supported by an API interface.

**3.1.2    blockchain** [b-FG-DPM TR D3.5]: A peer to peer distributed ledger based on a group of technologies for a new generation of transactional applications which may maintain a continuously growing list of cryptographically secured data records hardened against tampering and revision.
NOTE 1 – Blockchains can help establish trust, accountability and transparency while streamlining business processes.
NOTE 2 – Blockchains can be classified as three types (i.e. public, consortium and private) based on the relationship of the participants and the way to provide services.

**3.1.3    capabilities** [b-ITU-T X.1601]: Quality of being able to perform a given activity.

**3.1.4    community** [b-ISO 37153]: Group of people with an arrangement of responsibilities, activities and relationships, which shares geographic areas.

**3.1.5    data** [b-ISO 16091]: Information represented in a manner suitable for automatic processing.

**3.1.6    data consistency** [b-ISO 11519-1]: Feature of data processing and/or communication system where data remain consistent even after being partitioned and differently treated over time and location.

**3.1.7    data management** [b-ISO/IEC TR 10032]: The activities of defining, creating, storing, maintaining and providing access to data and associated processes in one or more information systems.

**3.1.8** **data processing** [b-ISO 5127]: Systematic performance of operations upon data

**3.1.9** **Internet of things (IoT)** [b-ITU-T Y.4000]: A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies.
NOTE 1 – Through the exploitation of identification, data capture, processing and communication capabilities, the IoT makes full use of things to offer services to all kinds of applications, whilst ensuring that security and privacy requirements are fulfilled.
NOTE 2 – In a broader perspective, the IoT can be perceived as a vision with technological and societal implications.

**3.1.10** **interoperability** [b-ITU-T Y.101]: The ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged.

**3.1.11** **lifecycle** [b-ISO/IEC TR 29110-5-3]: Evolution of a system, product, service, project or other human-made entity from conception through retirement.

**3.1.12** **personal data** [b-PAS 185]: Data which relates to a living individual who can be identified: a) from those data; or b) from those data and other information which is in the possession of, or is likely to come into the possession of, the data controller, and includes any expression of opinion about the individual and any indication of the intentions of the data controller or any other person in respect of the individual.

**3.1.13** **processed data** [b-ISO 5127]: Data which have been transformed from raw data or from an earlier data stage into a more refined stage by data cleaning, sorting, linking, verifying and similar operations.

**3.1.14** **raw data** [b-PAS 185]: Data that has not been processed for use.

**3.1.15** **requirements** [b-ISO 8000-2]: Need or expectation that is stated, generally implied or obligatory.

**3.1.16** **risk** [b-ISO 31000]: Effect of uncertainty on objects.

**3.1.17** **safety** [b-ISO/IEC Guide 51]: Freedom from risk which is not tolerable

**3.1.18** **scenario** [b-ISO 22398]: Pre-planned storyline that drives an exercise, as well as the stimuli used to achieve exercise project performance objectives.

**3.1.19** **security** [b-IEC Guide 120]: Condition that results from the establishment and maintenance of protective measures that insure a state of inviolability from hostile acts or influences.

**3.1.20** **service** [b-ITU-T Y.2091]: A set of functions and facilities offered to a user by a provider.

**3.1.21** **shared data** [b-PAS 185]: Data where the data owner has the legal authority  to share it with one or more organizations, subject to  a data or information sharing agreement which specifies that access is granted subject to specific restrictions and, where between different legal entities, is legally enforceable.

**3.1.22    stakeholders** [b-ISO/Guide 73]: Person or organization that can affect, be affected by, or perceive themselves to be affected by a decision or activity.

**3.1.23    thing** [b-ITU-T Y.4000]: An object of the physical world (physical things) or the information world (virtual things) that is capable of being identified and integrated into communication networks.

**3.1.24    trust** [b-ITU-T X.1252]: The reliability and truth of information or the ability and disposition of an entity to act appropriately, within a specified context.

**3.1.25    use case** [b-IEC 62559-2]: Specification of a set of actions performed by a system, which yields an observable result that is, typically, of value for one or more actors or other stakeholders of the system.

**3.1.26    use case template** [b-IEC 62559-2]: A form which allows the structured description of a use case in predefined fields.

## 3.2        Terms defined in this Technical Specification

This Technical Specification defines the following terms:

**3.2.1    closed data**: Data that requires access control to be divulgated.

**3.2.2    content owner**: An entity that owns the rights to content and can be watched, listened or read online.

**3.2.3    data commercialization**: The process of creating commercial value from data.
NOTE – It may encompass various activities, including, but not limited to, monetization, valuation, pricing, licensing, distribution, marketing and sales.

**3.2.4    data exchange:** Accessing, transferring and archiving of data.

**3.2.5    data governance**: Set of activities aimed to design, implement and monitor a strategic plan for data asset management.

**3.2.6    data marketplace**: An electronic marketplace whose main product is provisioning of data and/or related services around data.

**3.2.7    data processing and management**: The combination of all activities either directly performed on or indirectly influencing data.
NOTE 1 - Directly performed activities include among others [collecting/acquiring/capturing], exchanging, storing, securing, manipulating, reusing, aggregating, curating, disposing, monetizing and deleting data.
NOTE 2 - Indirectly influencing activities include among others policy and standards making, skills and innovation enhancement.

**3.2.8    data sharing**: The process of data exchange among different parties with specified conditions.

**3.2.9    ecosystem**: A set of organisations forming a distributed system with both technical and non-technical properties.

NOTE - In data processing and management, ecosystem refers to a data ecosystem, which is comprised of the technical and non-technical factors and mechanisms which directly or indirectly impact data processing and management activities in an ecosystem, based on various degrees of interoperability. Factors and mechanisms include, but are not limited to, data laws, regulations and policies, data standards, data skills, data research and development programs, data entrepreneurship, data economy financial incentives and data platforms.

**3.2.10    minimal interoperability:** The minimal sufficient degree needed to meet a certain requirement              for              data              sharing,              use              and              reuse.
NOTE – This is an approach to build a set of modular mechanisms, including information models, across multiple domains, locations and events. The definition aligns with the definition of "interoperability" in [b-ITU-T Y.101].

**3.2.11    open data:** Any information that has been made available for anyone under a legal framework to access, alter, and share without restrictions.
NOTE - It can be from a public source, e.g. government data, or from a business, e.g. company intelligence, and can be used for both commercial and non-commercial purposes.

**3.2.12   Smart Cities and Communities**: Effective integration of physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future for its citizens.
NOTE – This definition aligns with the definition of "Smart City" in [b-ISO/IEC 30182] and with the recommendation from the IEC/ISO/ITU Smart City terminology coordination Task team [b-IEC/ISO/ITU Draft White Paper].

# 4        Abbreviations and acronyms
This Technical Specification uses the following abbreviations and acronyms:

API      Application Programming Interface
DPM     data processing and management
IoT      Internet of things
SC&C   Smart Cities and Communities

# 5        Conventions
None

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