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Information technology — Smart city digital platform reference architecture — Data and service

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Foreword

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Introduction

Smart city digital platforms (SCDPs) aim to form a pragmatic development of information technology foundations that enable the integration of urban services. SCDPs are part of the digital transformation in urban infrastructure and services that is being driven by the deployment of the internet of things (IoT), artificial intelligence (AI), cloud computing, big data and digital twin solutions, and other digital technologies.

An SCDP is a space where different applications can share fundamental common resources and functions. It provides an interface to integrate a city's digital and physical infrastructure. It also provides integrated capability to coordinate data, services and applications across operational domains for multiple stakeholders in smart cities.

An SCDP is intended to help to break down the traditional system silos of a city by bringing connections between them. It looks beyond sectoral silos to reimagine existing systems, enable new processes and interactions, and migrate towards new forms of service delivery. The digital capabilities provided by SCDPs aim at connecting things, connecting data and connecting innovation. These capabilities are key criteria for enabling cities to build partnerships to ensure their economies, environment and services are fit for the future.

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Information technology — Smart city digital platform reference architecture — Data and service

1 Scope

This document specifies the reference architecture of smart city digital platforms (SCDPs), with a focus on supporting access to data and services for applications in smart cities.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
asset
anything that has value to a stakeholder

[SOURCE: ISO 22739:2020, 3.1]

3.2
data
representation of facts of objective reality in a formalized manner

EXAMPLE Data can be signs and symbols, and can be in analogue form, digital form or both.

Note 1 to entry: Data can be used for communication, interpretation or processing by human beings or automatic means.

[SOURCE: IEC CDV 60050-831, 2.2]

3.3
information
structured, contextualized and processed data that are endowed with meaning

Note 1 to entry: Information is meaningful and useful to human beings, or machines or both.

3.4
interoperability
property permitting diverse systems or components to work together for a specified purpose

[SOURCE: IEC 80001-1:2010, 2.11]

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3.5
metadata
data about data or data elements, possibly including their data descriptions, and data about data ownership, access paths, access rights and data volatility

Note 1 to entry: The term "metadata" in this document mainly aims to aid the identification, discovery, assessment and management of the data collected by SCDP.

[SOURCE: ISO/IEC 20546:2019, 3.1.24, modified — Note 1 to entry is added.]

3.6
platform
combination of an operating system and hardware that makes up the operating environment in which a program runs

[SOURCE: ISO/IEC/IEEE 26513:2017, 3.30]

3.7
smart city digital platform
SCDP
combination of software and hardware that makes up the operating environment to support smart city common services and applications

Note 1 to entry: The operating environment enables data from a variety of sources to be processed and common services to be provided.

Note 2 to entry: Common services are aimed at improving the interoperability of cross-domain systems, for example data exchange, catalogue service, subscription and distribution, etc.

4 Overview

A SCDP connects smart city information and communication technology (ICT) infrastructure, such as device, network and Internet, and smart city applications, such as e-government and public service, city operation, decision-making and industry service, as shown in Figure 1. The SCDP is characterized by the combined exploitation of software components with heterogeneous physical devices and protocols, furnishing smart city applications with ready-to-use software services and enhancing the system performance in various system environments. This ultimately provides optimized and integrated city services to the end users, such as governments, individuals, organizations and companies. One example of SCDP data service reusability for different applications is provided in Annex A.

SCDPs implement capabilities of the data and services supporting layer described in ISO/IEC 30145-3 (see Annex B). Guided by the design principles in Clause 5, the functions of an SCDP can be categorized into four groups:

1) technical support,

2) resource management,

3) capability exposure, and

4) interface.

This is shown in Figure 1.

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