BS ISO 24591-1:2024

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Smart water management

Part 1: General guidelines and governance

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National foreword

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Smart water management —

Part 1:
General guidelines and governance

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Partie 1: Lignes directrices générales et gouvernance

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Foreword

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This document was prepared by Technical Committee ISO/TC 224, *Drinking water, wastewater and stormwater systems and services*.

A list of all parts in the ISO 24591 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

In recent years, governments, enterprises and researchers have shown increasing interest in incorporating digital and smart approaches, including sensor monitoring, real-time data transmitting, data processing, artificial intelligence (AI) and real-time controlling, into water systems. The worldwide demand for water from the growing population, increasing urbanization and maintaining the cost of ageing infrastructure drive the growth of the smart water management market.

With the development of smart water management, water utilities are facing increasing challenges in developing an appropriate digital strategy for water, wastewater, stormwater systems and service. First, data silos and electro-mechanical rotating equipment with various communication protocols block systems integration and interoperability. Second, cybersecurity and user data protection are critical considerations when deploying smart water management. Third, managing data for valuable information is the key element in designing and managing a smart water system. Fourth, adopting digital technologies can bring up human resources concerns related to skills gaps, workforce transition and change management.

The digital maturity of water utilities is different but they all need to have digital architecture and general guidelines to develop value systems and governance to adapt to the changing environment and face these new challenges.

While there are some standards on data exchanging and data sharing relating to smart city and smart community infrastructures, standards on smart management in the water and wastewater domain have still to be developed.

This document provides principles and guidelines for smart water management relating to drinking water, wastewater, stormwater systems and services. It is intended to help water utilities decrease operational expenditure, increase workforce efficiency and increase user engagement and satisfaction. It also helps guide a new generation of water utilities during their uptake of digital strategy and integration into water services adapted to their context, and accelerates collaboration with public agencies and other businesses in the smart cities field.

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Smart water management —

Part 1:
General guidelines and governance

1 Scope

This document provides principles and guidelines for smart water management relating to drinking water, wastewater, stormwater systems and services.

The following are within the scope of this document:

— principles and guidelines for design of smart water management system;

— principles and guidelines for operation and maintenance of smart water management systems;

— principles and guidelines for governance of smart water management system.

This document applies to all sizes of public or private water utilities that want to design, develop, implement, operate and/or maintain smart water management systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 24513:2019, *Service activities relating to drinking water supply, wastewater and stormwater systems — Vocabulary*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24513 and the following 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/

3.1.1
controller
piece of equipment that combines the function of at least the input elements, the comparing elements and the amplifying and signal processing elements for a process control system

[SOURCE: ISO 1213-1:2020, 11.2.5]

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3.1.2
cybersecurity by design
approach to developing systems, applications or processes with security measures and hardware architecture embedded from the outset, prioritizing the prevention, detection and mitigation of cyber threats throughout the entire life cycle of the system

3.1.3
data management
process of keeping track of all data and/or information related to the creation, production, distribution, storage and use of e-media, and associated processes

[SOURCE: ISO 20294:2018, 3.5.4]

3.1.4
data repository
functional unit that stores and retrieves data

EXAMPLE A data repository can support services such as search, indexing, storage, retrieval and security.

[SOURCE: ISO/IEC 20944-1:2013, 3.21.13.15]

3.1.5
governance
system of directing and controlling water utilities, corporate governance systems, responsible bodies, relevant stakeholders, relevant authorities and responsible authorities

Note 1 to entry: This includes all of the processes of governing – whether undertaken by the government of a state, by a market or by a network – over a social system (e.g. family, tribe, formal or informal organization, territory or across territories) and whether through the laws, norms, power or language of an organized society.

[SOURCE: ISO 24540:2023, 3.2]

3.1.6
integration by design
approach where systems, hardware, applications or processes are developed and deployed with seamless interoperability and communication between components from the outset, fostering efficient and cohesive connections among elements throughout their entire life cycle

3.1.7
industrial internet of things
IIOT
industrial infrastructure of interconnected entities, people, systems and information resources, together with services which process and react to information from the physical world and the virtual world

Note 1 to entry: Industrial internet of things is used to identify the industrial specializations of the *internet of things* (3.1.8).

3.1.8
internet of things
IoT
infrastructure of interconnected entities, people, systems and information resources, together with services which process and react to information from the physical world and the virtual world

[SOURCE: ISO/IEC 20924:2021, 3.2.4]

3.1.9
sensor
detector or transducer normally used for measuring quantities and qualities or detecting occurrences

Note 1 to entry: Analogue transducers are sometimes called sensors.

[SOURCE: ISO 1213-1:2020, 11.2.1, modified — Definition revised.]

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