



APPLICATION AND FUTURE PLANNING FOR STANDARD KNOWLEDGE GRAPH

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ABSTRACT

This paper introduces the development directions of digitized standards of international organizations and the situations of digitized standards in relevant countries, with a focus on a detailed analysis of the principle, construction, and application of a standard-oriented knowledge graph. A future plan is also made for digitized standards and for a knowledge graph of standards.

KEYWORDS

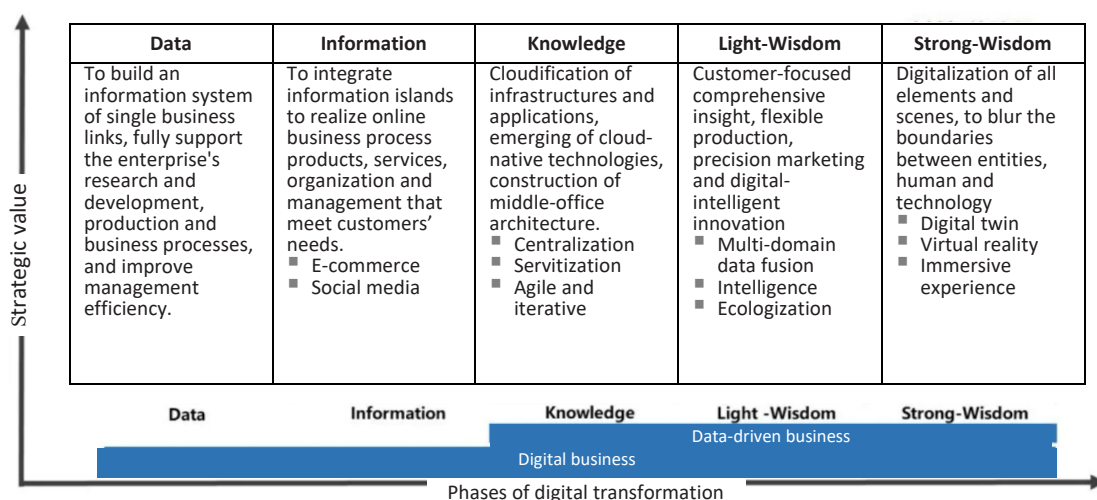
digitized standard, standard-oriented knowledge graph, white paper

1. DEVELOPMENT TRENDS OF DIGITIZED STANDARD

1.1. DIGITIZED STANDARD

With the continuous advancement of the global digitization process (as shown in FIGURE 1), the digitized standard is not only an inevitable result of economic and social development, changes in digital technology, and international strategic games but also a key factor in realizing the digital transformation of national quality infrastructures. Digitized standard refers to the process of using digital technologies (cloud computing, big data, blockchain, the Internet of Things, artificial intelligence, etc.) to empower the standard itself and its entire life cycle so that the rules and characteristics carried by the standard can be read, transmitted, and used through digital devices. It is a product of technological development and a fundamental requirement in a digital age and is able to make digitalization run through the entire life cycle of standardization while making use of the high efficiency of digitalization, which is conducive to the formulation, implementation, and promotion of standards. In a digital operating environment, the formulation, implementation, and promotion of standards and various businesses implemented in accordance with standards can be completed in a very short time with excellent results. FIGURE 1 shows the phases of the digital transformation [1].

FIGURE 1 Phases of the digital transformation



1.2. DEVELOPMENT DIRECTIONS OF DIGITIZED STANDARDS OF INTERNATIONAL ORGANIZATIONS

1.2.1. ISO'S MACHINE-READABLE STANDARD AND SMART ROADMAP

ISO has now laid out machine-readable standards as a strategic theme. To provide a stable foundation for the opportunities and challenges brought about by big data, ISO has identified the main drivers of change from four aspects: economy, technology, sociality, and environment, and has included digitalization as a focused technology and machine-readable standards as a strategic theme. In 2018, the ISO adopted the Technical Management Board Resolution 94 (TMB Resolution 94/2018), and ISO/TMB also established the Strategic Advisory Group on Machine-Readable Standards (SAG MRS) to further study the innovative technologies for digitized machine-readable/SMART (Standards Machine Applicable, Readable and Transferable) standards, which is responsible for the preliminary research on digitized standards and the development of a roadmap for the implementation of machine-readable standards.

In February 2021, ISO further discussed the SMART standard and proposed to align and strengthen its cooperation with the International Electrotechnical Commission (IEC) on this strategic theme, setting up a Guiding Group for SMART to work on digitized standards and calling for pilot projects around the “roadmap for introduction and implementation of SMART Standard.” Its work is to carry out research on digital transformation of standards in the industry and implement and promote digitized standards.

1.2.2. IEC'S DIGITAL TRANSFORMATION STRATEGY

To realize the vision of “IEC everywhere for a safer and more efficient world” and adapt to the rapid development of industrial digital transformation and technology, IEC is actively promoting the future strategic planning work. In 2018, the Digital Transformation and Systems Approach Strategic Group (IEC/SMB/SG12) was established. In 2021, IEC/CB set up the “SMART Standardization and Conformity Assessment” Task Group, making digital transformation an important proposition in the future. This strategic group conducts in-depth research on digital transformation related to standardization activities and digital transformation of international standards, analyzes the role of digital transformation, and prepares for fundamental changes affecting its core operations, such as open source and open data trends, as well as new digital standards used directly through machines. The implementation of the digital transformation program will focus on improving the quality and efficiency of the international standardization process and conducting research on whole-life-cycle digital solutions.