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Assessment of industrial digital twin system providers

工业数字孪生系统服务商评估

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Table of Contents

2	Normative references
4	General Requirements
4.2	Assessment and Grading
5	System service provider capability elements
5.1	Basic Capabilities
6	Evaluation Methods

Foreword

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Nan, Cao Huiming, Guo Yan. Industrial Digital Twin System Service Provider Evaluation

1.Scope This document specifies the evaluation framework and general requirements, evaluation elements, and descriptions of the corresponding evaluation criteria for industrial digital twin system service providers. method. This document is applicable to the assessment by the system construction and implementation entity of whether the system service provider has the corresponding capabilities to provide industrial digital twins that meet the requirements. The system and services should be selected from suitable service providers; this can also be used as a reference for system service providers or third-party organizations to evaluate the service capabilities of service providers.

2 Normative references

This document has no normative references.

4 General Requirements

4.1 Evaluation Framework The system service provider's capability elements include two capability domains. basic capabilities and products and services, comprising 14 capability items and 35 capability sub-items. By comprehensively evaluating the capabilities of various system service providers, the system service provider was selected as the industrial digital twin provider for the given implementation scope. The system construction and implementation capabilities include providing products and services, carrying out project implementation, etc., and in accordance with the credit qualifications and industrial digital twins. The system's construction and implementation capabilities are assessed comprehensively to determine the corresponding system service capability level. System service capability levels are categorized from highest to lowest as follows: Initial-level system service provider (L1 level), basic-level system service provider (L2 level), optimized-level system service provider (L3 level), intelligent-level system service provider (Level 4) Autonomous Level System Service Provider (Level 5) (see Figure 1). Within the same implementation scope, higher capability levels encompass lower capability levels. Characteristics. The system service provider's capabilities are divided into two primary indicators. basic capabilities and products and services, along with creditworthiness, financial status, model, and control. There are 14 secondary indicators, and 35 tertiary indicators, including credit status, qualification status, model fidelity, and model adaptability.

4.2 Assessment and Grading

4.2.1 Initial-level system service provider (Level 1) It can provide initial-level industrial digital twin system products and services for a given implementation scope, and has the following characteristics.

a) Basic capabilities such as creditworthiness, financial status, talent pool, management

mechanisms, R&D innovation, service capabilities, and ecosystem integration. generally;

b) Possess the capability to carry out digital, networked, and intelligent transformation of basic equipment and facilities;

c) It can provide necessary products and services for the construction and implementation of basic information systems, and has some capabilities for developing industrial digital twin systems. Model, control algorithm, interaction method, data, and application capabilities.

4.2.2 Basic-level system service providers (Level 2) It can provide basic-level industrial digital twin system products and services for a given implementation scope, possessing all the capabilities of an initial-level system service provider. In addition to its basic properties, it also possesses the following characteristics.

a) Basic capabilities such as creditworthiness, financial status, talent pool, management mechanisms, R&D innovation, service capabilities, and ecosystem integration. better;

b) Possess the ability to independently complete modeling, develop, establish, and implement monitoring and data collection mechanisms;

c) Possess the ability to develop geometric kinematics simulation analysis algorithms and functions with control logic according to system requirements;

d) Possess the ability to customize and develop visualization display mechanisms according to system needs.

4.2.3 Optimized System Service Provider (Level 3) It can provide optimized industrial digital twin system products and services for a given implementation scope, possessing all the capabilities of a basic-level system service provider. In addition to physical strength, it also possesses the following abilities.

a) Basic capabilities such as creditworthiness, financial status, talent pool, management mechanisms, R&D innovation, service capabilities, and ecosystem integration. good;

b) Able to independently develop models and establish mechanistic and informational models that incorporate industry and domain knowledge based on system requirements;

c) Possesses the capability to develop and implement mapping between physical entities and digital twins in virtual space, achieve synchronous control between virtual and real environments, and establish interaction mechanisms and computing capabilities. The power of law;

d) Possess the ability to develop operational status identification, operational optimization, and simulation prediction functions.

5.1 Basic Capabilities

5.1.1 Creditworthiness The creditworthiness factors that influence the capabilities of system

service providers mainly include the following.

- a) Credit status. This includes situations such as the legal entity's breach of trust and legal disputes affecting the service provider's ability to provide services.
- b) Qualifications. Technical certifications and qualifications possessed, experience in undertaking industrial digital twin-related systems or providing related services, etc. Condition.
- c) Creditworthiness information related to other industrial digital twin systems.

5.1.2 Financial Situation The financial factors that affect the capabilities of system service providers mainly include the following.

- a) Financial revenue. This includes key operating revenue, cost-profit ratio, etc.
- b) Asset situation. Total asset size, debt-to-equity ratio, etc.
- c) Other financial-related factors.

5.1.3 Talent Support The key factors affecting the capabilities of system service providers related to talent support include the following.

- a) Technical personnel. The number and proportion of technical personnel, their relevant qualifications, and their direct service in the construction of industrial digital twin information systems. Information such as the number of technical personnel involved in the project or providing related services.
- b) Management and Business Personnel. The percentage of management and business personnel, their relevant qualifications, and their direct service to industrial digitalization. Information such as the number of management and business personnel involved in the twin information system construction project or providing related services.
- c) Other factors related to talent support.

5.1.4 Management Mechanism The management mechanisms that influence the capabilities of system service providers mainly include the following elements.

- a) Management System. Establish or apply a management system in areas such as R&D, production, and service; and integrate it with the construction of industrial digital twin systems. The establishment or application of service-related management systems and regulations, compliance, and other related matters.

6 Evaluation Methods

6.1 Indicators and Weights In order to better enhance the relevance and suitability of the assessment, the evaluation comprehensively considers industry characteristics and the type of system service provider (including but not limited to...). In cases where the provider is not limited to technology product providers, integration solution providers, service