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**Intelligent Manufacturing - Industrial Cloud Service -
Capabilities Assessment**

智能制造 工业云服务 能力评估

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Intelligent Manufacturing - Industrial Cloud Service - Capabilities Assessment

1 Scope

This document proposes a framework for the capabilities assessment of industrial cloud service, stipulates the assessment content of industrial cloud service business capabilities in different life cycles and the assessment content of each business capability, and provides a process of the capabilities assessment of industrial cloud service.

This document is applicable to the guidance of the capabilities assessment of industrial cloud service.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in this text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 37724-2019 Information Technology - Industrial Cloud Service - Capabilities General Requirements

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 industrial cloud service

Industrial cloud service refers to one or multiple capabilities provided through an interface defined by industrial cloud.

3.2 industrial cloud service provider

Industrial cloud service provider refers to a participant providing industrial cloud service.

3.3 industrial cloud service partner

Industrial cloud service partner refers to a participant supporting or assisting the activities of industrial cloud service providers, the activities of industrial cloud service customers, or both.

3.4 documented information

Documented information refers to information and its media that an organization or individual needs to control and maintain.

NOTE: documented information is not limited to format, media and source.

3.5 business capability

Business capability refers to the capability of industrial cloud service provider in providing industrial cloud services throughout the entire product life cycle, including a variety of production activities.

NOTE: business capabilities mainly include R&D and design capabilities, procurement capability, production and manufacturing capabilities, testing capability, logistics capability, marketing capability and after-sales capability.

4 Abbreviations

The following abbreviations are applicable to this document.

APS: Advanced Planning and Scheduling

OLE: Object Linking and Embedding

OPC: OLE for Process Control

SCADA: Supervisory Control And Data Acquisition

5 Framework

The framework for the capabilities assessment of industrial cloud service includes the content and process of capabilities assessment of industrial cloud service. The content of the capabilities assessment of industrial cloud service is extended in accordance with the business capability division and business capability life cycle stipulated in GB/T 37724-2019. In terms of four capability life cycle stages: capability planning, capability building, capability operation and capability assessment, as well as seven business capabilities: R&D and design, procurement, production and manufacturing, testing, logistics, marketing and after-sales, the assessment elements are respectively determined. The process of the capabilities assessment of industrial cloud service includes assessment preparation, scheme preparation, implementation of assessment and analysis of assessment. The framework for the capabilities assessment of industrial cloud service is shown in Figure 1.

Capability building means that the industrial cloud service provider organizes resources and capabilities in accordance with the specific content of capability planning, and accesses industrial cloud service, so as to provide services to users.

The assessment elements of capability building shall at least include:

- a) With the team, management system, management means and management tools to carry out capability building;
- b) Physical or virtual resources form a resource pool, so as to provide scalable, multi-tenant, elastic, on-demand services and network access;
- c) In accordance with the reports and schemes formed in the capability planning stage, carry out capability building, and with relevant documented information;
- d) Form phased reports on capability building. The content of the phased reports shall include the current situation, problems and difficulties of capability building;
- e) Issue an acceptance inspection report on capability building. The content of the acceptance inspection report shall include the results of capability building and confirm the capability building scheme;
- f) With the process of capability building and optimization.

6.1.3 Capability operation

Capability operation refers to operations, such as: release, display, retrieval, consultation, transaction, delivery, update and withdrawal of business capabilities, etc.

The assessment elements of capability operation shall at least include:

- a) With the team and knowledge for carrying out services, such as: capability release and consultation, etc.;
- b) With the standard release procedures of business capabilities. All releases are limited to the business capabilities themselves, and will not cause interruption to other industrial cloud services;
- c) With keyword search of business capabilities;
- d) Support customers to flexibly order related services as needed;
- e) With complete function description and usage guidance on business capabilities, which enable customers to clearly understand what kind of problems the business capability can solve;
- f) Provide necessary communication means to allow industrial cloud service customers to negotiate with industrial cloud service providers, and complete necessary

consulting activities;

- g) Provide quantifiable and measurable acceptance indicators, which are used for industrial cloud service customers in the acceptance inspection of business capabilities;
- h) Provide a correlation impact analysis report on business capability updates;
- i) With the process of capability operation, such as: release, display, retrieval, consultation, transaction, delivery, update and withdrawal, etc.

6.1.4 Capability assessment

Capability assessment refers to the assessment of the comprehensive effect of industrial cloud service business capabilities. Industrial cloud service collaborators or industrial cloud service customers can assess the class of service provided by the industrial cloud service provider.

The elements of capability assessment shall at least include:

- a) With the team and knowledge for carrying out assessment and analysis of the comprehensive effect of industrial cloud service business capabilities;
- b) From the functional perspectives, such as: completeness, suitability, correctness and compliance, etc., as well as the non-functional perspectives, such as: reliability, usability and security, etc., determine the assessment scheme. Carry out the capability assessment and form assessment conclusions;
- c) Provide an indicator system covering all business capabilities;
- d) Provide data sources for all indicators;
- e) With the process of indicator development, data acquisition, analysis and assessment for business capability assessment.

6.2 Business Capabilities

6.2.1 R&D and design

The assessment elements of R&D and design capabilities shall at least include:

- a) Provide the release of R&D and design capabilities information, and the maintenance and management of such information shall ensure completeness;
- b) Provide customers with the function of describing their R&D and design demands;
- c) Resources, such as: R&D design models, documents and data, etc., can realize sharing in accordance with user's permission levels and business demands;
- d) Provide professional R&D and design services;

- f) Provide visual presentation of industrial data and scenarios, for example: central monitoring center;
- g) Provide the functions of production planning and scheduling, plan execution monitoring and plan adjustment, for example, APS;
- h) Provide the functions of production traceability and quality analysis, for example, production traceability system and quality management system;
- i) Provide monitoring of production energy consumption, for example, energy management system.

6.2.4 Testing

The assessment elements of testing capability shall at least include:

- a) Provide the release of testing capability information, and the maintenance and management of such information shall ensure completeness;
- b) Provide customers with the function of describing their testing demands;
- c) Provide consulting function for testing business;
- d) Provide documented information, such as: detailed testing process and suggestions for improvement of the testing object;
- e) Provide tracking and inquiry of testing tasks;
- f) Provide task distribution, crowdsourcing or off-site labor division and cooperation of testing tasks;
- g) Provide the functions of analysis and assessment of technical indicators of industrial equipment, systems or products.

6.2.5 Logistics

The assessment elements of logistics capability shall at least include:

- a) Provide the release of logistics capability information, and the maintenance and management of such information shall ensure completeness;
- b) Provide customers with the function of describing their logistics demands;
- c) Capable of realizing circulation processing, including auxiliary processing activities of the circulation process;
- d) Provide the function of logistics entrustment;
- e) Provide the functions of logistics management scheduling and logistics tracking;

- f) Provide rapid changes to logistics channels and logistics shipping equipment, etc.;
- g) Provide the function of crowdsourcing logistics.

6.2.6 Marketing

The assessment elements of marketing capability shall at least include:

- a) Provide the release of marketing capability information, and the maintenance and management of such information shall ensure completeness;
- b) Provide customers with the function of describing their marketing demands;
- c) Provide the functions of channel management, customer relationship management and supplier management, etc.;
- d) Support tracking and monitoring of the marketing process;
- e) Support the functions, such as: investigation, order management, expense management, price management, promotions and competition analysis, etc.

6.2.7 After-sales

The assessment elements of after-sales capability shall at least include:

- a) Provide the release of after-sales capability information, and the maintenance and management of such information shall ensure completeness;
- b) Provide customers with the function of describing their after-sales demands;
- c) Provide the functions of customer management, automated order-taking, on-demand task distribution and return-visit management;
- d) Provide the function of after-sales service information management;
- e) Provide the functions, such as: testing, fault early warning, remote diagnosis and collaborative maintenance, etc.

7 Assessment Process

7.1 Overview

The process of capability assessment of industrial cloud service includes four stages: assessment preparation, scheme preparation, implementation of assessment and analysis of assessment. The assessment process is shown in Figure 2.

- a) Assessment preparation is the preliminary activity for the implementation of assessment. The main tasks include clarifying the purpose of capability assessment of

capability assessment of industrial cloud service shall include an overview of assessment items, purpose of assessment, main content of assessment, principle and basis of assessment, etc.

- c) Prepare documents of capability assessment of industrial cloud service. The documents of capability assessment of industrial cloud service include indicator measurement result recording form, result confirmation letter and assessment contract, etc.

7.3 Scheme Preparation

The scheme preparation shall include the following main tasks.

- a) Identify the object of capability assessment of industrial cloud service. In accordance with the requirements of GB/T 37724-2019 and Chapter 6, determine the object of assessment.
- b) Formulate methods of capability assessment of industrial cloud service. The methods of capability assessment of industrial cloud service include document assessment and functional assessment, etc.
- c) Prepare schemes of capability assessment of industrial cloud service. The content of the assessment schemes includes, but is not limited to assessment content, assessment indicators and assessment methods, etc.

7.4 Implementation of Assessment

The main tasks of implementation of assessment shall include:

- a) Information collection of capability assessment of industrial cloud service. Capability assessment includes the processes of preparing for information collection (for example, signing a confidentiality agreement), implementing information collection and confirming the collection results, etc.;
- b) Information analysis of capability assessment of industrial cloud service. Capability assessment includes pre-processing of collected information and calculation of indicator results of capability assessment of industrial cloud service.

7.5 Analysis of Assessment

The analysis of assessment shall include the following main tasks.

- a) Form results of capability assessment of industrial cloud service. In accordance with the assessment scheme and assessment information analysis conclusions, form assessment results and prepare a report on capability assessment of industrial cloud service.

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