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Automation systems and integration — Use case of capability profiles for cooperation between manufacturing software units

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 5, *Interoperability, integration, and architectures for enterprise systems and automation applications*.

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

The motivation for ISO 16100 stems from the industrial and economic environment, in particular:

a) a growing base of vendor-specific solutions;

b) user difficulties in applying standards;

c) the need to move to modular sets of system integration tools;

d) the recognition that application software and the expertise to apply that software are assets of the enterprise.

ISO 16100 is an International Standard for the computer-interpretable and human readable representation of a capability profile. Its goal is to provide a method to represent the capability of a manufacturing software unit (MSU) in manufacturing application software relative to its role throughout the life cycle of a manufacturing application, independent of a particular system architecture or implementation platform. This can lead to reduced production and information management costs to users and vendors/suppliers of manufacturing applications.

This document describes an application of ISO 16100. Manufacturing software agents, which are one type of MSU, achieve interoperation using capability profiles specified in ISO 16100.

This document describes message language and protocol for software agents to collaborate with each other to emerge systems function. Presenting the MSU capability profile defined in ISO 16100-3, the agents mutually recognize the capability of manufacturing activity and recognizable messages. Software agents that need manufacturing activities are called customers, and agents that provide manufacturing activities are called performers. Customers describe the request messages for manufacturing activities by the message language. Performers describe the report messages of the result of the manufacturing activities by the message language.

Agent Communication Language (ACL), proposed by the Foundation for Intelligent Physical Agents (FIPA), is a message language exchanged with multi agents, and the protocol that defines the sequence of messages is a protocol to which the framework of interaction protocol is applied and identifies the agent in order to use the ontology prescribed by FIPA. By contrast, this document describes the protocol and message language in which the software agent acting as a customer and the software agent acting as a performer interact in a one-to-one manner and each software agent is identified using a capability profile specified in ISO 16100-3. Therefore, the protocol and message language described in ACL and in this document are different.

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TECHNICAL REPORT **ISO/TR 16161:2019(E)**

Automation systems and integration — Use case of capability profiles for cooperation between manufacturing software units

1 Scope

This document describes an approach for using ISO 16100 to achieve cooperation between software agents by exchanging manufacturing software unit (MSU) capability profiles. The exchanged profiles among agents describe the manufacturing capabilities requested by the requester and to be fulfilled by the performer.

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 terminological databases for use in standardization at the following addresses:

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

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

3.1
customer
requester of the manufacturing activity

3.2
C-subsystem
manufacturing software unit requesting the manufacturing activity

3.3
performer
provider of the manufacturing activity

3.4
P-subsystem
manufacturing software unit providing the manufacturing activity

3.5
capability profile service provider
software that implements the capability profile interface

[SOURCE: ISO 16100-3:2005, 3.1.2]

3.6
service provider
entity that plays the role of *capability profile service provider* (3.5) and is responsible for preparing and delivering a pair of *customer* (3.1) and *performer* (3.3)

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