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Industrial automation systems and integration — Industrial manufacturing management data —

Part 31: Resource information model

Systèmes d'automatisation industrielle et intégration — Données de gestion de fabrication industrielle —
Partie 31: Modèle d'information des ressources

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15531-31 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data*.

— A complete list of parts of ISO 15531 is available from the Internet at:

http://www.tc184-sc4.org/titles/MANDATE_titles.rtf

Introduction

Resources form the basis and technological foundation of any manufacturing system. The efficient use of resources is the main goal of cost management which, in turn, directly contributes to market success.

Different aspects of the resources depend on the viewpoint being considered. The choice of a specific aspect is a way of reducing complexity.

Therefore, future concepts for business process development and resource management require:

— an integrated view of the complete set of business processes and the relevant resource management activities;

— an integrated resource management including interfaces to external manufacturing unit.

NOTE external-manufacturing unit may be for example suppliers or subsidiaries.

Resource attributes and the required capabilities and capacities for manufacturing processes have to be described by data modelling, so that they can be communicated and used more efficiently for resource usage management. The means of information representation should therefore be standardized.

EXAMPLE resources attributes may be capability, capacity, and status.

In this International Standard the only aspect under consideration is the management of resources usage. The objective is to describe the resource management information to enable an unhindered flow of information between all systems and humans involved.

Industrial automation systems and integration — Industrial manufacturing management data —

Part 31: Resource information model

1. Scope

According to the scope ISO 15531-3X series that is reminded in annex A of this document, ISO 15531-31 is an introduction to the ISO 15531-3x series of part of ISO 15531. It describes the universe of discourse of this standard as well as the resources information model. It provides the main principles used in this series of parts of ISO 15531.

The following are within in the scope of this Part of ISO 15531:

— general overview of the parts 15531-3x series;

— definitions of terms used;

— fundamental principles used for conceptual model of resource usage management data;

— description of the resources information model (RIM);

— derivation process of identification and description of resources;

— structure of the standard and relationships between this series of parts and the others series of parts the standard is composed;

— use of standard (informative).

The following are out of the scope of this part of ISO 15531:

— detailed description of the resource information model;

— EXPRESS description of the model and related entities;

— definition of detailed level concepts and entities;

NOTE - Those three items are developed in the part 32 of ISO 15531 : *Conceptual model for resources usage management data.*

2. Normative references

The following referenced documents are indispensable for the application 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/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1) — Part 1: Specification of basic notation*

ISO 10303-1, *Industrial automation systems and integration — Product data representation and exchange — Part 1: Overview and fundamental principles*

ISO 10303-11, *Industrial automation systems and integration — Product data representation and exchange — Part 11: Description methods: The EXPRESS language reference manual*

ISO 10303-41, *Industrial automation systems and integration — Product data representation and exchange — Part 41: Integrated generic resources: Fundamentals of product description and support*

ISO 10303-49, *Industrial automation systems and integration — Product data representation and exchange — Part 49: Integrated generic resources: Process structure and properties*

ISO 13584-1, *Industrial automation systems and integration — Parts library — Part 1: Overview and fundamental principles*

ISO 14258, *Industrial automation systems — Concepts and rules for enterprise models*

ISO 15531-1, *Industrial automation systems and integration — Industrial manufacturing management data — Part 1: General overview*

3. Terms, definitions, and abbreviations

3.1. Terms defined in ISO 10303-1

This part of ISO 15531 makes use of the following terms defined in ISO 10303-1:

— conformance testing;

— data;

— data exchange;

— information;

— product;

— product data.

3.2. Terms defined in ISO 10303-11

This part of ISO 15531 makes use of the following terms defined in ISO 10303-11:

— entity.

3.3. Terms defined in ISO 15531-1

This part of ISO 15531 makes use of the following termes defined in ISO 15531-1:

— capability;

— capacity;

— construct;

— enterprise entity;

— model ;

— process;

— resource;

— universe of discourse.

3.4. Terms defined in ISO 14258

— enterprise;

— enterprise model;

3.5. Other definitions

For the purposes of this part of ISO 15531, the following definitions apply.

3.5.1
attribute
a piece of information stating a property of an enterprise entity.

NOTE – The concept provided here to the broad concept of entity as defined in European standard ENV 12204. The term entity used in the definition provided by the ENV 12204 has been replaced here by enterprise entity as in ISO 15531-1 to avoid any confusion and inconsistency with the reserved term “entity” defined in ISO 10303. The usage of this concept has been limited to the area of concern of ISO 15531 in order to enable the use of the term “enterprise entity” instead of “entity”, and the field of application of the term attribute is restricted to enterprise entities.

3.5.2
business process
a partially ordered set of activities of an enterprise which can be executed to realise a given objective of the enterprise or a part of the enterprise to achieve some desired end-result.

3.5.3
classification
the process of arranging abstractions into a structure organised according to their distinguishing properties.

3.5.4
definition of resource characteristics
set of resources properties that are characterised by physical values.

NOTE - Those physical values may be qualitative or quantitative.

3.5.5
definition of resource views
classified set of resource views.

NOTE - Those resource view may be defined either by the user or catalogues.

3.5.6

generic resource
structure belonging to resource hierarchy and encompassing the common properties of several resources.

NOTE - The corresponding entity `generic_resource` includes a complete definition of the related attribute without link to actual value.

3.5.7
object
concept or a physical thing which may exist in the real world.

3.5.8
operation
the completion of an action or work element to realise a specific result.

3.5.9
order
a construct which represents the necessary input for a business process that co-ordinates and controls some other business process or activity.

3.5.10
property

a real world characteristic which is represented by either attributes or constraints.

3.5.11
resource characteristic
main property of a resource according to a given purpose.

NOTE 1 - In ISO 15531 resource characteristics are mainly related to the management of the manufacturing resources.

3.5.12
resource configuration
set of properties of resource configured for a specific manufacturing task.

3.5.13
resource hierarchy
structure designed to enable a classification of resources.

3.5.14
resources information model (RIM)
model of information addressing management of resources usage.

3.5.15
resource status
property which identifies an individual resource availability at some point in time.

3.5.16
resource view
specific set of resource characteristic associated to a given purpose.

3.5.17
structure of resource characteristics
set of classified resource characteristics.

3.6. Abbreviations

For the purpose of this part of ISO 15531, the following abbreviation applies.

RIM resources information model

4. Overview of resource management universe of discourse

This series of parts refers to the resource usage management. This clause then describes the universe of discourses of resource management, while clause 5 describes the structures of the ISO 15531-31 series of part and clause 6 provides the requirements for resources management and the basic principles of the Resource Information Model.

NOTE 1 The description of the universe of discourse of resource usage (see the definition of this term in ISO FDIS 15531-1 clause 3-6-50) and requirements for a model of resource usage management data are different. For example the universe of discourse of resources may include their description or their maintenance process, while the usage management model may not address this topics. The requirements for such a model will be described in clause 6 of this standard.

Resources usage management includes resource configuration, capabilities and capacities as well as operation management, installation management and facilities management. It also includes quality features, maintenance features, and safety features.

NOTE 2 maintenance features are exclusively considered regarding the point of view of the resource management (e.g. availability).

Three different aspects must be considered about the resources:

— their description, their usage and their maintenance;

— the description of the functionality a resource is able to provide, its capacity and capability;

— the information model used to trigger, estimate and monitor the resource.

