INTERNATIONAL STANDARD ISO 14258:1998
TECHNICAL CORRIGENDUM 1

Published 2000-02-15

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Industrial automation systems — Concepts and rules for enterprise models

TECHNICAL CORRIGENDUM 1

Systèmes d'automatisation industrielle — Concepts et règles pour modèles d'entreprise

RECTIFICATIF TECHNIQUE 1

Technical Corrigendum 1 to International Standard ISO 14258:1998 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 5, *Architecture, communications and integration frameworks*.

Page 1

Definition 2.1.1

Replace text with:

a group of organizations sharing a set of goals and objectives to offer products or services or both

Definition 2.1.2

Replace text with:

the uncontrollable part of a system which is widened to the extent that a decision-making procedure cannot be conceived for the control of such a system

ICS 25.040.40 **Ref. No. ISO 14258:1998/Cor.1:2000(E)**

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Definition 2.2.3

Replace text with:

for a system, restrictions and limitations which can come from inside or outside the system under consideration; for a model, restrictions and limitations on the model imposed by the modeler for some purpose or in response to some system constraint

Definition 2.2.5

Replace text with:

a representation of what an enterprise intends to accomplish, how it operates, and, possibly, how it is organized

NOTE An enterprise model is an abstraction that identifies and represents the basic elements of an enterprise and their decomposition to any necessary degree. It is used, for example, to improve the effectiveness and efficiency of an enterprise. It also specifies the information requirements of these elements, and provides the information needed to define the requirements for integrated information systems.

Subclauses 3.1, 3.2, 3.2.1, and footnote

Change all occurrences of “systems theory” to “system theory”

Page 3

Subclause 3.2.3

Change the second and third list items to read:

— manage and operate an enterprise so that it can meet its objectives, and

— support an enterprise to modify, redesign, dismantle and rebuild it.

Subclause 3.2.4

Replace text with:

To make the information captured by an enterprise model available to humans and machines, that information shall be represented either in a neutral format (preferable) or as specified by the using application.

Subclause 3.2.5

Replace text with:

Models, as representations of enterprises, shall exhibit syntax and semantics so that contents of the model are understandable to human users. The syntax of a model refers to the permissible kinds of relations. The semantics of a model encompass the meanings of the elements and relations with respect to enterprise-model concepts. The syntactic form and semantic content of a model can be different depending, for example, on the purpose of the model and on the boundary and environment of the enterprise.

Subclause 3.3

Delete “(informative)” from heading

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Subclause 3.3.1

Replace text with:

Three types of activities are required to solve issues found within each high-level system life-cycle phase (Plan/Build, Use/Operate, Recycle/Dispose). These types are

— find out what to do (W activity),

— find out how to do it (H activity),

— do it (D activity).

Figure 1 is an example of a manufactured product showing a mapping between common names for system life-cycle phases and the what, how, and do activities.

The W, H, and D activities may be represented by different types of models. These models shall have the capability to interoperate where it has been determined that these activities need to communicate with each other.

Figure 1

Change the title of the figure to read:

Mapping between system life-cycle phases and system W, H, and D activities

Subclause 3.3.2

Change second paragraph to read:

Feeding modeled information forward and backward in life-cycle activities enables value-added iteration of enterprise processes that improves product quality.

Subclause 3.3.3

Replace text with:

The W, H, and D activities are recursive and decomposable. Therefore, each activity can be divided into subactivities, and these subactivities will consist of another set of W, H, and D activities (see Figure 2).

These subactivities may be represented by different types of models. These models shall be able to interoperate where it has been determined that these subactivities need to communicate with each other.

EXAMPLE In a manufacturing enterprise, the activity “Produce” can be, in turn, separated into lower-level W, H, and D activities. W activities are user-needs driven and comprise any activities finally resulting in a request for what is to be produced. H activities are technology-requirements driven and comprise any activities finally resulting in how the product/system has to be produced in terms of a release statement. D activities are task driven and comprise any activities finally resulting in the shipment of the product.

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Figure 2

Change the text in the box entitled “H2” to read:

Design Product (From H activity of Figure 1)

Change the title of the figure to read:

Decompose “Design Product” activity to show recursiveness of W, H, and D activities

Subclause 3.3.4

Change first paragraph to read:

The W, H, and D activities are iterative. Therefore, there is no fixed sequence of these activities, but it is possible to return to previous activities to repeat them with updated input (see Figure 3).

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Figure 3

Change the text in the box labeled “H2” to read:

Design Product (From H activity of Figure 1)

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Subclause 3.4.1

Change second paragraph to read:

From system theory (see 3.2) there are two kinds of hierarchies: part-of hierarchies and kind-of hierarchies. Part-of hierarchies represent the composition of elements or the decomposition of systems. Kind-of hierarchies represent levels of abstraction that are distinguished by generalization and specialization.

Subclause 3.4.2

Replace text with:

Kind-of hierarchies shall be used within models to classify building blocks for entities to be modeled. Part-of hierarchies shall be used to link models of different scope and detailing granularity of decomposition.

Subclause 3.5.1

Change first sentence of fifth paragraph to read:

From system theory (see 3.2) there are two structuring approaches commonly used for the mapping of elements and relations to enterprise related notions.

Subclause 3.6.1

Change first paragraph to read:

An enterprise is a social hybrid system, determined by properties of humans and machines. Humans (modeled as objects or resources) in the enterprise have a different behavior (e.g. learning and problem solving) from machines (e.g. acting and reacting) and sometimes need a different kind of information.

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Subclause 3.6.1.2

Replace text with:

Static representation of behavior is the description of the relations between elements of the system. For example, a business process is a logical sequence of relations between enterprise elements. For this static description it is not necessary to model the property time because it is the potentially allowed sequence of relations. Time related information (e.g. duration, concurrency) is missing.

Subclause 3.6.1.5

Replace text with:

Sequentiality is a necessary basis to describe behavior. Sequential cycles can be considered as similar states being traversed at different times. Measuring sequential cycles in terms of time enables discrimination between similar cycles that progress at different rates.

NOTE Sequentiality is used here in a broad sense of describing the ordering of activity-associated events. For example, serial, parallel, simultaneous, alternative, and repetitive relationships are included.

Subclause 3.6.2

Replace text with:

Enterprise models shall have the capability to describe behavior; that is, to represent sequentiality, events, actions, condition, states, state changes, start states, end states, sequencing relationship between actions, and description of transformation functions.

Properties of sequentiality shall be modeled to describe short-term changes whenever an individual element must be traced. Enterprise models used to analyze enterprise performance or to simulate certain processes shall have the capability to represent effects of sequential phenomena and the time duration of each sequence step. Enterprise models shall be capable of representing time duration, dynamic performance of processes, and sequential phenomena after specific units of time.

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Subclause 3.7.3

Delete “(informative)” from the heading

Replace the second paragraph with:

An enterprise modeler is an observer whose purpose is to create an enterprise model. The modeler shall define unambiguously the purpose for the model (see 3.7.5).

Subclause 3.7.4

Delete the second list item

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Subclause 3.7.4.2

Replace text with:

The function view is a description and representation of activities and processes in the enterprise. The function view describes the processing of elements and the organization of single processing steps into structures depicting complex processes, reflecting their logical connection and interdependence. The function view emphasizes the representation of system behavior, mutual dependencies, and influences of elements during function execution in the enterprise.

Subclause 3.7.5

Replace text with:

A full, integratable description of any model shall include statements and descriptions of its purpose and constraints (including modeler assumptions). This shall be done by including a minimum set of modeler views that ensure adequate completeness and consistency, and provide the potential for integrating multiple models of a same enterprise. The number and the type of modeler views to be included in that set depend on the methodology used and the purpose and level of the models. The modeler views might be expected to include views that present a useful combination of activities, information, control, resources, process capabilities, and, in particular, the information view and function views of 3.7.4.

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Subclause 3.8.3

Change the last list item of the third paragraph to read:

— the dynamics, if any, of the interaction involved.

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Subclause A.1

Change the first paragraph to read:

The manufacturing enterprise is a group of related processes that makes a product. Integration is a process that moves an enterprise nearer to the ideal state of operation in which all things are in place that enable the correct process to have access to the correct information at the correct time, every time. Most processes have a supplier and all have a customer, or else the process is useless. Business entities are free to define their product and the processes needed to make the product. These processes can span several companies or be a subset of the processes in one company. Therefore, an enterprise can be any group of related processes that is analyzed at any given time.