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Intelligent Information Request and Delivery – A process model for the exchange of information for use

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

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INTELLIGENT INFORMATION REQUEST AND DELIVERY – A PROCESS MODEL FOR THE EXCHANGE OF INFORMATION FOR USE

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IEC PAS 63485 has been processed by IEC technical committee 3: Documentation, graphical symbols and representations of technical information.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	Report on voting
3/1606/DPAS	3/1612/RVDPAS

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INTRODUCTION

According to the strategic business plan of IEC TC 3 as of 2019-07-12, standardization in the field of documentation covers rules, principles, and methods focusing on machine-readable representation of information, including ontologies for the definition, co-ordination, and management of the information required during the whole life cycle of a device, system, or plant.

This document approaches information for use that covers the life cycle stages of the use of products in B2C and especially B2B environments, for example for technicians who assemble, mount, operate, maintain, repair, or disassemble technical assets.

In a digitalized world, (printed) documents no longer support the information needs of people who are used to accessing all kinds of information quickly according to their need, either in their private life or in their professional contexts, on the internet, mostly on mobile devices. Especially in the context of smart manufacturing or the industrial internet of things, where any kind of technical objects are mirrored by their digital twins, all information regarding the efficient, effective, and safe use of technical objects or products (compare IEC 82079-1:2019) needs to be connected to these virtual objects in a dynamic way. Users do not want to search for technical information in huge documents. They want information matching their concrete use cases instead, according to their personal requests. Together with real-time descriptive and operational data, they need information at any time that helps them to interpret these data and to take adequate actions to guarantee smooth operation of the assets.

Where the traditional context of linear documents is lost, the metadata ontology of the Intelligent Information Request and Delivery Standard (iiRDS[TM 1]), maintained by the iiRDS consortium, helps to couple digital twins with the technical information needed in concrete use cases.

Such semantically supported information processes guarantee real-time delivery of the right information, at the right time, on the right place, to the immanent need of the users. It helps avoid huge costs for the operators of any kinds of assets, caused by wrong, outdated, or not easily accessible and understandable information.

To make sure that all information providers and information consumers can benefit from the practical and economic advantages of iiRDS, this specification defines a standard information flow (Clause 6), a metadata model (Clause 7), and a set of core metadata (Annex A) that shall be applied to facilitate this approach.

Within the ecosystem of IEC TC 3, iiRDS uses some administrative metadata according to IEC 82045. All other relevant standards in the field of information management have been evaluated as well to make sure that no unnecessary overlap occurs.

IEC 61355-1:2008 defines a general document classification framework that covers technical documentation at its lowest level but lacks a more granular categorization. iiRDS defines a metadata framework tailored to technical documentation which enables a more granular information access as a basis for intelligent information processes. iiRDS can, therefore, be considered as a domain-specific supplement to IEC 61355-1:2008.

Whereas IEC 62656-8 defines a product ontology, iiRDS sets requirements for information products (compare IEC/IEEE 82079-1:2019), also using a different technology for specifying its requirements. Thus, iiRDS adds new aspects to the representation of technical information with respect to information for use of products.

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1   iiRDS is the trade name of a product supplied by the iiRDS consortium. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

INTELLIGENT INFORMATION REQUEST AND DELIVERY – A PROCESS MODEL FOR THE EXCHANGE OF INFORMATION FOR USE

1 Scope

This specification addresses creators of information for use of products. Examples of information creators are information architects and technical communicators.

The document defines requirements for electronic request and delivery processes for any kind of information for use. Such processes are needed to bridge the gap between objects in the real world and the information needed by their dedicated users, especially in the context of smart manufacturing, industry 4.0 and the industrial internet of things. This document specifies processes in order to enable n:m relations between information sources and information users when there is no explicit agreement between information provider and information consumer. This document also specifies metadata.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC/IEEE 82079-1:2019, *Preparation of information for use (instructions for use) of products – Part 1: Principles and general requirements*

tekom (2020), iiRDS – The International open source standard for Intelligent Information Request and Delivery. Available at https://iirds.org/material-downloads/iirds-version-1-1/

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:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
creation application
software system which supports the creator in creating intelligent information

Note 1 to entry: Usually the application consists of an editor for structured authoring and managing metadata as well as a repository in which information units are stored and from which units can be retrieved and used for generating information products. A creation application also includes automatically generated content, for example generated texts generated by artificial intelligence or information products generated out of third party systems.

3.2
creator (intelligent information)
person who analyses, conceptualizes, and compiles information requirements and design

3.3
generator
system that processes output according to a defined exchange format

3.4
information for use
information provided by the supplier that provides the target audience with concepts, procedures, and reference material for the safe, effective, and efficient use of a supported product during its life cycle

EXAMPLE   Step-by-step instructions, troubleshooting information, service information, operation and maintenance instructions, and assembly instructions.

Note 1 to entry: "Instructions for use, procedures for the safe, effective, and efficient use of a supported product", was the term formerly used to include all the content defined as part of information for use.

Note 2 to entry: Excludes supplementary information, which is outside the scope of information for use.

[SOURCE: IEC/IEEE 82079-1:2019, 3.17]

3.5
information flow model
model to describe the flow of information from the creator to the user and vice versa

3.6
information unit
digital entity containing content for the user and metadata for the management of the conveyed information, e.g. a topic

3.7
intelligent information
structurally and semantically enhanced information that enables interactive and adaptive human-machine or machine-machine communication

3.8
information integrator
system that receives and integrates output from the generators and provides it for user applications

3.9
product knowledge
knowledge needed to identify the product for which information is requested

3.10
semantically rich metadata
data models that deliver contextually rich information, properly tagged and targeted to provide an enjoyable user experience

3.11
technical information creation
process of applying information design to create technical content and assign metadata

Note 1 to entry: Usually the task of information creation can be fulfilled by a human, by systems, or a combination of both.

Note 2 to entry: Information design is the process of developing content that meets the needs of the audience.

[SOURCE: ISO/IEC/IEEE 24765:2017, 3.1947]

3.12
user application
HMI (human-machine interface) or MMI (machine-machine interface) for the presentation of the information

Note 1 to entry: A role which is performed by a system.

3.13
use context
environment that affects the user's ability to understand and apply information

Note 1 to entry: The user context can include the location (geographic region), consumer or worker use, use at various stages of the product life cycle (installation, operation, maintenance), and preferred media for receiving information.

3.14
user
person who interacts with the product

Note 1 to entry: "User" can include persons who install, operate, service, maintain, or dispose of the product.

[SOURCE: IEC/IEEE 82079-1:2019, 3.47]

4   Fulfilment of requirements

A claim of fulfilment of requirements with this document shall only be made if the requirements are fulfilled with respect to the following aspects:

- allocation of processes, tasks, and organizational units as specified in Clause 5.
- information flow and information flow model as specified in Clause 6.
- metadata model as defined in Clause 7.
- match at the interface format as specified in 7.2.

5   Intelligent information

5.1   General

Intelligent information request and delivery shall enable applications to provide users with suitable information at the right time, according to their context and their tasks with the product, in an efficient and natural way. Intelligent information's scope is technical information, like product information, operating, troubleshooting and service information. A piece of intelligent information is always bound to some product or component or function, and some information use context.

5.2   Quality of intelligent information

Regarding the quality of contents of intelligent information, the requirements of IEC/IEEE 82079-1:2019, Clauses 5, 7, 8, 9 shall be fulfilled.

The quality of intelligent information can be assessed with regard to different aspects. Intelligent information shall have the following properties:

1) be structured according to rules and in a topic-oriented way.
   a) Each topic shall focus on answering only one specific question. This enables applications to provide the right minimal information.
   b) Intelligent information topics shall address specific user groups.
   c) Users shall get information that matches their roles and skill levels.