International Standard

ISO/IEC 19988

Information technology — GS1 Core Business Vocabulary (CBV)

Technologies de l'information — Vocabulaire normatif relatif aux activités de base GS1

Third edition
2024-03

Reference number
ISO/IEC 19988:2024(en)

© ISO/IEC 2024



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2024

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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 document should be noted (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

ISO and IEC draw attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO and IEC take no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO and IEC had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents and https://patents.iec.ch. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by GS1 [as the Core Business Vocabulary (CBV) Standard, Release 2.0] and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

This third edition cancels and replaces the second edition (ISO/IEC 19988:2017), which has been technically revised.

The main changes are as follows:

— support for GS1 Web Vocabulary, URI semantic equivalence by means of owl:sameAs relationships;

— new "How" event dimension;

— overview of EPCIS event "dimensions" with cross-references to relevant sections in EPCIS (ISO/IEC 19987) and CBV (this document);

— new Persistent Disposition indicating non-transient business state of an object;

— use of new prefix 952 in all examples;

— new business step values: sampling, sensor_reporting;

— clarified definitions of business step values: commissioning, encoding, inspecting, removing;

© ISO/IEC 2024 – All rights reserved

— addition of new disposition values: available, completeness_verified, completeness_inferred, conformant, container_open, mismatch_instance, mismatch_class, mismatch_quantity, needs replacement, non_conformant, unavailable;

— clarified definition and example of disposition value in_progress, recommending omission;

— deprecated disposition value: no_pedigree_match;

— new business transaction types cert, testprd, testres, upevt;

— clarified definition of business transaction type poc to make it clear that Purchase Order Confirmation is also used to represent Sales Order;

— sensor measurement types now supported;

— clarification of HTTPS URLs as a recommended approach alongside HTTP URLs;

— introduced support for constrained set of GS1 Digital Link URIs supported alongside generic HTTP URLs for identification of object instance, class, location, business transaction, source/destination, and transformation;

— clarification preference for PGLN to identify owning and possessing parties;

— introduction of Hash URI as business transaction identifier;

— introduction of EPCIS Event Hash ID as an event Identifier;

— introduction of chemical substance identifiers;

— introduction of microorganism identifiers;

— restriction of date types to specific subset of W3C primitive datatypes;

— extended support for QNames to express master data attributes;

— incorporation of additions published previously as CBVCNs 17-339 (Tax ID), 18-108 (Fish Attributes);

— inclusion of certification attributes in Certification List;

— additionalTradeItemId now as additionalTradeItemIDList;

— deprecation of latitude and longitude from location/party master data;

— addition of geoLocation and geoFence to location/party master data;

— addition of AdditionalPartyIDList;

— example event data moved to machine-readable artefacts;

— introduction of https://ref.gs1.org/cbv namespace, to underpin CBV 2.0 support for Linked Data.

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 and www.iec.ch/national-committees.

© ISO/IEC 2024 – All rights reserved

Table of Contents

1 Introduction – Core Business Vocabulary 1

2 Relationship to the GS1 System Architecture 2

3 Relationship to EPCIS 2

3.1 EPCIS event structure 2
3.2 Overview of EPCIS event "dimensions" (non-normative) 4
3.3 Vocabulary kinds 6
3.3.1 Standard Vocabulary 7
3.3.2 User Vocabulary 7

4 Terminology and typographical conventions 8

5 Compliance and compatibility 8

5.1 CBV-Compliant 9
5.2 CBV-Compatible 11

6 Use of Uniform Resource Identifiers (URIs) 12

6.1 URI prefix for Standard Vocabularies in the CBV 12
6.2 Limitation on Use of the epcglobal URN prefix 12
6.2.1 Example of limitation of use of epcglobal URN prefix (non-normative) 12

7 Standard Vocabularies 13

7.1 Business steps 13
7.1.1 URI structure 13
7.1.2 Compliant usage 13
7.1.3 Business step values and definitions 14
7.2 Dispositions 20
7.2.1 URI structure 20
7.2.2 Compliant usage 21
7.2.3 Disposition values and definitions 21
7.3 Business Transaction Types 27
7.3.1 URI structure 27
7.3.2 Compliant usage 27
7.3.3 Business Transaction values and definitions 27
7.4 Source/Destination types 28
7.4.1 URI structure 28
7.4.2 Compliant usage 29
7.4.3 Source/Destination Type values and definitions 29
7.5 Error reason identifiers 29
7.5.1 URI structure 29
7.5.2 Compliant usage 30
7.5.3 Error reason identifier values and definitions 30
7.6 Sensor measurement types 30
7.6.1 URI structure 30
7.6.2 Compliant usage 31
7.6.3 Sensor measurement type values and definitions 31
7.7 Sensor alert types 35
7.7.1 URI structure 35
7.7.2 Compliant usage 35
7.7.3 Sensor alert type values and definitions 35

© ISO/IEC 2024 – All rights reserved

7.8 Sensor report component type 36
7.8.1 URI structure 36
7.8.2 Compliant usage 36
7.8.3 Sensor report component types and definitions 36

8 User vocabularies 38

8.1 General considerations and syntax forms 38
8.1.1 EPC URI 39
8.1.2 GS1 Digital Link URI 39
8.1.3 Private or Industry-wide URN 39
8.1.4 HTTP or HTTPS URL 40
8.2 Physical or digital objects (Instance-Level Identification) 41
8.2.1 EPC URI for Instance-level identification of objects 42
8.2.2 GS1 Digital Link URIs for Instance-level identification of objects 42
8.2.3 Private or Industry-wide URN for Instance-level identification of objects 43
8.2.4 HTTP or HTTPS URLs for Instance-level identification of objects 44
8.3 Physical or digital objects (Class-level identification) 45
8.3.1 EPC URI for Class-level identification of objects 45
8.3.2 GS1 Digital Link URIs for Class-level identification of objects 46
8.3.3 Private or Industry-wide URN for Class-level identification of objects 47
8.3.4 HTTP or HTTPS URLs for Class-level identification of objects 47
8.4 Locations 48
8.4.1 EPC URI for Location identification 49
8.4.2 GS1 Digital Link URIs for Location identification 49
8.4.3 Private or Industry-wide URN for Location identification 49
8.4.4 HTTP or HTTPS URLs for Location identification 50
8.4.5 Geographic Location URIs for Location identifiers 50
8.5 Business transactions 51
8.5.1 EPC URI for Business transaction identifiers 51
8.5.2 GS1 Digital Link URIs for business transaction identification 52
8.5.3 GLN-based identifier for legacy system business transaction identifiers 52
8.5.4 Private or Industry-wide URN for business transaction identifiers 52
8.5.5 HTTP or HTTPS URLs for business transaction identifiers 53
8.6 Hash URI for business transaction identifiers 54
8.7 Source/Destination identifiers 55
8.7.1 EPC URI for Source/Destination identifiers 55
8.7.2 GS1 Digital Link URIs for Source/Destination identification 55
8.7.3 Private or Industry-wide URN for Source/Destination identifiers 56
8.7.4 HTTP or HTTPS URLs for Source/Destination identification 56
8.8 Transformation identifiers 57
8.8.1 EPC URI for Transformation identifiers 57
8.8.2 GS1 Digital Link URIs for Transformation identification 57
8.8.3 GLN-based Identifier for Legacy System Transformation identifiers 57
8.8.4 Private or Industry-wide URN for Transformation identifiers 58
8.8.5 HTTP or HTTPS URLs for Transformation identification 58
8.9 Event identifiers 59
8.9.1 Universally Unique Identifier (UUID) URIs for Event identification 60
8.9.2 EPCIS Event Hash ID 60
8.10 Chemical substance identifiers 63
8.10.1 InChI (International Chemical Identifier) Key URI 64

© ISO/IEC 2024 – All rights reserved

8.11 Microorganism identifiers 64
8.11.1 NCBI Web URI....64

9 Master data 65
9.1 Data type restrictions 65
9.1.1 Dates....65
9.1.2 Master data attribute names 65
9.1.3 Certification attributes....66
9.2 Trade item master data 68
9.2.1 Trade item master data attributes....69
9.2.2 Trade item master data attributes – trade item level....69
9.2.3 Trade item master data attributes – lot level 72
9.2.4 Trade item master data attributes – instance-level 75
9.2.5 Values of type measurement 76
9.3 Location and party master data 76
9.3.1 Location and party master data attributes 77
9.3.2 Location master data code list values 82

10 List of abbreviations (non-normative) 84

11 References 87

© ISO/IEC 2024 – All rights reserved

Index of figures

Figure 7-1 Coordinate reference systems 38
Figure 8-1 EPCIS Event HashID example..... 63
Figure 9-1 geoFence example..... 80

© ISO/IEC 2024 – All rights reserved

1 Introduction – Core Business Vocabulary

This GS1 standard defines the Core Business Vocabulary (CBV). The goal of this standard is to specify various vocabulary elements and their values for use in conjunction with the EPCIS standard [EPCIS2.0], which defines mechanisms to exchange information both within and across organisation boundaries. EPCIS and the CBV are developed, maintained and published by GS1; EPCIS and the CBV are also published within ISO's PAS process as ISO/IEC 19987 and ISO/IEC 19988, respectively. The vocabulary identifiers and definitions in this standard will ensure that all parties who exchange EPCIS data using the CBV will have a common understanding of the semantic meaning of that data.

This standard is intended to provide a basic capability that meets the above goal. In particular, this standard is designed to define vocabularies that are *core* to the EPCIS abstract data model and are applicable to a broad set of business scenarios common to many industries that have a desire or requirement to share data. This standard intends to provide a useful set of values and definitions that can be consistently understood by each party in the supply chain.

Additional end user requirements may be addressed by augmenting the vocabulary elements herein with additional vocabulary elements defined for a particular industry or a set of users or a single user. Additional values for the standard vocabulary types defined in this standard may be included in follow-on versions of this standard.

This standard includes identifier syntax and specific vocabulary element values with their definitions for these *Standard Vocabularies*:

- Business step identifiers
- Disposition identifiers
- Business transaction types
- Source/Destination types
- Error reason identifiers
- Sensor measurement types
- Sensor alert types

This standard provides identifier syntax options for these *User Vocabularies:*

- Objects
- Locations
- Business transactions
- Source/Destination identifiers
- Transformation identifiers
- Event identifiers
- Chemical substance identifiers
- Microorganism identifiers

This standard provides *Master Data Attributes and Values* for describing Physical Locations including:

- Site Location
- Sub-Site Type
- Sub-Site Attributes
- Sub-Site Detail

Additional detailed master data regarding locations (addresses, etc.) are not defined in this standard.

© ISO/IEC 2024 – All rights reserved

2 Relationship to the GS1 System Architecture

The CBV is a companion standard to the EPCIS standard. EPCIS is the standard that defines the technical interfaces for capturing and sharing event data. EPCIS defines a framework data model for event data. The CBV is a GS1 *data standard* that supplements that framework by defining specific data values that may populate the EPCIS data model. As such, the CBV exists in the "Share" group of GS1 standards.

3 Relationship to EPCIS

This section specifies how the CBV standard relates to the EPCIS standard.

3.1 EPCIS event structure

The EPCIS 2.0 standard [EPCIS2.0] specifies the data elements in an EPCIS event. The following lists these data elements, and indicates where the CBV provides identifiers that may be used as values for those data elements.

- **The "what" dimension** contains (for most event types) one or more unique identifiers for physical or digital objects or classes of physical or digital objects. Identifiers for physical or digital objects are specified in section 8.2 and 8.3. In the case of an EPCIS `TransformationEvent`, an optional `TransformationID` may be used to link together multiple events that describe the same transformation. `TransformationID`s are included in section 8.8.
- **The "when" dimension** reflects the moment in time at which an EPCIS event occurred. Event time is fully specified in the EPCIS standard.
- **The "where" dimension** consists of two identifiers that describe different aspects of where an event occurred:
  - **Read Point** (`readPoint`): The location where the EPCIS event took place. In the case of an EPCIS event arising from reading a barcode or RFID tag, the Read Point is often the location where the barcode or RFID tag was read. Identifiers for read points are specified in section 8.3.

    Example: A reader is placed at dock door #3 at the London Distribution Centre (DC). Product passed through the dock door. Read point = <The identifier that stands for London DC Dock Door #3>
  - **Business Location** (`bizLocation`): The location where the subject of the event is assumed to be following an EPCIS event, until a new event takes place that indicates otherwise. Identifiers for business locations are specified in section 8.3.

    Example: A product is read through the sales floor transition door at store #123. The product is now sitting on the sales floor. Business location = <The identifier that stands for store #123 Sales Floor>
- **The "why" dimension** provides business process information associated with the event, including the business process step that "triggered" the event's capture:
  - **Business Step** (`bizStep`): Denotes a specific activity within a business process. The business step field of an event specifies what business process step was taking place that caused the event to be captured. Identifiers for business steps are specified in section 7.1.

    Example: an EPCIS event is generated as a product departs the location identified by the Read Point. Business Step = <The identifier that denotes "shipping">
  - **Disposition** (`disposition`): Denotes the business state of an object. The disposition field of an event specifies the business condition of the subject of the event (the things specified in the "what" dimension), subsequent to the event. The disposition is assumed to hold true until another event indicates a change of disposition. Identifiers for dispositions and persistent dispositions (see below) are specified in section 7.2.

© ISO/IEC 2024 – All rights reserved