INTERNATIONAL STANDARD

ISO 8000-120

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Data quality —

Part 120: Master data: Exchange of characteristic data: Provenance

Qualité des données —

Partie 120: Données permanentes: Échange des données caractéristiques: Provenance

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 4, *Industrial data*.

This first edition of ISO 8000-120 cancels and replaces ISO/TS 8000-120:2009, which has been technically revised.

ISO 8000 is organized as a series of parts, each published separately. The structure of ISO 8000 is described in ISO/TS 8000-1.

Each part of ISO 8000 is a member of one of the following series: general data quality, master data quality, transactional data quality, and product data quality. This part of ISO 8000 is a member of the master data quality series.

A list of all parts in the ISO 8000 series can be found on the ISO website.

Introduction

The ability to create, collect, store, maintain, transfer, process and present data to support business processes in a timely and cost effective manner requires both an understanding of the characteristics of the data that determine its quality, and an ability to measure, manage and report on data quality.

ISO 8000 defines characteristics that can be tested by any organization in the data supply chain to objectively determine conformance of the data to ISO 8000.

ISO 8000 provides frameworks for improving data quality for specific kinds of data. The frameworks can be used independently or in conjunction with quality management systems.

ISO 8000 covers industrial data quality characteristics throughout the product life cycle from conception to disposal. ISO 8000 addresses specific kinds of data including, but not limited to, master data, transaction data, and product data.

ISO 8000-110 specifies requirements that can be checked by computer for the exchange, between organizations and systems, of master data that consists of characteristic data. It provides requirements for data quality, independent of syntax. This part of ISO 8000 specifies requirements for capture and exchange of data provenance information and supplements the requirements of ISO 8000-110. This part of ISO 8000 includes a conceptual data model for data provenance.

Data provenance information can be used to detect data echoes, and can be used to determine the credibility, currency or value of data. Data provenance information provides a necessary capability to support claims of data accuracy.

NOTE Requirements regarding claims of data accuracy are covered in ISO 8000-130.

Any claim of conformance to this part of ISO 8000 implies a claim of conformance to ISO 8000-110.

This part of ISO 8000 can be used with any other standard that specifies a formal syntax for a data set.

Data quality —

Part 120:
Master data: Exchange of characteristic data: Provenance

1 Scope

This part of ISO 8000 specifies requirements for the representation and exchange of information about the provenance of master data that consists of characteristic data, and supplements the requirements of ISO 8000-110.

NOTE 1 ISO 8000-110 specifies that such data be represented as property values. This part of ISO 8000 provides additional requirements for property values when provenance information needs to be captured. Provenance is the history or pedigree of a property value.

This part of ISO 8000 does not specify a complete model for characteristic data, nor does it specify an exchange format for characteristic data with provenance information.

NOTE 2 This is done in other standards that reference this part of ISO 8000, e.g. ISO 22745-40.

The following are within the scope of this part of ISO 8000:

— scenarios for data provenance;

— requirements for capture and exchange of data provenance information;

— conceptual data model for data provenance information.

The following are outside the scope of this part of ISO 8000:

— exchange format for data provenance information;

— scheme for registering and resolving organization identifiers and person identifiers;

— provenance of data that are not characteristic data represented as property values;

— configuration management;

— change control;

— syntax of identifiers;

— resolution of identifiers.

Some of the requirements in this part of ISO 8000 can apply to exchange of data that is not master data which consists of characteristic data represented as property values.

NOTE 3 ISO 8000-100 provides an overview of the master data quality series of parts of ISO 8000 and a description of its overall structure.

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 8000-2, *Data quality — Part 2: Vocabulary*

ISO 8000-110, *Data quality — Part 110: Master data: Exchange of characteristic data: Syntax, semantic encoding, and conformance to data specification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8000-2 apply.

4 Abbreviated terms and notation

4.1 Abbreviated terms

id	Identifier
UML	Unified Modeling Language
XML	Extensible Markup Language

4.2 Notation

p	Property
v	Value
e	event1)
pv(p, v)	property value asserting that property p has value v
pv(p, v, (e1, e2,...))	property value asserting that property p has value v, with provenance information given by events e1, e2, etc.
query(I, p)	query for current value of property p of item I
create(orgID, personID, t)	event that is the creation of a property value by the organization and person at time t
extract(orgID, personID, t)	event that is the extraction of a property value by the organization and person at time t
MDM(I, (pv1, pv2,...))	master data message containing property values pv1, pv2, etc.
null	no value given

5 Fundamental concepts and assumptions

The Oxford English Dictionary defines provenance as:

— the fact of coming from some particular source or quarter; origin, or derivation;

— the history or pedigree of a work of art, manuscript, rare book, etc.; concretely a record of the ultimate derivation and passage of an item through its various owners.

In this part of ISO 8000, the term “data provenance” corresponds to the first part of the second definition above: “history or pedigree of a property value”; the term “provenance record” corresponds to the second half of second definition above: “record of the ultimate derivation and passage of a property value through its various custodians”.

6 Provenance data model

6.1 Diagram

The UML class diagram for the provenance model is given in Figure 1.

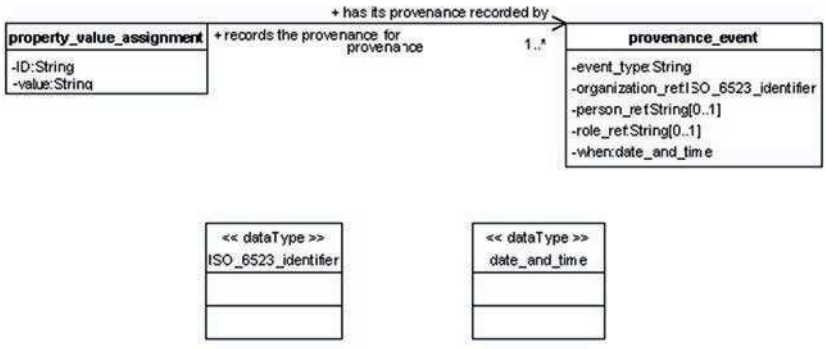

Figure 1 — UML class diagram for provenance

NOTE The entity property_value_assignment is the intersection point between this data model and the target data model: the model of data for which provenance information is to be recorded. When the data model in Clause 6 is integrated with the target data model, this entity needs to be replaced with the appropriate entity from the target data model.

6.2 date_and_time

A date_and_time is a point in time, expressed in Universal Coordinated Time (UTC).

6.3 ISO_6523_identifier

An ISO_6523_identifier is an identifier of an organization and possibly a subdivision of an organization, conforming to the structure specified in ISO/IEC 6523-1.

NOTE The syntax of ISO/IEC 6523-1 identifiers is not specified in this part of ISO 8000.

6.4 property_value_assignment

A property_value_assignment is a data_object that is a pair of a value and an identifier to a property defined in a data dictionary.

Attribute definitions:

ID: the string that unambiguously identifies the property_value_assignment within the organization that created it.

NOTE 1 The identifier need only be unique or meaningful within the organization that created the property_value_assignment.

NOTE 2 The format of the identifier is not specified in this part of ISO 8000.

provenance: the provenance_event that provides information on the provenance of the property_value_assignment.

Assertions:

Each property_value_assignment has its provenance recorded by one or many provenance_event objects. Each provenance_event records the provenance for exactly one property_value_assignment.

6.5 provenance_event

A provenance_event is an event for which data provenance information is recorded.

Attribute definitions:

event_type: the event for which data provenance information is recorded.

organization_ref: the unambiguous identifier of the organization and possibly the subdivison of the organization that performed the event, conforming to the structure defined in ISO/IEC 6523-1 and assigned in accordance with ISO/IEC 6523-2.

person_ref: the identifier assigned by the organization to the person who performed the event.

NOTE 1 The identifier need only be unique within the organization.

NOTE 2 The format of the identifier is not specified in this part of ISO 8000.

role_ref: the identifier assigned by the organization to the role within the organization played by the person who performed the event.

NOTE 3 The identifier need only be unique within the organization.

NOTE 4 The format of the identifier is not specified in this part of ISO 8000.

when: the point in time at which the event took place.

Assertions:

Each provenance event records the provenance for exactly one property_value_assignment. Each property_value_assignment has its provenance recorded by one or many provenance_event objects.

7 Data provenance record

The data provenance record for a property value is the record of the ultimate derivation and passage of the property value through its various custodians.

The data provenance record for a property value shall be either:

— included in the structure that represents property value;
EXAMPLE 1 The following is an XML code fragment in which the data provenance record is included in the XML structure that represents property value.

Coded:

<property-value property-ref=”0161-1#02-015007#1”>

<controlled-value value-ref=”0161-1#07-000435#1”/>

<provenance-event event-type=”create” organization-ref=”0161-ABCDE” person-ref=”ROLLINS1” date=”2008-10-27T15:40:31.287”/>

</property-value>

Decoded:

<property-value property-ref=”inclosure material”>

<controlled-value value-ref=”ceramic”/>

<provenance-event event-type=”create” organization-ref=”ABC Company” person-ref=”William F. Rollins” date=”2008-10-27T15:40:31.287”/>

</property-value>

— stored separately and referenced from the structure that represents property value.

EXAMPLE 2 The following is an XML code fragment in which the data provenance record is referenced from the XML structure that represents property value.

Coded:

<property-value property-ref=”0161-1#02-015007#1” provenance-ref=”p4153”>

<controlled-value value-ref=”0161-1#07-000435#1”/>

</property-value>

…

<provenance-record id=”p4153”>

<provenance-event event-type=”create” organization-ref=”0161-ABCDE” person-ref=”ROLLINS1” date=”2008-10-27T15:40:31.287”/>

</provenance-record>

Decoded:

<property-value property-ref=”inclosure material” provenance-ref=”p4153”>

<controlled-value value-ref=”ceramic”/>

</property-value>

…

<provenance-record id=”p4153”>

<provenance-event event-type=”create” organization-ref=”ABC Company” person-ref=”William F. Rollins” date=”2008-10-27T15:40:31.287”/>

</provenance-record>

NOTE 1 See D.1 for an explication of the codes in the examples above.

NOTE 2 This part of ISO 8000 does not require that a master data message use the specific structures shown in the examples above, or that it use XML syntax at all.

NOTE 3 In the examples above, data are given in coded form followed by decoded form for clarity. An actual master data message is required to be in coded form (see ISO 8000-110).

The data provenance record for a property value shall include:

— identification of the data creator (the organization, and possibly the person and role within the organization, that created the data);

— identification of each data extractor (the organization, and possibly the person and role within the organization, that extracted the data).

NOTE 4 As specified in 6.5, the following information is required for a provenance event:

— event type (e.g. “create”, “extract”);

— organization reference;

— event date and time.

8 Conformance requirements

Any property value for which conformance to this part of ISO 8000 is claimed shall:

— conform to ISO 8000-110;

— have a data provenance record that satisfies the requirements of Clause 7.

This part of ISO 8000 provides for a number of options that may be supported by an implementation. These options have been grouped into the following conformance classes:

— free decoding;

— fee-based decoding.

Conformance to the free decoding conformance class requires conformance to the free decoding conformance class of ISO 8000-110.

Conformance to the fee-based decoding conformance class requires conformance to the fee-based decoding conformance class of ISO 8000-110.

Annex A
(normative)

Document identification

To provide for unambiguous identification of an information object in an open system, the object identifier

{ iso standard 8000 part (120) version (1) }

is assigned to this part of ISO 8000. The meaning of this value is defined in ISO/IEC 8824-1, and is described in ISO 10303-1.

Annex B
(informative)

Information to support implementations

Additional information may be provided to support implementations.

Annex C
(informative)

Scenarios

C.1 Purpose

The purpose of this annex is to help explain the business case for this part of ISO 8000. It is not essential to the application of this part of ISO 8000.

C.2 Abbreviated terms

The following abbreviated terms are used in this annex:

DDCMO	Department of Defense Demilitarization Coding Management Office
DEMIL	Demilitarization
DRS	Data Requirements Statement
FLIS	Federal Logistics Information System
NATO	North Atlantic Treaty Organization
NCB	National Codification Bureau
NIIN	National Item Identification Number
NSN	National Stock Number
PICA	Primary Inventory Control Activity

C.3 Background

The National Stock Number (NSN) is accepted by a number of countries as a unique identifier for an item of supply. The NSN consists of 13 digits. The first four are the NATO Supply Classification Code (NSC), and the remaining nine digits are the National Item Identification Number (NIIN). The NIIN, in turn, is made up of a two-digit NATO code for the National Codification Bureau (NCB), followed by a seven digit number assigned by the individual NCB.

The use cases in the following clauses use the United States NCB, the DLA logistics information service, as an example. DLA logistics information service's catalogue of items of supply is the Federal Logistics Information System (FLIS), which is federated with other NCBs' catalogues through the NATO system.

NOTE It is expected that the issues would be similar for any large organization that manages its own items of supply.

C.4 Provisioning requirements for a new NSN

Each service provisioning agreement is different, but all requirements for NSNs must have at minimum a part number and a manufacturer with a NATO Commercial and Government Entity (NCAGE) code, in addition to other essential codes such as demilitarization (DEMIL). Technical Data should be required based on specific contracts/agreements between countries (companies).

The cataloguer first validates technical data by ensuring that the data provided is accurate for item identification. For each type of drawing (vendor item drawing, source control drawing, envelope drawing, altered item drawing, etc.) the government has a list of requirements these drawings must meet. The cataloguer then transcribes the information from the drawings into FLIS, documenting what types of part numbers correspond to the different types of drawings. The NIIN assignment date is established and the drawings are stored within electronic databases for future reference.

EXAMPLE Table C.1 shows the technical and logistics data for NSN 5962–00–057–7131.

Table C.1 — Technical and logistics data for NSN 5962-00-057-7131

Property	Value
Class	microcircuit,digital
body length	0,785 in maximum
body width	0,250 in nominal
body height	0,165 in maximum
maximum power dissipation rating	75,0 mW
operating temp range	–55,0/+125, 0 °C
storage temp range	–65,0/+200,0 °C
features provided	hermetically sealed and monolithic and positive outputs
enclosure material	ceramic
enclosure configuration	dual-in-line
output logic form	transistor-transistor logic
input circuit pattern	triple 3 input
design function and quantity	3 gate, NAND [a]
voltage rating and type per characteristic	5,5 V nominal output
time rating per characteristic	20,00 ns maximum propagation delay time, low to high level output and 20,00 ns maximum propagation delay time, high to low level output
unpackaged unit weight	2,0 g
test data document	19200-10548170 drawing
terminal type and quantity	1 case

[a] NAND = NOT AND

C.5 Demilitarization

When a new item is stocked, the item manager inputs an initial DEMIL code, which is a code instructing the user on method and degree to which an item that is no longer needed needs to be demilitarized before it is disposed of.

Tracking of DEMIL codes from inception to disposal from a Department of Defense Demilitarization Coding Management Office (DDCMO) perspective is accomplished through the historical records maintained within the FLIS.

The DEMIL code's validity and the subsequent actions necessary to ensure proper disposal, or restriction from reutilization by unauthorized parties, are often verified using the past documentation on how the code was originally determined and what significant regulatory requirements may have changed that would drive a different code to be assigned. The DEMIL code plays a significant role in ensuring that parts and systems are maintained, stocked, stored and issued with the interests of national security and safety in mind. Changes to the DEMIL code can occur throughout the item of supply lifecycle, and are often utilized from an investigatory standpoint by law enforcement and international agencies. The history provides a means by which the code can be tracked by date, organization and individual making the decision, as well as the rationale for the decision.

When a DEMIL code is input, the database captures both the identity of the person inputting the code (through employee number), as well as the date and time of the input. The database keeps track of all previous versions of this information. By capturing this information, a person can trace the original provenance of the DEMIL information and capture any changes in the code. This is extremely important because incorrect DEMIL codes can cause revenue losses, significant hazard to personnel or material, and security incidents if material does not get demilitarized correctly.

DLA logistics information service stores the DEMIL code and its provenance information in database table "Table 812". The columns are defined as follows:

I_I_NBR_4131	Item identification number. An arbitrary number assigned by DLA logistics information service to identify the item of supply. This constitutes the last seven characters of the NIIN (and hence, the NSN).
PICA_2866	A code indicating the principal supply control activity responsible for establishing stockage objectives, controlling stockage objectives and maintaining item accountability for an item of supply.
DEMIL_CD_0167	A code to identify each item requiring demilitarization and the type of demilitarization required.
RECM_DEMIL_2847	Recommended demilitarization code. The code that represents the DEMIL code recommended by the DLA logistics information service DDCMO.
USR_CD_1101	User CODE. A code used for the purpose of identifying an individual and determining what that individual can access in the online environment.
DEMIL_REVW_DT_0146	Demilitarization item review Julian date. The Julian date on which the DEMIL code is reviewed by the DLA logistics information service DDCMO. Format: YYYYDDD.
PICA_RSP_DT_0150	Demilitarization PICA response Julian date. The Julian date on which the PICA responds by inputting the recommended DEMIL code to FLIS. Format: YYYYDDD.

NOTE Columns and rows not relevant to the discussion in this annex have been omitted.

EXAMPLE Table C.2 shows an extract of Table 812 for National Stock Number (NSN) 5962–00–057–7131. (The first column, "Row number", is not part of Table 812 but is included here to allow rows to be referenced conveniently.)

— The DCMO performed the initial review upon stocklisting on Julian date 1999250 (1999-09-07) and recommended that the DEMIL code be changed from "A" to "B".

  This is recorded in row 1 of Table C.2. The date of review is in column DEMIL_REVW_DT_0146.

— The recommended change to the DEMIL code from the first review (step a) was circulated, and following coordination, the DEMIL code was changed to "B" in FLIS on Julian date 2000066 (2000-03-06).

  This is recorded in row 2 of Table C.2. The date of change is in column PICA_RSP_DT_0150.

— The DCMO performed a subsequent review after initial stocklisting on Julian date 2007047 (2007-02-16) for one of several reasons (e.g. technical data availability, turn in at a Defense Reutilization Marketing Office, challenge generated) and recommended that the DEMIL code be changed to "D".

  This is recorded in row 3 of Table C.2. The date of change is in column DEMIL_REVW_DT_0146.

— The recommended change to the DEMIL code from the second review (step c) was circulated, and following coordination, the DEMIL code was changed to “D” in FLIS on Julian date 2007105 (2007-04-15).

This is recorded in row 4 of Table C.2. The date of change is in column PICA_RSP_DT_0150.

Table C.2 — Extract of DLA logistics information service Table 812 (DEMIL data) for NSN 5962-00-057-7131

Row no.	I_I_NBR _4131	PICA_2866	DEMIL_CD _0167	RECM_DEMIL_2847	USR_CD _1101	DEMIL_REVW_DT_0146	PICA_RSP _DT_0150
1	0577131	9D	A	B		1999250	2000066
2	0577131	ZH	B	B		1999250	2000066
3	0577131	9D	B	D	SDJ2816	2007047	0
4	0577131	ZH	D	D	SDJ2816	2007047	2007105

C.6 Data echo

Data that was traditionally moved as files is now moved as data elements in response to a query with the result that the consolidation (the process of taking data from different systems in order to create a unified view), integration (the process of combining two or more data sets into a larger data set) and partitioning (the process of dividing a data set into its smaller subsets or component parts) of data are common business processes used to obtain and maintain master data. As data is exchanged between systems it is possible to create a feedback loop similar to that of an audio system when a microphone is located in close proximity to a speaker.

EXAMPLE 1 An example of this is in the rental of address between mailing companies where databases are first consolidated then de-duplicated (merge-purge). Without provenance at the level of an individual address the remaining “valid” address depends solely on the order of the process and as multiple merge-purge processes the quality of the resulting list becomes increasingly uncertain.

Associated with each item of supply in the NATO Codification System (NCS) are zero or more items of production.

NOTE Normally, there will be at least one item of production associated with an item of supply, but the case of zero can occur, for example, if the items of production associated with an item of supply go out of production and no suitable replacements can be found.

Since the manufacturer controls the specification of an item of production, and can change the specification without changing the part number, an item of production that once conformed to an item of supply may no longer conform.

EXAMPLE 2 For the digital microcircuit in Table C.1, the manufacturer might change the enclosure material from ceramic to resin. The manufacturer, which supplies primarily to consumer electronics manufacturers, does not consider the enclosure material to be a differentiating property, and decides to keep the same part number. However, the item of supply is used in certain aircraft applications where resin enclosures are not permitted. The item of production no longer conforms to the item of supply in FLIS and needs to be removed from the list of items of production associated with the item of supply.

As a consequence of such changes, DLA logistics information service occasionally reviews the data in FLIS for an item of supply and confirms the list of conforming items of production. In order to do this, DLA logistics information service must have up-to-date data on each item of production. A DLA logistics information service cataloguer can get such data from a variety of sources, including queries to the manufacturer, Internet search, and data aggregators. It is important for DLA logistics information service to know the provenance of each property value, particular property values from data aggregators, as an aggregator might have gotten the property value from the manufacturer, from DLA logistics information service, or from other source. If the aggregator got the property value from the FLIS, then it is of no value for updating the FLIS. Feeding such data back into FLIS could cause a

more recent update from some other source to be overwritten. This is illustrated in the UML sequence diagram in Figure C.1.

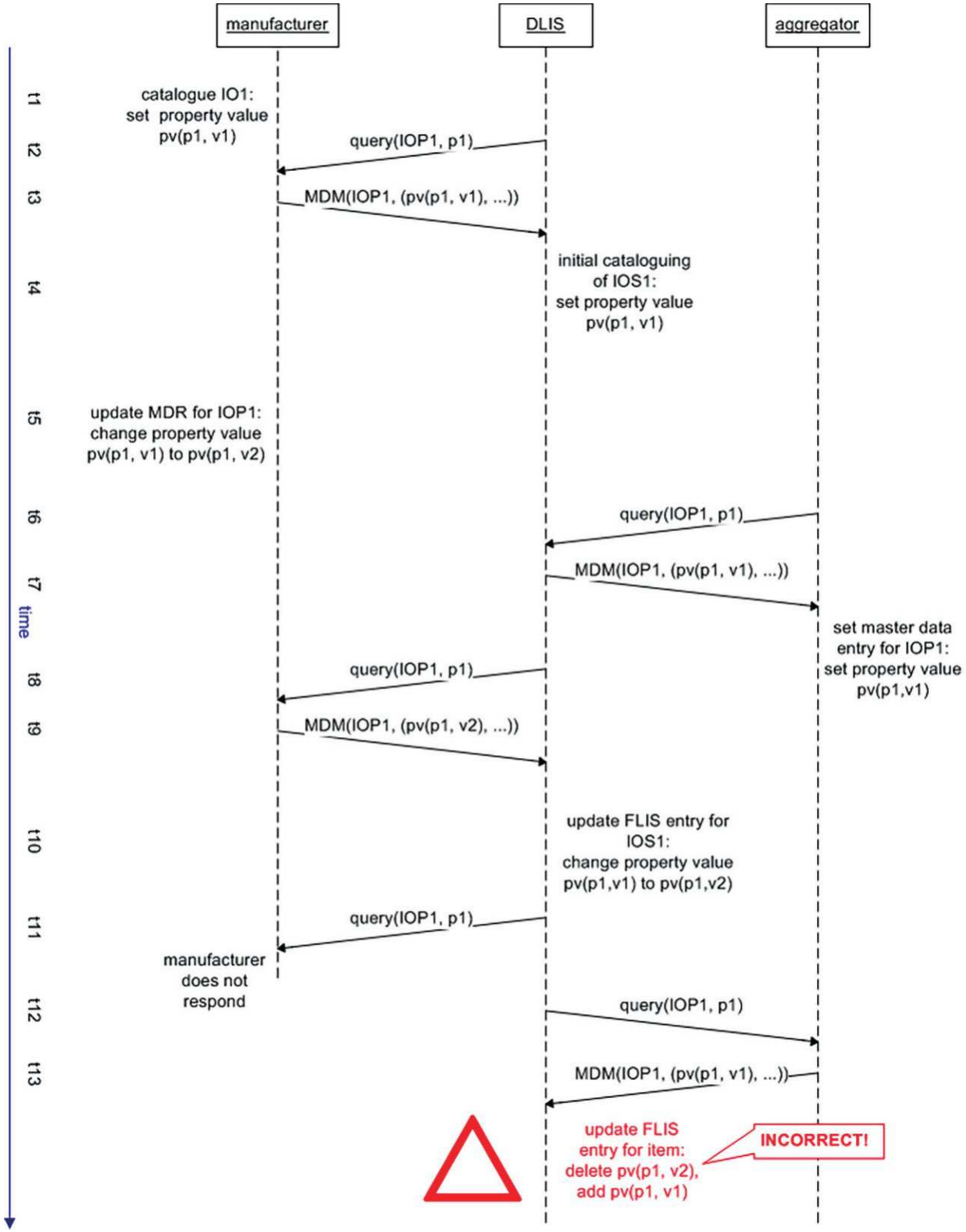

Figure C.1 — Sequence diagram for data echo

By analysing the provenance information, DLA logistics information service can determine that the value v1 for property p is out-of-date at time 1999-12-04, and therefore avoid overwriting the new value v2 with the old value v1.

If the cataloguer gets values for the same property of an item of production from several sources, they can use the provenance information to determine the most timely and reliable value for each property.

Annex D
(informative)

Use cases

D.1 General

This annex contains a number of use cases illustrating the business requirements for, creation of, and use of provenance information for property values. In accordance with ISO 8000-110, master data messages are coded using concepts from a data dictionary. Table D.1 lists the concept identifiers that are used in this annex and their meanings.

Table D.1 — Concepts used

Identifier	Type	Name
0161-1#02-015007#1	Property	enclosure material
0161-1#07-000435#1	value of property	ceramic
0161-1#07-185586#1	value of property	resin

NOTE 1 This annex uses concept identifiers from the ECCMA (Electronic Commerce Code Management Association) Open Technical Dictionary (eOTD). Any dictionary that met the requirements of ISO 8000-110 could have been used.

Table D.2 lists the organizations that are referenced in this annex with their identifiers.

Table D.2 — Organizations referenced

Identifier	Name	Role
0161-XYZQW	IM1	Manager of catalogue of items of supply
0161-ABCDE	ABC Company	Manufacturer of microcircuits
0161-BCDEF	XYZ Company	Data aggregator

NOTE 2 This annex uses organization identifiers from the eOTD. Any ISO/IEC 6523 compliant organization identification scheme could have been used.

NOTE 3 See ISO/IEC 6523-1 for the specification of the elements of an organization identifier.

IM1 maintains master data for items of supply in IOS-MS (Item of Supply Management system).

Table D.3 lists the persons who are referenced in this annex with thier identifiers.

Table D.3 — Persons referenced

Identifier	Name	Company	Role
JPS3642	John P. Smith	IM1	Cataloguer
ROLLINS1	William F. Rollins	ABC Company	Engineer
BAKER2	Catherine A. Baker	ABC Company	Engineer
DOE1	Jane E. Doe	ABC Company	Customer service representative

NOTE 4 The codes “0161-ABCDE”, “0161-BCDEF” and “0161-XYZQW” are dummy codes used for illustration purposes.

In this annex, times are given to the day, e.g. 1998-12-01, for simplicity. This part of ISO 8000 allows times to be given to any finer level of precision, e.g. 1998-12-01T08:41:36.118.

Data is given in coded and decoded form, using the notation in the Introduction. An actual master data message conforming to this part of ISO 8000 would have data in coded form.

D.2 Abbreviated terms

The following abbreviated terms are used in this annex:

PDM Product Data Management

D.3 UC1: Initial cataloguing of item of production

This use case covers initial cataloguing of an item of production by a manufacturer. The microcircuit described in C.1 is used as sample data for this use case.

Actors:

William F. Rollins engineer at ABC Company assigned to design the microcircuit

Steps:

1 Mr. Rollins designs the microcircuit with the properties listed in C.1.

2 On 1998-02-07, Mr. Rollins enters the property values into the record for the item in the manufacturer's product data management (PDM) system, including the property value to indicate that the chosen enclosure material is ceramic.

3 The PDM system records the property values with provenance information. The property value that the enclosure material is ceramic is recorded as:

Coded:

pv("0161-1#02-015007#1", "0161-1#07-000435#1",

(create("0161-ABCDE", "ROLLINS1", 1998-02-07)))

Decoded:

pv("enclosure material", "ceramic",

(create("ABC Company", "William F. Rollins", 1998-02-07)))

D.4 UC2: Initial cataloguing of item of supply from drawings

This use case covers initial cataloguing of an item of production by a manufacturer. The microcircuit described in C.1 is used as sample data for this use case.

Actors:

John P. Smith cataloguer at IM1 responsible for initial cataloguing of the microcircuit

Steps:

1 A request for codification is forwarded to IM1 with supporting documentation, including the part drawings.

2 Mr. Smith determines properties of the microcircuit from the drawings and other documentation supplied with the codification request.

3 On 1998-06-13, Mr. Smith enters the property values into the record for the item in IOS-MS, including the property value to indicate that the chosen enclosure material is ceramic.

4 IOS-MS records the property values with provenance information. The property value that the enclosure material is ceramic is recorded as:

Coded:

pv("0161-1#02-015007#1", "0161-1#07-000435#1",

(create("0161-XYZQW", "JPS3642", 1998-10-11)))

Decoded:

pv("enclosure material", "ceramic",

(create("IM1", "John P. Smith", 1998-10-11)))

5 Once all property values are entered, the NSN (5962-00-057-7131) is assigned to the item.

D.5 UC3: Initial cataloguing of item of supply using cataloguing at source

This use case covers initial assignment of a value for the item of supply described in C.1 during initial cataloguing by IM1. The cataloguer obtains technical property values by querying the manufacturer.

Actors:

John P. Smith	cataloguer at IM1 responsible for initial cataloguing of the microcircuit
Jane E. Doe	customer service representative at ABC Company responsible for responding to requests for data

Preconditions:

1 Use case UC1 has been executed.

Steps:

1 A request for codification is forwarded to IM1 with supporting documentation, including the part number

2 On 1998-10-11 Mr. Smith sends a query to ABC Company asking for values for all properties of the microcircuit required by IM1's data requirements statement (DRS).

3 On 1998-10-12 Ms. Doe extracts the properties of the microcircuit from its PDM system and sends them in a master data message to Mr. Smith.

4 On 1998-10-15, after validating the property values received from the manufacturer against IM1's DRS, Mr. Smith copies the property values into the record for the item in IOS-MS, including the property value to indicate that the chosen enclosure material is ceramic.

5 The IOS-MS records the property values with provenance information. The property value that the enclosure material is ceramic is recorded as:data requirements statement

Coded:

pv("0161-1#02-015007#1", "0161-1#07-000435#1",

(create("0161-ABCDE", "ROLLINS1", 1998-02-07),

extract("0161-ABCDE", "DOE1", 1998-10-12)))

Decoded:

pv("enclosure material", "ceramic",

(create("ABC Company", "William F. Rollins", 1998-02-07),

extract("ABC Company", "Jane E. Doe", 1998-10-12)))

Since the property value for the enclosure material is copied from data provided by the manufacturer, the create event refers back to the original entry of the property value at the manufacturer.

6 Once all property values are entered, the NSN (5962-00-057-7131) is assigned to the item.

D.6 UC4: Update catalogue entry for item of production

This use case covers the update of the catalogue record of an item of production by a manufacturer. The microcircuit described in C.1 is used as sample data for this use case.

Actors:

Catherine A. Baker engineer at ABC Company assigned to update the design of the microcircuit

Preconditions:

1 Use case UC1 has been executed.

Steps:

1 Ms. Baker creates a new version of the design of the microcircuit, changing the enclosure material to resin.

2 On 1998-11-01, Ms. Baker enters the new property value for enclosure material into the manufacturer's PDM system, indicating that the enclosure material is resin.

3 The PDM system records the new property value with provenance information as:

Coded:

pv("0161-1#02-015007#1", "0161-1#07-185586#1",

(create("0161-ABCDE", "BAKER2", 1998-11-01)))

Decoded:

pv("enclosure material", "resin",

(create("ABC Company", "Catherine A. Baker", 1998-11-01)))

D.7 UC5: Publication of initial catalogue record for item of supply

This use case covers the publication of the catalogue record of an item of supply by the master data manager. The microcircuit described in C.1 is used as sample data for this use case.

Preconditions:

1 Use case UC3 has been executed.

Steps:

1 On 1999-12-04 a batch process that extracts characteristic data from IOS-MS runs automatically.

2 The data is written to CD-ROMs and delivered to subscribers.

3 The property value with provenance information for the enclosure material of the microcircuit is written to the CD-ROM as:

Coded:

pv("0161-1#02-015007#1", "0161-1#07-000435#1",

(create("0161-ABCDE", "ROLLINS1", 1998-02-07),

extract("0161-ABCDE", "DOE1", 1998-10-11),

extract("0161-XYZQW", null, 1999-12-04)))

Decoded:

pv("enclosure material", "ceramic",

(create("ABC Company", "William F. Rollins", 1998-02-07),

extract("ABC Company", "Jane E. Doe", 1998-10-11),

extract("IM1", null, 1999-12-04)))

D.8 UC6: Update to catalogue entry for item of supply using cataloguing at source

This use case covers the update of a property value for the item of supply described in C.1 during a data quality assurance program. The cataloguer obtains the technical property values by querying the manufacturer.

Actors:

John P. Smith	cataloguer at IM1 responsible for maintaining the catalogue record of the microcircuit
Jane E. Doe	customer service representative at ABC Company responsible for responding to requests for data

Preconditions:

1 Use case UC4 has been executed.

Steps:

1 As part of a data quality assurance program, on 1998-12-05 Mr. Smith sends ABC Company a query to verify the property values for the microcircuit.

2 On 1998-12-07 Ms. Doe extracts the properties of the microcircuit from its PDM system and sends them in a master data message to Mr. Smith

3 Mr. Smith compares the property values in the master data message to those in IOS-MS, and determines that the enclosure material property has changed.

4 On 1998-12-10, after validating the property value against IM1's DRS, Mr. Smith copies the property value into the record for the item in IOS-MS, to indicate that the chosen enclosure material is resin

5 IOS-MS records the updated property value with provenance information as:

Coded:

pv("0161-1#02-015007#1", "0161-1#07-185586#1",

(create("0161-ABCDE", "BAKER2", 1998-11-01),

extract("0161-ABCDE", "DOE1", 1998-12-07)))

Decoded:

pv("0161-1#02-015007#1", "0161-1#07-185586#1",

(create("ABC Company", "Catherine A. Baker", 1998-11-01),

extract("ABC Company", "Jane E. Doe", 1998-12-07)))

Since the property value for the enclosure material is copied from data provided by the manufacturer, the create event refers back to the original entry of the property value at the manufacturer.

D.9 UC7: Aggregation of information on item of supply

This use case covers the extraction of data on an item of supply from IOS-MS and integration with other data.

Preconditions:

1 Use case UC5 has been executed.

Steps:

1 XYZ Company receives a copy of the CD-ROM and integrates it with its database of master data.

2 The property value with provenance information for the enclosure material of the microcircuit is written to the aggregator's database of master data as:

Coded:

pv("0161-1#02-015007#1", "0161-1#07-000435#1",

(create("0161-ABCDE", "ROLLINS1", 1998-02-07),

extract("0161-ABCDE", "DOE1", 1998-10-11),

extract("0161-XYZQW", null, 1999-12-04)))

Decoded:

pv("enclosure material", "ceramic",

(create("ABC Company", "William F. Rollins", 1998-02-07),

extract("ABC Company", "Jane E. Doe", 1998-10-11),

extract("IM1", null, 1999-12-04)))

D.10 UC8: Review of catalogue entry for item of supply using cataloguing at source

This use case covers the review of a property value for the item of supply described in C.1 during a data quality assurance program. The cataloguer obtains the technical property values by querying the manufacturer.

Actors:

John P. Smith cataloguer at IM1 responsible for maintaining the catalogue record of the microcircuit

Preconditions:

1 Use cases UC6 and UC7 have been executed.

Steps:

1 As part of a data quality assurance program, on 1998-12-05 Mr. Smith sends ABC Company a query to verify the property values for the microcircuit.

2 ABC Company does not respond.

3 Mr. Smith sends a query for data about the microcircuit to XYZ Company's data service.

4 On 1999-02-21 the data service responds with a record containing the following:

Coded:

pv(“0161-1#02-015007#1”, “0161-1#07-000435#1”,
(create(“0161-ABCDE”, “ROLLINS1”, 1998-02-07),
extract(“0161-ABCDE”, “DOE1”, 1998-10-11),
extract(“0161-XYZQW”, null, 1999-12-04),
extract(“0161-BCDEF”, null, 1999-02-21)))

Decoded:

pv(“enclosure material”, “ceramic”,
(create(“ABC Company”, “William F. Rollins”, 1998-02-07),
extract(“ABC Company”, “Jane E. Doe”, 1998-10-11),
extract(“IM1”, null, 1999-12-04),
extract(“XYZ Company”, null, 1999-02-21)))

5 Mr. Smith compares the property value returned by the data service with that in IOS-MS:

Coded:

pv(“0161-1#02-015007#1”, “0161-1#07-185586#1”,
(create(“0161-ABCDE”, “BAKER2”, 1998-11-01),
extract(“0161-ABCDE”, “DOE1”, 1998-12-07)))

Decoded:

pv(“enclosure material”, “resin”,
(create(“ABC Company”, “Catherine A. Baker”, 1998-11-01),
extract(“ABC Company”, “Jane E. Doe”, 1998-12-07)))

6 By comparing the dates of the create events, Mr. Smith easily determines that the property value in IOS-MS is more up-to-date than the property value sent by the data service; furthermore, the orgID in the extract(“0161-XYZQW”, null, 1999-12-04) event indicates that the property value from the data service is an echo of an older value from IOS-MS. Therefore, he does not make any update to IOS-MS based on this data.

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