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**Information technology — Business
operational view —**

Part 21:
**Guidance on the application of
the Open-edi business transaction
ontology in distributed business
transaction repositories**

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Foreword

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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. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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This document was prepared jointly by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

A list of all parts in the ISO/IEC 15944 series can be found on the ISO and IEC websites.

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.

Introduction

ISO/IEC 15944-4 defines the Open-edi Business Transaction Ontology (OeBTO) as a formal, rule-based specification and definition of the concepts pertaining to business transactions and scenarios and the relationships that hold among these concepts.

Figure 1 overviews the ontology of a business transaction. It is taken from ISO/IEC 15944-4:2015, Figure 21, modified as follows to bring to light certain properties that were not illustrated at the time:

- the generalization of “Partner” to “Person” is according to ISO/IEC 15944-4:2015, Figure 18;
- the business policy connections between the three types (i.e. Economic Resource Type, Economic Event Type and Economic Role) is according to ISO/IEC 15944-4:2015, Figure 13; and
- the connections of party (OeP) and counterparty (OeCP) are shown as distinct persons having negotiated the Economic Contract.

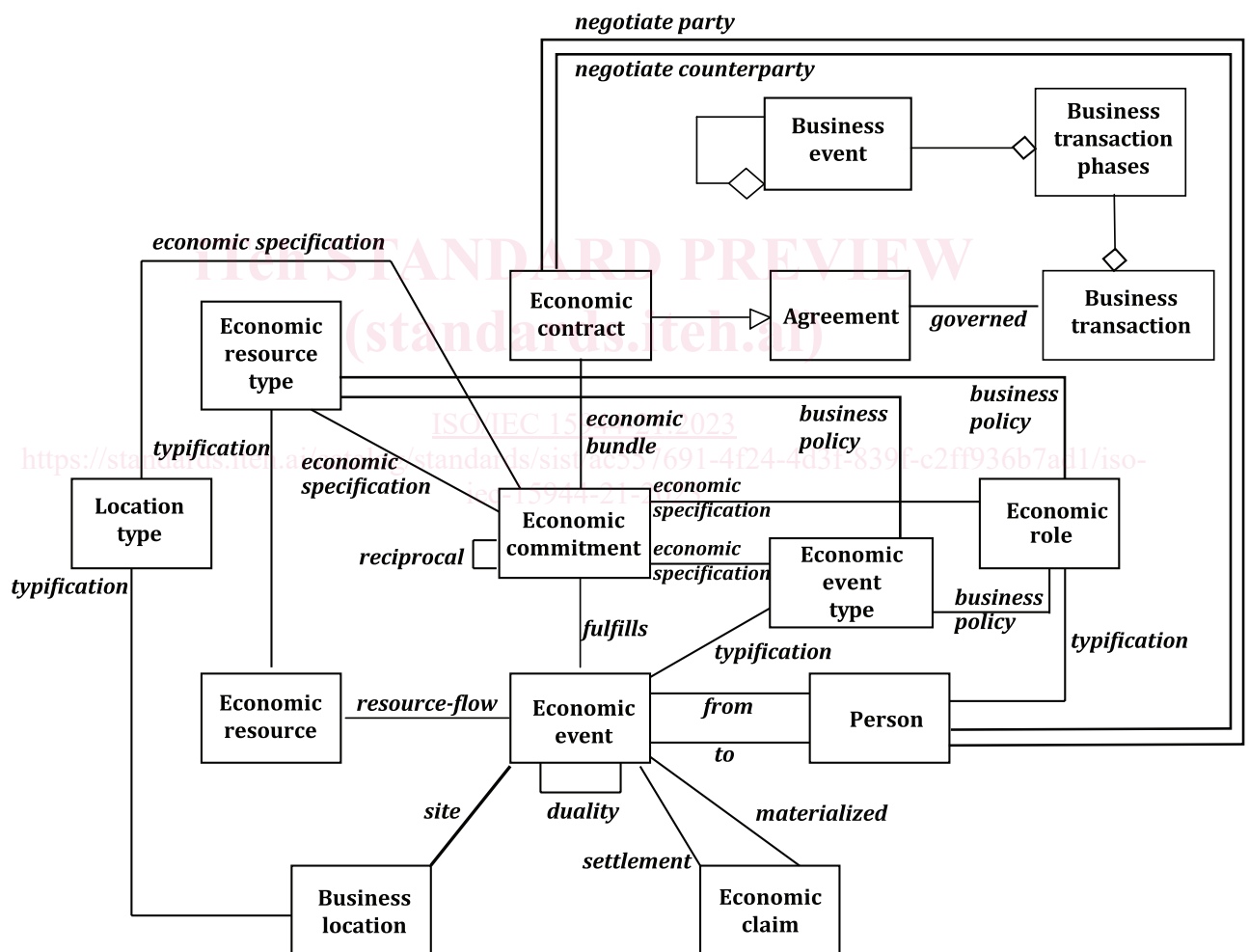


Figure 1 — Open-edi Business Transaction Ontology

According to ISO/IEC 15944-4, each business entity, depicted as a box in the diagram, is a computable representation of a real-world entity that participates, occurs, or is materialized during a business transaction. These are either static representations for the duration of the business transaction or dynamically changing representations implemented as individual state machines. Different business events effecting the business transaction are inputs influencing different sets of one or more of the state machines and changing their individual states. The particular states that each business entity can exhibit are established prior to the business transaction starting in order that the state machines act

as deterministic automaton for the duration. Initiating the business transaction instantiates the state machine of each business entity based on its negotiated definition.

The concept of a business collaboration that is illustrated in [Figure 2](#). It has been updated from ISO/IEC 15944-4:2015, Figure 3 to bring to light the party (OeP) and counterparty (OeCP) as distinct persons of a generic nature, not necessarily a buyer nor a seller.

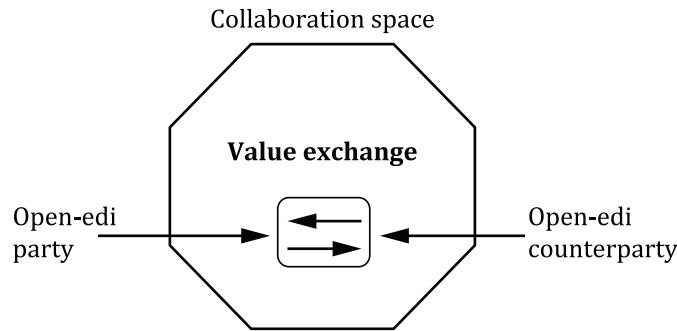


Figure 2 — Concept of a Business Collaboration

The collaboration space captures the information regarding a value exchange between the party and counterparty who have entered into an economic contract. The business transaction occurs within this space. The duality of the business transaction is that it involves two economic events, that is, two transfers of value in the value exchange. One transfer of value is from the OeP to the OeCP, and the other transfer of value is from the OeCP to the OeP.

ISO/IEC 15944-4 describes the ontology as the properties of this active multi-step process of the business transaction between party and counterparty from planning through to post-actualization. The business transaction transits through a series of states, one with each step, with each state stimulus being a business event. After any business event in the business transaction one can view the status of the interrelations between the ontology components as an outcome of that event.

This document supplements ISO/IEC 15944-4 by describing the Open-edi Distributed Business Transaction Repository (OeDBTR) properties of an indelible history or formal record of these changes in interrelations. This history can subsequently be queried or inspected. Without such a history of the state transitions of business entities, there is no record of the life cycle of the business transaction from instantiation to termination.

Information technology — Business operational view —

Part 21:

Guidance on the application of the Open-edi business transaction ontology in distributed business transaction repositories

1 Scope

This document specifies the business operational view of an implementation of an Open-edi Distributed Business Transaction Repository (OeDBTR), building on the principles and concepts defined in ISO/IEC 15944-4 of a business transaction. The repository stores the history of the transitions in states of the economic claim and/or other business entities that happen over the course of a business transaction, and does so for a collection of business events. These business events, comprised of transactions and their states, can be identified unambiguously so as to provide the ability to inspect or query the information at some point after the record has been made. The distributed nature of the repository offers users ubiquitous and robust access to the recorded history.

A history of business transactions of market exchanges can be useful in auditing or other memoing-based activities, looking back at the immutable record of the interactions between parties.

This document does not specify the Functional Services View of a particular implementation of an Open-edi Distributed Business Transaction Repository. For best performance, candidate technologies would likely exhibit properties of long-term permanence, robust immutability, decentralized access, distributed resilience, and fine-grained addressability.

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.

ISO/IEC 15944-4, *Information technology — Business operational view — Part 4: Business transaction scenarios — Accounting and economic ontology*

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:

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

3.1

business

series of *processes* (3.34), each having a clearly understood purpose, involving more than one *Person* (3.33), realized through the exchange of information and directed towards some mutually agreed upon goal, extending over a period of time

[SOURCE: ISO/IEC 14662:2010, 3.2]

3.2

business event

occurrence in time that an *Open-edi Party* (3.28) and an *Open-edi Counterparty* (3.26) in a *business transaction* (3.4) wish to monitor or control

Note 1 to entry: Business events are the workflow tasks that business partners need to accomplish to complete a business transaction among themselves. As business events occur, they cause a business transaction to move through its various phases of planning, identification, negotiation, actualization, and post-actualization.

Note 2 to entry: Occurrences in time can either: (a) be internal as mutually agreed to among the parties to a business transaction and/or (b) reference some common publicly available and recognized date/time referencing schema (e.g. one based on using ISO 8601 and/or ISO 19135 standards).

[SOURCE: ISO/IEC 15944-4:2015, 3.5 (adapted)]

3.3

business operational view

BOV

perspective of *business transactions* (3.4) limited to those aspects regarding the making of business decisions and *commitments* (3.6) among *Persons* (3.33), which are needed for the description of a *business transaction*

[SOURCE: ISO/IEC 14662:2010, 3.3]

3.4

business transaction

predefined set of activities and/or *processes* (3.34) of *Persons* (3.33) which is initiated by a *Person* to accomplish an explicitly shared *business* (3.1) goal and terminated upon recognition of one of the agreed conclusions by all the involved *Persons* although some of the recognition might be implicit

[SOURCE: ISO/IEC 14662:2010, 3.4]

3.5

collaboration space

business activity space where an *economic exchange* (3.12) of valued resources is viewed independently and not from the perspective of any business partner

Note 1 to entry: In collaboration space, an individual partner's view of economic phenomena is de-emphasized. Thus, the use of common business and accounting terms like purchase, sale, cash receipt, cash disbursement, raw materials, and finished goods, etc. is not allowed because they view resource flows from a participant's perspective.

[SOURCE: ISO/IEC 15944-4:2015, 3.12]

3.6

commitment

making or accepting of a right, obligation, liability or responsibility by a *Person* (3.33) that is capable of enforcement in the jurisdictional domain in which the commitment is made

[SOURCE: ISO/IEC 14662:2010, 3.5]

3.7

constraint

rule, explicitly stated, that prescribes, limits, governs or specifies any aspect of a *business transaction* (3.4)

Note 1 to entry: Constraints are specified as rules forming part of components of Open-edi scenarios, i.e., as scenario attributes, roles, and/or information bundles.

Note 2 to entry: For constraints to be registered for implementation in Open-edi, they shall have unique and unambiguous identifiers.

Note 3 to entry: A constraint may be agreed to among parties (condition of contract) and is therefore considered an "internal constraint". Or a constraint may be imposed on parties (e.g., laws, regulations, etc.), and is therefore considered an "external constraint".

[SOURCE: ISO/IEC 15944-1:2023, 3.11]

3.8 data

reinterpretable representation of *information* (3.18) in a formalized manner suitable for communication, interpretation, or processing

Note 1 to entry: Data can be processed by humans or by automatic means.

[SOURCE: ISO/IEC 2382:2015, 2121272]

3.9 eBusiness

business transaction (3.4), involving the making of *commitments* (3.6), in a defined *collaboration space* (3.5), among *Persons* (3.33) using their *Information Technology System* (3.20), according to *Open-edl standards* (3.30)

Note 1 to entry: eBusiness can be conducted on both a for-profit and not-for-profit basis.

Note 2 to entry: A key distinguishing aspect of eBusiness is that it involves the making of commitment(s) of any kind among the Persons in support of a mutually agreed upon goal, involving their IT systems, and doing so through the use of EDI (using a variety of communication networks including the Internet).

Note 3 to entry: eBusiness includes various application areas such as e-commerce, e-administration, e-logistics, e-government, e-medicine, e-learning, etc.

Note 4 to entry: The equivalent French language term for "eBusiness" is always presented in its plural form.

[SOURCE: ISO/IEC 15944-7:2009, 3.6] O/IEC 15944-21:2023

3.10 economic claim

expectation of one *Person* (3.33) to receive a future inflow of an *economic resource* (3.13) from another *Person* because of an *economic exchange* (3.12) which is currently incomplete

[SOURCE: ISO/IEC 15944-4:2015, 3.21]

3.11 economic event

occurrence in time wherein ownership of an *economic resource* (3.13) is transferred from one *Person* (3.33) to another *Person*

Note 1 to entry: Occurrences in time can either: (a) be internal as mutually agreed to among the parties to a business transaction and/or (b) reference some common publicly available and recognized date/time referencing schema (e.g. one based on using ISO 8601 and/or ISO 19135 standards).

[SOURCE: ISO/IEC 15944-4:2015, 3.25]

3.12 economic exchange

type of a *business transaction* (3.4) where the goal is an exchange of *economic resources* (3.13) between two *Persons* (3.33) where both parties derive higher utility after the settlement of the *business transaction*.

Note 1 to entry: An economic exchange usually involves two economic events with different types of economic resources flowing in opposite directions. For example, an exchange of cash for a good involves a shipment with a required payment following.

[SOURCE: ISO/IEC 15944-4:2015, 3.27]

3.13

economic resource

good, right, or service of value, under the control of a *Person* (3.33)

[SOURCE: ISO/IEC 15944-4:2015, 3.28]

3.14

Electronic Data Interchange

EDI

automated exchange of any predefined and structured data for *business* (3.1) purposes among information systems of two or more *Persons* (3.33)

Note 1 to entry: This definition includes all categories of electronic business transactions.

[SOURCE: ISO/IEC 14662:2010, 3.8]

3.15

entity

any concrete or abstract thing that exists, did exist, or might exist, including associations among these things

EXAMPLE A person, object, event, idea, process, etc.

Note 1 to entry: An entity exists whether data about it are available or not.

[SOURCE: ISO/IEC 2382:2015, 2121433]

3.16

external constraint

constraint (3.7) which takes precedence over *internal constraints* (3.21) in a *business transaction* (3.4), i.e. is external to those agreed upon by the parties to a *business transaction*

Note 1 to entry: Normally, external constraints are created by law, regulation, orders, treaties, conventions or similar instruments.

Note 2 to entry: Other sources of external constraints are those of a sectorial nature, those which pertain to a particular jurisdictional domain or mutually agreed common business conventions (e.g., INCOTERMS, exchanges, etc.).

Note 3 to entry: External constraints can apply to the nature of the good, service and/or right provided in a business transaction.

Note 4 to entry: External constraints can demand that a party to a business transaction meet specific requirements of a particular role. For example:

- a) Only a qualified medical doctor may issue a prescription for a controlled drug.
- b) Only an accredited share dealer may place transactions on the New York Stock Exchange.
- c) Hazardous wastes may only be conveyed by a licensed enterprise.

Note 5 to entry: Where the Information Bundles (IBs), including their Semantic Components (SCs) of a business transaction are also to form the whole of a business transaction (e.g., for legal or audit purposes), all constraints shall be recorded. For example, there may be a legal or audit requirement to maintain the complete set of recorded information pertaining to a business transaction, i.e., as the information bundles exchanged, as a "record".

Note 6 to entry: A minimum external constraint applicable to a business transaction often requires one to differentiate whether the Person that is a party to a business transaction is an "individual", "organization", or "public administration". For example, privacy rights apply only to a Person as an "individual".

[SOURCE: ISO/IEC 15944-1:2023, 3.23]

3.17**Functional Service View****FSV**

perspective of *business transactions* (3.4) limited to those information technology interoperability aspects of *Information Technology Systems* (3.20) needed to support the execution of *Open-edi transactions* (3.31)

[SOURCE: ISO/IEC 14662:2010, 3.10]

3.18**information**

knowledge concerning *objects* (3.23), such as facts, events, things, *processes* (3.34), or ideas, including concepts, that within a certain context has a particular meaning

[SOURCE: ISO 2382-1:1993 (01.01.01)]

3.19**Information Bundle****IB**

formal description of the semantics of the *recorded information* (3.36) to be exchanged by *Open-edi Parties* (3.28) playing *roles* (3.38) in an *Open-edi Scenario* (3.29)

[SOURCE: ISO/IEC 14662:2010, 3.11]

3.20**Information Technology System****IT System**

set of one or more computers, associated software, peripherals, terminals, human operations, physical processes, information transfer means, that form an autonomous whole, capable of performing information processing and/or information transfer

[SOURCE: ISO/IEC 14662:2010, 3.13] <https://standards.iteh.ai/catalog/standards/sist/ac557691-4f24-4d3f-839f-c2ff936b7ad1/iso-iec-15944-21-2023>

3.21**internal constraint**

constraint (3.7) which forms part of the *commitment(s)* (3.6) mutually agreed to among the parties to a *business transaction* (3.4)

Note 1 to entry: Internal constraints are self-imposed. They provide a simplified view for modelling and re-use of scenario components of a business transaction for which there are no external constraints or restrictions to the nature of the conduct of a business transaction other than those mutually agreed to by the buyer and seller.

[SOURCE: ISO/IEC 15944-1:2023, 3.11]

3.22**materialized**

association between an *economic event* (3.11) and an *economic claim* (3.10) where the occurrence of the *economic event* causes the *economic claim* to come into existence

[SOURCE: ISO/IEC 15944-4:2015, 3.40]

3.23**object**

anything perceivable or conceivable

Note 1 to entry: Objects may also be material, (e.g., engine, a sheet of paper, a diamond), or immaterial, (e.g., conversion ratio, a project play), or imagined, (e.g., a unicorn).

[SOURCE: ISO 1087-1:2000, 3.1.1]