INTERNATIONAL STANDARD

ISO/IEC 15944-4

Second edition
2015-04-01

Information technology — Business Operational View —

Part 4:
Business transaction scenarios — Accounting and economic ontology

Technologies de l'information — Vue opérationelle d'affaires —

Partie 4: Scénarios de transactions d'affaires — Ontologie comptable et économique

Contents

Page

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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC 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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, SC 32, *Data management and interchange*.

This second edition cancels and replaces the first edition (ISO/IEC 15944-4:2007), of which it constitutes a minor revision.

ISO/IEC 15944 consists of the following parts, under the general title *Information technology — Business Operational View*:

— *Part 1: Operational aspects of Open-edi for implementation*

— *Part 2: Registration of scenarios and their components as business objects*

— *Part 4: Business transaction scenarios — Accounting and economic ontology*

— *Part 5: Identification and referencing of requirements of jurisdictional domains as sources of external constraints*

— *Part 6: Technical introduction to e-Business modelling* [Technical Report]

— *Part 7: eBusiness vocabulary*

— *Part 8: Identification of privacy requirements as external constraints on business transactions*

— *Part 9: Business transaction traceability framework for commitment exchange*

— *Part 10: IT-enabled coded domains as semantic components in business transactions*

— *Part 20: Linking business operational view to functional service view to functional service view*

The following parts are under preparation:

— *Part 11: Descriptive techniques for foundational modelling in Open-edi*

0   Introduction

0.1   Purpose and overview

This work is motivated with important ideas from the ISO Open-edi specifications as represented in ISO/IEC 15944-1. In ISO/IEC 15944-1 and in some of its earlier foundational expositions, such as ISO/IEC 14662, there were important concepts defined and interrelated such as business transaction, fundamental activities of a business transaction, commitment, Person, role, scenario, and others. A need for relating all of these concepts in a formal framework for the Open-edi work is apparent.

This is a question of ontology: a formal specification of the concepts that exist in some domain of interest and the relationships that hold them[17]. In this case, the domains of interest are those that encompass Open-edi activities, that is, law, economics, and accounting in an extended sense, not the internal accounting of one particular firm, but the accountabilities of each of the participants in a market-based business transaction.

Ontologies are generally classified as either upper-level ontologies, dealing with generalized phenomena like time, space, and causality, or domain ontologies, dealing with phenomena in a specific field like military operations, manufacturing, medical practice, or business. The economic and accounting ontology being used in electronic business eXtended Markup Language (ebXML), in the UN/CEFACT modelling methodology, and E-Commerce Integration Meta-Framework (ECIMF) work is entitled the Resource-Event-Agent (REA) ontology[1]. REA is used here as an ontological framework for specifying the concepts and relationships involved in business transactions and scenarios in the Open-edi sense of those terms. The resulting framework is titled the Open-edi business transaction ontology (OeBTO).

The REA ontology is actually an elementary set of concepts derived from basic definitions in accounting and economics. These concepts are illustrated most simply with a UML class diagram. See Figure 1, which illustrates the simple Resource-Event-Agent structure that gives REA its name. A business transaction or exchange has two REA constellations joined together, noting that the two parties to a simple market transfer expect to receive something of value in return when they trade. For example, a seller, who delivers a product to a buyer, expects a requiting cash payment in return.
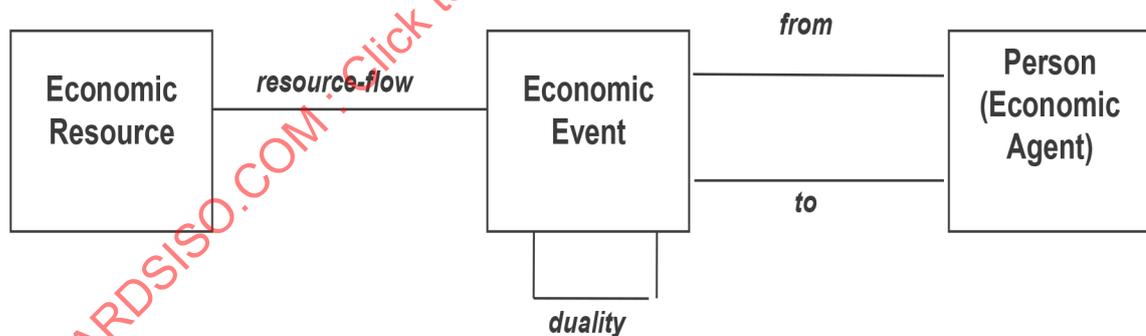
Figure 1 — Basic economic primitives of the Open-edi ontology

There are some specific points of synergy between the REA ontology and the ISO Open-edi specifications as represented in ISO/IEC 15944-1.

ISO/IEC 15944-1, 3.9 defines commitment as *"the making or accepting of a right, obligation, liability, or responsibility by a Person..."*. Commitment is a central concept in REA. Commitments are promises to execute future economic events, for example, to fulfill an order by executing a delivery event.

ISO/IEC 15944-1, 6.1.3, Rule 1 states: *"Business transactions require both information exchange and commitment exchange."* REA firmly agrees with and helps give definition to this assertion. Reciprocal commitments are exchanged in REA via economic contracts that govern exchanges, while information

---

1)   Elements of the REA ontology as they are used in other standards work are explained in Annex B.

exchange is tracked via business events that govern the state transitions of business transaction entities that represent various economic phenomena.

ISO/IEC 15944-1, 6.3.1, Rule 39 states: *"Conceptually a business transaction can be considered to be constructed from a set of fundamental activities. They are planning, identification, negotiation, actualization, and post-actualization."* For REA, actualization is the execution of economic events that fulfill commitments. Planning and identification involve business partners with types of economic resources, events, and persons, while negotiation is finalized by an economic contract which is a bundle of commitments. The UN/CEFACT Business Process Group has also defined negotiation protocols that assist in forming commitments. The Open-edi set of activities and the REA economic concepts will help each other tie together all the activities into a cohesive business transaction, and then unite that transaction definition with its related information models.

Finally, with regard to the preliminary agreement between Open-edi and REA, the two major sets of ideas that characterize the Open-edi work, the specification of business transactions and the configuration of scenarios, correspond well at the aggregate level to what the REA ontology calls the accountability infrastructure and the policy infrastructure. A business transaction specifies, in a <u>descriptive</u> sense, actual business events of what has occurred or has been committed to. Conversely, a scenario is more <u>prescriptive</u>: it configures what could be or should be. The realm of both descriptions and prescriptions is important both to Open-edi and REA, and they can work well in developing standards for each.

0.2 Definition of Open-edi Business Transaction Ontology (OeBTO)

According to the most widely accepted definition from Tom Gruber (1993), an ontology is a formal, explicit specification of a shared conceptualization.[2] The individual components of this meaning are each worth examining.

— formal = machine-readable;

— explicit specification = concepts, properties, relations, constraints, and axioms are explicitly defined;

— of a shared = consensus knowledge;

— conceptualization = abstract model of some phenomenon in the real world.

At present, the REA model is certainly an explicit specification of a shared conceptualization of economic phenomena in the accounting community. A formal, machine-readable specification is not proposed in this part of ISO/IEC 15944; however, such extensions may follow in other standards work.

This part of ISO/IEC 15944 focuses on integrating the Gruber definition of ontology with a REA-based approach. It does so from an accounting and economic ontology perspective within an Open-edi Reference Model context. This is achieved through the introduction of the concept (or construct) of "Open-edi Business Transaction Ontology (OeBTO)", which is defined as follows:

formal, rule-based specification and definition of the concepts pertaining to business transactions and scenarios and the relationships that hold among those concepts.

0.3 Use of the "independent" and "trading partner" perspective in the Open-edi ontology work

In normal business use, the naming perspective for the ontological primitives would be that of the entrepreneur or of one of the two trading partners engaged in collaborative commerce. The other trading partner would ordinarily have a mirror-image view. Thus, a sale, a cash receipt, or a resource inflow for a particular entrepreneur would become a purchase, a cash disbursement, or a resource outflow for a corresponding trading partner. From this perspective, business events and their accompanying economic phenomena would be modeled twice, once in the database of each trading partner. However, for Open-edi purposes, or for that matter for any other independent modeling of business collaborations like the Business Requirement View BRV level of the UN/CEFACT modeling methodology, this redundancy

---

2) See also the expert contribution by Dr. Jake V. Knoppers in the JTC1/SC32/WG1 document N0220, "*Draft Definition for Open-edi Business Transaction Ontology (OeBTO)",* 2002-05-06.

is not acceptable because it allows the states of the two representations to become inconsistent. This difference in naming perspective is explained below and illustrated in Figure 2.[3]

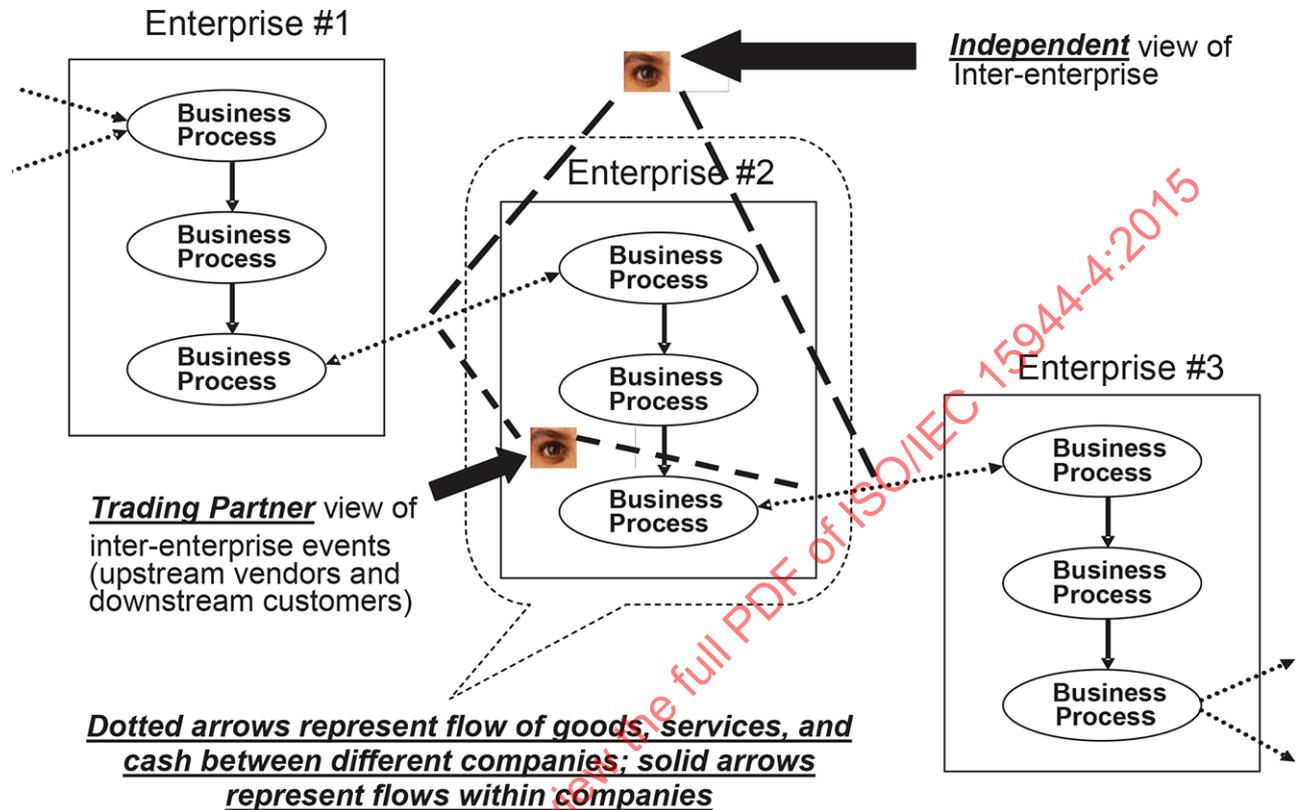## Collaboration Perspective: Trading Partner vs. Independent

Figure 2 — Different views of business collaboration

Figure 2 illustrates three independent value chains for three different enterprises. Each company has a connected network of business processes that takes its initial input of resources (called factor inputs for their production functions) and transforms them via cumulative flows of goods, services, rights, and/or cash into an output for that firm's downstream customers. For Open-edi collaboration modeling, these internal processes are not relevant until a resource flow crosses enterprise boundaries, as is illustrated for Enterprise #2 which accepts materials from Enterprise #1 and which delivers materials to Enterprise #3 (most probably in both cases for cash payments in return). The two dotted lines with double-headed arrows show these inter-enterprise events.

The independent or collaboration perspective of resource flows is anchored on the view of the eye outside of Enterprise #2. This view sees both exchanges as conceptually similar with flows of materials being requited by flows of funds. Such a perspective is quite different from that of the eye inside of Enterprise #2, which sees the flow between Enterprise #1 and Enterprise #2 as a "purchase" and the flow between Enterprise #2 and Enterprise #3 as a "sale". Note that an eye inside of Enterprise #1 (not shown on diagram) would have modeled the "purchase" of Enterprise #2 as a "sale" of Enterprise #1, hence the redundancy and the inevitable inconsistency.

Business process modeling can take either of the perspectives shown by the eyes of Figure 2, but the independent perspective is clearly the choice for Open-edi. This leads to the concept of a business

---

3)   Figure 2 was contributed by the Japanese delegation to SC 32, led by Katsuhiro Morita, during the Open-edi group meeting in Victoria in October 2001. {See further, the JTC1/SC32/WG1 document N1 N0190 "*AIW15944-4, Information technology — Business Agreement Descriptive techniques Part 4: Open-edi Ontology*", 2001-10-22} (Morita 2001). Some conceptual changes and naming conventions have been added since that first contribution.

collaboration that is illustrated in <u>Figure 3</u>[4]. Most generally, there is a value exchange between two Persons, with one assuming the role of a "buyer" (has money, desires goods, services, and/or rights) and the other assuming the role of a "seller" (has goods, services, and/or rights, desires money). It is also possible to anchor the independent view on time, with one event being the initiating flow and the requiting event being the responding flow. For internal database purposes of corporate accountability, "trading partner perspective" terms are directly derivable from "independent perspective" terms.
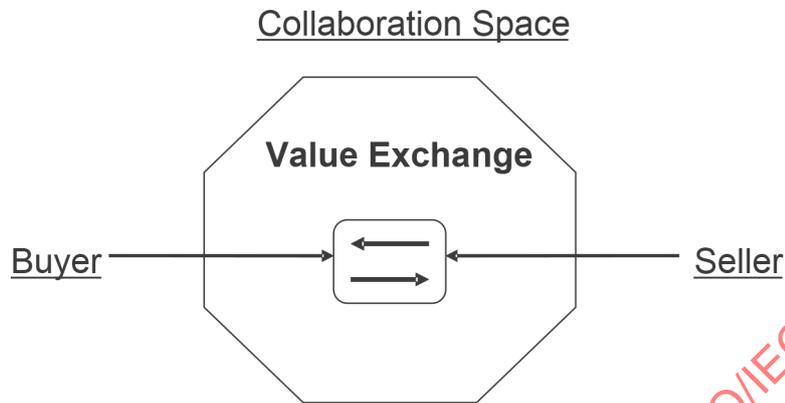
Collaboration Space

Figure 3 — Concept of a business collaboration

0.4   The "Open-edi Business Transaction Ontology" (OeBTO)

"Definition of Open-edi Business Transaction Ontology (OeBTO)" and "Use of 'independent' and 'trading partner' perspective in the Open-edi ontology work" have suggested

— that the components of the REA domain ontology model are sufficiently well-defined, stable, and well-known that they can clearly serve as the basis for an ontological specification of the concepts involved in collaborative exchanges between trading partners, and

— that the components of that model must be viewed from the outside perspective of a modeler viewing the economic phenomena independently.

Because the primitive economic terms are being adopted here for use with the operational aspects of Open-edi from ISO/IEC 15944-1, the ontology to be defined will be termed the "Open-edi Business Transaction Ontology" (OeBTO). Its definition is

formal, rule-based specification and definition of the concepts pertaining to business transactions and scenarios and the relationships that hold among these concepts

From the definitional foundations of both ISO/IEC 15944-1 and the REA model, it follows that the OeBTO will follow these five principles:

— as a business transaction ontology, a distinguishing characteristic of OeBTO is that in addition to information exchange, it incorporates commitment exchange among autonomous Persons;

— an OeBTO requires the use of clear and pre-defined rules, principles, and guidelines (see ISO/IEC 15944-1, 5.1);

— an OeBTO is neutral in terms of technology, representation, and application;

— the scope of an OeBTO covers all areas of business transactions (public/private, industry sectors, international, regional, etc.);

— the semantics of the concepts represented in an OeBTO are explicitly specified and constrained.

---

4)   Figure 3 was contributed by the Japanese delegation to SC 32, led by Katsuhiro Morita, during the Open-edi group meeting in Seoul, in May 2002.

0.5   Organization and description of this part of ISO/IEC 15944

Clause 1 and Clause 2 provide scope and normative references for OeBTO. The basic OeBTO definitions are first enumerated in Clause 3, while Clause 4 provides a table of symbols and abbreviations. Clause 5 provides the declarative substance for this part of ISO/IEC 15944, which is a set of UML class diagrams and conceptual explanations that circumscribe the Open-edi Business Transaction Ontology. Clause 6 explains the mechanics of a business transaction state machine, which is the procedural component of an OeBTO, while Clause 7 explains the (internal) constraint component of OeBTO, which is its repository for business rules.

At the end of this part of ISO/IEC 15944 are some helpful Annexes that provide elaboration on the points raised in the main body. Normative Annex A is a consolidated list of all the terms and definitions used in this part of ISO/IEC 15944 in both ISO English and ISO French. The other normative annex is Annex C, which is common to ISO/IEC 15944-2, ISO/IEC 15944-4, ISO/IEC 15944-5, and ISO/IEC 15944-8. Annex B is informative text providing more detailed background information on the REA Model. This part of ISO/IEC 15944 concludes with a bibliography.

Information technology — Business Operational View —

Part 4:
Business transaction scenarios — Accounting and economic ontology

1 Scope

This part of ISO/IEC 15944 provides a set of UML class diagrams and conceptual explanations that circumscribe the Open-edi Business Transaction Ontology (OeBTO). It explains the mechanics of a business transaction state machine, the procedural component of an OeBTO, and the (internal) constraint component of OeBTO, its repository for business rules.

This part of ISO/IEC 15944 addresses collaborations among independent trading partners as defined in ISO/IEC 15944-1. This part of ISO/IEC 15944 applies to both binary collaborations (buyer and seller) and mediated collaborations (buyer, seller, third-party). The ontological features described herein propose standards only for the Business Operational View (BOV), that is, the business aspects of business transactions as they are defined in ISO/IEC 15944-1.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE   One or more terms and definitions of the referenced International Standards listed below are used in Clause 3 Terms and definitions.

ISO/IEC 6523-1:1998, *Information technology — Structure for the identification of organizations and organization parts — Part 1: Identification of organization identification schemes*

ISO/IEC 11179-3:2003, *Information technology — Metadata registries (MDR) — Part 3: Registry metamodel and basic attributes*

ISO/IEC 14662:2010, *Information technology — Open-edi reference model*

ISO/IEC 15944-1:2011, *Information technology — Business Operational View — Part 1: Operational aspects of Open-edi for implementation*

ISO/IEC 15944-5:2008, *Information technology — Business Operational View — Part 5: Identification and referencing of requirements of jurisdictional domains as sources of external constraints*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
agent
Person (3.52) acting for another *Person* (3.52) in a clearly specified capacity in the context of a *business transaction* (3.8)

Note 1 to entry: Excluded here are agents as "automatons" (or robots, bobots, etc.). In ISO/IEC 14662, "automatons" are recognized and provided for but as part of the Functional Services View (FSV) where they are defined as an "Information Processing Domain (IPD)".

[SOURCE: ISO/IEC 15944-1:2011, 3.1]

3.2
attribute
characteristic of an *object* (3.42) or *entity* (3.32)

[SOURCE: ISO/IEC 11179-3:2003, 3.1.3]

3.3
bilateral transaction
sub-type of a *business transaction* (3.8) where the *Persons* (3.52) include only the *buyer* (3.11) and the *seller* (3.61), or alternatively other *Persons* (3.52) acting as *agents* (3.1) for the *buyer* (3.11) and/or *seller* (3.61)

3.4
business
series of *processes* (3.53), each having a clearly understood purpose, involving more than one *Person* (3.52), realized through the exchange of *recorded information* (3.56) and directed towards some mutually agreed upon goal, extending over a period of time

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

3.5
business event
occurrence in time that *partners* (3.51) to a *business transaction* (3.8) 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).

3.6
business location
geographic site where an *economic event* (3.25) is deemed to occur with its attendant transfer of an *economic resource* (3.28) from one *Person* (3.52) to another

3.7
Business Operational View
BOV
perspective of *business transactions* (3.8) limited to those aspects regarding the making of business decisions and *commitments* (3.13) among *Persons* (3.52), which are needed for the description of a *business transaction* (3.8)

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

3.8
business transaction
predefined set of activities and/or processes of *Persons* (3.52) which is initiated by a *Person* (3.52) to accomplish an explicitly shared business goal and terminated upon recognition of one of the agreed conclusions by all the involved *Persons* (3.52), although some of the recognition may be implicit

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

3.9
business transaction entity
computable representation of any real-world entity that participates, occurs, or is materialized during a *business transaction* (3.8)

3.10
business transaction entity type
abstract specification of a *business transaction entity* (3.9), detailing its recommended characteristics, its recommended methods, and its recommended life-cycle states

Note 1 to entry: A business transaction entity type will usually specify the types of business events that cause a business transaction entity of this type to proceed through its different states as the business transaction itself progresses through its phases of planning, identification, negotiation, actualization and post-actualization.

3.11
buyer
Person (3.52) who aims to get possession of a good, service, and/or right through providing an acceptable equivalent value, usually in terms of money, to the *Person* (3.52) providing such a good, service, and/or right

[SOURCE: ISO/IEC 15944-1:2011, 3.8]

3.12
collaboration space
business activity space where an *economic exchange* (3.27) 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.

3.13
commitment
making or accepting of a right, obligation, liability, or responsibility by a *Person* (3.52) that is capable of enforcement in the jurisdiction in which the *commitment* (3.13) is made

[SOURCE: ISO/IEC 15944-1:2011, 3.9]

3.14
constraint
rule, explicitly stated, that prescribes, limits, governs, or specifies any aspect of a *business transaction* (3.8)

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 must 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 15944-1:2011, 3.11]

3.15
custody
association between a *Person* (3.52) and an *economic resource* (3.28) where the *Person* (3.52) has physical control only over the resource or controls access

Note 1 to entry: Having custody of a good, service, and/or right does not imply and is differentiated from having economic control of the same (e.g. a Person may have economic control of a good even though it is not under its custody).

3.16
data (in a business transaction)
representations of *recorded information* (3.56) that are being prepared or have been prepared in a form suitable for use in a computer system

[SOURCE: ISO/IEC 15944-1:2011, 3.14]

3.17
defined market model
trade model where the *buyer* (3.11) and *seller* (3.61) accept the entry terms of a specified market in advance and where that market has an accepted and recognized source for business rules and conventions

Note 1 to entry: In a defined market, the phases of a business transaction, planning, identification, negotiation, actualization, and post-actualization are governed by the rules and conventions of the particular defined market.

3.18
duality
association between *economic events* (3.25) where one is the legal or economic consideration for the other in an exchange

Note 1 to entry: Duality is the conceptual analog of double entry in traditional bookkeeping. For example, a shipment from a partner requires a matching flow in, like a payment, to balance accounts between the parties.

3.19
economic agreement
arrangement of reciprocated *economic commitments* (3.22) between two *partners* (3.51) where the abstract specification of terms of trade is incomplete and not subject to legal enforcement

3.20
economic bundle
association between *economic commitments* (3.22) and the *economic contract* (3.23) that bundles those promises and binds them to the two *partners* (3.51) who negotiated them

3.21
economic claim
expectation of one *Person* (3.52) to receive a future inflow of *economic resources* (3.28) from another *Person* (3.52) because of an *economic exchange* (3.27) which is currently incomplete

3.22
economic commitment
type of *commitment* (3.13) by one *Person* (3.52) to transfer *economic resources* (3.28) to another *Person* (3.52) at some specified point in the future

3.23
economic contract
bundling of reciprocated *economic commitments* (3.22) between two *partners* (3.51) where the abstract specification of the proposed *economic exchange* (3.27) is deemed to be complete

3.24
economic control
association between a *Person* (3.52) and an *economic resource* (3.28) where the *Person* (3.52) either owns the *economic resource* (3.28) or is otherwise able to derive economic benefit (utility) from it

3.25
economic event
occurrence in time wherein ownership of an *economic resource* (3.28) is transferred from one *Person* (3.52) to another *Person* (3.52)

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).

3.26
economic event type
abstract specification of an *economic event* (3.25) where its grouped properties can be designated without attachment to an actual, specific occurrence in time

Note 1 to entry: Examples of attributes at the type level for events might be expected-duration or standard-pricing-percentage.

3.27
economic exchange
type of a *business transaction* (3.8) where the goal is an exchange of *economic resources* (3.28) between two *Persons* (3.52) where both parties derive higher utility after the completed *business transaction* (3.8)

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 requited payment following.

3.28
economic resource
good, right, or service of value, under the control of a *Person* (3.52)

3.29
economic resource type
abstract specification of an *economic resource* (3.28) where its grouped properties can be designated without attachment to an actual, specific *economic resource* (3.28)

Note 1 to entry: Example of attributes at the type level for an economic resource like an automobile might include its designated fuel capacity or its maximum expected range.

3.30
economic role
abstract specification of a *Person* (3.52) for economic purposes where its grouped properties can be designated without attachment to an actual *Person* (3.52)

EXAMPLE   An economic role might be a qualified buyer or approved shipper, i.e. from an economic perspective only.

3.31
economic specification
association between an *economic commitment* (3.22) and the abstract properties of an *economic event* (3.25), an *economic resource* (3.28), a *partner* (3.51), or a *business location* (3.6)

3.32
entity
concrete or abstract thing that exists, did exist, or might exist including associations among these things

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

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

[SOURCE: ISO/IEC 2382-17:1999, 17.02.05]

3.33
external constraint
constraint (3.14) which takes precedence over *internal constraints* (3.38) in a *business transaction* (3.8), i.e. is external to those agreed upon by the parties to a *business transaction* (3.8)

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 jurisdiction, or mutually agreed to 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.

EXAMPLE 1   Only a qualified medical doctor may issue a prescription for a controlled drug.

EXAMPLE 2   Only an accredited share dealer may place transactions on the New York Stock Exchange.

EXAMPLE 3   Hazardous wastes may only be conveyed by a licenced 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 must be recorded.

EXAMPLE 4   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, i.e. 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 15944-1:2011, 3.23]

3.34
fulfillment
association between an *economic commitment* (3.22) and an *economic event* (3.25) where the event executes the promised resource flow from one *Person* (3.52) to another

EXAMPLE   A delivery to a customer would fulfill that customer's sale order.

3.35
governed
association between an *economic agreement* (3.19) and the *business transaction* (3.8) whose conduct and phases are subject to that *economic agreement* (3.19)

3.36
individual
Person (3.52) who is a human being, i.e. a natural person, who acts as a distinct indivisible entity or is considered as such

[SOURCE: ISO/IEC 15944-1:2011, 3.28]

3.37
Information Bundle
IB
formal description of the semantics of the information to be exchanged by *Open-edi Parties* (3.45) playing *roles* (3.60) in an *Open-edi scenario* (3.46)

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

3.38
internal constraint
constraint (3.14) which forms part of the *commitment(s)* (3.13) mutually agreed to among the parties to a *business transaction* (3.8)

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

[SOURCE: ISO/IEC 15944-1:2011, 3.33]

3.39
location type
abstract specification of an economic location where its grouped properties can be designated without attachment to an actual place

EXAMPLE   A location type might be an accepted shipping facility or approved hospital location.

3.40
materialized
association between an *economic event* (3.25) and an *economic claim* (3.21) where the occurrence of the *economic event* (3.25) causes the *economic claim* (3.21) to come into existence

3.41
mediated transaction
sub-type of a *business transaction* (3.8) where a *third party* (3.65) mediates between the *partners* (3.51) as mutually agreed to by the *partners* (3.51)

3.42
object
anything perceivable or conceivable

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

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

3.43
Open-edi
electronic data interchange among multiple autonomous *Persons* (3.52) to accomplish an explicit shared *business* (3.4) goal according to Open-edi standards

[SOURCE: ISO/IEC 14662:2010, 3.14]

3.44
Open-edi Business Transaction Ontology
OeBTO
formal, rule-based specification and definition of the concepts pertaining to *business transactions* (3.8) and scenarios and the relationships that hold among those concepts

3.45
Open-edi Party
OeP
Person (3.52) that participates in *Open-edi* (3.43)

Note 1 to entry: Often referred to generically in this, and other eBusiness standards, (e.g., parts of the ISO/IEC 15944 multipart "eBusiness" standard) as "party" or "parties" for any entity modelled as a Person as playing a role in Open-edi scenarios.

[SOURCE: ISO/IEC 14662:2010, 3.17]

3.46
Open-edi scenario
OeS
formal specification of a class of *business transactions* (3.8) having the same *business* (3.4) goal

[SOURCE: ISO/IEC 14662:2010, 3.18]

3.47
organization
unique framework of authority within which a person or persons act, or are designated to act, towards some purpose

Note 1 to entry: The kinds of organizations covered by this part of ISO/IEC 15944 include the following examples.

EXAMPLE 1   An organization incorporated under law.

EXAMPLE 2   An unincorporated organization or activity providing goods and/or services including: (a) partnerships, (b) social or other non-profit organizations or similar bodies in which ownership or control is vested in a group of individuals, (c) sole proprietorships, and (d) governmental bodies;

EXAMPLE 3   Groupings of the above types of organizations where there is a need to identify these in information interchange.

[SOURCE: ISO/IEC 6523-1:1998, 3.1]

3.48
organization part
any department, service, or other *entity* (3.32) within an *organization* (3.47), which needs to be identified for information interchange

[SOURCE: ISO/IEC 6523-1:1998, 3.2]

3.49
organization Person
organization part (3.48) which has the properties of a *Person* (3.52) and thus is able to make *commitments* (3.13) on behalf of that *organization* (3.47)

Note 1 to entry: An organization can have one or more organization Persons.

Note 2 to entry: An organization Person is deemed to represent and act on behalf of the organization and to do so in a specified capacity.

Note 3 to entry: An organization Person can be a "natural person" such as an employee or officer of the organization.

Note 4 to entry: An organization Person can be a legal person, i.e. another organization.

[SOURCE: ISO/IEC 15944-1:2011, 3.46]

3.50
participates
association between an *economic event* (3.25) and each of the two *Persons* (3.52) participating in the *economic event* (3.25)

Note 1 to entry: Usually there is a "from" association and a "to" association, depending upon the direction of the flow of the economic resource.

3.51
partner
sub-type of *Person* (3.52) that includes *buyer* (3.11) and *seller* (3.61)

3.52
Person
entity (3.32), i.e. a natural or legal person, recognized by law as having legal rights and duties, able to make *commitment(s)* (3.13), assume and fulfill resulting obligation(s), and able to be held accountable for its action(s)

Note 1 to entry: Synonyms for "legal person" include "artificial person", "body corporate", etc., depending on the terminology used in competent jurisdictions.

Note 2 to entry: Person is capitalized to indicate that it is being utilized as formally defined in the standards and to differentiate it from its day-to-day use.

Note 3 to entry: Minimum and common external constraints applicable to a business transaction often require one to differentiate among three common subtypes of Person, namely, "individual", "organization", and "public administration".

[SOURCE: ISO/IEC 15944-1:2011, 3.47]

3.53
process
series of actions or events taking place in a defined manner leading to the accomplishment of an expected result

[SOURCE: ISO/IEC 15944-1:2011, 3.53]

3.54
public administration
entity (3.32), i.e. a *Person* (3.52), which is an *organization* (3.47) and has the added attribute of being authorized to act on behalf of a *regulator* (3.57)

[SOURCE: ISO/IEC 15944-1:2011, 3.54]

3.55
reciprocal
association between *economic commitments* (3.22) where the promise by one *partner* (3.51) to execute an *economic resource* (3.28) transfer in the future is reciprocated by the other *partner* (3.51) promising a requited transfer in the opposite direction

3.56
recorded information
any information that is recorded on or in a medium, irrespective of form, recording medium, or technology utilized, and in a manner allowing for storage and retrieval

Note 1 to entry: This is a generic definition and is independent of any ontology (e.g. those of "facts" versus "data" versus "information" versus "intelligence" versus "knowledge", etc.).

Note 2 to entry: Through the use of the term "information", all attributes of this term are inherited in this definition.

Note 3 to entry: This definition covers: (a) any form of recorded information, means of recording, and any medium on which information can be recorded and (b) all types of recorded information including all data types, instructions, or software databases, etc.

[SOURCE: ISO/IEC 15944-1:2011, 3.56]

3.57
regulator
Person (3.52) who has the authority to prescribe *external constraints* (3.33) which serve as principles, policies, or rules governing or prescribing the behavior of *Persons* (3.52) involved in a *business transaction* (3.8), as well as the provisioning of goods, services, and/or rights interchanged

[SOURCE: ISO/IEC 15944-1:2011, 3.59]

3.58
resource-flow
association between an *economic event* ([3.25](3.25)) and an *economic resource* ([3.28](3.28))

EXAMPLE   A resource-flow between some inventory and the shipment that caused control of that inventory to flow from one Person to another.

3.59
responsibility
association between *Persons* ([3.52](3.52)) where one is responsible for the other or between a *Person* ([3.52](3.52)) and an *organization Person* ([3.49](3.49)) where that *Person* ([3.52](3.52)) is assigned

Note 1 to entry: Sub-types of Persons include individuals, organizations, and public administrations. An "individual" is non-divisible but organizations and public administrations are and as such will assign specific responsibilities to organization Persons.

Note 2 to entry: See ISO/IEC 15944-1, 6.2.7 and Figure 17.

3.60
role
specification which models an external intended behaviour (as allowed within a scenario) of an *Open-edi Party* ([3.45](3.45))

[SOURCE: ISO/IEC 14662:2010, 3.25]

3.61
seller
Person ([3.52](3.52)) who aims to hand over, voluntarily or in response to a demand or a request, a good, service, and/or right to another *Person* ([3.52](3.52)) and in return receives an acceptable equivalent value, usually in money, for the good, service, and/or right provided

[SOURCE: ISO/IEC 15944-1:2011, 3.62]

3.62
Semantic Component
SC
unit of *recorded information* ([3.56](3.56)) unambiguously defined in the context of the *business* ([3.4](3.4)) goal of the *business transaction* ([3.8](3.8))

Note 1 to entry: An SC may be atomic or composed of other SCs.

[SOURCE: ISO/IEC 14662:2010, 3.27]

3.63
settlement
association between a requiting *economic event* ([3.25](3.25)) and an *economic claim* ([3.21](3.21)) where the occurrence of the event causes the *economic claim* ([3.21](3.21)) to expire

3.64
site
association between an *economic event* ([3.25](3.25)) and the *business location* ([3.6](3.6)) where the transfer of *economic resources* ([3.28](3.28)) involved in that event is deemed to have occurred

3.65
third party
Person ([3.52](3.52)) besides the two primarily concerned in a *business transaction* ([3.8](3.8)) who is *agent* ([3.1](3.1)) of neither and who fulfills a specified role or function as mutually agreed to by the two primary *Persons* ([3.52](3.52)) or as a result of *external constraints* ([3.33](3.33))

Note 1 to entry: It is understood that more than two Persons can at times be primary parties in a business transaction.

[SOURCE: ISO/IEC 15944-1:2011, 3.65]

3.66
typification
association between a concrete *entity* (3.32) and the abstract specification of its grouped properties

3.67
undefined market model
trade model where participants are not registered in advance and where that market does not have accepted and recognized sources for business rules and conventions

4   Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply:

AAA	American Accounting Association
BDV	Business Domain View
BRV	Business Requirements View
BOV	Business Operational View
BTE	Business Transaction Entity
BTET	Business Transaction Entity Type
BTV	Business Transaction View
ebXML	electronic business eXtended Markup Language
ECIMF	E-Commerce Integration Meta-Framework
EDI	Electronic Data Interchange
IB	Information Bundle
IPD	Information Processing Domain
IPR	Intellectual Propery Rights
OCL	Object Constraint Language
OeBTO	Open-edi Business Transaction Ontology
OeDT	Open-edi Descriptive Technique
OeP	Open-edi Party
OeS	Open-edi Scenario
REA	Resource-Event-Agent
SC	Semantic Component
UML	Unified Modeling Language
UMM	UN/CEFACT Modelling Methodology
UN	United Nations
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business

5   The declarative component of an OeBTO — Primitive and derived data classes

5.1   Person and economic resources

One of the most fundamental ideas in Open-edi is the category of Person as an entity recognized as having legal rights and duties, able to make commitments, and fulfill resulting obligations. Based on applicable external constraints, a Person can be decomposed into three separate sub-types, namely,

"individual", "organization", and "public administration"[5]. These sub-types are illustrated in the UML class diagram of Figure 4.

In this part of ISO/IEC 15944, the focus is on the OeBTO from an internal constraints perspective only[6]. However, users of this part of ISO/IEC 15944 should note that where and whenever Person is utilized, it covers the three sub-types of individual, organization, and public administration.
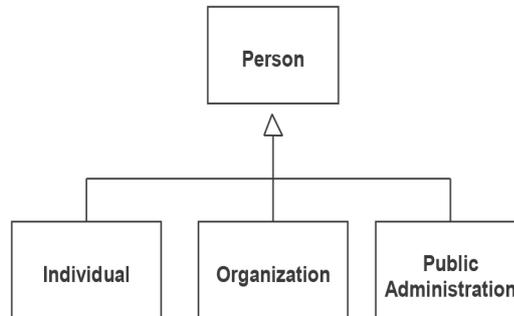
Figure 4 — Sub-types of Person based on external constraints

Rule 1:

Irrespective of the use of any particular information technology and related devices, Persons shall be the only entities which are legally recognized as able to make commitments, able to agree to the rights and obligations entered into, and able to be held accountable for their actions, etc., i.e., Persons are the only entities able to participate in a business transaction and able to make commitments for exchanges of value[7].

Persons are the entities who drive the economic exchanges forward in Open-edi collaborations. Ontologically and normatively, they are considered as *homo economicus* in the classical microeconomic sense; that is, they are parties interested in commercial activity as a means of maximizing utility.

Besides Person, a second very important notion in the OeBTO is the concept of an economic resource which is something of value under the control of a Person. These two fundamental categories appear on the left of Figure 5, connected by an economic control relationship which indicates that the Person either owns the resource or is otherwise able to derive economic value (utility) from it.

---

5) See further in ISO/IEC 15944-1:2011, 6.2 "*Rules governing Person*" and in particular, 6.2.7 "*Person and external contraints: individual, organization and public administration.*"

6) With respect to incorporating external constraints, see further ISO/IEC 15944-5:2008; in particular, see 5.2.2 "*Collaboration space — internal constraints only*" and 5.2.3 "*Collaboration space — the role of "regulator" representing "external contraints"*", and Annex G.

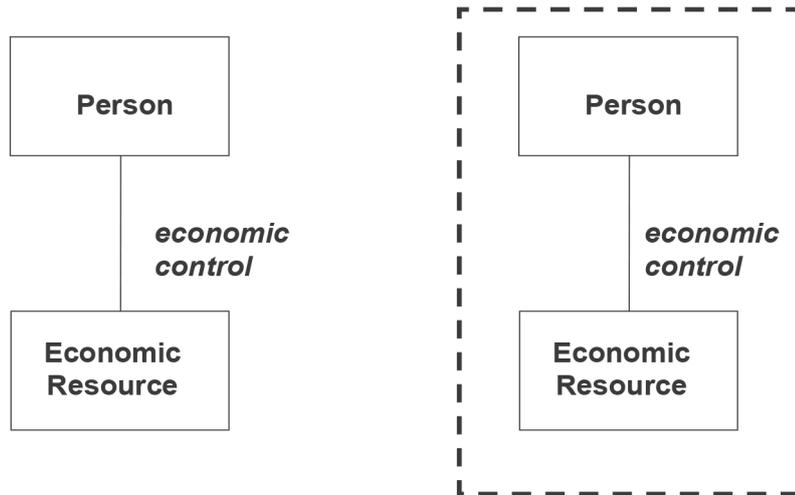7) This Rule 1 is based on ISO/IEC 15944-1:2011, 6.2, Rule 11.

Figure 5 — Person and economic resource as the basis for exchange

Onto the right side of Figure 5 (inside the dotted lines) is now added an additional Person and economic resource association, thus setting the stage for a possible exchange where both parties might view control of the other Person's resource as a means of deriving higher utility than present circumstances render. This "value exchange" as it is titled in the collaboration space of Figure 3 is the basis for what Open-edi calls a business transaction between the two Persons.

Rule 2:

An Open-edi Business Transaction is an economic exchange occasioned by the presence of two Persons as trading partners, each possessing a resource of value desirable to the other party, and these Persons shall be autonomous parties with competing economic interests, able to commit to a requited exchange with the other Person.

The Open-edi Business Transaction Ontology does not construct exhaustive classification hierarchies for the primitive classes of Person and economic resource, but it does provide a limited taxonomy for both. The hierarchical decomposition of both of these ontology items beyond 2-3 levels becomes very dependent upon the context of industry structure. Particular decompositions beyond the second or third level may be joined to the minimum classification structures illustrated here to give more detailed taxonomies for a particular industry domain.

In addition to being classified on identity, Persons may also be classified on the basis of their roles, which are the abstract specification of the functions they perform in business transactions. This functional decomposition through three levels is illustrated in the UML class diagram of Figure 6 and explained below.

— *Partner* which itself further specializes to *Buyer* (has money, desires goods) and *Seller* (has goods, desires money).

— *Regulator* which represents Persons who impose external constraints on Business Transactions.

— *Third Party* which specializes to a number of other classes such as *Escrow, Guarantor, Mediator,* and *Notary.*

— *Agent* which is a special sub-type in Open-edi that can act for any other Person in a clearly specified capacity, most commonly for a buyer or a seller.
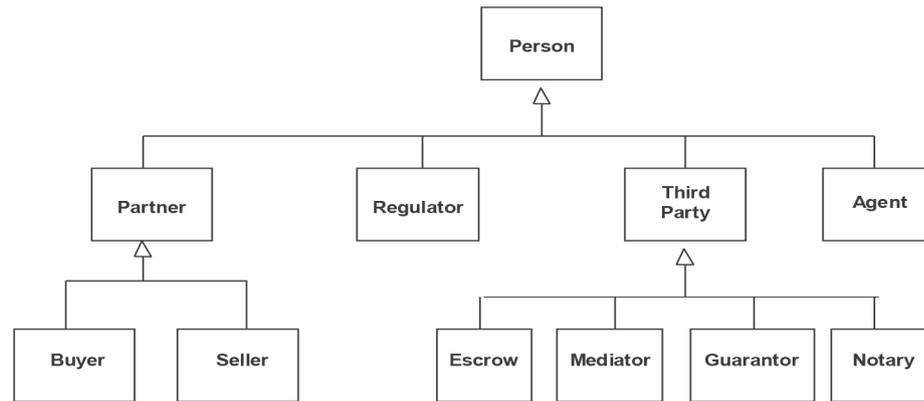
Figure 6 — Sub-types of Person based on roles in a business transaction

When fully-specified business transactions occur, Persons are able to play roles as indicated by the different sub-typing shown in Figure 6. Again, this taxonomy could be extended with industry-specific specializations of these role levels[8].

Figure 7 illustrates some of the possible sub-typing for the other OeBTO primitive – economic resource – illustrated in Figure 5. This taxonomy has a second level derived directly from the text of 15944-1 which categorizes resources as:

— *Goods* which are tangible resources to include:

   — *Materials* including capital assets (like trucks), basic raw materials and natural resources (like steel or petroleum) plus sub-components of a larger assembled product (like seats for an automobile).

   — *Funds* like money or marketable securities.

   — *Real Estate* like office buildings or warehouses.

— *Services* which are the provision of value-adding activities by a seller to a buyer to include:

   — *Regulatory Services* such as the right to import/export or the right to do business in a certain segment or area.

   — *Transportation Services* like packing/picking or actual shipments.

   — *Human Services* like temporary workers or consultants.

   — *Warranty Services* such as the automatic provision of replacement goods under faulty judgments.

   — *Insurance Services* such as guaranteed payment under exigent circumstances.

— *Rights* which are intangible resources to include examples like Intellectual Property Rights (IPR) and Rights-of-way.[9]

---

8)   Because of this industry specificity, these hierarchical decompositions should be viewed as informative rather than normative. This is especially true of the decomposition of "third party" where industry specificity gives rise to many different types of role names.

9)   Again as in Figure 6, these hierarchical decompositions should be viewed as informative rather than normative. This is especially true of the third level decomposition in Figure 7 which is clearly designed as an example enumeration.
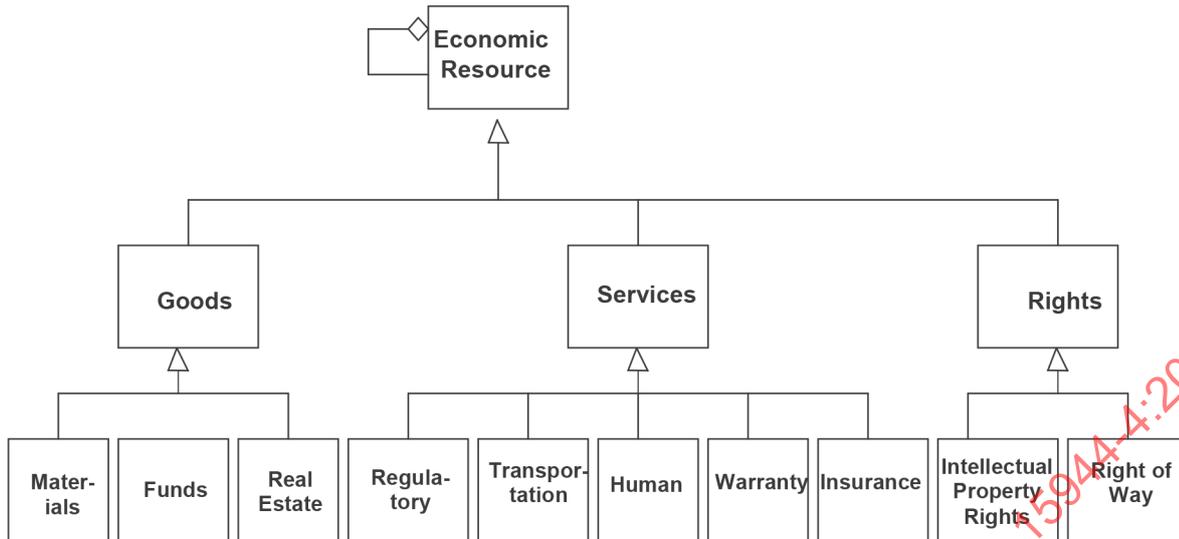
    15

Figure 7 — Sub-types (possible) for economic resource

Rule 3:

Economic resources shall be classified as goods, services or rights; particular industry level classifications can further specialize this first level of decomposition.

Figure 7 also shows a recursive association that is especially important in ontological terms because it reflects an important aspect of economic reality -- that economic resources often have component structures. This means that their value is often derived from an assemblage of other resources. For a product example, those components could be the physical material, its advertised cache, its delivered-to-the-door-status, and its warranty.

Rule 4:

Economic resources in the vast majority of trading cases shall have component structures that can be identified and treated differentially in economic exchanges.

As an example of the logic of Rule 4, example goods that are termed free-on-board at source (FOB source) would be missing a delivery component that free-on-board destination (FOB destination) would have included.

In Open-edi, a business transaction involves an economic exchange of resources between Persons with competing economic interests, each attempting to maximize his or her own economic utility. As portrayed in 15944-1 and shown in Figure 8, there are two additional fundamental elements of a Business Transaction Model besides PERSON (discussed amply above). The first of these is the DATA involved in the transaction, and the ontological categories for capturing that data will be the topic for the rest of this Clause 5. The other fundamental element is the PROCESS involved in a business transaction and that will be the main topic for the following Clause 6. Clause 7 illustrates the constraint component where the business rules concerning both data and processes are enumerated.
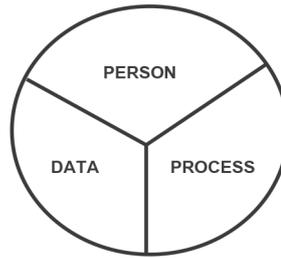
Figure 8 — Fundamental parts of a business transaction

5.2 The normative data categories for a business transaction involving an economic exchange: resources, events, and Persons plus their fundamental relationships

The UML class diagram of Figure 9 illustrates the high level semantic view of the essentials of an economic exchange. In Open-edi, the full details of this exchange are realized within the scope of a single business transaction as trading partners identify each other, negotiate commitments, and engage in the actual exchange of resources with value.

As a starting point for ontological definition, this collaboration space diagram concentrates on the object answers to four fundamental questions:

— **Who** is involved in the collaboration (Persons)?

— **What** is being exchanged in the collaboration (economic resources)?

— **When** (and under what trading conditions) do the components of the exchange occur (economic events)?

— **Why** are the trading partners engaged in the collaboration (duality relationships between resource flows)?

The normative infrastructure of the Open-edi Business Transaction Ontology (OeBTO) encompasses these essential question components, as explained in 5.3 that follows. Clause 5.4 illustrates the ontological components that result from typifying the OeBTO normative infrastructure, while 5.5 deals with the non-normative extensions of claims and business locations. Clause 5.6 discusses the elaborate commitment structures of the OeBTO, and 5.7 accounts for the extended ontology objects of scenarios and markets.

Figure 9 illustrates the basic economic primitives of OeBTO in a UML class diagram. An actual value exchange in the collaboration space of Open-edi between a buyer and a seller would involve two instances of this object pattern. That is, there would a resource-event-Person pattern instance for an initial resource transfer from one partner to the other; this would then be followed by a connected (with duality associations) resource-event-Person pattern instance for a requiting resource transfer. A full example of this is shown in Figure 10 with a delivery of product followed by a payment of cash. In very general terms, a full economic exchange of value in collaboration space is defined as a business transaction in the Open-edi ontology. It is important to remember that bilateral ransactions between a buyer and a seller constitute the basic collaborative unit in Open-edi. These bilateral transactions may be aggregated to mediated transactions involving more than two Persons.
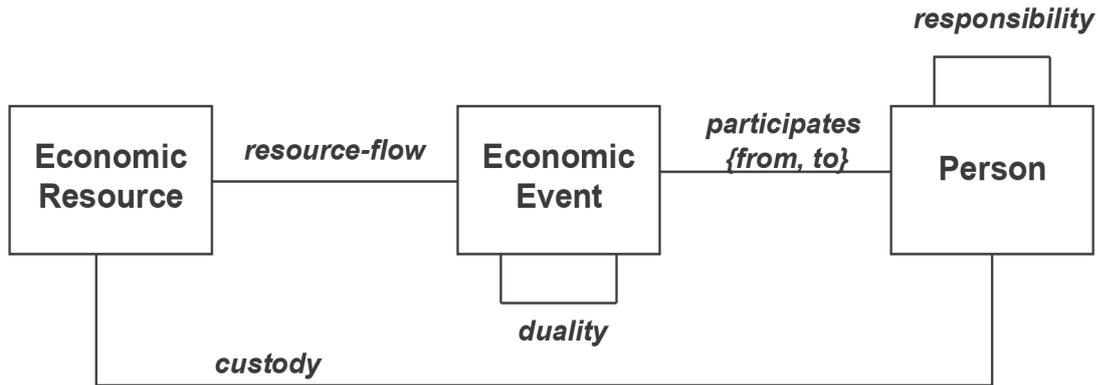
Figure 9 — Basic exchange primitives of the Open-edi ontology
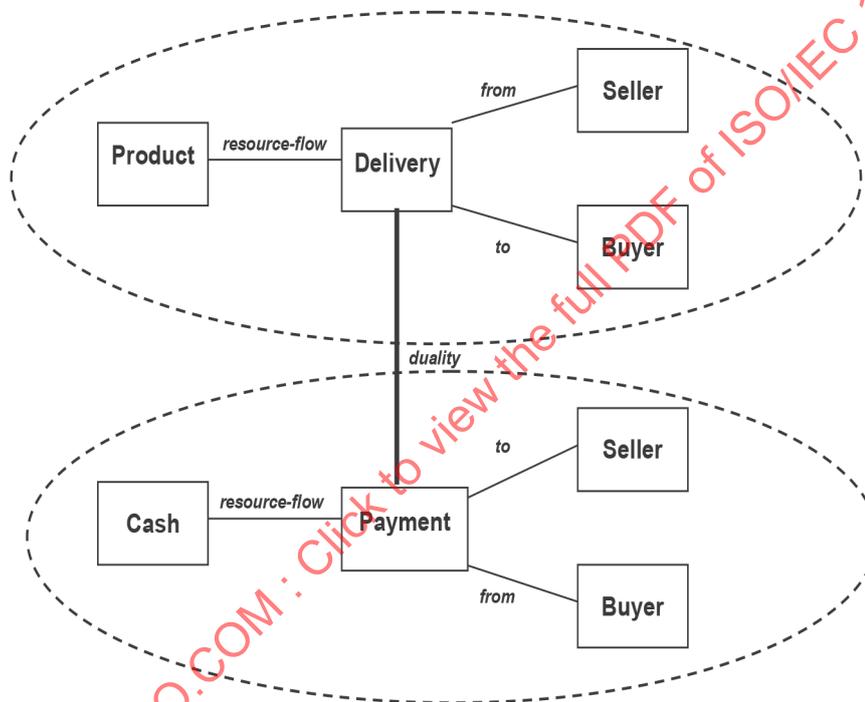
Figure 10 — Exchange of value in collaboration space involves two symmetrical clusters

5.2.1 Entity definitions:

a) A Person is a natural or legal person unit empowered to control the flow of economic resources (including his or her own labor) by engaging in economic events. Persons are also empowered to make commitments or promises to execute resource flows in the future. The Person class may also include persons who are responsible for subordinates' participation in economic events. A sub-set of Person is partner; partners are Persons who play the leading roles in business transactions as sellers and buyers (or alternatively, as producers and consumers of services).

b) An economic resource is a scarce good, right, or service that possesses utility (economic value) and that is presently under the identifiable control of a particular Person.

c) An economic event most simply is an inflow or outflow of an economic resource. Economic events reflect changes in economic resources resulting from exchanges, conversions, or transportation.

5.2.2 Relationship definitions:

a) A resource-flow relationship is an association between an economic resource and an economic event. From the independent perspective, resource-flow instances are matched in bi-directional fashion with each party both giving and taking in the same exchange.

b) A participates relationship is an association between a Person and an economic event. Economic events normally have two participates relationships with independent parties who have competing economic interests (that is, they are said to have an arm's length relationship with each other). One of these is specialized on the class diagram of Figure 9 as "from" and the other as "to", indicating again the independent perspective of collaboration.

c) A duality relationship is an association between two (or more) economic events where one is the economic or legal consideration for the other in an economic exchange. Dualities are needed for every binary component of mediated transactions.

d) A custody relationship is an association between a Person and an economic resource where physical control or access to physical control possession is indicated.

e) Responsibility is a relationship between (among) two or more Persons. These responsibility associations indicate hierarchical orderings within an enterprise that are necessarily revealed to trading partners in a collaboration model.

Rule 5:

The minimum normative constellation of business transaction entities needed for a valid business transaction are economic resources, economic events, and Persons plus their exchange relationships (resource-flow, duality, and participates).

Rule 6:

Custody and responsibility relationships are not required for a valid economic exchange, but they may provide critical additional data to the basic exchange template.

5.3 Addition of business event to basic exchange pattern

In Figure 11, the primitive business event has been added to the basic OeBT ontology pattern in a UML class diagram. A business event is an occurrence in time in collaboration space that Persons wish to plan, control, monitor, or evaluate. To bring about the occurrence of an economic event, it is often necessary to perform multiple business events. Additionally, business events may also be aggregates of other, finer-grained business events, so the UML component structure for a business workflow is shown as recursive business events. In a state machine sense where many elements of the OeBTO become business transaction entities (representing business transaction entity types as explained in Clause 6) with defined object states and defined object lifecycles, a business event can be defined more precisely as an occurrence that causes a state change in one or more business transaction entities.

Rule 7:

Business events shall either occur instantaneously or have duration and so for a business event that has duration, it shall be possible to specify as its components, both starting and finishing events of instantaneous nature.
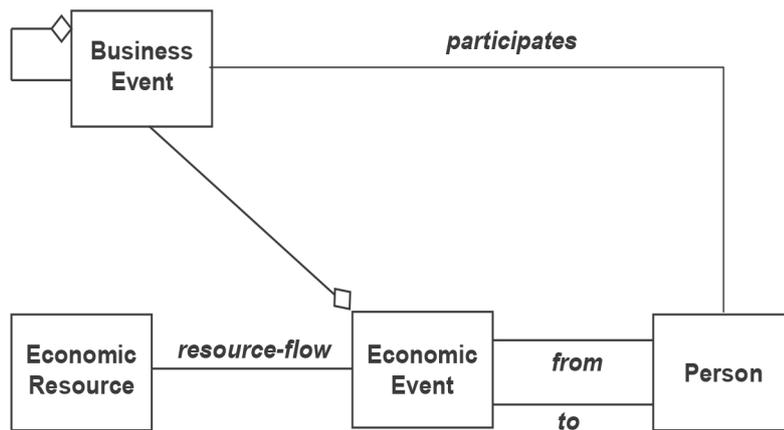
Figure 11 — Addition of business event to basic business transaction pattern

5.4   Extension of the OeBTO into types

Abstract concepts are information structures used to describe the intangible components of actual phenomena. For ontologists, this is an important distinction. In the OeBT ontology, "type images" are used to represent the abstract structure of economic phenomena. For the construction of abstract concepts, the common abstraction mechanism of typification[10] is used. This abstraction method is portrayed in Figure 12.

The bottom of Figure 12 represents things that really exist or have actually happened, like a digital product or some real material or an event that has transferred ownership of such resources. In concrete economic terms, this is where accountability for past and near future activities lies. At the top of the figure is where policies are specified in terms of the abstract economic future: things that could be or should happen. Typification works by abstractly specifying the grouped properties of real things, and policies can then be derived by associating those abstract entities.

In the UML class diagram of Figure 13, three of the economic primitives defined previously (economic resource, economic event, and Person), are typified to produce their abstract specification classes shown at the top of the figure (economic resource type, economic event type, and economic role).

---

10)   See explanation of typification in Geerts, G., and McCarthy W.E., Policy-level specifications in REA Enterprise Information Systems. *Journal of Information Systems*, 2006, 20(2) pp.37-63. (2006).
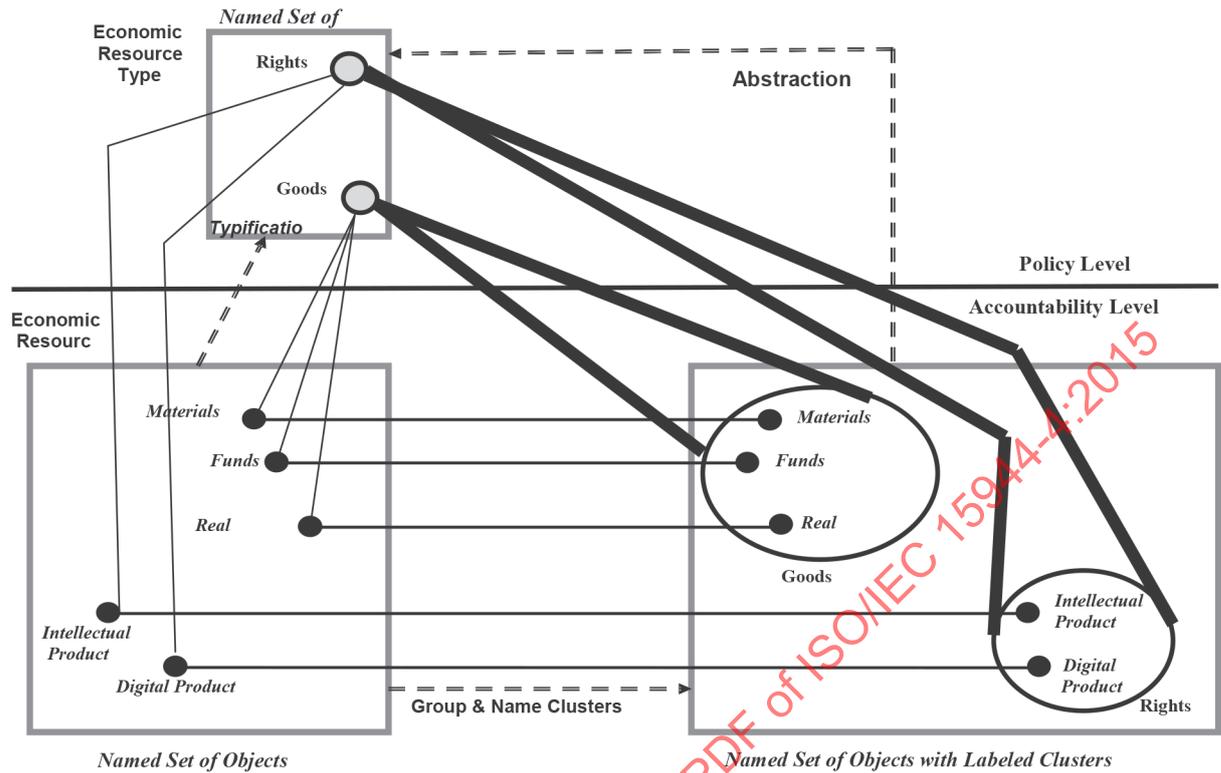
Figure 12 — Abstract specification with typification

When type images are connected with each other as illustrated in the top constellation of Figure 13, policy artifacts often emerge, such as the association between an economic event type (for example, large amount sales) and an economic role (such as the managerial position needed to authorize such a class of transactions). This kind of abstract specification is especially important to the pre-actualization components (planning, identification, and negotiation) of an Open-edi business transaction. For example, parties often specify in advance the types of goods they desire to be shipped under different delivery categories by different types of shipping agencies. Typification is strongly linked to the concept of Open-edi Scenarios which are formal specifications of particular classes of business transactions designed for reusability. As discussed below in Clause 6, connected type images also result many times in control artifacts such as the rules embodied in internal and external Open-edi constraints. Such constraints supply pre- and post-conditions on state machine transitions.
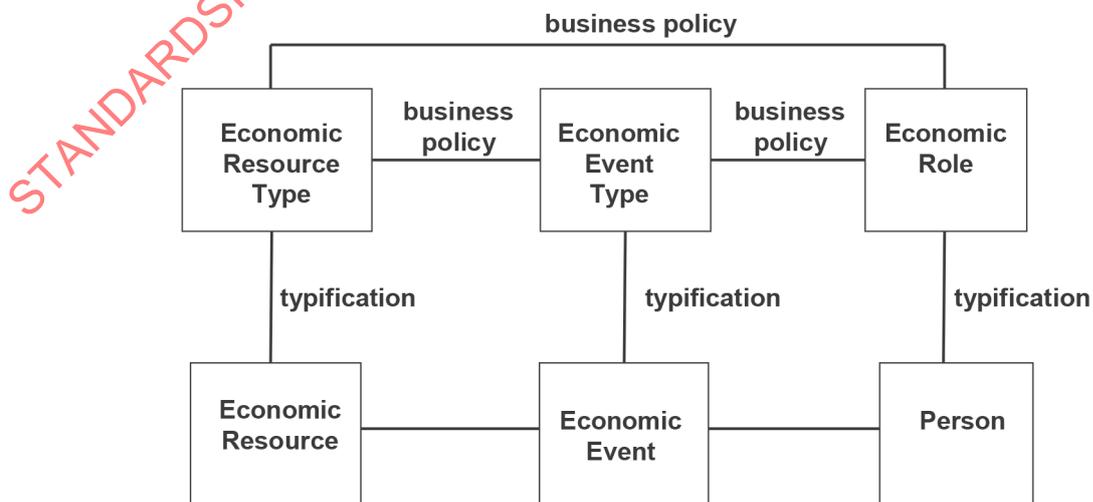
Figure 13 — Type connections for business policy

Rule 8:

Typification is a non-normative extension of the components of a basic economic exchange; thus connecting typified entities may specify the abstract rules or business policies under which business transactions occur.

5.5 Locations and claims

The UML class diagram of Figure 14 illustrates two non-normative additions to the basic Open-edi ontological framework; namely:

a) a business location designates the site where an economic event occurs if such information is needed. Locations also indicate the targeted delivery points for Economic Commitments. Location Types indicate grouped instances like an approved kind of delivery warehouse or an acceptable medical facility.

b) an economic claim is an optional materialization of a temporal imbalance in a duality relationship where an economic event has occurred without its requited correspondence to another economic event. An initial economic event materializes the claim, while the requiting economic event settles it.
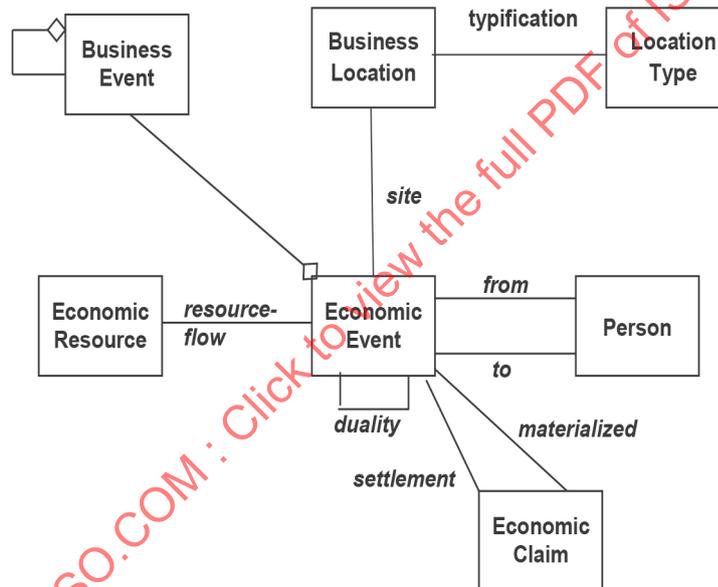
Figure 14 — Addition of business location and economic claim

5.6 Adding commitments to economic exchanges

In the Open-edi ontology, a business transaction pertains to the exchange of something of value as illustrated in the delivery-payment example of Figure 10. An additional key property of an Open-edi business transaction is that it involves commitment exchange as illustrated in Figure 15. In economic terms however, commitments do not occur in isolation because partners simply do not agree to value exchanges without reciprocation. Commitments are bundled in economic contracts between trading partners where, for example, a commitment to deliver some product is reciprocated by a commitment to pay cash.
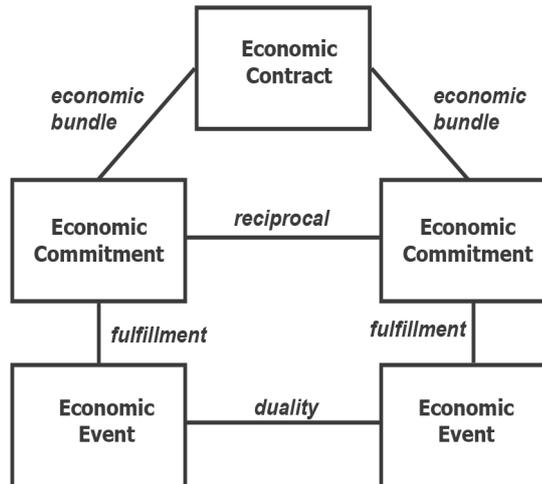
Figure 15 — Contract as a bundle of commitments

Rule 9:

Economic commitments are fulfilled by economic events; these commitments are the promised analog of economic events which are connected by duality relationships; and thus, commitments also shall occur in reciprocal pairs where the promise of one party is requited by the promise of the other.

In Figure 16, the ex ante nature of commitments is illustrated further. At a minimum, an Open-edi economic commitment should specify the type of economic resource expected in the fulfilling economic event. For example, a catalogue order chooses from a product list for delivery. Additionally, the economic commitment often will specify:

a) the type of event to fulfill it (such as an expedited delivery or a purchase under wholesale pricing), and

b) the business roles needed in the eventual exchange (such as a buyer, a seller, a seller agent, and a third-party escrow).

Economic commitments may less commonly specify types of locations, like an approved class of warehouses.
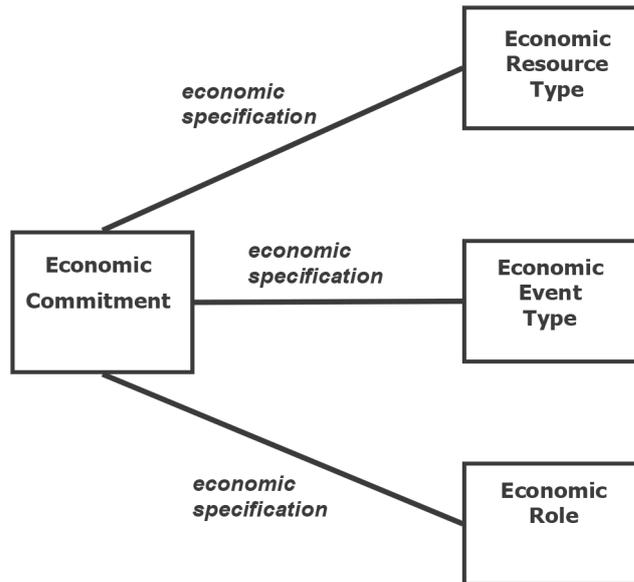
Figure 16 — Abstract specification of commitments

5.7 Business transactions with contracts

The UML class diagram of Figure 17 formally adds economic commitment structures to the basic notion of an economic exchange. As mentioned previously, commitment is one of the defining features of Open-edi, so these structures are extremely important ontological components.

a) An economic commitment is a promise to execute an economic event at some point in the future. The specification of an economic commitment may involve relationships with four type-level classes: economic resource type, location type, economic event type, and economic role. Economic commitments may also have relationships with economic resource (reserves), Person (participate), and business location (target).

b) A fulfillment relationship is an association between an economic commitment and the economic event that executes that commitment.

c) A reciprocal relationship is an association between economic commitments that each in turn individually fulfills compensating economic events.

d) An economic contract is a bundle of reciprocating commitments wherein two parties agree to a future schedule of exchanges with compensating economic events. An agreement is similar to an economic contract, but it is not legally enforceable.

e) An economic bundle relationship is an association between an economic contract and its pair of reciprocal economic commitments.
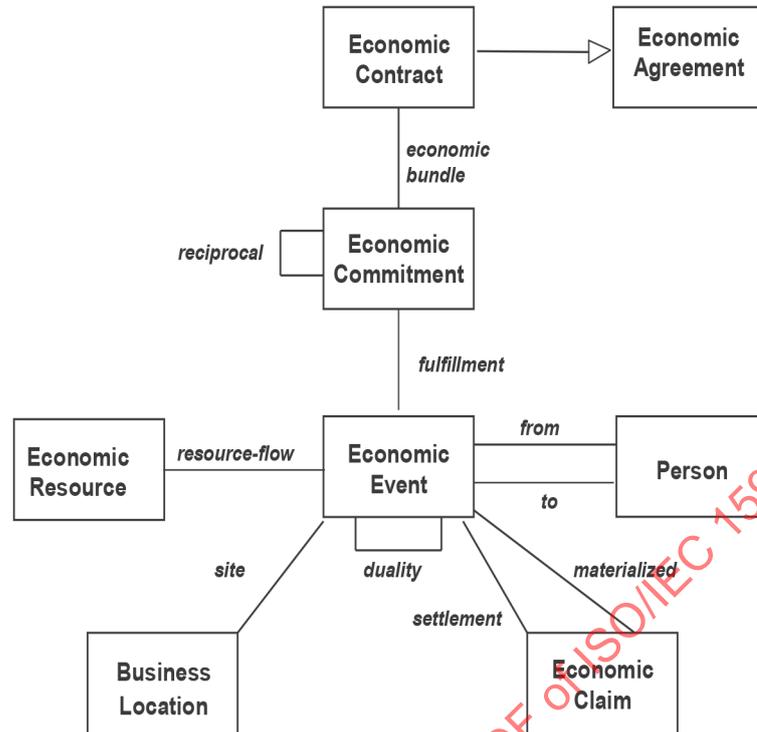
Figure 17 — Business transaction model with bundled commitments

Rule 10:

An economic contract is a reification of the reciprocal relationship among groups of economic commitments; however when the paired commitments have simple structures and there are no legal needs for a formal agreement, the economic contract entity becomes optional.

Figure 18 illustrates the full addition of the "commitments to type specification" by combining Figures 16 and 17. Additionally, it extends the concept of a *bilateral transaction* to that of a *mediated transaction* by including the previously-defined *third party* role of a *Person* as an essential ingredient of mediated collaborations. Figure 18 also indicates the essential roles of *regulators* who are Persons who constrain business transactions.
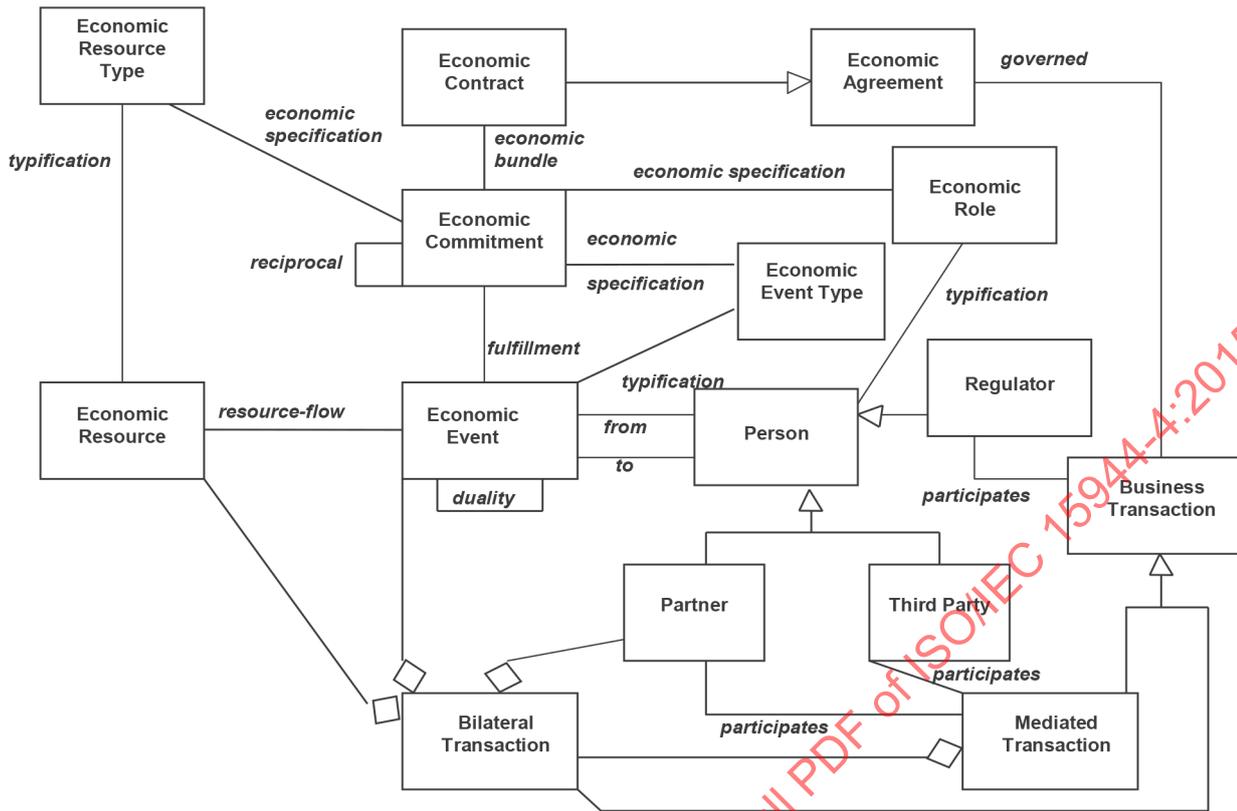
Figure 18 — Collaboration with commitment structures

Rule 11:

A bilateral business transaction shall include just the two basic kinds of partner: the buyer and the seller (or an agent for one or both); mediated business collaborations may involve the participation of a third party like a guarantor or a notary.

Rule 12:

All Open-edi business transactions, which include the modeling of external constraints in addition to internal constraints only, are subject to the participation of a regulator – a Person with the authority to prescribe external constraints which serve as principles or rules governing the behaviour of other types of participants in a business transaction.

5.8   Typifying agreements and business transactions

Figure 19 and Figure 20 illustrate typification of economic agreements and business transactions.

a)   All business transactions are set in both defined markets and undefined markets, both of which are overseen by various jurisdictional domains.

b)   Business transactions may be classified into different kinds of Open-edi scenarios such as the 2x2x2 (overall giving eight combinations) factoring shown in the cloud at the bottom of Figure 19[11].

c)   An agreement can be decomposed into classes like leases/rentals, service agreements, consignments, and purchases. Agreements have pricing methods like reverse auctions, open and closed bids, and individual quotes. These methods can in turn be typified into classes (Pricing) like bid, auction, or matching. These are all illustrated in Figure 20.

---

11)   A more complete explanation of this classification scheme for Open-edi scenarios is given in ISO/IEC 15944-1, Clause 6.6 "*Primitive classification and identification of Open-edi scenarios*".

The modeling specifications illustrated in Figure 4 through Figure 20 give specific conceptual definition to many of the Open-edi business transaction terms used in ISO/IEC 15944-1. In the following clause, the behavioural use of these components is explained with explicit reference to the Open-edi notion of business transaction phases. According to ISO/IEC 15944-1, a business transaction proceeds through the stages of planning, identification, negotiation, actualization, and post-actualization, and an ontologically-based state machine model of this progress is explained there.
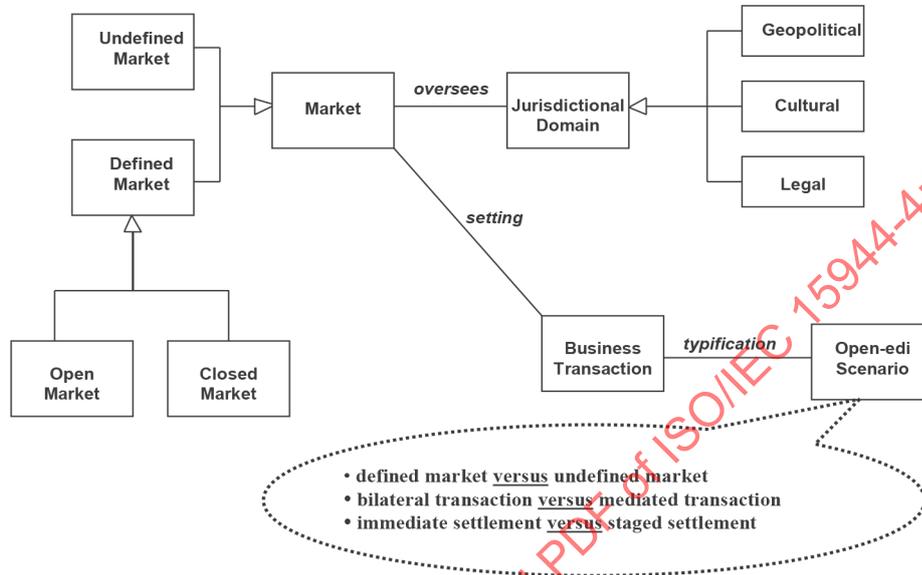
Figure 19 — Addition of markets and scenarios for business transactions
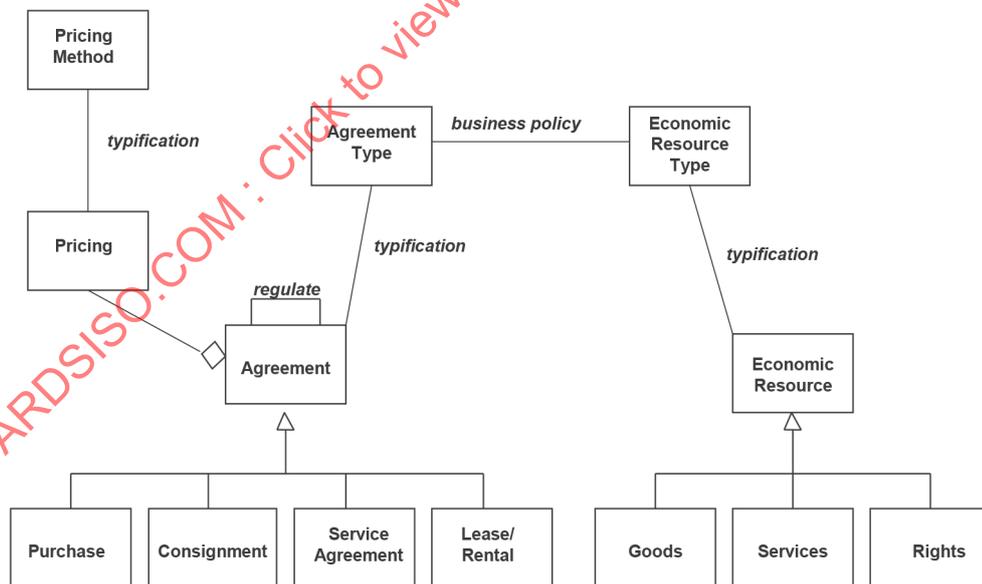
Figure 20 — Agreement types with pricing methods

6 The procedural component of an OeBTO — Business transaction state machines

An ontology has a <u>declarative</u> component – which specifies the categories into which collaboration data exchanged among Persons in a business transaction may be slotted; a <u>procedural</u> component – which specifies how that data is to be used in deriving conclusions; and a <u>constraint</u> component – which specifies the business rules for both data and procedures. In an operational use of the Open-edi Business Transaction Ontology, the various declarative components specified in <u>Clause 5</u> – for example all of the classes illustrated in <u>Figure 18</u> – become defined as business transaction entity types (BTET). BTETs represent the abstract specification of business transaction entities (BTE), detailing their recommended attributes, their recommended methods, and their recommended life-cycle states. Additionally, a business transaction entity type will usually specify the types of business events that cause a BTE of this type to proceed through its different states as the business transaction itself progresses through its own phases of planning, identification, negotiation, actualization, and post-actualization. A BTE thus is a particular real instance of a business transaction entity type.

Rule 13:

A business transaction entity (BTE) shall be viewed and defined as the computable representation of any real world entity that participates, occurs, or is materialized during a particular business transaction, and for procedural materialization of conclusions during a business transaction, the combined use of the BTE attributes, methods, and states shall be used to determine its status as a component in an economic exchange.

6.1 Relating ontological components to the Open-edi business transaction phases

From ISO/IEC 15944-1, the paragraphs below enumerate the five identified phases of an Open-edi business transaction[12]. This phase specification is one of the major building blocks of ISO/IEC 15944-1.

a) <u>Planning:</u> In the planning phase, both the buyer and seller are engaged in activities to decide what action to take for acquiring or selling a good, service, and/or right.

b) <u>Identification</u>: The identification phase pertains to all those actions or events whereby data is interchanged among potential buyers and sellers in order to establish a <u>one-to-one linkage.</u>

c) <u>Negotiation</u>: The negotiation phase pertains to all those actions and events involving the exchange of information following the identification phase where a potential buyer and seller have (1) identified the nature of good(s) and/or service(s) to be provided; and, (2) identified each other at a level of certainty. The process of negotiation is directed at achieving an explicit, mutually-understood, and agreed-upon goal of a business collaboration and associated terms and conditions. This may include such things as the detailed specification of the good, service, and/or right, quantity, pricing, after sales servicing, delivery requirements, financing, use of agents and/or third parties, etc.

d) <u>Actualization</u>: The actualization phase pertains to all activities or events necessary for the execution of the results of the negotiation for an actual business transaction. Normally the seller produces or assembles the goods, starts providing the services, prepares and completes the delivery of good, service, and/or right, etc., to the buyer as agreed according to the terms and conditions agreed upon at the termination of the negotiationphase. Likewise, the buyer begins the transfer of acceptable equivalent value, usually in money, to the seller providing the good, service, and/or right.

e) <u>Post-Actualization</u>: The post-Actualization phase includes all of the activities or events and associated exchanges of information that occur between the buyer and the seller after the agreed upon good, service, and/or right is deemed to have been delivered. These can be activities pertaining to warranty coverage, service after sales, post-sales financing such as monthly payments or other financial arrangements, consumer complaint handling and redress or some general post-actualization relationships between buyer and seller.

---

12)   SOURCE: ISO/IEC 15944-1, Clause 6.3 "*Rules governing the process component*".

Rule 14:

Conceptually, a business transaction shall be considered to be constructed from a set of fundamental activities which are planning, identification, negotiation, actualization and post-actualization.

Figure 21 adds the definition of these business transaction phases to the OeBTO declarative primitives for a bilateral collaboration.
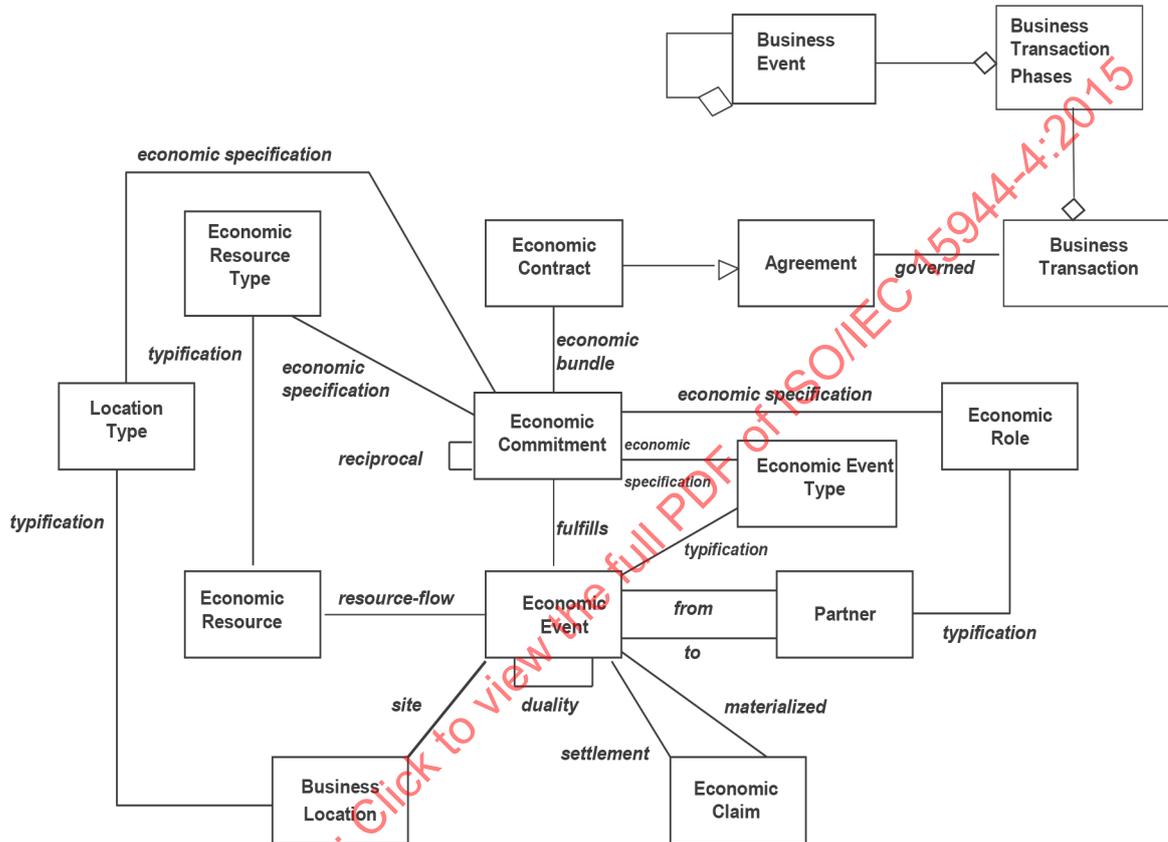
Figure 21 — Open-edi ontology with business transaction phases and business events

Figure 21 also specifies that these Open-edi business process phases have business events as components, illustrating the behavioral progress through each phase as marked by collaborative activities. A business event is defined as an occurrence in time that partners to a business transaction wish to monitor or control. Business events are the fuel that drives a business transaction state machine, as they progress that dynamic representation through its five phases by changing the states of the ontological components illustrated in Figure 21. Additionally, business events have component structures as illustrated by the recursive relationships in Figure 21, and this facilitates the modeling of activities in business collaboration space at whatever level of granularity is needed. Business event components of instant duration can drive the state of a higher-level business event with extended duration from start to completion, and that higher level component may then effect a state change in one of the other business transaction entities for a particular transaction.

Figure 22 illustrates the approximate correspondence of the Open-edi business transaction phases with the categories of ontological components defined in Clause 5.
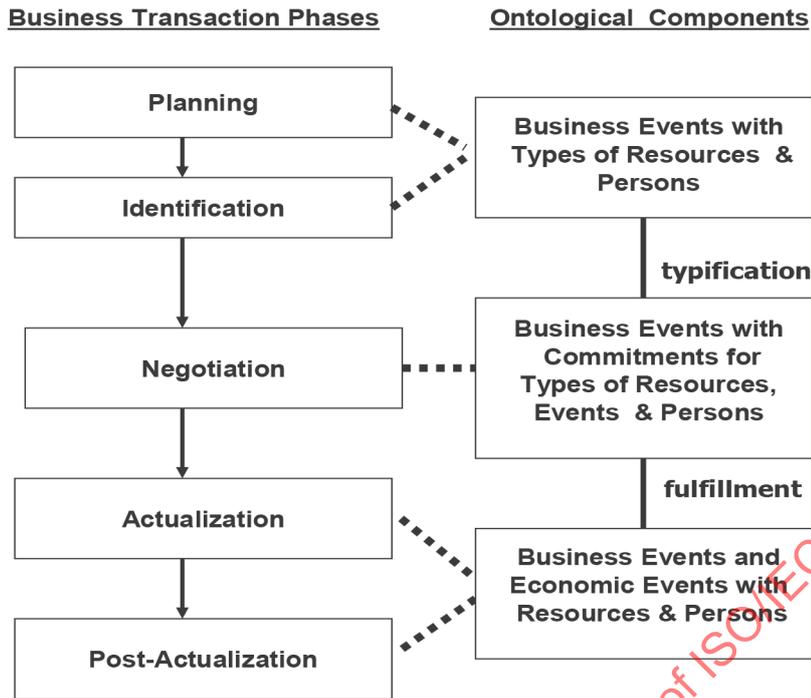
Figure 22 — ISO Open-edi phases with components

— Planning and identification involve business events wherein potential buyers and sellers identify each other by matching on proposed types of resources to be exchanged and their actual trading partners.

— Negotiation involves business events wherein linked business partners cooperate on the abstract specification of their proposed exchange (its type of resources, events, and roles as stipulated in a contract).

— Actualization and post-actualization involve business events that aggregate to the performance of resource transfers (the actual economic events) between the buyer and seller.

Business events are the specific activities that mark the explicit states that trading partners expose to each other as they complete an exchange. For example, supplying a quote on a listed product during negotiation may progress an economic commitment from status (or state) "unspecified" to "proposed" while simultaneously marking a resource type and an event type as "specified". If this business event of supplying a quote was followed by a quote acceptance and then a payment terms acceptance, an economic contract might move into status "in-force" and then the entire negotiation phase might move into state "completed." This completed negotiation would keep the entire business transaction in state "in progress," whereas an unsuccessful negotiation might have moved the overall business transaction into state "aborted" or state "suspended."

Rule 15:

Business events are the activities or messages that collaborative business partners shall use to communicate their progress through a business transaction.

Figure 23 portrays the individual phases of a business transaction and the targeted object states that would signal to each business partner that a particular phase was now complete.

a) Planning is complete when both trading partners have formulated an abstract vision of an exchange. This involves moving the entities representing the potential partner and the potential type of resource into "candidate" states.

b) Identification is complete when the corresponding partners have been identified along with their identified resource types. This establishes a 1-to-1 linkage between the partners concerning a common trading interest.

c) Negotiation is complete when the abstract specification of economic commitments is done and when all the commitments and a contract move to an "in-force" condition. Generally, this would mean that the entities for the types of resources to be exchanged are in state "specified." It could also mean that economic specifications are complete for the type of event, the economic roles, and the types of location.

d) Actualization is complete when the requiting economic event entities are both in state "complete," thus marking the completion of the full exchange.

e) Post-Actualization is complete when the possible warranty (or similar post-exchange exception condition) component of an economic resource is invoked, and the conditions of the exchange reach their final values.
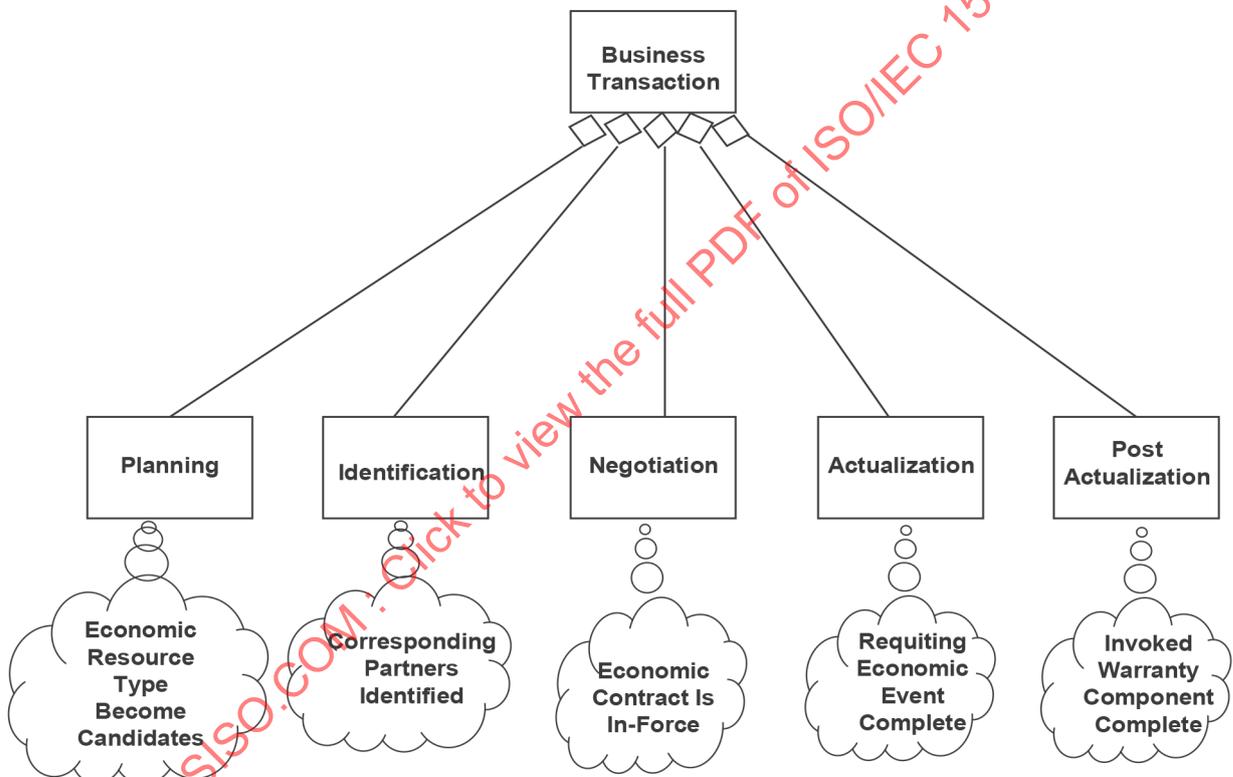
Figure 23 — Phases of a business transaction and object states for completion

Figure 24 illustrates how the declarative ontological components of Open-edi (referred to here as business transaction entity types) can be augmented to account for state machine mechanics. Each ontological component is envisioned as a possible business transaction entity with a defined business transaction entity lifecycle consisting of multiple business transaction entity states. The transition to these states is effected by the occurrence of a business event.
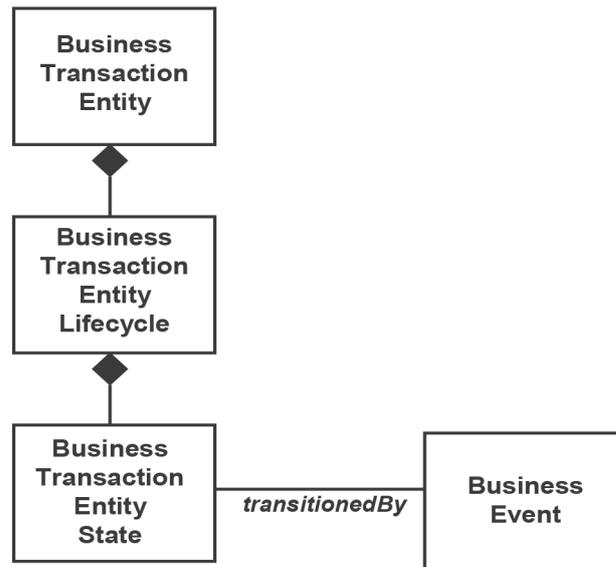
Figure 24 — Business transaction entities, lifecycles, states, and events

Figure 25 illustrates some example states that could be identified for some of the Open-edi Ontology components defined thus far. In a full ontological specification, all of the business transaction entity types defined in this document would be given fully-enumerated lifecycles of object states (as specified in Figure 24). However, these would change from one business context to another, so the exposition here is limited to these four samples.

Rule 16:

In the OeBTO, all declarative components shall become candidates for business transaction entities, and each of these in turn shall have a defined life cycle of states that shall mark its progressive use in the representation of a real economic exchange.

Sample Business Transaction Entity	**Example States (Lifecycles) for Business Transaction Entity**
Business Transaction	• Waiting-Start • In-Service • Completed • Aborted • Suspended
Economic Claim	• Materialized • Settled
Economic Resource Type	• Candidate • Planned • Identified • Proposed • Specified • Actualized
Business Transaction Phase	• Pending • In-Service • Complete

Figure 25 — Sample states for business transaction entities

Figure 26 lists an example set of business events involved in a typical instance of a business transaction. These 14 business events represent a full collaboration between an example buyer and seller, as it proceeds through the Open-edi phases. Again, each business event might cause multiple state changes. For example:

a) The fourth activity – Buyer sends Availability and Price Request to Seller – would cause:

   1) the economic resource type to move into its *Specified* state, plus

   2) the identification phase to move into its *In-Force* state.

b) The ninth activity – Buyer sends an Order Acceptance to Seller for parts – would cause:

   1) the economic resource types, the economic event types, and the economic roles to move into their *Specified* states, plus

   2) the economic contract and the economic commitment entities to move into their *In-Force* states.

c) The eleventh activity – Buyer sends *Receiving Report* to Seller when inspected goods are accepted – would cause the economic event to move into its *Completed* state, and the economic resource to move into its *Transferred* state.

BT Phase	Example Business Event
Planning	Seller publishes *Catalog*
	Buyer sends *Catalog Request* to Seller
	Seller sends *Catalog* to Prospective Buyer
Identification	Buyer sends *Availability and PriceRequest* to Seller
	Seller returns *Availability and PriceResult* to Buyer
Negotiation	Seller sends *Order Request* to Buyer
	Buyer sends *Offer* to Seller
	Seller sends *Counter Offer* to Buyer
	Buyer sends an *Order Acceptance* to Seller for parts (alternatively a *Non Acceptance* would suspend or abandon the Business Transaction)
Actualization	Seller sends an *Advance Shipping Notice* when goods are prepared for shipping
	Buyer sends *Receiving Report* to Seller when inspected goods are accepted
	Seller sends an *Invoice* to Buyer after parts are shipped
	Buyer sends *Remittance Advice* to Seller with information about payment of the *Invoice*
Post-Actualization	Buyer sends *Warranty Invocation* to Seller

Figure 26 — Example business transaction with business events grouped in phases

A UML state machine diagram is the best formal specification of dynamic object behavior with state changes. Such a specification is illustrated in Figure 27 for the *business entity type* "economic resource type" as it moves through the example collaboration.

a) The economic resource type (for example a type of inventory) would become a *Candidate* when the Publish-Catalog event occurs, moving from its initial undefined state (black dot).

b) The Send-Availability-And-Price-Request event would then move the inventory into state *Planned.* This same event would move the identification phase of the business transaction into state *In-Service* (not shown in Figure 27).

c) The Return-Availability-And-Price-Result would cause the inventory to become *Identified.* This same event would move the identification phase of the business transaction into state *Complete* (not shown).

d) The Send-Offer event would shift the example inventory into its *Proposed* state.

e) The Accept-Offer would cause the economic resource type to become *Specified*.

f) And finally, a Send-Shipping-Notice action would cause the resource type to move to an *Actualization* state (end of object life cycle).[13]

---

13)   In reality, this state machine example for economic inventory type is slightly more complicated as the individual state changes would need to be tracked through a UML association class between the economic inventory type and the business transaction.
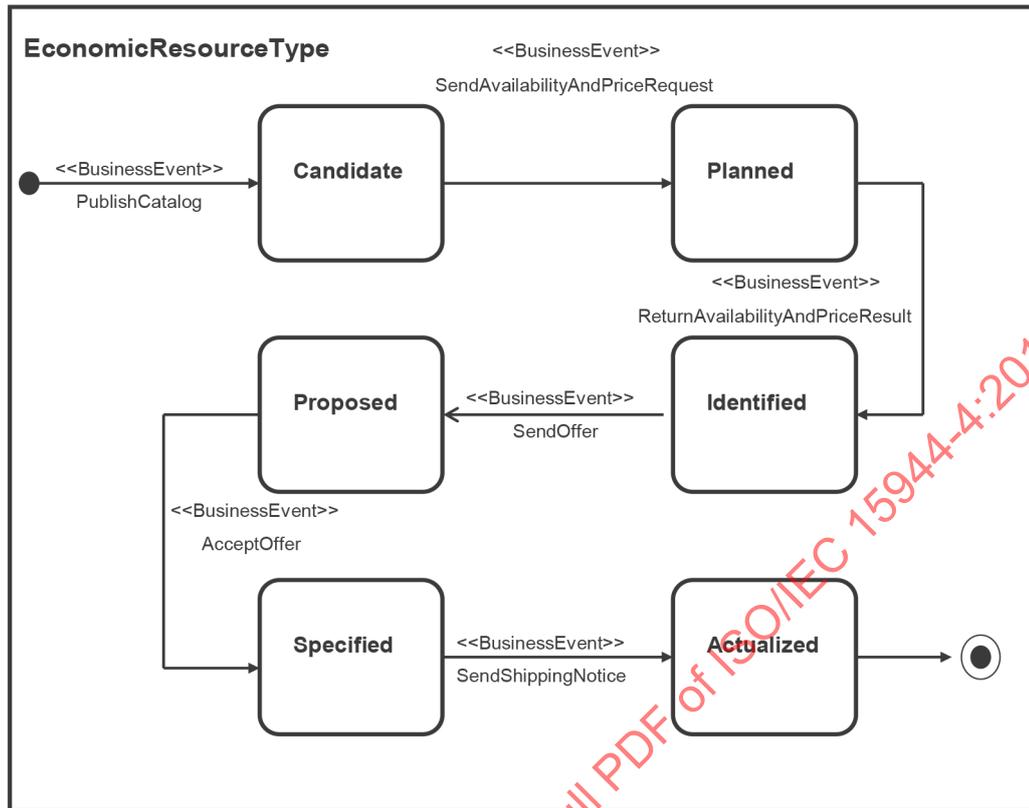
Figure 27 — State machine diagram for economic resource type

Figure 27 illustrates the progress of a collaboration between two trading partners from the perspective of one business transaction entity as it progresses through its state changes. Figures 28-31 provide a different, but much more comprehensive view of progress through the first three phases (planning, identification, and negotiation)[14] of the same business transaction[15]. Each of these figures illustrates a UML activity graph with various business events (such as "Publish-Catalog" at the top right of Figure 28) being performed by either the buying partner (left column) or the selling partner (right column). The collaboration space between the buyer and seller (first illustrated in Figure 3) is where the shared business entity states reside that allow each partner to determine simultaneously what the exact status of the overall business collaboration is. For example in Figure 28, the Publish-Catalog event at the upper right causes the entity economic resource type to move into state *Candidate* (as earlier illustrated in Figure 27) and the entity planning phase to move into state *Waiting Start*. For purposes of parsimony, Figures 28-31 do not illustrate all of the state changes that would occur in a collaboration, only an illustrative subset. For example, it would commonly be the case that the *Completed* state of one transaction phase (such as identification) would cause the following phase (such as negotiation) to move into a *Waiting Start* state. However, this state transition is not shown.

---

14)   The exposition here is limited to these first three phases for parsimony sake. Including the phases of actualization and post-actualization would make the activity documentation twice as long with little gained in explanation power.

15)   Figures 28-31 are intended to be read consecutively. For example, the start of Figure 29 (illustrated as a filled-in circle) connects with the finish of Figure 28 (illustrated as a target circle).
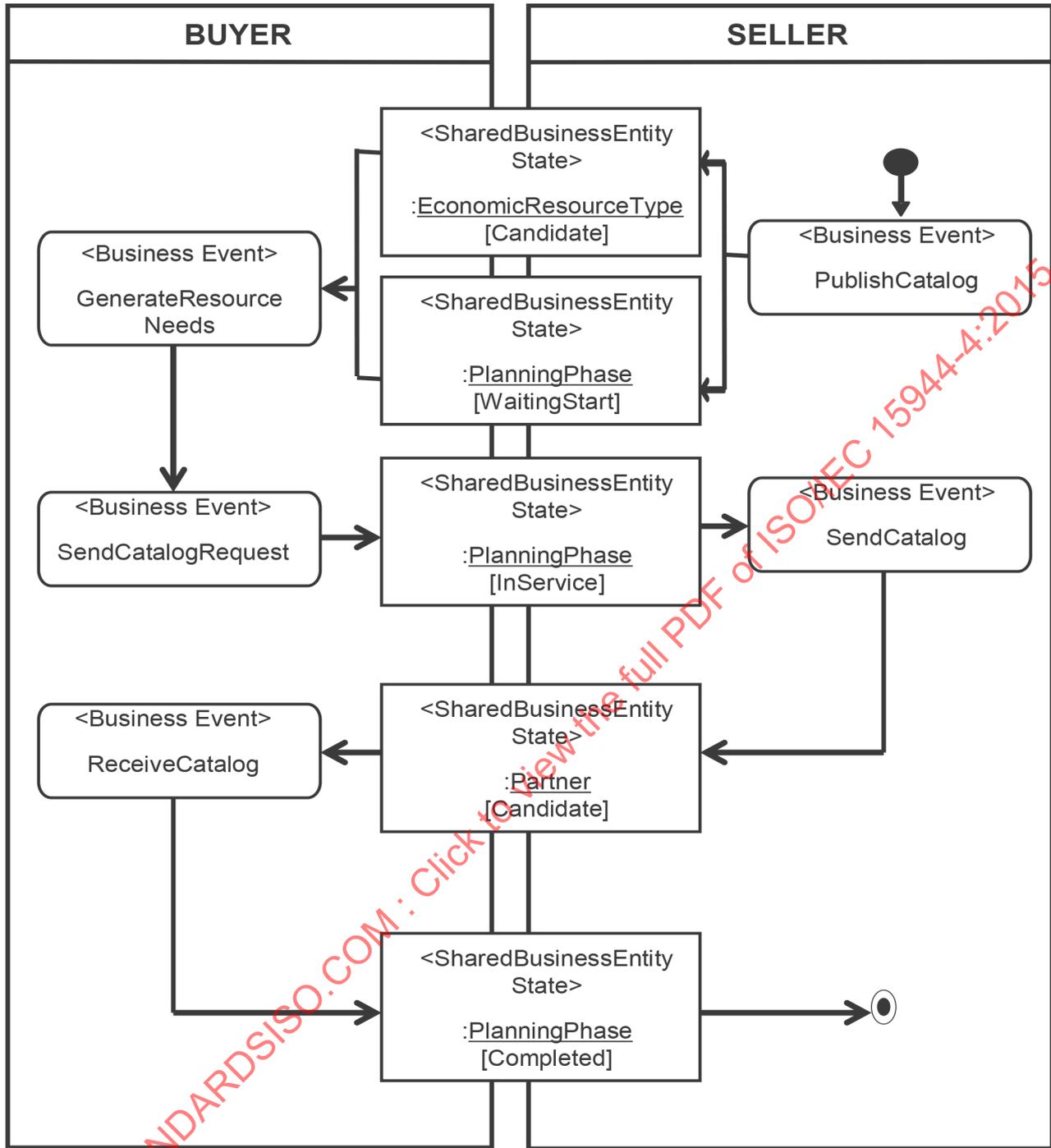
Figure 28 — Activity graph (1) for collaboration

Figure 29 — Activity graph (2) for collaboration

BUYER	SELLER

<Business Event>

EvaluateOffer

yes   **OK?**   no

<InternalBusiness
EntityState>

:Order
[Acceptable
ShipmentTerms]

<InternalBusiness
EntityState>

:Order
[NotAcceptable
ShipmentTerms]

<SharedBusinessEntity
State>

:EconomicResourceType
[IProposed]

<Business Event>

PrepareCounterOffer

<SharedBusinessEntity
State>

:EconomicEventType
[Proposed]

<SharedBusinessEntity
State>

:EconomicRole
[Proposed]

<Business Event>

SubmitCounterOffer

<Business Event>

EvaluateOffer

Figure 30 — Activity graph (3) for collaboration
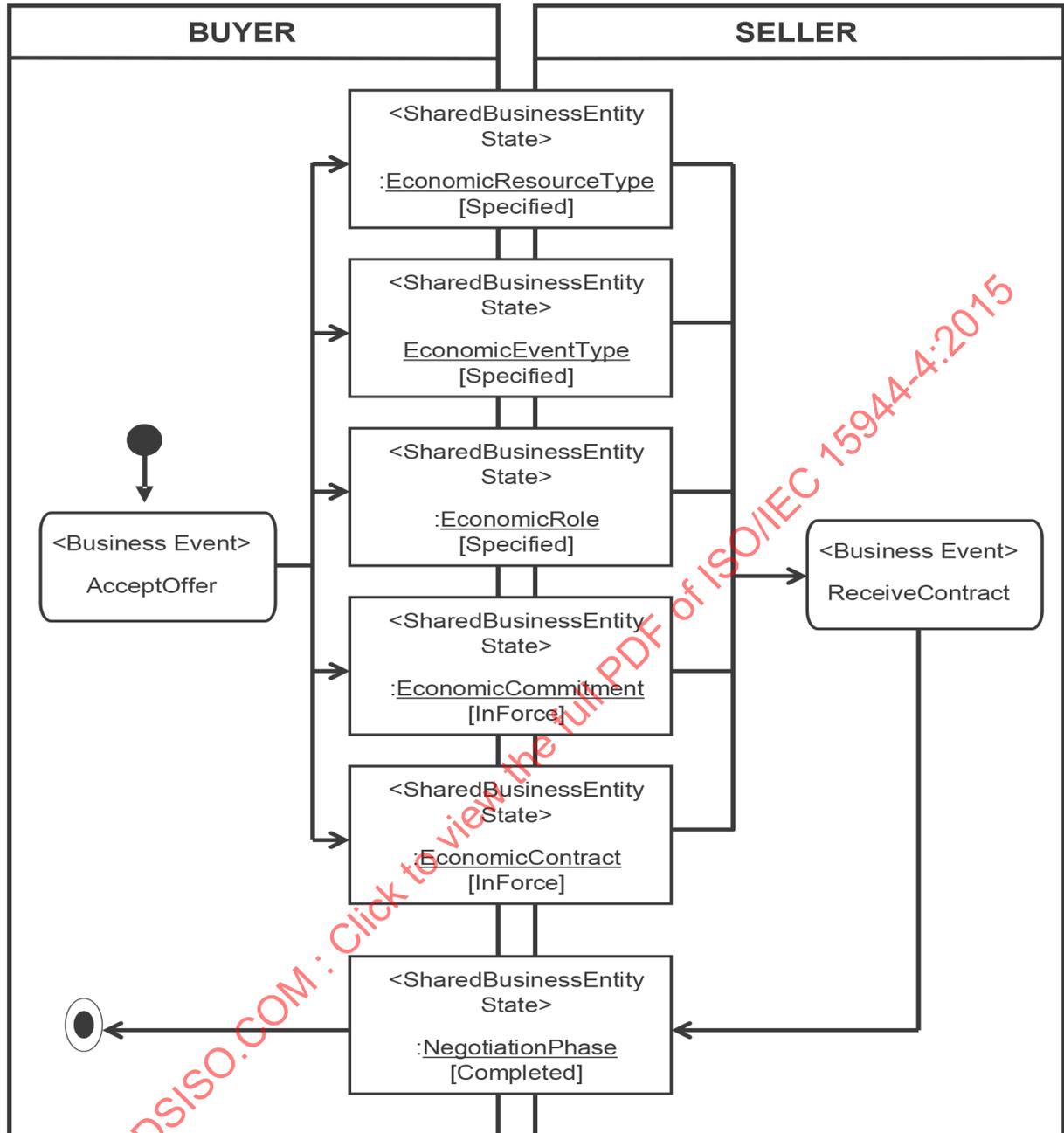
Figure 31 — Activity graph (4) for collaboration

To summarize the state machine presentation, it is necessary to understand how the definitions of Clause 5 and Clause 6 work together.

a) Clause 5 defined the declarative components of the Open-edi ontology. This is a specification of the primitive classes as they model the components of a business transaction. These primitive classes become candidates for business transaction entity types, and their realization during an actual business collaboration would become business transaction entities.

b) Clause 6 defined the procedural components of the Open-edi ontology. This illustrated the dynamic mechanics of tracking business collaboration through each of the five Open-edi phases using state machine mechanics. This progress was illustrated with the UML, first from the perspective of a single business transaction entity (state machine diagram) and second from the perspective of the entire workflow (activity graphs).

With partners communicating with each other through shared states of business transaction entities, the actual status of an Open-edi collaboration is exactly determined for each at any point in time.

Rule 17:

In the OeBTO, the declarative components – the business transaction entities – and the procedural components – the shared collaboration space state machines – shall work in tandem to fully track the activities and progress in an economic exchange.

A realization of the OeBTO may require an integrated specification of both features – declarations and procedures — in the conduct of an Open-edi business transaction.

7 The constraint component of an OeBTO — Incorporating business rules into business transactions

7.1 Business rules and Open-edi constraints

Business rules specifying computational procedures, approved sequences of actions, valid inferences, and effective control monitoring govern the day-to-day operations of business enterprises. A useful definition of a "business rule" from Eriksson and Penker (2000:81) is:

> … a statement that can control or affect the execution of a business process as well as the structure of the resources in a business. The statement specifies a condition that must be upheld, or a condition that controls which activity should follow next. It can express a business goal, specify the way a process should execute, detail the conditions of a relationship, or constrain the behavior of a resource.

In the database world somewhat synonymously, "constraints" are defined as rules governing the integrity of data that prevent a database from moving from one representation state to another without proper validation, and in the most simple ontological case, their function is exactly congruous with the business rules definition given above. Database integrity constraints are also commonly referred to as assertions.

In ISO/IEC 15944-1, a **constraint** is defined as "a rule, explicitly stated, that prescribes, limits, governs, or specifies any aspect of a *business transaction*." That same standard differentiates those constraints that are self imposed by the trading parties (internal) from those constraints created by law, regulation, orders, treaties, conventions, or similar instruments (external):

a) **internal constraint**: a constraint which forms part of the *commitment(s)* mutually agreed to among the parties to a *business transaction*

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

Open-edi further divides the category of external constraints into (1) those that are common and horizontal in nature as introduced by the additional presence in a business transaction of a "regulator" as a third sub-type of Person representing "public administration", and (2) those that are more sectorial in nature (involving standard rules, both across many sectors and across just one sector). Open-edi differentiates these classes of constraints in order to provide summaries of complex bundles of rules for scenario registration. For example, the simplest constraint bundle for a scenario could aggregate only internal constraints; the next most complex could add horizontal external constraints, etc.

In the OeBTO, constraints encapsulating business rules constitute the third major representation component. The first component was the declarative specification of domain classes and associations in Clause 5, while the second component was the procedural aspects associated with business transaction state machines and activity graphs as explained in Clause 6.

7.2　OeBTO constraint examples

Constraints may be expressed informally in natural language, such as the following accounting rule for separation of duties as applied to the class diagram of Figure 9:

"the Person who fills the participation role in an economic event that involves a certain economic resource should not be the same Person who has a custody relationship with that economic resource"

The need for this constraint to a business transaction could be derived for example from the widely-used internal control *separation of duties* constraint common to most accounting applications.

Constraints may also be expressed more formally with the Object Constraint Language (OCL) of the UML. For example, a state sales tax rule for Michigan (another sectorial external constraint) on merchandise orders (a subtype of economic contract) could be specified as 6% of the gross amount of the order:

context Order inv michiganSalesTaxCalculation

salesTax = grossAmount × .06

Such a constraint could be placed in curly brackets on a UML class diagram next to the class definition for order (for example, a more specific form of Figure 18), and it then becomes an invariant (inv) or a condition that must be true for all objects of that class.

According to both Odell (1998) and Eriksson and Penker (2000), constraints may be of two general behavioral kinds:

a) Those that define how knowledge in one form may be inferred or derived from another form. Examples of this constraint category might be the Michigan sales tax calculation shown above. Another example might be a constraint that designates a scheduled shipment as "hazardous" if it exceeds a designated weight threshold of goods (economic resources) typed as "dangerous if unpackaged" shown in an inheritance taxonomy that would give domain level expansion to the three levels initially shown in Figure 7.

b) Those that "constrain either the possible structure or the behavior of objects or processes, that is, the way objects are related to each other or the way objects or process state changes may occur."(Eriksson and Penker 2000:154). An especially prominent illustration for the OeBTO of this class of constraints are rules that define pre-conditions and post-conditions for the types of state changes described in Clause 6. For example in Figure 29, the state machine diagram makes it clear that for Economic Resource Type to achieve its "proposed" state, it has a pre-condition of being in state "identified" and a post-condition of state "specified" and that these transitions are effected by the business events shown. These same types of rules can be specified as constraints in OCL and portrayed on UML class diagrams.

Both derivation business rules and constraint business rules are important to effective business operation in collaboration space, so their characterization in the Open-edi Business Transaction Ontology is an important third step in insuring interoperability and semantic integrity. To the extent that the declarative and procedural components of an ontology are specified correctly, the parties to a business transaction are given computable methods for ensuring compliance with both internal and external rules of business behavior.

7.3　Summary

There is certainly now a critical opportunity for developing coherence in worldwide standards for business level definitions of economic phenomena. Open-edi, especially in its prior work of ISO/IEC 15944-1, has standardized much of the technical and economic environment for economic exchanges, and the field of ontology provides an extended opportunity for unifying and coordinating that work. This part of ISO/IEC 15944 aims to provide that unity with an ontological analysis of the declarative, procedural, and constraint components of Open-edi. Certainly, the majority of the work in this document concentrates on the declarative components of the OeBTO – those data classes that model the fundamental categories of economic endeavors in collaboration space and the relationships that exist among those categories.

This declarative emphasis is reasoned and deliberate. As noted by John Sowa (1984:24), conceptual progress in a specialized domain is usually marked by an increasing percentage of the knowledge in that field being embedded in its declarative components. As ad hoc procedures and constraints become more structured and predictable, they lead naturally to better theoretical and conceptual structures.

In concert, the declarative, procedural, and constraint components of the Open-edi ontology provide a definitive specification that is formal, explicit, and conceptual. An ontological foundation is one of the key components of that coherence.

Annex A
(normative)

Consolidated list of terms and definitions with cultural adaptability: ISO English and ISO French language equivalency

A.1 Introduction

Users of this part of ISO/IEC 15944 may not have ready access to all standards referenced in either the ISO English language version or the ISO French language equivalent where available.

This part of ISO/IEC 15944 maximizes the use of existing standards where and whenever possible including relevant and applicable existing terms and definitions. This annex contains the consolidated list of the ISO English and ISO French language paired terms and definitions used in this part of ISO/IEC 15944 including those terms and definitions introduced in this part of ISO/IEC 15944. The source is Clause 3, Terms and Definitions.

This annex is based on the approach taken for this multipart standard established in Annex A of ISO/IEC 15944-1:2011.

A.2 ISO English and ISO French

This part of ISO/IEC 15944 recognizes that the use of English and French as natural languages is not uniform or harmonized globally. (Other examples include use of Arabic, German, Portuguese, Russian, Spanish, etc., as natural languages in various jurisdictions).

Consequently, the terms "ISO English" and "ISO French" are utilized here to indicate the ISO's specialized use of English and French as natural languages in the specific context of international standardization, i.e., as a "special language".

A.3 Cultural adaptability and quality control

ISO/IEC JTC1 has added "cultural adaptability" as the third strategic direction which all standards development work should support. The two other existing strategic directions are "portability" and "interoperability". Not all ISO/IEC JTC1 standards are being provided in more than one language, i.e., in addition to "ISO/IEC English", in part due to resource constraints.

Terms and definitions are an essential part of a standard. This Annex serves to support the "cultural adaptability" aspects of standards as required by ISO/IEC JTC1. Its purpose is to ensure that if, for whatever reason, an ISO/IEC JTC1 standard is developed in one ISO/IEC "official" language only, at the minimum the terms and definitions are made available in more than one language.[16] A key benefit of translation of terms and definitions is that such work at providing bilingual/multilingual equivalency:

— should be considered a "quality control check" in that establishing an equivalency in another language ferrets out "hidden" ambiguities in the source language. Often it is only in the translation that ambiguities in the meaning, i.e., semantics, of the term/definition are discovered. Ensuring bilingual/multilingual equivalency of terms/definition should thus be considered akin to a minimum "ISO 9000-like" quality control check; and,

---

16) Other ISO/IEC member bodies are encouraged to provide bilingual/multilingual equivalencies of terms/definitions for the language(s) in use in their countries.

— is considered a key element in the widespread adoption and use of standards world-wide (especially by users of this standard who include those in various industry sectors, within a legal perspective, policy makers and consumer representatives, other standards developers, IT hardware and service providers, etc.).

A.4 List of terms in French alphabetical order

Generally, within a standard, the Clause 3 terms and definitions are presented in alphabetical order and assigned Clause 3.nn ID numbers accordingly. The Consolidated Matrix of terms and definitions presented below does the same.

In order to facilitate the identification of the terms in the French language the following list presents them in French alphabetical order along with their English language equivalents in a table of three column where,

— Column 1 = the number assigned to the term/definition pair in Clause 3

— Column 2 = the Term - French

— Column 3 = the Term – English

Clause 3 Number (1)	Term — French (2)	Term — English (3)
3.19	accord économique	economic agreement
3.11	acheteur	buyer
3.54	administration publique	public administration
3.4	affaires	business
3.2	attribut	attribute
3.57	autorité de réglementation	regulator
3.62	Composant sémantique (SC)	Semantic Component (SC)
3.14	contrainte	constraint
3.33	contrainte externe	external constraint
3.38	contrainte interne	internal constraint
3.23	contrat économique	economic contract
3.24	contrôle économique	economic control
3.16	donnée	data
3.18	dualité	duality
3.27	échange économique	economic exchange
3.43	EDI-ouvert	Open-edi
3.6	emplacement d'affaires	business location
3.13	engagement	commitment
3.22	engagement économique	economic commitment
3.32	entité	entity
3.9	entité de transaction d'affaires	business transaction entity
3.12	espace de collaboration	collaboration space

Clause 3 Number (1)	Term — French (2)	Term — English (3)
3.5	évènement d'affaires	business event
3.25	évènement économique	economic event
3.34	exécution	fulfillment
3.37	faisceau d'informations (IB)	information bundle (IB)
3.20	faisceau économique	economic bundle
3.58	flux des ressources	resource-flow
3.15	garde	custody
3.36	individu	individual
3.56	information enregistrée	recorded information
3.1	mandataire	agent
3.40	matérialisé	materialized
3.17	modèle de marché défini	defined market model
3.67	modèle de marché indéfini	undefined market model
3.42	objet	object
3.44	Ontologie de transaction d'affaires de l'EDI ouvert	Open-edi Business Transaction Ontology (OeBTO)
3.47	organisation	organization
3.51	partenaire	partner
3.45	Partenaire d'EDI-ouvert (OeP, Open-edi Party)	Open-edi Party (OeP)
3.50	participe	participates
3.48	partie d'organisation	organization part
3.52	Personne	Person
3.49	Personne d'organisation	organization Person
3.53	processus	process
3.55	réciproque	reciprocal
3.21	réclamation économique	economic claim
3.35	régi	governed
3.63	règlement	settlement
3.59	responsabilité	responsibility
3.28	ressource économique	economic resource
3.60	rôle	role
3.30	rôle économique	economic role
3.46	scénario d'EDI-ouvert (OeS)	Open-edi scenario (OeS)
3.64	site	site
3.31	spécification économique	economic specification
3.65	tierce partie	third party
3.41	transaction arbitrée	mediated transaction
3.3	transaction bilatérale	bilateral transaction

Clause 3 Number (1)	Term — French (2)	Term — English (3)
3.8	transaction d'affaires	business transaction
3.39	type d'emplacement	location type
3.10	type d'entité de transaction d'affaires	business transaction entity type
3.26	type d'évènement économique	economic event type
3.29	type de ressource économique	economic resource type
3.66	typification	typification
3.61	vendeur	seller
3.7	Vue opérationnelle des affaires (BOV)	Business Operational View (BOV)

A.5 Organization of A.6, "Consolidated matrix of terms and definitions"

NOTE   One should consider A.6:

—to be a matrix-based approach to the English and French language equivalents as found in any ISO or IEC standard which is issued as an English/French side-by-side document (e.g. the multipart ISO/IEC 2382, *Information technology — Vocabulary/Technologies de l'information — Vocabulaire*);

—an approach which is expandable for multilingual equivalency and human interface equivalency purposes; and,

—a necessary component in being able to reference any standard cited.

The terms/definitions are organized in matrix form in alphabetical order (English language). The columns in the matrix are as follows:

Col. No.	Use
0	ID as per this part of ISO/IEC 15944 as stated in Clause 3, i.e. as the "nnn" in "3.nnn"
1	The unique eBusiness Vocabulary identifier from ISO/IEC 15944-7.
2	Source. International Standard referenced or this part of ISO/IEC 15944.
3	ISO English Language - Term
4	Gender of the ISO English Language Term[a]
5	ISO English Language - Definition
6	ISO French Language - Term[b]
7	Gender of the French Language Term[a]
8	ISO French Language - Definition[b]

[a]   The codes representing gender of terms in natural languages are those based on ISO/IEC 15944-5:2008, 6.2.6 titled "*Gender and Official Languages*". The codes used in Columns 4 and 7 are those based on the coded domain "15944-5:2008-01", titled "Codes representing Gender in Natural Languages". As follows:

—   for ISO English, in Column 4, the gender code is "99" (= Not Applicable) since the English language does not have gender in its grammar; and

—   for ISO French, in Column 7, the possible gender codes are "01" = masculine/masculine, "02" = feminine/féminine; or, "03" = neuter/neutre.

[b]   This indicates that the International Standard referenced (other than this part of ISO/IEC 15944) in Columns 6 and 8 does not have an ISO French language version. For these terms and definitions, this part of ISO/IEC 15944 is providing the ISO French language equivalent.

The primary reason for organizing the columns in this order is to facilitate the addition of equivalent terms/definitions in other languages as added sets of paired columns, (e.g., Spanish, Japanese, German, Russian, etc.).

A.6   Consolidated matrix of ISO/IEC 15944-4 terms and definitions in ISO English and ISO French

Table A.6 — Consolidated matrix of ISO/IEC 15944-4 terms and definitions in ISO English and ISO French

15944-4 Clause 3 Ref	eBus. Vocab. ID	Source Ref. ID	Term	G	Definition	Term	G	Definition
		IT-Interface Identification	ISO English			ISO French		
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3.1	D005	ISO/IEC 15944-1:2011, 3.1	agent	99	**Person** acting for another **Person** in a clearly specified capacity in the context of a **business transaction**. NOTE Excluded here are agents as "automatons" (or robots, bobots, etc.). In ISO/IEC 14662, "automatons" are recognized and provided for but as part of the Functional Service View (FSV) where they are defined as an "Information Processing Domain (IPD)".	mandataire	01	**Personne** agissant au nom d'une autre **Personne** à titre précis dans le contexte d'une **transaction d'affaires**. NOTE Sont exclus les mandataires tels que les «automates» (ou les robots, bobots, etc.). Dans l'ISO/CEI 14662, les «automates» sont pris en compte et prévus, mais à titre de vue de services fonctionnels (FSV), où ils sont définis comme «domaine de traitement de l'information (IPD)».
3.2	D009	ISO/IEC 11179-3:2003, 3.1.3	attribute	99	characteristic of an **object** or **entity**	attribute*	02	caractéristique d'un **objet** ou d'une **entité**
3.3	D012	ISO/IEC 15944-4:2007, 3.3	bilateral transaction	99	sub-type of a **business transaction** where the **Persons** include only the **buyer** and the **seller**, or alternatively other **Persons** acting as **agents** for the **buyer** or **seller**	transaction bilatérale	02	sous-type de **transaction d'affaires** dans lequel les **Personnes** n'incluent que l'**acheteur** et le **vendeur**, ou alternativement d'autres **Personnes** à titre d'**agents** de l'**acheteur** et/ou du **vendeur**
3.4	D014	ISO/IEC 14662:2010, 3.2	business	99	series of **processes**, each having a clearly understood purpose, involving more than one **Person**, realized through the exchange of **recorded information** and directed towards some mutually agreed upon goal, extending over a period of time	affaires	02	série de **processus**, ayant chacun une finalité clairement définie, impliquant plus d'une **Personne**, réalisés par échange d'information enregistrée et tendant à l'accomplissement d'un objectif accepté par accord mutuel pour une certaine période de temps
3.5	D015	ISO/IEC 15944-4:2007, 3.5	business event	99	an occurrence in time that **partners** to a **business transaction** wish to monitor or control. NOTE 1 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.	événement d'affaires	01	circonstance temporelle que des **partenaires** dans une **transaction d'affaires** souhaitent surveiller ou contrôler. NOTE 1 Les événements d'affaires sont les tâches de flux des travaux que les partenaires d'affaires doivent accomplir pour conclure une transaction d'affaires entre eux. Lorsque des événements d'affaires se produisent, ils obligent une transaction d'affaires à passer par les différentes étapes de planification, d'identification, de négociation, d'actualisation et de post-actualisation.

Table A.6 *(continued)*

		IT-Interface Identification	Human Interface Equivalents (HIE) Components					
			ISO English			ISO French		
15944-4 Clause 3 Ref	eBus. Vocab. ID	Source Ref. ID	Term	G	Definition	Term	G	Definition
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					NOTE 2 Occurrences in time can either be: (a) 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).			NOTE 2 Les circonstances temporelles peuvent être: (a) internes, par accord mutuel entre les parties d'une transaction d'affaires; et/ou, (b) une référence à un schéma de référencement horodateur communément reconnu et publiquement disponible (par exemple une basée sur l'utilisation des normes l'ISO 8601 et/ou de l'ISO 19135).
3.6	D016	ISO/IEC 15944-4:2007, 3.6	business location	99	geographic site where an **economic event** is deemed to occur with its attendant transfer of an **economic resource** from one **Person** to another.	emplacement d'affaires	01	lieu géographique où un **événement économique** est réputé se produire avec le transfert en attente d'une **ressource économique** d'une **Personne** à une autre
3.7	D021	ISO/IEC 14662:2010, 3.3	Business Operational View (BOV)	99	perspective of **business transactions** limited to those aspects regarding the making of **business** decisions and **commitments** among **Persons**, which are needed for the description of a **business transaction**	Vue opérationnelle des affaires (BOV)	01	vue perspective sur les **transactions d'affaires,** restreinte à ceux des aspects relatifs à la prise par les **Personnes** de décisions et d'**engagements** concernant leurs **affaires** qui sont nécessaires pour décrire une **transaction d'affaires**
3.8	D022	ISO/IEC 14662:2010, 3.4	business transaction	99	predefined set of activities and/or **processes** of **Persons** which is initiated by a **Person** to accomplish an explicitly shared **business** goal and terminated upon recognition of one of the agreed conclusions by all the involved **Persons** although some of the recognition may be implicit	transaction d'affaires	02	ensemble prédéterminé d'activités et/ou de **processus** menées par des **Personnes** et/ou de procédures qu'elles suivent, déclenché par une **Personne** qui vise à atteindre dans les **affaires** un but expressément partagé, terminé lorsqu'est observée une des conclusions convenues par toutes les **Personnes** prenantes, bien que cette observation puisse être partiellement implicite
3.9	D023	ISO/IEC 15944-4:2007, 3.9	business transaction entity	99	computable representation of any real-world **entity** that participates, occurs or is **materialized** during a **business transaction**	entité de transaction d'affaires	02	représentation calculable de toute **entité** du monde réel qui participe à une **transaction d'affaires**, se produit ou est **matérialisée** durant celle-ci
3.10	D024	ISO/IEC 15944-4:2007, 3.10	business transaction entity type	99	abstract specification of a **business transaction entity**, detailing its recommended characteristics, its recommended methods and its recommended life-cycle states	type d'entité de transaction d'affaires	01	spécification abstraite d'une **entité de transaction d'affaires** détaillant ses caractéristiques recommandées, ses méthodes recommandées et ses états de cycle de vie recommandés

Table A.6 *(continued)*

15944-4 Clause 3 Ref	eBus. Vocab. ID	IT-Interface Identification Source Ref. ID	Human Interface Equivalents (HIE) Components					
			ISO English			ISO French		
			Term	G	Definition	Term	G	Definition
(0)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
					NOTE A business transaction entity type will usually specify the types of business events that cause a business transaction entity of this type to proceed through its different states as the business transaction itself progresses through its phases of planning, identification, negotiation, actualization and post-actualization.			NOTE Un type d'entité de transaction d'affaires spécifie généralement les types de transaction d'affaires qui amènent une entité de transaction d'affaires de ce type à passer par ses différents états au fur et à mesure que la transaction d'affaires elle-même progresse dans ses phases de planification, d'identification, de négociation, d'actualisation et de post-actualisation.
3.11	D026	ISO/IEC 15944-1:2011, 3.8	buyer	99	**Person** who aims to get possession of a good, service and/or right through providing an acceptable equivalent value, usually in money, to the **Person** providing such a good, service and/or right	acheteur	01	**Personne** désirant acquérir un bien, service et/ou droit en fournissant une valeur équivalente acceptable, généralement de l'argent, à la **Personne** qui offre ce bien, service et/ou droit
3.12	D038	ISO/IEC 15944-4:2007, 3.12	collaboration space	99	**business** activity space where an **economic exchange** of valued resources is viewed independently and not from the perspective of any business **partner** NOTE In collaboration space, an individual partner's view of economic phenomena is de-emphasized. Thus, the 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.	espace de collaboration	01	espace d'activité d'**affaires** dans lequel un **échange économique** de ressources valorisées est considéré indépendamment et non du point de vue de tout **partenaire** d'affaires NOTE Dans l'espace de collaboration, la perspective qu'un partenaire individuel a d'un phénomène économique est désaccentuée. Ainsi, les termes d'affaires et de comptabilité communément utilisés tels qu'achat, vente, reçu de caisse, décaissement, matières premières, produits finis, etc. ne sont pas autorisés à être utilisés car ils considèrent les flux de ressources du point de vue d'un participant.
3.13	D039	ISO/IEC 15944-1:2011, 3.9	commitment	99	making or accepting of a right, obligation, liability or **responsibility** by a **Person** that is capable of enforcement in the jurisdictional domain in which the **commitment** is made	engagement	01	création ou acceptation d'un droit, d'une obligation, d'une dette ou d'une **responsabilité** par une **Personne** qui est apte à appliquer le domaine juridictionnel conformément à laquelle l'engagement est pris
3.14	D048	ISO/IEC 15944-1:2011, 3.11	constraint	99	rule, explicitly stated, that prescribes, limits, governs or specifies any aspect of a **business transaction.**	contrainte	02	**règle**, énoncée explicitement, qui prescrit, limite, régit ou spécifie tout aspect d'une **transaction d'affaires.**

Table A.6 *(continued)*

	IT-Interface				Human Interface Equivalents (HIE) Components			
15944-4	Identification				ISO English		ISO French	
Clause 3 Ref	eBus. Vocab. ID	Source Ref. ID	Term	G	Definition	Term	G	Definition
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					NOTE 1 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 For constraints to be registered for implementation in Open-edi, they must have unique and unambiguous identifiers. NOTE 3 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".			NOTE 1 Les contraintes sont spécifiées comme des règles faisant partie de composantes de scénarios d'EDI-ouvert, c.-à-d. d'attributs de scénarios, de rôles, et/ou de faisceaux d'information. NOTE 2 Les contraintes doivent avoir des identificateurs uniques et non ambigus afin d'être enregistrées pour application dans l'EDI-ouvert. NOTE 3 Une contrainte peut faire l'objet d'un accord entre des parties (clause du contrat), et est par conséquent considérée comme «contrainte interne». Une contrainte peut aussi être imposée à des parties (par exemple des lois, des règlements, etc.), et est par conséquent considérée comme une «contrainte externe».
3.15	D058	ISO/IEC 15944-4:2007, 3.15	custody	99	association between a **Person** and an **economic resource** where the **Person** has physical control only over the resource or controls access. NOTE Having custody of a good, service and/or right does not imply and is differentiated from having economic control of the same (e.g. a Person may have economic control of a good even though it is not under its custody.	garde	01	association entre une Personne et une ressource économique dans laquelle la Personne exerce un contrôle physique uniquement sur la ressource ou en contrôle l'accès. NOTE Avoir la garde d'un produit, d'un service et/ou d'un droit n'implique pas, et est différencié, d'exercer un contrôle économique sur celui-ci (par exemple, une Personne peut exercer un contrôle économique sur un bien même si celui-ci n'est pas sous sa garde).
3.16	D060	ISO/IEC 15944-1:2011, 3.14	data (in a business transaction)	99	representations of **recorded information** that are being prepared or have been prepared in a form suitable for use in a computer system.	donnée (dans une transaction d'affaires)	02	représentations d'**informations enregistrées** qui sont préparées ou l'ont été de façon à pouvoir être traitée par un ordinateur
3.17	D069	ISO/IEC 15944-4:2007, 3.17	defined market model	99	trade model where the **buyer** and **seller** accept the entry terms of a specified market in advance and where that market has an accepted and recognized source for **business** rules and conventions	modèle de marché défini	01	modèle de marché dans lequel l'**acheteur** et le **vendeur** acceptent d'avance les termes d'un marché spécifié et dans lequel ce marché est couvert par des règles et des conventions d'**affaires** acceptées et reconnues

Table A.6 *(continued)*

15944-4	Identification	IT-Interface	Human Interface Equivalents (HIE) Components					
Clause			ISO English			ISO French		
3 Ref	eBus. Vocab. ID	Source Ref. ID	Term	G	Definition	Term	G	Definition
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					NOTE In a defined market, the phases of a business transaction – planning, identification, negotiation, actualization and post-actualization – are governed by the rules and conventions of the particular defined market.			NOTE Dans un marché défini, les phases d'une transaction d'affaires c.à d.la planification, l'identification, la négociation, l'actualisation et la post-actualisation, sont régies par les règles et les conventions de ce marché défini particulier.
3.18	D075	ISO/IEC 15944-4:2007, 3.18	duality	99	association between **economic events** where one is the legal or economic consideration for the other in an exchange NOTE Duality is the conceptual analog of double entry in traditional bookkeeping. For example, a shipment from a partner requires a matching flow, like a payment, to balance accounts between the parties.	dualité	02	association entre des **événements économiques** dans laquelle l'une est la considération légale ou économique de l'autre au cours d'un échange NOTE La dualité est l'équivalent conceptuel d'une double entrée en tenue de comptabilité traditionnelle. Par exemple une expédition par un partenaire exige un flux correspondant tel qu'un versement pour solder les comptes entre les parties.
3.19	D077	ISO/IEC 15944-4:2007, 3.19	economic agreement	99	arrangement of reciprocated **economic commitments** between two **partners** where the abstract specification of terms of trade is incomplete and not subject to legal enforcement	accord économique	01	accord d'**engagement économique** réciproque entre deux **partenaires** dans lequel la spécification abstraite des termes de l'échange est incomplète et non sujette à une exécution légale
3.20	D078	ISO/IEC 15944-4:2007, 3.20	economic bundle	99	association between **economic commitments** and the **economic contract** that bundles those promises and binds them to the two **partners** who negotiated them	faisceau économique	01	association entre des **engagements économiques** et le **contrat économique** qui groupe ces promesses et les lie aux deux **partenaires** qui les ont négociées
3.21	D079	ISO/IEC 15944-4:2007, 3.21	economic claim	99	expectation of one **Person** to receive a future inflow of **economic resources** from another **Person** because of an **economic exchange** which is currently incomplete	réclamation économique	02	attente qu'a une **Personne** de recevoir un futur flux de **ressources économiques** d'une autre **Personne** pour cause d'**échange économique** encore incomplet
3.22	D080	ISO/IEC 15944-4:2007, 3.22	economic commitment	99	type of **commitment** by one **Person** to transfer **economic resources** to another **Person** at some specified point in the future	engagement économique	01	type d'**engagement** par une **Personne** à transférer des **ressources économiques** à une autre **Personne** à un moment donné dans le futur
3.23	D081	ISO/IEC 15944-4:2007, 3.23	economic contract	99	bundling of reciprocated **economic commitments** between two **partners** where the abstract specification of the proposed **economic exchange** is deemed to be complete	contrat économique	01	groupement d'**engagements économiques** réciproques entre deux **partenaires** dans lequel la spécification abstraite de l'**échange économique** proposé est jugée complète

Table A.6 *(continued)*

	IT-Interface Identification				Human Interface Equivalents (HIE) Components			
					ISO English		ISO French	
15944-4 Clause 3 Ref	eBus. Vocab. ID	Source Ref. ID	Term	G	Definition	Term	G	Definition
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3.24	D082	ISO/IEC 15944-4:2007, 3.24	economic control	99	association between a **Person** and an **economic resource** where the **Person** either owns the resource or is otherwise able to derive economic benefit (utility) from it	contrôle économique	01	association entre une **Personne** et une **ressource économique** dans laquelle la **Personne** est propriétaire de la ressource ou est en mesure d'en retirer un avantage (ou une utilité) économique
3.25	D083	ISO/IEC 15944-4:2007, 3.25	economic event	99	occurrence in time wherein ownership of an **economic resource** is transferred from one **Person** to another **Person** NOTE 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).	événement économique	01	circonstance temporelle dans laquelle la propriété d'une **ressource économique** est transférée d'une **Personne** à une autre **Personne** NOTE Les circonstances temporelles peuvent être: (a) internes, par accord mutuel entre les parties d'une transaction d'affaires, et/ou (b) une référence à un schéma de référencement horodateur communément reconnu et publiquement disponible (par exemple une basée sur l'utilisation des normes l'ISO 8601 et/ou de l'ISO 19135).
3.26	D084	ISO/IEC 15944-4:2007, 3.26	economic event type	99	abstract specification of an **economic event** where its grouped properties can be designated without attachment to an actual, specific occurrence in time NOTE Examples of attributes at the type level for events might be expected-duration or standard-pricing-percentage.	type d'événement économique	01	spécification abstraite d'un **événement économique** dans laquelle ses propriétés groupées peuvent être désignées sans rattachement à un réel événement temporel spécifique NOTE La durée prévue ou le pourcentage de tarification normalisée sont des exemples d'attributs au niveau du type d'événements.
3.27	D085	ISO/IEC 15944-4:2007, 3.27	economic exchange	99	type of a **business transaction** where the goal is an exchange of **economic resources** between two **Persons** where both parties derive higher utility after the completed **business transaction** NOTE 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 requited payment following.	échange économique	01	type de **transaction d'affaires** dans lequel l'objectif est un échange de **ressources économiques** qui en obtiennent une plus grande utilité une fois la **transaction d'affaires** achevée NOTE Un échange économique implique généralement deux événements économiques au cours desquels les ressources s'écoulent dans des directions opposées. Par exemple un échange d'espèces contre un bien implique une expédition accompagnée d'une opération avec contrepartie.
3.28	D086	ISO/IEC 15944-4:2007, 3.28	economic resource	99	good, right or service of value, under the control of a **Person**	ressource économique	02	produit, droit ou service de valeur, sous le contrôle d'une **Personne**

Table A.6 *(continued)*

15944-4 Clause 3 Ref	IT-Interface Identification: eBus. Vocab. ID	Source Ref. ID	Human Interface Equivalents (HIE) Components — ISO English Term	G	ISO English Definition	ISO French Term	G	ISO French Definition
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3.29	D087	ISO/IEC 15944-4:2007, 3.29	economic resource type	99	abstract specification of an **economic resource** where its grouped properties can be designated without attachment to an actual, specific **economic resource** NOTE Example of attributes at the type level for an economic resource like an automobile might include its designated fuel capacity or its maximum expected range.	type de ressource économique	01	spécification abstraite d'une **ressource économique** dans laquelle ses propriétés groupées peuvent être désignées sans rattachement à une réelle **ressource économique** spécifique NOTE La capacité du réservoir de carburant d'une automobile ou son autonomie sont un exemple d'attributs au niveau du type d'une ressource économique.
3.30	D088	ISO/IEC 15944-4:2007, 3.30	economic role	99	abstract specification of a **Person** for economic purposes where its grouped properties can be designated without attachment to an actual **Person** EXAMPLE Economic role might be qualified buyer or approved shipper.	rôle économique	01	spécification abstraite d'une **Personne** à des fins économiques dans laquelle ses propriétés groupées peuvent être désignées sans rattachement à une **Personne** réelle EXEMPLE D'un point de vue économique uniquement, un acheteur qualifié ou un expéditeur approuvé.
3.31	D089	ISO/IEC 15944-4:2007, 3.31	economic specification	99	association between an **economic commitment** and the abstract properties of an **economic event**, an **economic resource**, a **partner** or a **business location**	spécification économique	02	association entre un **engagement économique** et les propriétés abstraites d'un **événement économique**, d'une **ressource économique**, d'un **partenaire** ou d'un **emplacement d'affaires**
3.32	D093	ISO/IEC 2382-17:1999, 17.02.05	entity	99	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 An entity exists whether data about it are available or not.	entité	02	objet ou association d'objets, concret ou abstrait, existant, ayant existé ou pouvant exister EXEMPLE Personne, événement, idée, processus, etc. NOTE Une entité existe que l'on dispose de données à son sujet ou non.
3.33	D098	ISO/IEC 15944-1:2011, 3.23	external constraint	99	**constraint** which takes precedence over **internal constraints** in a **business transaction**, i.e. is external to those agreed upon by the parties to a **business transaction** NOTE 1 Normally external constraints are created by law, regulation, orders, treaties, conventions or similar instruments.	contrainte externe	02	**contrainte** qui l'emporte sur les **contraintes internes** dans une **transaction d'affaires**, c.-à-d. qui est externe à celles convenues entre les parties dans une **transaction d'affaires** NOTE 1 Normalement, les contraintes externes découlent des lois, règlements, décrets, traités, conventions ou autres instruments semblables.

Table A.6 *(continued)*

	IT-Interface Identification		Human Interface Equivalents (HIE) Components					
15944-4 Clause 3 Ref	eBus. Vocab. ID	Source Ref. ID	ISO English			ISO French		
			Term	G	Definition	Term	G	Definition
(0)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
					NOTE 2 Other sources of external constraints are those of a sectorial nature, those which pertain to a particular jurisdiction or mutually agreed to common business conventions (e.g. INCOTERMS, exchanges, etc.). NOTE 3 External constraints can apply to the nature of the good, service and/or right provided in a business transaction. NOTE 4 External constraints can demand that a party to a business transaction meet specific requirements of a particular role. EXAMPLE 1 Only a qualified medical doctor may issue a prescription for a controlled drug. EXAMPLE 2 Only an accredited share dealer may place transactions on the New York Stock Exchange. EXAMPLE 3 Hazardous wastes may only be conveyed by a licenced enterprise. NOTE 5 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 must be recorded. 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 2 D'autres sources de contraintes externes sont de nature sectorielle, qui relèvent d'un domaine juridictionnel particulier ou de conventions d'affaires convenues mutuellement, (par exemple INCOTERMS, les échanges, etc.). NOTE 3 Des contraintes externes peuvent s'exercer sur la nature des biens, des services, et/ou au droit accordé dans une transaction d'affaires. NOTE 4 Des contraintes externes peuvent exiger qu'une partie dans une transaction d'affaires réponde aux exigences spécifiques d'un rôle. EXEMPLE 1 Seul un médecin diplômé peut prescrire une ordonnance pour un médicament contrôlé. EXEMPLE 2 Seul un courtier en actions accrédité peut effectuer des transactions à la bourse de New-York. EXEMPLE 3 Seule une entreprise attitrée peut transporter des déchets dangereux. NOTE 5 Lorsque les Faisceaux d'information, y compris leurs composantes sémantiques, d'une transaction d'affaires constituent l'ensemble d'une transaction d'affaires (par exemple à des fins juridiques ou comptables), toutes les contraintes doivent être enregistrées. EXEMPLE Il peut exister une exigence juridique ou comptable de conserver la totalité des documents enregistrés relatifs à une transaction d'affaires, c.-à-d. les Faisceaux d'information échangés, comme un «enregistrement».

Table A.6 *(continued)*

		IT-Interface Identification		Human Interface Equivalents (HIE) Components				
			ISO English			ISO French		
15944-4 Clause 3 Ref	eBus. Vocab. ID	Source Ref. ID	Term	G	Definition	Term	G	Definition
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					NOTE 6 A minimum external constraint applicable to a business transaction often requires one to differentiate whether the Person, i.e. 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".			NOTE 6 Une contrainte externe minimale applicable à une transaction d'affaires exige souvent de distinguer si une Personne, c-à-d. une partie dans une transaction d'affaires, est un «individu», une «organisation» ou une «administration publique». Par exemple, les droits de protection de la vie privée ne s'appliquent qu'à une Personne en tant qu' «individu».
3.34	D100	ISO/IEC 15944-4:2007, 3.34	fulfillment	99	association between an economic commitment and an economic event where the event executes the promised resource flow from one Person to another EXAMPLE A delivery to a customer would fulfill that customer's sale order.	exécution	02	association entre un engagement économique et un événement économique dans laquelle l'événement exécute le flux de la ressource promise d'une Personne à une autre EXEMPLE La livraison à un client exécute la commande de celui-ci.
3.35	D104	ISO/IEC 15944-4:2007, 3.35	governed	99	association between an economic agreement and the business transaction whose conduct and phases are subject to that economic agreement of the business transaction	régi	03	association entre un accord économique et la transaction d'affaires dont la conduite et les phases sont sujettes à cet accord économique d'une transaction d'affaires
3.36	D113	ISO/IEC 15944-1:2011, 3.28	individual	99	Person who is a human being, i.e. a natural person, who acts as a distinct indivisible entity or is considered as such	individu	01	Personne qui est un être humain, c-à-d. une personne physique, qui agit à titre d'entité indivisible distincte ou qui est considérée comme telle
3.37	D116	ISO/IEC 14662:2010, 3.11	Information Bundle (IB)	99	formal description of the semantics of the recorded information to be exchanged by Open-edi Parties playing roles in an Open-edi scenario	Faisceau d'informations (IB)	01	description formelle de la valeur sémantique des informations enregistrées échangées entre partenaires d'EDI-ouvert jouant un rôle dans un scénario d'EDI-ouvert
3.38	D119	ISO/IEC 15944-1:2011, 3.33	internal constraint	99	constraint which forms part of the commitment(s) mutually agreed to among the parties to a business transaction NOTE Internal constraints are self-imposed. They provide a simplified view for modeling and re-use of scenario components of a business transaction for which there are no external constraints or restrictions on the nature of the conduct of a business transaction other than those mutually agreed to by the buyer and seller.	contrainte interne	02	contrainte qui fait partie de l'engagement convenu mutuellement entre les parties d'une transaction d'affaires NOTE Les contraintes internes sont volontaires. Elles présentent une vue simplifiée de modélisation et de réutilisation des composantes de scénario d'une transaction d'affaires sans contraintes ou restrictions externes quant à la conduite d'une transaction d'affaires autres que celles convenues mutuellement entre l'acheteur et le vendeur.

Table A.6 *(continued)*

15944-4 Clause 3 Ref	IT-Interface Identification eBus. Vocab. ID	IT-Interface Identification Source Ref. ID	ISO English Term	G	ISO English Definition	ISO French Term	G	ISO French Definition
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3.39	D139	ISO/IEC 15944-4:2007, 3.39	location type	99	abstract specification of a **business location** where its grouped properties can be designated without attachment to an actual place. EXAMPLE A location type might be an accepted shipping facility or approved hospital location.	type d'emplacement	01	spécification abstraite d'un **emplacement d'affaires** dans laquelle ses propriétés groupées peuvent être désignées sans rattachement à un emplacement réel. EXEMPLE Une installation d'expédition acceptée ou un emplacement d'hôpital approuvé.
3.40	D135	ISO/IEC 15944-4:2007, 3.40	materialized	99	association between an **economic event** and an **economic claim** where the occurrence of the **economic event** causes the **economic claim** to come into existence	matérialisé	03	association entre un **événement économique** et une **réclamation économique** dans laquelle la production d'un **événement économique** amène la **réclamation économique** à exister
3.41	D136	ISO/IEC 15944-4:2007, 3.41	mediated transaction	99	sub-type of a **business transaction** where a **third party** mediates between the **partners** as mutually agreed to by the **partners**	transaction arbitrée	01	sous-type de **transaction d'affaires** dans laquelle une **tierce partie** arbitre entre les **partenaires** selon un accord mutuel entre les **partenaires**
3.42	D146	ISO/IEC 1087-1:2000, 3.1.1	object	99	anything perceivable or conceivable. NOTE Objects may be material (e.g. an engine, a sheet of paper, a diamond), immaterial (e.g. a conversion ratio, a project plan) or imagined (e.g. a unicorn).	objet	01	tout ce qui peut être perçu ou conçu. NOTE Les objets peuvent être matériels (par exemple un moteur, une feuille de papier, un diamant), immatériels (par exemple un rapport de conversion, un plan de projet) ou imaginaires (par exemple une licorne).
3.43	D155	ISO/IEC 14662:2010, 3.14	Open-edi	99	**electronic data interchange** among multiple autonomous **Persons** to accomplish an explicit shared **business** goal according to **Open-edi** standards	EDI-ouvert	01	**échange de données informatisé** par application des normes d'**EDI-ouvert** entre plusieurs **Personnes** autonomes visant un objectif d'**affaires** explicitement partagé
3.44	D156	ISO/IEC 15944-4:2007, 3.44	Open-edi Business Transaction Ontology (OeBTO)	99	formal, rule-based specification and definition of the concepts pertaining to **business transactions** and scenarios and the relationships that hold among these concepts	Ontologie de transaction d'affaires de l'EDI ouvert (OeBTO)	02	spécification et définition formelles, basée sur des règles, des concepts relatifs aux **transactions et scénarios d'affaires**, et rapports qui existent entre ces concepts

Human Interface Equivalents (HIE) Components