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**Information technology — Business  
Operational View —**

**Part 6:  
Technical introduction to e-Business  
modelling**

*Technologies de l'information — Vue opérationnelle d'affaires —*

*Partie 6: Introduction technique à la modélisation d'affaires  
électroniques*

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## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

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.

ISO/IEC TR 15944-6, which is a Technical Report of type 2, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

ISO/IEC TR 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 eBusiness modelling* [Technical Report]
- *Part 7: eBusiness vocabulary*

- *Part 8: Identification of privacy protection requirements as external constraints on business transactions*
- *Part 10: IT-enabled coded domains as semantic components in business transactions*

The following parts are under preparation:

- *Part 9: Business transaction traceability framework for commitment exchange*
- *Part 11: Descriptive Techniques for Foundational Modelling in Open-edi*
- *Part 12: Privacy protection requirements on information life cycle management (ILCM) in EDI*
- *Part 20: Linking business operational view to functional service view*

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## Introduction

It is desired to be able to commence eBusiness by simply choosing a particular scenario from the registered set of scenarios and applying the same to the actual, i.e. instantiated, business transaction. In this context, the registered Open-edi scenario is supposed to be a generic class of various specific scenarios. In addition, if the generic scenario class were successfully obtained, it could consist of a small number of mandatory attributes and many conditional and/or optional attributes, i.e. as scenario components.

Although such a standardization idea for Open-edi scenarios seems to be a straightforward solution, it is likely to be difficult to distinguish a particular scenario from the others. In particular, the scenario description with many conditional attributes may be so complex that the semantics could not be clearly compiled even if an excellent description technique is employed. In addition, for those scenarios having the same attributes but with slightly different domains and the combinatorial, it is not evident whether they all have to be interpreted as single scenario class or not. Even if individual scenarios could be formally identified as having a unique identifier, many scenarios that are semantically equivalent may be redundantly registered. The more redundant registration increases, the more confusion occurs.

One of the effective solutions to avoid the redundant registration is to establish a classification scheme based on well-defined criteria, which may reduce the complexity of conditional attributes as much as possible.

This part of ISO/IEC 15944 discusses the fundamentals of business transaction and the principles of eBusiness modelling, from which the classification schemes are derived for Open-edi scenarios and their components. This is in addition to:

- 1) the use of the templates for scoping Open-edi Scenarios and the rules for specifying Open-edi scenarios and their components as stated in ISO/IEC 15944-1:2002;
- 2) the use of templates for registering Open-edi Scenarios and their components as stated in ISO/IEC 15944-2:2006; and,
- 3) the use of templates for the identification and referencing of scenarios and scenario components which are structured to be able to support the requirements of jurisdictional domains as sources of external constraints as stated in ISO/IEC 15944-5:2007.”
- 4) the ontology of eBusiness modelling introduced in ISO/IEC 15944-4:2007.

# Information technology — Business Operational View —

## Part 6: Technical introduction to e-Business modelling

### 1 Scope

This part of ISO/IEC 15944 discusses and describes the following three topics of eBusiness modelling:

- fundamentals of business transaction modelling that describe the conceptual aspects of eBusiness;
- principles of eBusiness modelling that specify the semantic aspect of business transactions and their components and relationships involved in the business transaction;
- classification scheme of Open-edi scenarios based on eBusiness modelling.

### 2 Normative references

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

ISO/IEC 15944-1:2002, *Information technology — Business agreement semantic descriptive techniques — Part 1: Operational aspects of Open-edi for implementation*

### 3 Terms and definitions<sup>1)</sup>

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

#### 3.1

##### agent

**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)".

[ISO/IEC 15944-1:2002 (3.1)]

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1) This clause contains a subset of key terms and definitions used in this part of ISO/IEC 15944. For the complete set of concepts and their definitions as well as associated terms used in the ISO/IEC 14662 "Open-edi Reference Model" as well as those used in ISO/IEC 15944, see "Annex D (normative) Consolidated list of normative references for the eBusiness Vocabulary" in ISO/IEC 15944-7 "eBusiness Vocabulary".

3.2

**attribute**

characteristic of an object or entity

[ISO/IEC 11179-3:2003 (3.1.3)]

3.3

**authentication**

provision of assurance of the claimed identity of an **entity**

[ISO/IEC 10181-2:1996(3.30)]

3.4

**business**

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

[ISO/IEC 14662:2004 (3.2)]

3.5

**business transaction**

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

[ISO/IEC 14662:2004 (3.4)]

3.6

**buyer**

**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

[ISO/IEC 15944-1:2002 (3.8)]

3.7

**collaboration space**

**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 use business and accounting terms like purchase, sale, cash receipt, cash disbursement, raw materials, and finished goods is not allowed because they view resource flows from a participant's perspective.

[ISO/IEC 15944-4:2006 (3.12)]

3.8

**commitment**

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

[ISO/IEC 14662:2004 (3.5)]

3.9

**constraint**

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

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".

[ISO/IEC 15944-1:2002 (3.11)]

### 3.10 consumer

a **buyer** who is an **individual** to whom **consumer** protection requirements are applied as a set of external **constraints** on a **business transaction**

NOTE 1 Consumer protection is a set of explicitly defined rights and obligations applicable as external constraints on a business transaction.

NOTE 2 The assumption is that consumer protection applies only where a buyer in a business transaction is an individual. If this is not the case in a particular jurisdiction, such external constraints should be specified as part of scenario components as applicable.

NOTE 3 It is recognized that external constraints on a buyer of the nature of consumer protection may be peculiar to a specified jurisdiction.

[ISO/IEC 15944-1:2002 (3.12)]

### 3.11 defined market model

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

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.

[ISO/IEC 15944-4:2006 (3.17)]

### 3.12 Electronic Data Interchange EDI

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

NOTE This definition includes all categories of electronic business transactions.

[ISO/IEC 14662:2004 (3.8)]

### 3.13 entity

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

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

NOTE An entity exists whether data about it are available or not.

[ISO/IEC 2382-17:1999 (17.02.05)]

### 3.14 external constraint

**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.

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 licensed enterprise.

NOTE 5 Where the information bundles (IBs), including the 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 A minimum external constraint applicable to a business transaction often requires one to differentiate whether the Person, i.e. 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".

[ISO/IEC 15944-1:2002 (3.23)]

### 3.15 governed

association between an economic agreement and the **business transaction** whose conduct and phases are subject to that economic agreement of the **business transaction**

[ISO/IEC 15944-4:2006 (3.35)]

### 3.16 identification

**rule-based process**, explicitly stated, involving the use of one or more **attributes**, i.e., data elements, whose value (or combination of values) is used to identify uniquely the occurrence or existence of a specified **entity**

[ISO/IEC 15944-1:2002 (3.26)]

### 3.17 identifier (in a business transaction)

**unambiguous**, unique and a linguistically neutral value, resulting from the application of a **rule-based identification process**

NOTE 1 Identifiers must be unique within the identification scheme of the issuing authority.

NOTE 2 An identifier is a linguistically independent sequence of characters capable of uniquely and permanently identifying that with which it is associated. {See ISO 19135:2005 (4.1.5)}

[ISO/IEC 15944-1:2002 (3.27)]

**3.18****individual**

**Person** who is a human being, i.e., a natural person, who acts as a distinct indivisible **entity** or is considered as such

[ISO/IEC 15944-1:2002 (3.28)]

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

formal description of the semantics of the **recorded information** to be exchanged by **Open-edi Parties** playing **roles** in an **Open-edi scenario**

[ISO/IEC 14662:2004 (3.11)]

**3.20****internal constraint**

**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 the modelling and re-use of scenario components of a business transaction for which there are no external constraints or restrictions to the nature of the conduct of a business transaction other than those mutually agreed to by the buyer and seller.

[ISO/IEC 15944-1:2002 (3.33)]

**3.21****jurisdictional domain**

jurisdiction, recognized in law as a distinct legal and/or regulatory framework, which is a source of **external constraints** on **Persons**, their behaviour and the making of **commitments** among **Persons** including any aspect of a **business transaction**

NOTE 1 The pivot jurisdictional domain is a United Nations (UN) recognized member state. From a legal and sovereignty perspective they are considered "peer" entities. Each UN member state, (a.k.a. country) may have sub-administrative divisions as recognized jurisdictional domains, (e.g., provinces, territories, cantons, länder, etc.), as decided by that UN member state.

NOTE 2 Jurisdictional domains can combine to form new jurisdictional domains, (e.g. through bilateral, multilateral and/or international treaties).

EXAMPLE Included here, for example, are the European Union (EU), NAFTA, WTO, WCO, ICAO, WHO, Red Cross, ISO, the IEC, the ITU, etc.

NOTE 3 Several levels and categories of jurisdictional domains may exist within a jurisdictional domain.

NOTE 4 A jurisdictional domain may impact aspects of the commitment(s) made as part of a business transaction including those pertaining to the making, selling, transfer of goods, services and/or rights (and resulting liabilities) and associated information. This is independent of whether such interchange of commitments are conducted on a for-profit or not-for-profit basis and/or include monetary values.

NOTE 5 Laws, regulations, directives, etc., issued by a jurisdictional domain are considered as parts of that jurisdictional domain and are the primary sources of external constraints on business transactions.

[ISO/IEC 15944-5:2006 (3.67)]

**3.22****model**

abstraction of some aspect of reality

[ISO 19115:2003 (4.9)]

3.23

**Open-edi**

**electronic data interchange** among multiple autonomous **Persons** to accomplish an explicitly shared business goal according to **Open-edi standards**

[ISO/IEC 14662:2004 (3.14)]

3.24

**Open-edi Description Technique**

**OeDT**

specification method such as a Formal Description Technique, another methodology having the characteristics of a Formal Description Technique, or a combination of such techniques as needed to formally specify **BOV** concepts, in a computer processable form

[ISO/IEC 14662:2004 (3.16)]

3.25

**Open-edi Party**

**OeP**

**Person** that participates in **Open-edi**

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

[ISO/IEC 14662:2004 (3.17)]

3.26

**Open-edi scenario**

**OeS**

formal specification of a class of **business transactions** having the same **business goal**

[ISO/IEC 14662:2004 (3.18)]

3.27

**Open-edi standard**

**standard** that complies with the Open-edi Reference Model

[ISO/IEC 14662:2004 (3.19)]

3.28

**organization**

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

NOTE The kinds of organizations covered by this International Standard include the following examples.

EXAMPLE 1 An organization incorporated under law.

EXAMPLE 2 An unincorporated organization or activity providing goods and/or services including: 1) partnerships; 2) social or other non-profit organizations or similar bodies in which ownership or control is vested in a group of individuals; 3) sole proprietorships; 4) governmental bodies.

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

[ISO/IEC 6523-1:1998 (3.1)]

**3.29****partner**

sub-type of **Person** that includes **buyer** and **seller**

[ISO/IEC 15944-4:2006 (3.51)]

**3.30****Person**

**entity**, i.e., a natural or legal person, recognized by law as having legal rights and duties, able to make **commitment(s)**, assume and fulfil resulting obligation(s), and able of being held accountable for its action(s)

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

NOTE 2 "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 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".

[ISO/IEC 14662:2004 (3.24)]

**3.31****principle**

fundamental, primary assumption and quality which constitutes a source of action determining particular objectives or results

NOTE 1 A principle is usually enforced by rules that affect its boundaries.

NOTE 2 A principle is usually supported through one or more rules.

NOTE 3 A principle is usually part of a set of principles which together form a unified whole.

EXAMPLE Within a jurisdictional domain, examples of a set of principles include a charter, a constitution, etc.

[ISO/IEC 15944-2:2006 (3.81)]

**3.32****privacy protection**

set of **external constraints** of a **jurisdictional domain** pertaining to recorded information on or about an identifiable **individual**, i.e. personal information, with respect to the creation, collection, management, retention, access and use and/or distribution of such recorded information about that **individual** including its accuracy, timeliness, and relevancy

NOTE 1 Recorded information collected or created for a specific purpose on an identifiable individual, i.e. the explicitly shared goal of the business transaction involving an individual, shall not be utilized for another purpose without the explicit and informed consent of the individual to whom the recorded information pertains.

NOTE 2 Privacy requirements include the right of an individual to be able to view the recorded information about him/her and to request corrections to the same in order to ensure that such recorded information is accurate and up-to-date.

NOTE 3 Where jurisdictional domains have legal requirements which override privacy protection requirements these must be specified (e.g. national security, investigations by law enforcement agencies, etc.).

[ISO/IEC 15944-5:2006 (3.109)]

**3.33****process**

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

[ISO/IEC 15944-1:2002 (3.53)]

**3.34**

**property**

peculiarity common to all members of an object class

[ISO/IEC 11179-1:2004 (3.3.29)]

**3.35**

**registration**

**rule-based process**, explicitly stated, involving the use of one or more data elements, whose value (or combination of values) are used to identify uniquely the results of assigning an OeRI

[ISO/IEC 15944-2:2006 (3.95)]

**3.36**

**Registration Schema**

**RS**

formal definition of a set of **rules** governing the data fields for the description of an **entity** and the allowable contents of those fields, including the **rules** for the assignment of identifiers

[ISO/IEC 15944-1:2002 (3.58)]

**3.37**

**regulator**

**Person** who has authority to prescribe **external constraints** which serve as **principles**, policies or **rules** governing or prescribing the behaviour of **Persons** involved in a **business transaction** as well as the provisioning of goods, services, and/or rights interchanged

[ISO/IEC 15944-1:2002 (3.59)]

**3.38**

**responsibility**

association between **Persons** where one is responsible to the other or between a **Person** and an **organization Person** where that **Person** is assigned

NOTE Subtypes 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. {See further Clause 6.2.7 and Figure 17 in ISO/IEC 15944-1:2002}

[ISO/IEC 15944-4:2006 (3.59)]

**3.39**

**role**

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

[ISO/IEC 14662:2004 (3.25)]

**3.40**

**rule**

statement governing conduct, procedure, conditions and relations

NOTE 1 Rules specify conditions that must be complied with. These may include relations among objects and their attributes.

NOTE 2 Rules are of a mandatory or conditional nature.

NOTE 3 In Open-edi, rules formally specify the commitment(s) and role(s) of the parties involved, and the expected behaviour(s) of the parties involved as seen by other parties involved in (electronic) business transactions. Such rules are applied to: content of the information flows in the form of precise and computer-processable meaning, i.e. the semantics of data; and, the order and behaviour of the information flows themselves.

NOTE 4 Rules must be clear and explicit enough to be understood by all parties to a business transaction. Rules also must be capable of being able to be specified using a Formal Description Technique(s) (FDTs).

EXAMPLE A current and widely used FDT is "Unified Modelling Language (UML)".

NOTE 5 Specification of rules in an Open-edi business transaction should be compliant with the requirements of ISO/IEC 15944-3 "Open-edi Description Techniques (OeDT)".

[ISO/IEC 15944-2:2006 (3.101)]

### 3.41

#### scenario attribute

formal specification of information, relevant to an **Open-edi scenario** as a whole, which is neither specific to roles nor to **information bundles**

[ISO/IEC 14662:2004 (3.26)]

### 3.42

#### scenario component

one of the three fundamental elements of a scenario, namely role, **information bundle**, and **semantic component**

[ISO/IEC 15944-2:2006 (3.104)]

### 3.43

#### seller

**Person** who aims to hand over voluntarily or in response to a demand, a good, service and/or right to another **Person** and in return receives an acceptable equivalent value, usually in money, for the good, service and/or right provided

[ISO/IEC 15944-1:2002 (3.62)]

### 3.44

#### Semantic Component

#### SC

unit of recorded information unambiguously defined in the context of the **business** goal of the **business transaction**

NOTE A SC may be atomic or composed of other SCs.

[ISO/IEC 14662:2004 (3.27)]

### 3.45

#### settlement

association between a requiring economic event and an economic claim where the occurrence of the event causes the economic claim to expire

[ISO/IEC 15944-4:2006 (3.63)]

### 3.46

#### standard

documented agreement containing technical specifications or other precise criteria to be used consistently as **rules**, guidelines or definitions of characteristics, to ensure that materials, products, **processes** and services are fit for their purpose

NOTE This is the generic definition of "standard" of the ISO and IEC (and now found in the ISO/IEC JTC1 Directives, Part 1, Section 2.5:1998). {See also ISO/IEC Guide 2: 1996 (1.7)}

[ISO/IEC 15944-1:2002 (3.64)]

**3.47**

**term**

designation of a defined concept in a special language by a linguistic expression

NOTE A term may consist of one or more words, i.e. a simple term, complex term or even contain symbols.

[ISO 1087:2000 (5.3.1.2)]

**3.48**

**text**

data in the form of characters, symbols, words, phrases, paragraphs, sentences, tables, or other character arrangements, intended to convey a meaning and whose interpretation is essentially based upon the reader's knowledge of some natural language or artificial language

EXAMPLE A business letter printed on paper or displayed on a screen.

[ISO/IEC 2381-23:1994 (23.01.01)]

**3.49**

**third party**

**Person** besides the two primarily concerned in a **business transaction** who is **agent** of neither and who fulfils a specified role or function as mutually agreed to by the two primary **Persons** or as a result of external **constraints**

NOTE It is understood that more than two **Persons** can at times be primary parties in a business transaction.

[ISO/IEC 15944-1:2002 (3.65)]

**3.50**

**undefined market model**

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

[ISO/IEC 15944-4:2006 (3.67)]

**3.51**

**vendor**

**seller** on whom **consumer** protection requirements are applied as a set of external **constraints** on a **business transaction**

NOTE 1 Consumer protection is a set of explicitly defined rights and obligations applicable as external constraints on a business transaction.

NOTE 2 It is recognized that external constraints on a seller of the nature of consumer protection may be peculiar to a specified jurisdiction.

[ISO/IEC 15944-1:2002 (3.67)]

**4 Abbreviated terms**

**D-I-M:** Defined Immediate Mediated

**D-S-B:** Defined Separate Bilateral

**D-S-M:** Defined Separate Mediated

**OeDT:** Open-edi Description Technique

**OeP:** Open-edi Party

**OeS:** Open-edi scenario

**RS:** Registration Schema

**SC:** Semantic Component

**U-I-B:** Undefined Immediate Bilateral

**U-I-M:** Undefined Immediate Mediated

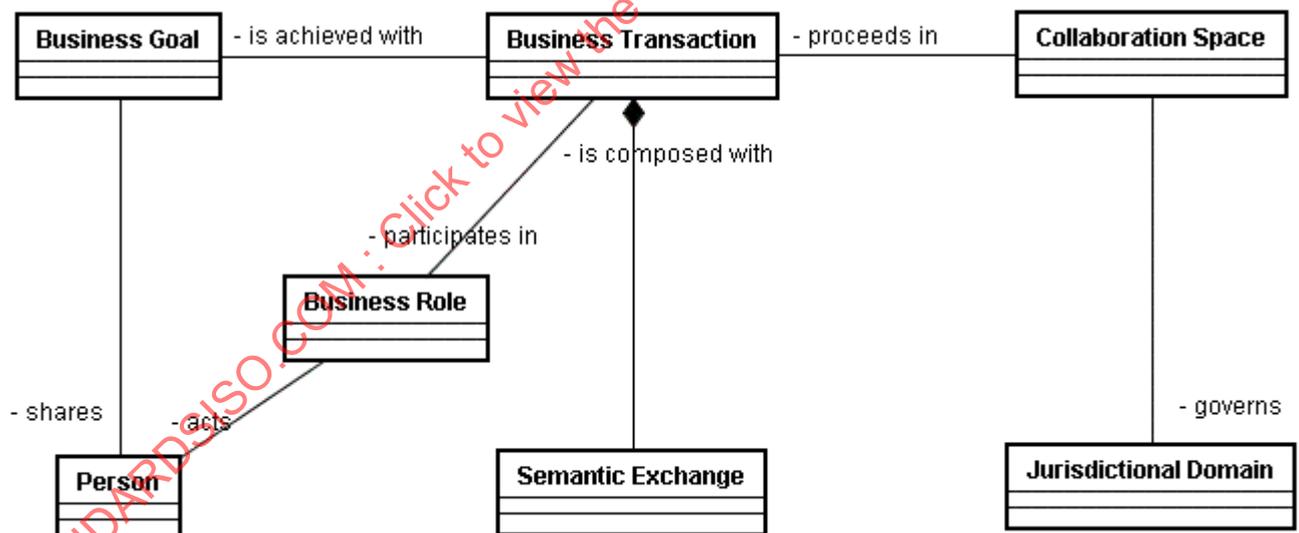
**U-S-B:** Undefined Separate Bilateral

**U-S-M:** Undefined Separate Mediated

## 5 Fundamentals of Business Transaction Modelling

### 5.1 Introduction to Business Transaction Modelling

As shown in Figure 1, a business goal is achieved with an integrated business transaction that is proceeding in a collaboration space governed by the relevant jurisdictional domains, where the involved business roles participate to share a common business goal. A business transaction consists of a set of semantic exchanges, of which each has a conceptually separate action, conforming to a specification of external business process that all the involved parties have common understandings.



**Figure 1 — General Understandings of Business Transaction**

When discussing business transactions, it is important to distinguish the difference between intra-enterprise and inter-enterprise business processes. Even where processes appear to have the same function, the business context is very different when it is operated as an internal business process within an enterprise compared with operation as an external business process between two autonomous enterprises.

When the business process is operated as an internal business process, the completion condition or the interruption case is controlled by the internal procedures and/or rules of enterprise. The accounting business process is interpreted with the internal accounting guidelines. However, when the business process is operated as an external business process, the completion condition or the interruption case have to be

defined with a clear understandings of the commitment and obligation among the involved parties. It is necessary to assume various cases to be occurred and to specify clearly the responsibility among parties. If the consideration is insufficient, when an inter-enterprise business process encountered an interruption failure, the involved parties may have to consume much time and money to resolve the problems. In some case, a particular party may owe excessive obligation, or every party may take unexpected business risks.

To clearly distinguish the nature of two types of business processes, we call such an inter-enterprise business process as a business transaction.

This chapter explains the fundamental concept and characteristics of business transaction that differs from internal business processes.

## 5.2 Basic Aspects of Business Transaction Modelling

### 5.2.1 Basic Structure of Business Transaction

The basic structure of business transaction denotes an exchange of economic values between buyer and seller, that the seller provides a goods, services and/or rights to the buyer and the buyer pays the legal money to the seller. The business transaction consists of processes 1) to identify the counterparty as well as the goods, services and/or rights to be provided, 2) to negotiate and close the agreement of the price and delivery terms, and 3) to settle the obligation of both parties by delivering the goods, services and/or rights and paying the legal money according to the agreement.

This basic business transaction is described with a set of model constructs as illustrated in Figure 2.

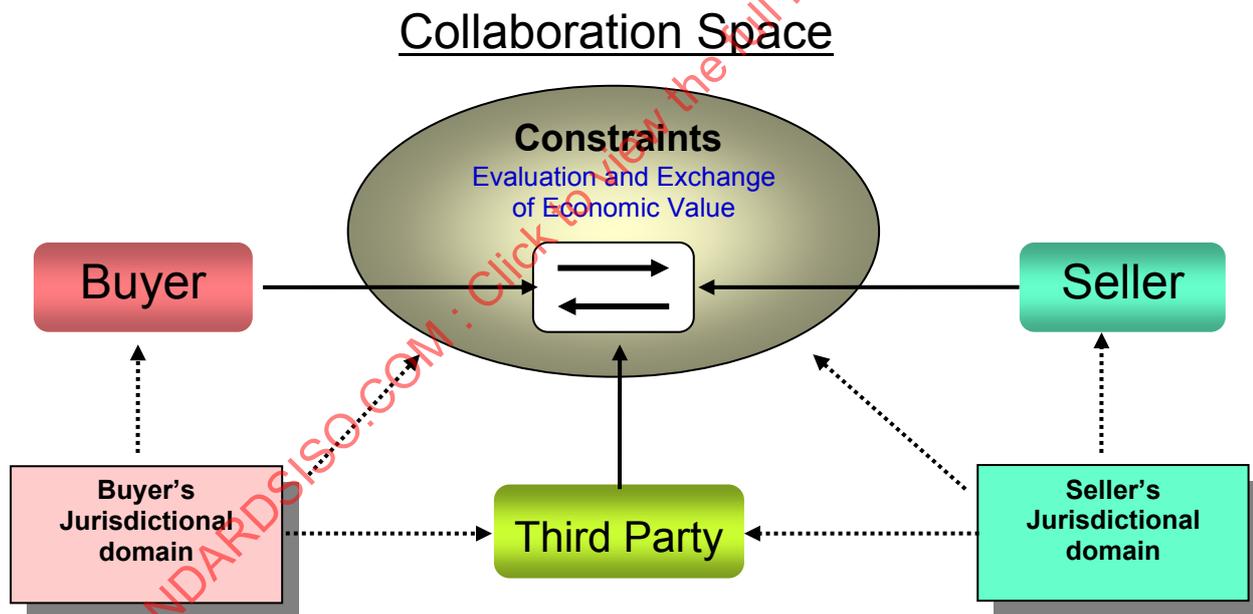


Figure 2 — Basic Model Constructs of a Business Transaction

### 5.2.2 Collaboration Space

For a business transaction, the jurisdictional aspects are deeply involved. Two autonomous parties, buyer and seller, are required to establish a mutual consent by explicit or implicit agreement. This type of jurisdictional constraints on business transaction is not addressed for internal business process within an enterprise, but for external business process among enterprises.

International business transaction requires more sophisticated consideration on the jurisdictional constraints, that may be different depending on parties involved in the business transaction. A certain type of constraint is only applied to a specific party, but not to the others. For example, when a Japanese franchise of restaurant intends to procure rice from a US food company, the seller is not disturbed by their regulation, but the Japanese buyer is restricted to import the rice from United States by Japanese regulation of food and drug control.

This type of restriction on business transaction may appear in not only international business, but also a certain type of domestic business. The provision of financial services, medical services and educational services may be restricted to such business entities that hold specific licences or authorization according to the relevant jurisdictional constraints. In addition, such a restricted business transaction may be operated through specific market or institutional facility complying with the relevant regulation.

In general, a business transaction is operated in a collaboration space that complies explicitly or implicitly the involved jurisdictional constraints. In this context, the collaboration space is a conceptual framework of jurisdictional business environment.

On the other hand, collaboration space may also provide the function of pricing for goods and services, which are exchanged by business transaction. The price of goods, services and/or rights may be planned by buyer or seller based on the marginal utility or production cost. But, actual price is often decided depending on the market position. In the recent eBusiness, we can observe various pricing methods, which are classified into 5 types as follows:

1) list price

The seller will decide the price and show on the price list

2) bidding price

The buyer will choose the lowest price from the prices the sellers have shown.

3) auctioning price

The seller leads the highest price, making the buyers competing with others.

4) reverse auctioning price

The buyer leads the lowest price, making the sellers competing with others.

5) matching price

The seller and buyer show their expected prices to the counterparty respectively and decide on the matching price.

### 5.2.3 Parties and Business Roles

The buyer and seller are parties in a business transaction, who are acting the relevant business roles in the collaboration space. The business role is a business aspect of Person that denotes specific business function in a business transaction. A Person may be an individual, organization, or two or more organizations acting as a single entity, from a business modelling perspective. Such Persons may, in addition to the roles of a buyer and seller, also include the role of a regulator, as well as a third party, (e.g. acting as a mediator).

A business transaction is an exchange of economic values among parties, which involve at the minimum the roles of a buyer and a seller. The buyer acquires the goods, services and/or rights from the seller and pays the counter money to the seller.

In the real business world, some type of business transaction requires involvement of third party who is also an autonomous entity other than the buyer or seller. Some type of business commitment is effective only if the

third party is involved in, or mediates the business transaction. From a business transaction perspective, a business transaction is classified into the following three types based on the difference of participants:

1) Bilateral direct trade

The bilateral direct trade is a trade where buyer and seller directly participates in the business transaction. This is the most primitive business transaction among others, i.e. one which does not involve a third party, use of an agent or the role of a regulator.

2) Bilateral agent trade

The bilateral agent trade is a business transaction that either buyer or seller, or both participate in the business transaction through an agent(s)<sup>2)</sup>. The agent participates in the business transaction behalf of the buyer or of the seller. The ownership of economic value exchanged through the business transaction does not belong to the agent but to the buyer or seller. The obligation of delivery of goods, services and/or rights to the buyer does not belong to the seller's agent but to the seller. And, the obligation of payment to the seller does not belong to the buyer's agent but to the buyer. The agent simply plays a certain role behalf of the seller or buyer, and does not take the ultimate business risk involved in the business transaction.

3) Mediated trade

Some type of business transaction requires involvement of other party than buyer and seller or their agents. These involve the services of a third party who fulfils a specified role or function as mutually agreed to by the buyer and seller, or as the result of external constraints, (e.g. those of the applicable jurisdictional domain). For example, real estate trade through escrow is a typical case of mediated trade involving the use of a third party. In this type of business transaction, buyer deposits the money for the payment with escrow, and the seller entrusts the transfer registration of real estate with escrow. The escrow processes the transfer registration of real estate behalf of the seller, and pays the deposited money to the seller behalf of the buyer, after confirming the legal validity of the real estate transaction. Then, the escrow guarantees the result of business transaction for a certain period, establishing a insurance to cover the payment of real estate transaction for hidden failure. A business transaction settled with credit card is also one of the mediated trade that the credit company gives the credit for the payment to the buyer and takes the payment risk for the seller.

**5.2.4 Goods, Services and/or Rights**

Ultimate objective of business transaction is to acquire the goods, services and/or rights for the buyer and the money for the seller. There are various goods and services for trade, including physical goods, labour services, rental or lease of facility or equipment, ownership of real estate, intellectual property rights, financial products, insurance, security and bond, etc.

**5.2.5 Payment**

Usually legal money such as cash or fund transfer of bank account is used to settle the payment of business transaction.

In some cases, an equivalent goods, services and/or rights or other financial product than legal money may be used for the payment of business transaction. However, such an alternative payment may cause various problems. The precise evaluation of actual economic value may be difficult. If the evaluation is significantly biased, the taxation issues may be addressed. If the alternative payment was done with something illegally acquired may lose the validity of payment.

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2) For the rules governing "agent", see further ISO/IEC 15944-1:2002, Clause 6.2.5 "Person and delegation to "agent" and/or "third party".

Accordingly, even if the payment of business transaction is settled with other instrument than legal money, it had better to virtually split such a business transaction into two trades, original and counter trade, which are both settled with an estimated amount of legal money.

### 5.3 Business Transaction Pattern

An example of a typical business transaction pattern consists of five processes as defined in Clause 6.3 of 15944-1. They are planning, identification, negotiation actualization and post-actualization. For the purpose of this document we provide an example that focuses on the following processes and activities as shown in Figure 3.

- Identification of counterparty and objective goods, services and/or rights
- Negotiation of business terms and conditions
- Delivery of goods, services and/or rights (part of actualization)
- Payment of counter money (part of actualization)
- Warranty of post delivery (part of post-actualization)

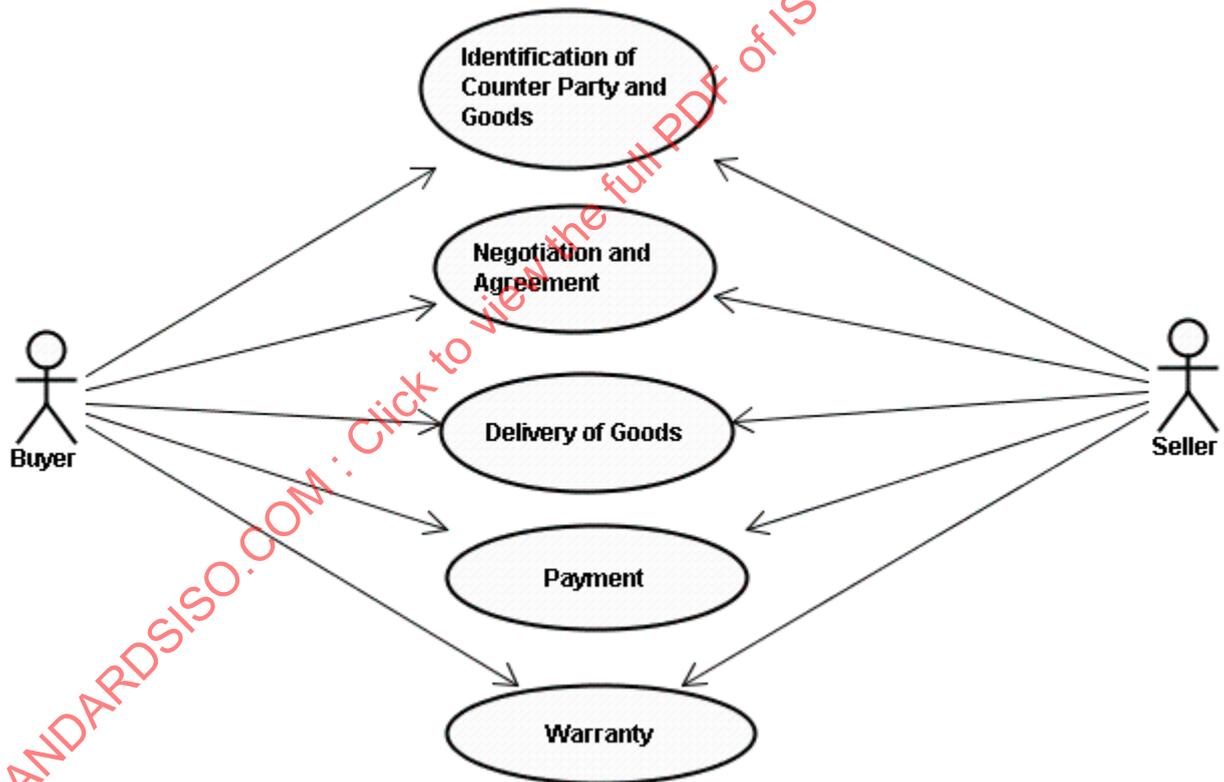


Figure 3 — Basic Business Transaction Pattern

This basic business transaction pattern denotes a high-level combination of business activities that are logically composed in a typical business transaction. However, the actual business transaction may or may not follow the sequence. In addition, a particular activity could be divided into smaller activities and/or some activities are combined into a bigger activity. And, the sequence of those activities are varying depending on the business cases. The typical variations are as follows:

1) Business transaction with combined identification and negotiation

Usually a business transaction begins from identification of counterparty and goods, services and/or rights. After identification completed, negotiation is triggered and reaches the agreement. And, finally the delivery of goods, services and/or rights and payment will be performed. However, as seen in stock market, some trade types of financial products may follow the very different sequences. As shown in Figure 4, for a given product list, buyers and sellers propose their own expected prices at the first, and the trade will be closed when both expected prices match mutually. This type of trade does not have a clear precedence between identification of party and negotiation of pricing. Two processes are simultaneously progressing.

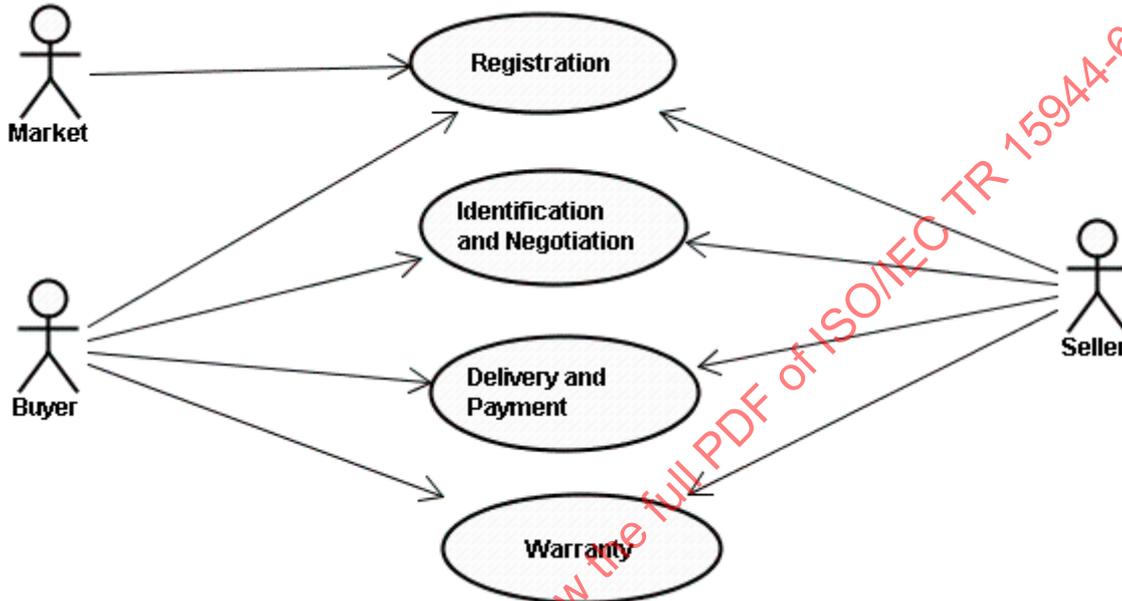


Figure 4 — Business Transaction with Combined Identification and Negotiation

As long as the traditional business practice of manufacturing and logistics industry, this type of business transaction has been rarely seen. However, this trade type is now recognised by all the industries as an effective procurement approach. The simple replacement of traditional procurement with modern eBusiness process may achieve very restricted advantages, just for labour replacement with computer process. But, this type of business transaction may dramatically save the procurement cost.

To operate effectively the business transaction with combined identification and negotiation, it is necessary to clarify the prescribed conditions and terms for the participants. It is also important to reduce the time and workload for the agreement among relevant parties. It is preferable to develop and establish specialized markets for specific type of business transaction with well-defined rules and procedures for participants.

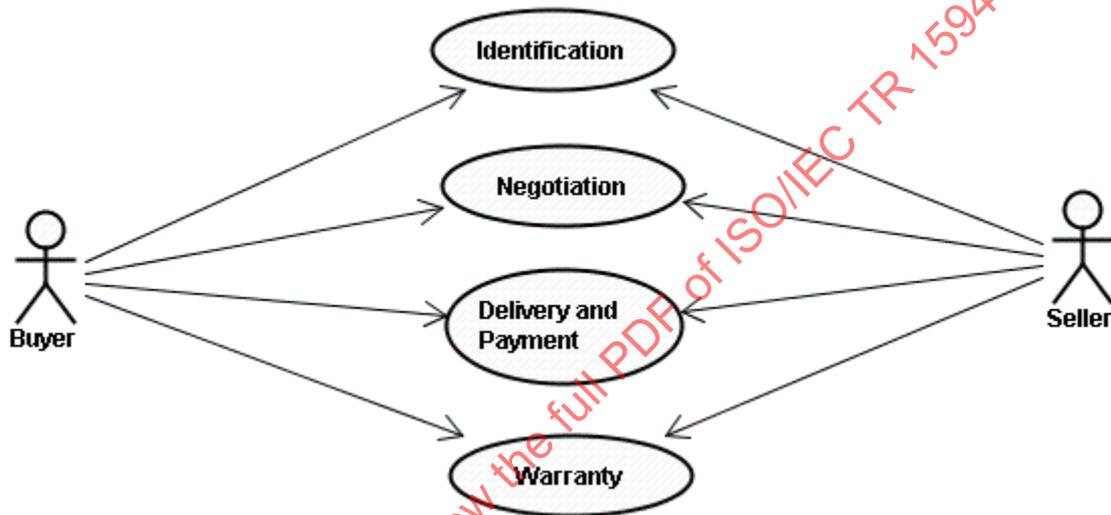
2) Business transaction with combined delivery and payment

For a usual business transaction, the delivery of goods, services and/or rights precedes the payment, or the precedence is reversed. In this case, either the buyer or seller, of whom payment or delivery preceded the other, should take the business risk. For example, in the case where the delivery of goods, services and/or rights precedes the payment, the seller could have risk of losing money because the buyer may declare bankruptcy after the delivery but before the payment. This type of business transaction conducted over the Internet may have greater risk of failure than through traditional channels.

There are various means to avoid such a default risk associated with business transaction. The simplest solution is to perform the delivery of goods, services and/or rights and the payment at the same time as shown in Figure 5.

The business transaction with combined delivery and payment is almost equivalent to the trade that the buyer identifies the goods, services and/or rights and buys it with cash, the legal tender, at the shop in downtown. The procurement of digital contents such as music or information providing services with e-money through the internet is very close to the shopping in downtown.

Another safer approach is that the identification and negotiation is made through the internet, but that the delivery of goods, services and/or rights are made at a shop in downtown, or reclaiming the cash by the courier company when delivering the goods, services and/or rights to the buyer. This is a variation of business transaction with combined delivery and payment.



**Figure 5 — Business Transaction with Combined Delivery and Payment**

### 3) Business transaction with advanced delivery against payment

In a typical business transaction, the delivery of the goods, services and/or rights and payment may be usually performed after the negotiation and agreement. Particularly, the international trade often complies the sequence. However, in some countries including Japan, a special business transaction type as shown in Figure 6 is frequently observed, that the supplement of goods is preceded and then the negotiation of condition and terms is made after evaluating the business performance at the certain close date. When the price of goods, services and/or rights is not stable and the evaluation in advance is difficult, the business transaction with advanced delivery against the payment is an effective solution to avoid the excessive pricing risk and efforts for both parties.

Some oil companies also employ a similar business transaction type for their business of products distribution to the retailers. The oil company delivers their product to the service stations that made the distribution agreement with the oil company. The delivery volume is decided by the oil company after confirming the current stock at the service station. Then, the volume discount is applied later depending on the actual delivery volume. In this case, the service station can reduce the effort of sales planning and accounting workloads. Small size business such as service station can save the cost for back office and focus their resources on maintaining customer relationship and sales supports.

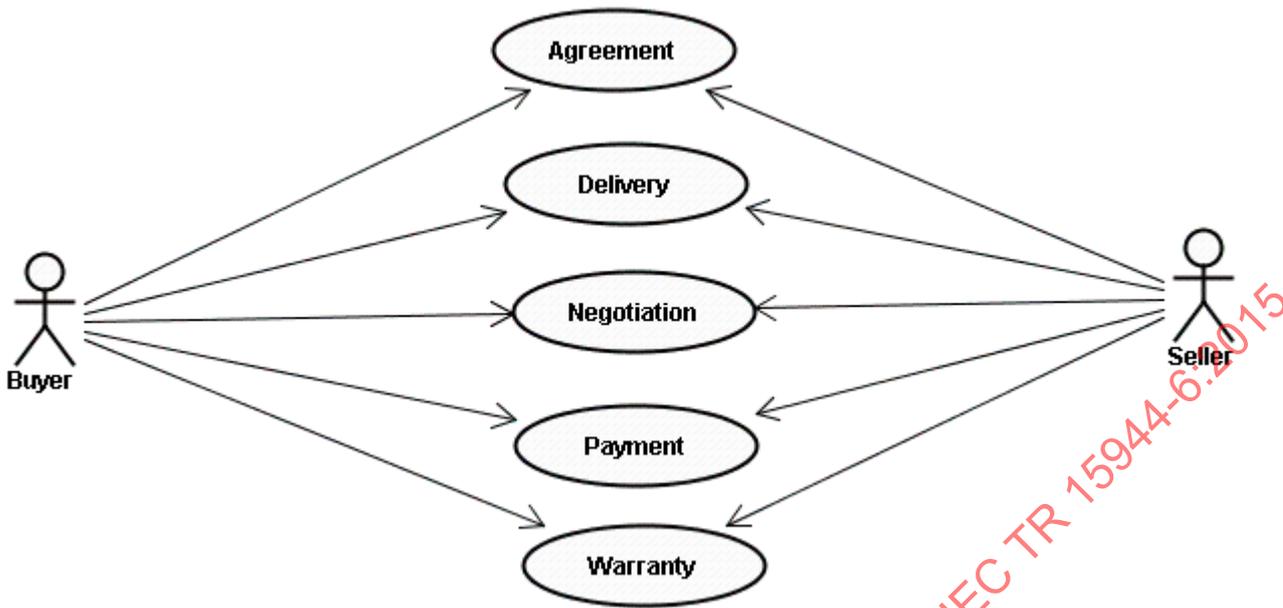


Figure 6 — Business Transaction with Advanced Delivery against Payment

## 6 Principles of eBusiness Modelling

### 6.1 Introduction to eBusiness Modelling

An Open-edi scenario is a specification aspects of eBusiness transaction among the relevant parties, which are particularly focused on the external behaviour of the involved parties.

In general, the internal business processes of business parties are designed and built to optimize their internal value chains reflecting the jurisdictional constraints governing their collaboration space. The relevant consideration of jurisdictional domain is tightly coupled with the internal business processes as their business restrictions and/or accelerators. Their unique conventions and inventions are allowed for the internal business processes to pursue their business competencies as well as they are enforced to comply with a certain type of regulatory constraints. The internal business process may be unique to each business party, but must be consistent to its own business environment. The internal business processes once built under a certain jurisdictional domain may not be compatible with other jurisdictional domain.

On the other hand, business transaction among parties should share a common business process that is recognised as an external business process of the relevant parties. Although the external business process is established upon an agreement of all the relevant parties, the enforcement of the business process may be deeply affected by the individual jurisdictional domain associated with each party involved in and the collaboration space where the business transactions are performed. A business transaction may be valid or invalid depending on the jurisdictional domain actually resided. In addition, the optimization of internal business processes associated with their external behaviour is not necessarily consistent to each other among the parties to the business transaction.

Some difficulties may arise to fully guarantee the enforcement of external business process, particularly when different jurisdictional domains are involved in a business transaction. Either party or all parties may hold a failure risk of business transaction, missing the consistency among jurisdictional domains involved in. A certain type of business risks of a business transaction is eliminated or recovered by a third party involvement in the business transaction, transforming the symmetric and bilateral value exchange process into an asymmetric and multi-lateral one. A credit company, trade insurance company or escrow is a typical third party of business transactions. In a sense, a third party provides to the relevant parties such services that could virtually equate to fill the gaps embedded in an external business process against different jurisdictional

domains of involved parties as well as providing the risk conversion and transfer to the third party from the business partners.

One of the most considerable things when discussing Open-edi scenarios is to establish a common framework, i.e. a reference ruler, for analysing and understanding the external business process among relevant parties in a formal manner from the overall viewpoint of business context including economics and jurisdictional aspects but not restricted to those two. Figure 7 illustrates the high-level eBusiness modelling giving a grand perspective of the external business processes among relevant parties.

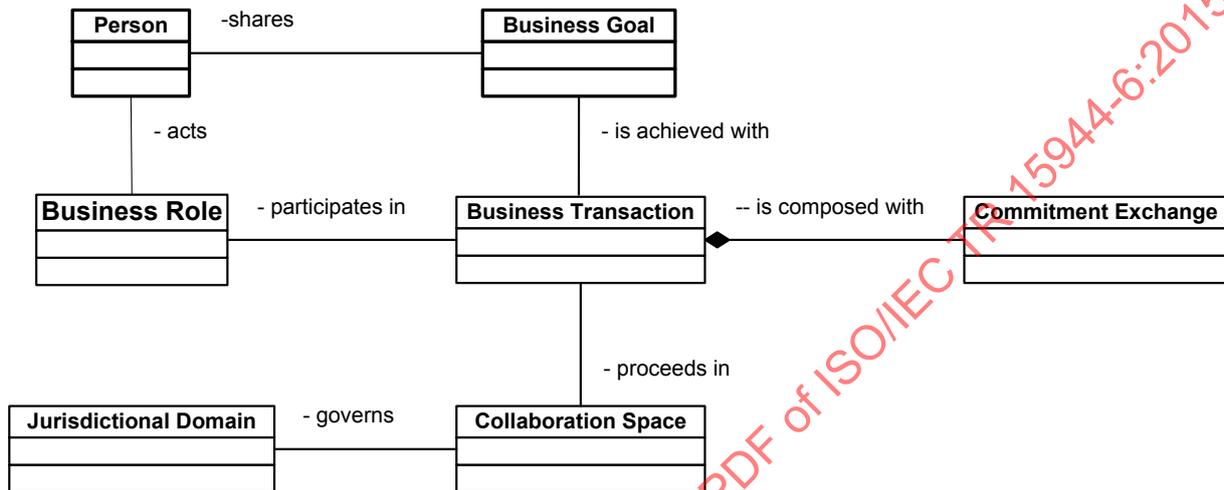


Figure 7 — High-level eBusiness Modelling

The high-level eBusiness modelling is explained with the relationship among the following components:

- Business Transaction
- Business Goal (<Why/What>, Resources,)
- Business Role and Person (<Who>, Actor)
- Collaboration Space and Jurisdictional Domain (<Where>, Space)
- Semantic Exchange<sup>3</sup> (<When/How>, Event)

Business transaction is performed by business roles that Persons act in a collaboration space governed by particular jurisdictional domain for a particular business goal with the relevant semantic exchanges.

## 6.2 Business Role and Person

The business roles in a business transaction are represented by specific Person to the business transaction. The most essential business roles in a business transaction are partners, i.e. buyer and seller. Agent may act behalf of buyer or seller. Some type of business transaction may require involvement of third party

3) Semantic exchange here is used to include Information Bundles (IB), and Semantic Components (SC) which are the two basic components of exchanges of recorded information pertaining to the making and instantiations of commitments among parties to an Open-edi business scenario. With respect to IBs and SCs, see further in ISO/IEC 15944-1, Clause 6.4 "Rules governing the data component" and Annex G "informative Business transaction model: Data Component".

independent from buyer and seller to mediate the business transaction. Figure 8 is an illustration focused on the business role and Person of the eBusiness modelling.

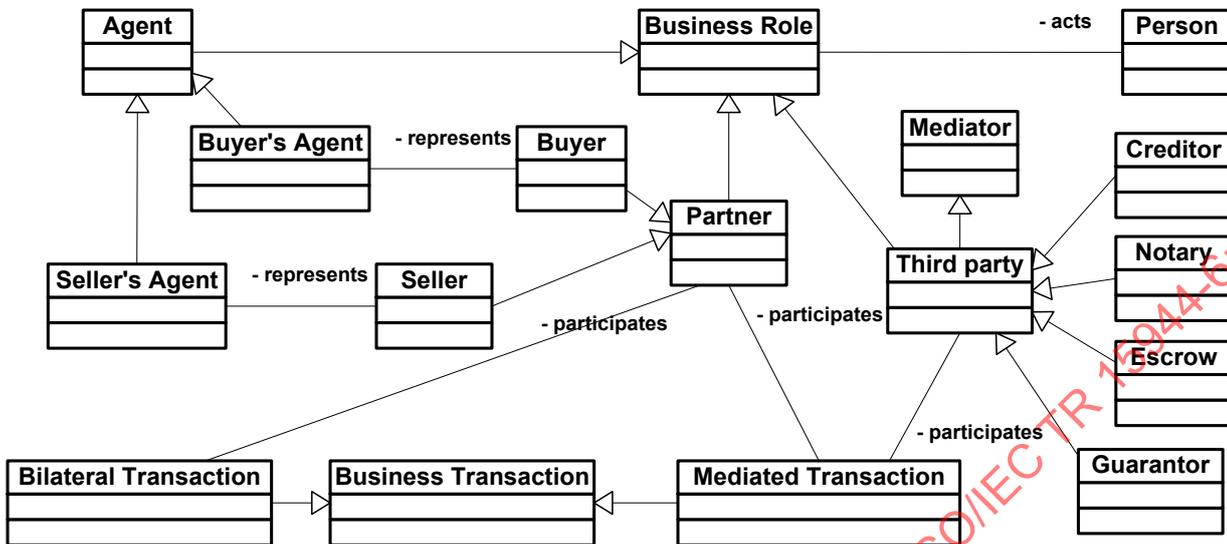


Figure 8 — eBusiness Modelling focused on Business Role and Person

NOTE With respect to Figure 8 above, it must be noted that the inclusion of “Creditor”, “Notary”, “Escrow”, and “Guarantor” in Figure 8 serve as examples of types of third parties which must be party to a business transaction when the business transaction is of a nature where the legal or regulatory requirements of the applicable jurisdictional domain require this.

### 6.3 Business Goal

Business transaction is performed by the relevant parties to achieve a shared business goal, typically an exchanging of resources. The resource is a specific goods, services and/or rights for the buyer and an expected amount of money as a legal tender for the seller. The resources are classified into various types. The legal tender may be various currencies. Figure 9 is the illustration focused on the business goal of the eBusiness modelling.

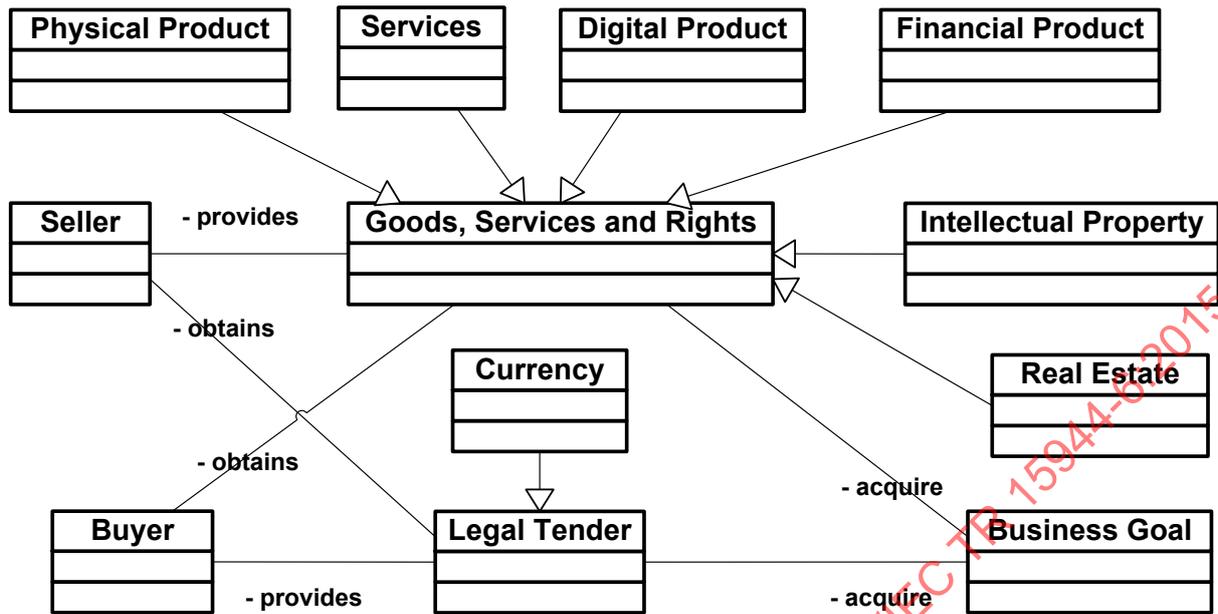


Figure 9 — eBusiness Modelling focused on Business Goal

NOTE The examples of goods and services, i.e. physical product, services, digital product, financial products, intellectual property and real estate, are of a representative nature only. They are intended to serve as examples.

#### 6.4 Collaboration Space and Jurisdictional Domain

A business transaction is performed in a specific collaboration space, which consist of market and community. Market may or may not be explicitly defined with a certain statement or regulation. Community is governed by a specified jurisdictional domain including legal, geopolitics and cultural aspects but not restricted to those. Figure 10 is the illustration focused on the collaboration space and jurisdictional domain of the eBusiness modelling.

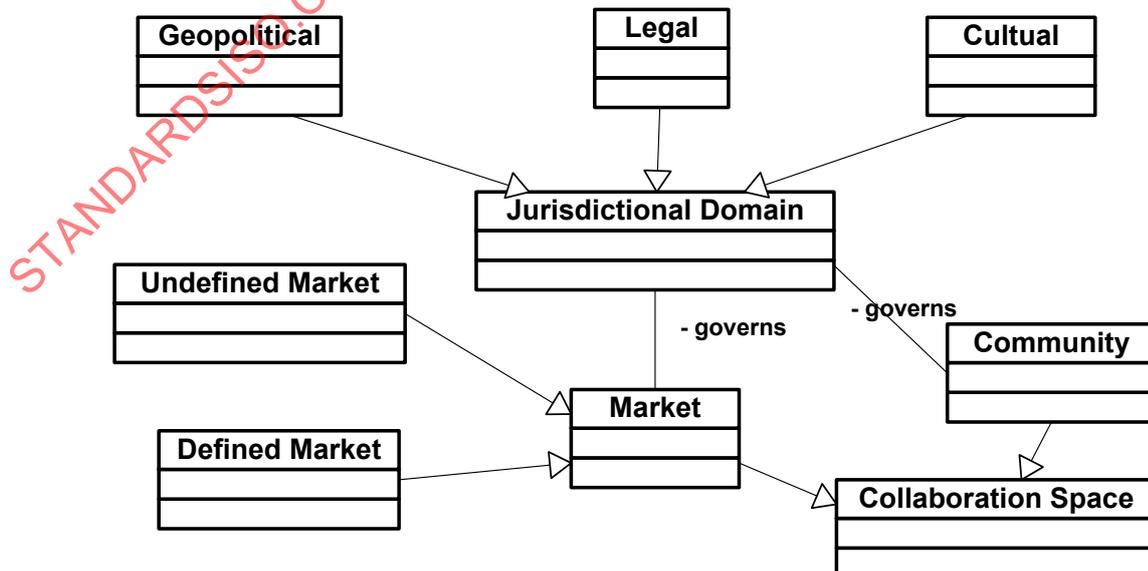


Figure 10 — eBusiness Modelling focused on Collaboration Space and Jurisdictional Domain

### 6.5 Business Transaction

Business transaction consists of a series of business activities of which sequence varies depending on the nature of particular business transaction pattern and agreement of the relevant parties. Planning, Identification, Negotiation, Actualization and Post-actualization activities are conceptually essential business activities of a business transaction, although some of them may be physically absorbed or eliminated in an actual business transaction. For example, an “all sales are final” condition would eliminate the “post-actualization” activities such as refunds, warranties, etc. In negotiation activity, the terms and condition of business transaction is agreed. The sequence of actualization is aligned by settlement terms and conditions upon agreed among partners. Pricing, order, delivery, payment and warranty activities are performed complying with the corresponding terms and conditions respectively. Identification activity may require mandatory and/or preferred qualification. Negotiation activity is initiated by buyer or seller. Agreement has a particular offer type of purchase, contract, rental, lease or consignment. There are various pricing methods including matching, bidding and auction. Order activity is either of ad-hoc and repeating. Figure 11 is the illustration focused on the business activity of the eBusiness modelling.

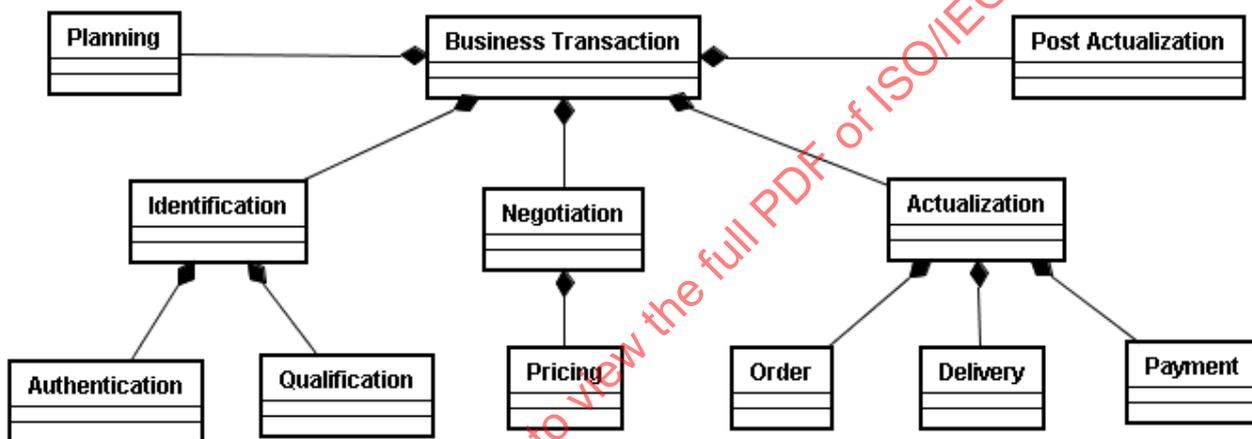


Figure 11 — eBusiness Modelling focused on Business Activity

NOTE The examples of in Figure 11 of “Authentication”, “Qualification”, “Pricing”, “Order”, “Delivery”, and “Payment” are of an illustrative nature only.

## 7 Key Attributes for Classification of a Business Transaction

### 7.1 Introduction to Classification of Open-edi Scenarios

The classification for Open-edi scenarios should meet the following requirements:

- **Simplicity:** the classification is plainly and unambiguously defined.
- **Selectivity:** the classification is disjoint and non-redundant.
- **Inclusiveness:** the classification is an all-inclusive of Open-edi scenarios.
- **Stability:** the classification is stable for the environmental changes.
- **Reality:** the classification is realistic for the real business world.

According to the requirements mentioned above, the classification scheme should be conceived from the fundamentals of business transactions in the real world such as market, party, goods, services and/or rights and payment, not necessarily being tied to the existing classification schemata.

For the purpose, the following three factors are considered as the typical example of key attributes for the classification of Open-edi scenarios. This classification approach could be extensively applied to complex scenarios in real business world when additional classification factors are taken into account.

- **Market Type**

- **Settlement Type**

- **Participation Type**

## 7.2 Key Attributes for Classification of a Business Transaction

### 7.2.1 Market Type on business boundary

In the real business world, a typical business transaction consists of the following business processes.

- 1) A buyer finds a relevant seller(s) through the network by using a certain services and/or tools, such as a portal site and/or a search engine.
- 2) The buyer negotiates the business terms and conditions with the seller(s).
- 3) The buyer receives the goods, services and/or rights and pays the amount of price to the seller(s) according to the business terms and conditions.

Although the business transaction mentioned above does not explicitly describe the market environment, in the real business world, many business transactions are performed through a relevant markets. For example, in a typical case of financial business transaction, which mainly trades a value and/or credit with other persons without the physical delivery of cash or security, the financial markets have significant roles in the business transaction. In such a well-defined market, the buyers and sellers could be free from the individual negotiation efforts of the principal terms and conditions for their business transactions. They would participate in the defined market, accepting the principal terms and conditions at the registration in advance.

Other scenario context, such as authentication procedure, may be also greatly changed depending on whether the defined market exists or not. It seems to be much easier to discuss the classification of Open-edi scenarios if the market type, defined or undefined, is taken into account. The market type is particularly meaningful in identifying the boundary of business transaction such as the trigger and completion terms.

### 7.2.2 Settlement Type in Business Process

From the viewpoint of a business process, another consideration is that the delivery of goods, services and/or rights and payment are simultaneously settled through the network, or separately performed through different channels. In the case of simultaneous settlement, the business transaction could be immediately completed if the goods, services and/or rights and the payment are both valid and acceptable for all of the participants. On the other hand, if the delivery and payment are separately performed through different channels respectively, the business transaction could not be completed until their acceptance of delivery and settlement of payment would be confirmed later.

In order to bridge the time difference and/or spatial gap of the delivery and payment, the concrete identification of the business transaction and the authentication of either or both of participants are required for establishing the credit and debit relationship among them relevant to the business transaction. It also implies that the scenario is classified depending on the settlement type.

7.2.3 Participation Type of Role

Regarding the role of Open-edi, the participation type, direct or mediated is meaningfully distinguished. In many cases, a business transaction is completed when the delivery and settlement are both confirmed between the buyer and seller. However, in some cases of business transactions, such as a real estate collaboration through an escrow company, the third participant other than the buyer and seller is involved in the business transaction. In that case, the business transaction is completed only when the escrow has confirmed the delivery and settlement of payment according to the terms and conditions of the specific business transaction. Each participation type may have its own scenario class respectively.

7.3 Trade Model Based on the Classification Attributes

7.3.1 Basic Trade Model

The simplest business process shown in Figure 12 is the basic trade model, from which we start the discussion of trade models derived from the classification approach mentioned in 7.1.

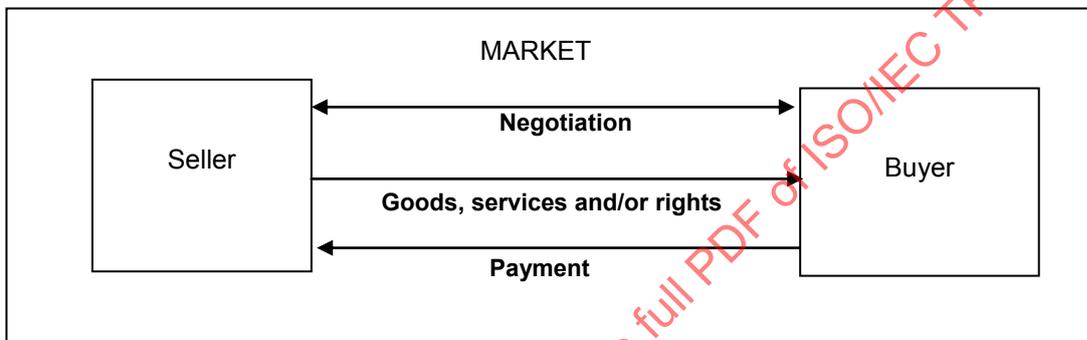


Figure 12 — Basic Trade Model

The brief description of this Basic Trade Model is as follows:

**Beginning of Trade:** either, or both buyer and seller find the counterparty by appropriate approaches in a market.

**Scenario:** either or both buyer and seller explicitly or implicitly show a scenario which may be acceptable to the counterparty, and negotiate the terms and conditions of the business transaction. In general, the way how to accept a particular scenario may be a part of the terms and conditions.

**Completion of Trade:** the trade will complete when both the delivery of goods, services and/or rights and payment are successfully finished.

**Authentication of Participants:** for the confirmation of the settlement of credit and/or debit between the buyer and seller, the authentication of buyer or seller is mandatory in the case that the payment or delivery is performed later than the agreement. If both delivery and payment are performed later than the agreement, the authentication of both participants is also mandatory. On the contrary, if the delivery and payment are simultaneously and immediately performed as well as the agreement, no authentication is required.

7.3.2 Trade Model by Market Type

Two trade models are derived from the classification of the market type.

**Undefined Market Model:**

a trade model, conforming to the description of Basic Trade Model, which is performed in unbounded market under the Open-edi environment

In this trade model, the buyer and seller begin the business transaction from seeking their counterparty by appropriate services and/or tools such as a portal site and search engine. The scenario to be applied to the

business transaction is decided upon the individual case. The buyer or seller may simply accept the scenario proposed by the counterparty, or they are mutually negotiating.

In order to save the negotiation efforts, it is possible that the buyer or seller is seeking the counterparty specifying a specific scenario in the search criteria at the beginning of the business transaction. However, generally speaking, this type of scenario should explicitly or implicitly include, as a part of scenario, the negotiation process of the terms and conditions. Thus, the Undefined Trade Model necessarily requires the coincident agreement of how to accept a specific scenario and the contents of terms and conditions.

**Defined Market Model:**

a trade model where buyer(s) and seller(s) accept the entry terms of market in advance and then commence the actual business transaction in the market under the Open-edi environment.

The scenario class to be applied to this trade model is explicitly established by the market administrator. The market administrator may be a buyer, seller or the third party. In any case, the buyer and seller participate in the market through an explicit or implicit registration procedure in advance. There may be two types of registration scheme; i.e. an explicit registration is required for either of buyer or seller while the other implicitly participates in the market, or the explicit registration is required for both.

The significance of the Defined Market Model is that the scenario applied to the market is defined at the individual market. It makes the buyers and sellers free from the negotiation efforts of principal terms and conditions to be applied for the individual business transaction. In this trade model, although the authentication of buyer and/or seller is not necessarily required, it may not be excluded that the registration procedure of market requires the authentication of participants in advance. The authentication at registration could save the repeating efforts in the individual business transactions.

### 7.3.3 Trade Model by Settlement Type

Two trade models are derived from the classification of the settlement type.

**Immediate Settlement Model:**

a trade model where the entire business activities of business transaction, i.e. planning, identification, negotiation, actualization (delivery and payment), is completed in real-time under the Open-edi environment.

One of the typical cases is downloading a software product or music from the vendor site, and paying with e-money or debit account. This trade model is almost equivalent to a casual procurement of goods, services and/or rights, which is done by cash at a store on the street. The procurement can be completed at the moment when it has been confirmed that the goods, services and/or rights is acceptable for the buyer and the payment is valid for the seller. The identification of particular business transaction and/or authentication of buyer and/or seller are not required. Rather, from the viewpoint of privacy protection, such a trade model should not be excluded from the Open-edi environment.

**Separate Settlement Model:**

a trade model where the business transaction is performed under the Open-edi environment, and where the delivery of goods, services and/or rights and/or payment are separated from the agreement process.

In this trade model, a special consideration should be taken on the scenario to bridge the time difference and/or spatial gap among agreement, delivery and payment.

In this trade model, at the first, an explicit identification of the particular business transaction is required for mapping the agreement to the delivery and/or payment performed separately. Secondly, the authentication of buyer and/or seller is required to confirm the relationship of credit and debit among participants that is kept through the business transaction from agreement to delivery and payment. Thirdly, the transition status of business transaction should be identified to be able to track the completion of individual business activities through the business transaction.

### 7.3.4 Trade Model by Participation Type

Two trade models are derived from the classification of the participation type.

**Bilateral Trade Model:**

a trade model where buyer(s) and seller(s) are directly involved in the business transaction without any involvement of any intermediary party.

In this trade model, the business transaction is basically closed among the parties. The business transaction is completed when the credit and/or debit settled between the buyer and seller.

**Mediated Trade Model:**

a trade model where a third party mediates a specified role(s) or function(s) as mutually agreed to by the buyer(s) and seller(s) for a certain business transaction.

One of the typical cases is the business transaction of real estate that an escrow company mediates the buyer and seller. In this trade model, the role of the third party may have many variations. The scenario is required to explicitly denote the role and responsibility of the third party participating to the business transaction. And, the business transaction should also satisfy the terms and conditions for the completion, which are relevant to the third party, not only the settlement of the debit/credit between the buyer and seller.

**7.4 Classification Scheme of Open-edi Scenarios**

**7.4.1 Scenario Classification and Types**

The classification attributes mentioned in the previous section, Market Type, Settlement Type and Participation Type are mutually disjoint. The classification result of Open-edi scenarios according to the three attributes is summarized in Table 1.

**Table 1 — Scenario Classification and Types**

Class	Classification Attributes			Scenario Types
	Market	Settlement	Participation	
<b>U-I-B</b>	Undefined	Immediate	Bilateral	-Basic Bilateral Trade Scenario
<b>U-I-M</b>	Undefined	Immediate	Mediated	-Basic Mediated Trade Scenario
<b>U-S-B</b>	Undefined	Separate	Bilateral	-Bilateral Agreement Scenario -Separate Delivery Scenario -Separate Payment Scenario -Authentication Scenario
<b>U-S-M</b>	Undefined	Separate	Mediated	-Mediated Agreement Scenario -Separate Delivery Scenario -Separate Payment Scenario -Authentication Scenario
<b>D-I-B</b>	Defined	Immediate	Bilateral	-Membership Registration Scenario -Defined Bilateral Trade Scenario
<b>D-I-M</b>	Defined	Immediate	Mediated	-Membership Registration Scenario -Defined Mediated Trade Scenario
<b>D-S-B</b>	Defined	Separate	Bilateral	-Membership Registration Scenario -Defined Bilateral Agreement Scenario

				-Separate Delivery Scenario -Separate Payment Scenario -Defined Authentication Scenario
<b>D-S-M</b>	Defined	Separate	Mediated	-Membership Registration Scenario -Defined Mediated Agreement Scenario -Separate Delivery Scenario -Separate Payment Scenario -Defined Authentication Scenario

**U-I-B Scenario Classification Type:**

a scenario class of business transactions, which is attributed by Undefined Market, Immediate Settlement and Bilateral Participation.

This scenario class consists of single Basic Bilateral Trade Scenario that is conforming to the Basic Trade Model under the Open-edi environment.

**U-I-M Scenario Classification Type:**

a scenario class of business transactions, which is attributed by Undefined Market, Immediate Settlement and Mediated Participation.

This scenario class consists of single Basic Mediated Trade Scenario, which is a complete set of mediated trade processes under the Open-edi environment.

**U-S-B Scenario Classification Type:**

a scenario class of business transactions, which is attributed by Undefined Market, Separate Settlement and Bilateral Participation.

This scenario class consists of the following four scenario types: Bilateral Agreement Scenario, Separate Delivery Scenario, Separate Payment Scenario and Authentication Scenario.

**U-S-M Scenario Classification Type:**

a scenario class of business transactions, which is attributed by Undefined Market, Separate Settlement and Mediated Participation.

This scenario class consists of the following four scenario types: Mediated Agreement Scenario, Separate Delivery Scenario, Separate Payment Scenario and Authentication Scenario.

**D-I-B Scenario Classification Type:**

a scenario class of business transactions, which is attributed by Defined Market, Immediate Settlement and Bilateral Participation.

This scenario class consists of the following two scenario types: Membership Registration Scenario and Defined Bilateral Trade Scenario.

**D-I-M Scenario Classification Type:**

a scenario class of business transactions, which is attributed by Defined Market, Immediate Settlement and Mediated Participation.

This scenario class consists of the following two scenario types: Membership Registration Scenario and Defined Mediated Trade Scenario.

**D-S-B Scenario Classification Type:**

a scenario class of business transactions, which is attributed by Defined Market, Separate Settlement and Bilateral Participation.

This scenario class consists of the following five scenario types: Membership Registration Scenario, Defined Bilateral Agreement Scenario, Separate Delivery Scenario, Separate Payment Scenario and Defined Authentication Scenario.

**D-S-M Scenario Classification Type:**

a scenario class of business transactions, which is attributed by Defined Market, Separate Settlement and Mediated Participation.

This scenario class consists of the following five scenario types: Membership Registration Scenario, Defined Mediated Agreement Scenario, Separate Delivery Scenario, Separate Payment Scenario and Defined Authentication Scenario.

**7.4.2 Scenario Types**

As mentioned in Table 1, the scenario types are quite different depending on scenario classes. Those scenario types are described as follows:

**7.4.2.1 Basic Bilateral Trade Scenario Type**

This scenario type includes all processes of a business transaction to begin and complete a Basic Bilateral Trade.

At the beginning of trade, either or both the buyer and seller find the counterparty, by appropriate approaches.

Then, either or both the buyer and seller show explicitly or implicitly an acceptable scenario to the counterparty, and negotiate the terms and conditions of business transaction. The way how to accept a particular scenario may be a part of the terms and conditions.

The trade will complete when both the delivery of goods, services and/or rights and payment are coincidentally and successfully finished.

No authentication of buyer and seller is required because the delivery and payment are simultaneously and immediately performed as well as the agreement of business transaction.

**7.4.2.2 Basic Mediated Trade Scenario Type**

This scenario type includes all processes of a business transaction to begin and complete a Basic Mediated Trade.

At the beginning of trade, either or both the buyer and seller find the counterparty by appropriate approaches or through an appropriate mediator.

Then, either or both the buyer and seller show explicitly or implicitly an acceptable scenario to the counterparty, and negotiate the terms and conditions of business transaction under the mediation of mediator(s). The way how to accept a particular scenario may be a part of the terms and conditions.

The trade will complete when both the delivery of goods, services and/or rights and payment are coincidentally and successfully finished and confirmed by the participants according to the terms and conditions agreed upon the business transaction.

No authentication of buyer and seller may be required because the delivery and payment are simultaneously and immediately performed as well as the agreement of business transaction. The mediator is required a certain authentication to qualify the ability of mediation. The qualification depends on the role of mediator.

#### 7.4.2.3 Defined Bilateral Trade Scenario Type

This scenario type is the core of D-I-B scenario and includes entire processes of a business transaction to begin and complete a Defined Bilateral Trade of which the principal terms and conditions the participants accepted in advance.

Before participating to the trade, the buyer and/or seller are required to make a membership registration to the defined market and to accept the principal terms and conditions of trade.

Either or both the buyer and seller begin the individual business transaction according to the direction provided by the market administrator.

The trade will complete when both the delivery of goods, services and/or rights and payment are coincidentally and successfully finished and confirmed by the participants according to the terms and conditions defined in the market and/or agreed upon the business transaction.

The qualification of membership is required for the participants. But no authentication of buyer and seller may be required because the delivery and payment are simultaneously and immediately performed as well as the agreement of business transaction.

#### 7.4.2.4 Defined Mediated Trade Scenario Type

This scenario type is the core of D-I-M scenario and includes entire processes of a business transaction to begin and complete a Defined Mediated Trade of which the principal terms and conditions the participants accepted in advance.

Before participating to the trade, the buyer, seller and/or mediator are required to make a membership registration to the defined market and to accept the principal terms and conditions of trade.

Either or both the buyer and seller begin and negotiate the individual business transaction under the mediation of an appropriate mediator according to the direction provided by the market administrator.

The trade will complete when both the delivery of goods, services and/or rights and payment are coincidentally and successfully finished and confirmed by the participants according to the terms and conditions defined in the market and/or agreed upon the business transaction.

The qualification of membership is required for the participants. But no authentication of buyer and seller may be required because the delivery and payment are simultaneously and immediately performed as well as the agreement of business transaction.

#### 7.4.2.5 Bilateral Agreement Scenario Type

This scenario type is the agreement part of U-S-B scenario, which precedes the delivery of goods, services and/or rights and/or payment of the business transaction.

At the beginning, either or both the buyer and seller find the counterparty, by appropriate approaches. Then, either or both of them show explicitly or implicitly an acceptable scenario to the counterparty, and negotiate the terms and conditions of business transaction. The way how to accept a particular scenario may be a part of the terms and conditions.

In the agreement, it is explicitly described that the delivery and/or payment are separately performed later. A unique identification of the business transaction is required for mapping the agreement to the delivery and/or payment performed separately. And, the identification should be unique in the global scope because the undefined market could not have a well-defined boundary.

The business transaction will complete when both the delivery and payment are successfully finished and confirmed by the participants according to the Separate Delivery Scenario and Separate Payment Scenario.

#### 7.4.2.6 Defined Bilateral Agreement Scenario Type

This scenario type is the agreement part of D-S-B scenario, which precedes the delivery of goods, services and/or rights and/or payment of the business transaction.

Before participating to the trade, the buyer and/or seller are required to make a membership registration to the specific market and to accept the principal terms and conditions of trade.

Either or both the buyer and seller begin the individual business transaction according to the direction provided by the market administrator.

In the agreement, it is explicitly described that the delivery and/or payment are separately performed later. A unique identification of the business transaction is required for mapping the agreement to the delivery and/or payment performed separately. And, the identification should be unique in the market boundary.

The business transaction will complete when both the delivery and payment are successfully finished and confirmed by the participants according to the terms and conditions defined in the market and/or to the Separate Delivery Scenario and Separate Payment Scenario.

#### 7.4.2.7 Mediated Agreement Scenario Type

This scenario type is the agreement part of U-S-M scenario, which precedes the delivery of goods, services and/or rights and/or payment of the business transaction.

Either or both the buyer and seller begin and negotiate the individual business transaction under the mediation of an appropriate mediator according to the direction provided by the market administrator.

The trade will complete when both the delivery and payment are and successfully finished and confirmed by the participants according to the Separate Delivery Scenario and Separate Payment Scenario.

In the agreement, it is explicitly described that the delivery and/or payment are separately performed later. In addition, a unique identification of the business transaction is required for mapping the agreement to the delivery and/or payment performed separately. And, the identification should be unique in the global scope because the undefined market could not have a well-defined boundary.

The business transaction will complete when both the delivery and payment are successfully finished and confirmed by the participants according to the Separate Delivery Scenario and Separate Payment Scenario.

#### 7.4.2.8 Defined Mediated Agreement Scenario Type

This scenario type is the agreement part of D-S-M scenario, which precedes the delivery of goods, services and/or rights and/or payment of the business transaction.

Either or both the buyer and seller begin and negotiate the individual business transaction under the mediation of an appropriate mediator according to the direction provided by the market administrator.

In the agreement, it is explicitly described that the delivery and/or payment are separately performed later. A unique identification of the business transaction is required for mapping the agreement to the delivery and/or payment performed separately. And, the identification should be unique in the market boundary.

The business transaction will complete when both the delivery and payment are successfully finished and confirmed by the participants according to the terms and conditions defined in the market and/or to the Separate Delivery Scenario and Separate Payment Scenario.

#### 7.4.2.9 Separate Delivery Scenario Type

This scenario type is the delivery part of U-S-B, U-S-M, D-S-B and D-S-M scenarios, which is separately performed after the agreement of business transaction.

When the delivery of goods, services and/or rights is separately performed from the agreement of the business transaction, the specific terms and conditions of delivery should be explicitly described. The delivery status should be explained in the scenario, as the completion of delivery is a mandatory factor for the completion of the business transaction as a whole.

Furthermore, the delivery scenario should keep a stable reference to the precedent agreement scenario to denote the relationship among the separated activities of a business transaction.

#### **7.4.2.10 Separate Payment Scenario Type**

This scenario type is the payment part of U-S-B, U-S-M, D-S-B and D-S-M scenarios, which is separately performed after the agreement activity of business transaction.

When the payment is separately performed after the agreement activity of the business transaction, the payment scenario is required to explicitly describe the specific terms and conditions of payment.

The payment status should also be explained in the scenario, as the completion of payment is a mandatory factor for the completion of the business transaction as a whole.

Furthermore, the payment scenario should keep a stable reference to the precedent agreement scenario to denote the relationship among the separated activities of a business transaction.

#### **7.4.2.11 Authentication Scenario Type**

This scenario type is the authentication part of U-S-B and U-S-M scenarios, which identifies and confirms the agreement and/or the participants relevant to the business transaction.

When the delivery of goods, services and/or rights and/or payment is separately performed after the agreement of the business transaction, the authentication scenario is required to explicitly identify and confirm the credit and debit relationship among participants involved in the business transaction. The identification should be unique in the global scope because the undefined market could not have a well-defined boundary.

The authentication scenario should also keep a stable reference to the relevant agreement scenario to denote the relationship among the business transaction, the agreement and/or the participants.

#### **7.4.2.12 Defined Authentication Scenario Type**

This scenario type is the authentication part of D-S-B and D-S-M scenarios, which identifies and confirms the agreement and/or the participants relevant to the business transaction.

When the delivery of goods, services and/or rights and/or payment is separately performed after the agreement of the business transaction, the authentication scenario is required to explicitly identify and confirm the credit and debit relationship among participants involved in the business transaction.

The market administrator provides the authentication scheme of the market. The identification should be unique in the market boundary.

The authentication scenario should also keep a stable reference to the relevant agreement scenario to denote the relationship among the business transaction, the agreement and/or the participants.

### **7.4.3 Assumption for scenario classification**

For the simplicity of discussion, this scenario classification idea has many assumptions. In the real business world, those assumptions should be further compiled to reflect the practical aspects of business transactions.

Actual business transaction may have many types of regulatory constraints than the normative rules explicitly or implicitly involved in the business transaction. Each of them is partially or entirely applied to a specific market type, participant type, goods, services and/or rights type, delivery type and/or payment type. In

addition, some of them are particularly effective in a certain country or region and/or in a certain period. However, the scenario classification is considered to be independent from the regulatory constraints.

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