TECHNICAL REPORT

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Information technology — Business operational view —

Part 14: Open-edi reference model and cloud computing architecture

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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.

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) or the IEC list of patent declarations received (see http://patents.iec.ch).

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

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 Purpose and overview

Open-edi is defined in ISO/IEC 14662 as *"electronic data interchange among multiple autonomous Persons to accomplish an explicit shared business goal according to Open-edi standards"*. Cloud computing is defined in ISO/IEC 17788 as *"a paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on demand"*. There are many similarities and commonalities among the Open-edi reference model and cloud computing reference architecture.

ISO/IEC 15944 is a multipart eBusiness standard which is based on and focuses on the BOV perspective of the ISO/IEC 14662 Open-edi reference model. This document is intented to serve as a bridge among standards development involved in Open-edi and cloud computing.

The primary purpose of this document is to identify commonalities between:

a) the ISO/IEC 14662 Open-edi reference model (and related ISO/IEC 15944 series); and,

b) ISO/IEC 17789 (and related standards).

0.2 Link to ISO/IEC 14662 and ISO/IEC 15944 perspectives

0.2.1 ISO/IEC 14662 Open-edi reference model[1)]

The ISO/IEC 14662, Open-edi reference model states the conceptual architecture necessary for carrying out electronic business transactions among autonomous parties. That architecture identifies and describes the need to have two separate and related views of the business transaction.

The first is the business operational view (BOV). The second is the functional service view (FSV). Figure 1 (copied from ISO/IEC 14662) illustrates the Open-edi environment.

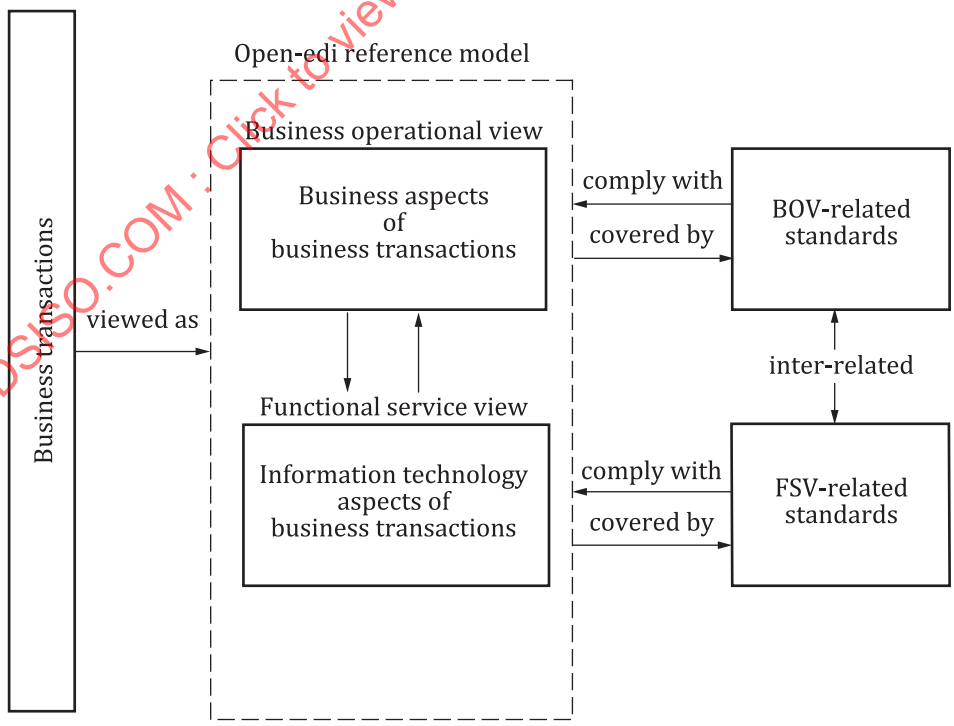

Figure 1 — Open-edi environment

1) The Memorandum of Understanding between ISO, IEC, ITU and UN/ECE (2000) concerning standardization in the field of electronic business is based on this *Model*. See https:// www .unece .org/ fileadmin/ DAM/ oes/ MOU/ 2000/ 24March2000 _IEC _ISO _ITU .pdf.

0.2.2 ISO/IEC 15944-1

ISO/IEC 15944-1 states the requirements of the BOV aspects of Open-edi in support of electronic business transactions. They are required to be taken into account in the development of business semantic descriptive techniques for modelling e-business transactions and components thereof as re-useable business objects. They include:

— commercial frameworks and associated requirements;

— legal frameworks and associated requirements;

— public policy requirements particularly which apply to individuals, i.e., are rights of individuals, which are of a generic nature such as consumer protection, privacy protection, and accessibility (see further in ISO/IEC 15944-5:2008, 6.3);

— requirements arising from the need to support cultural adaptability. This includes meeting localization and multilingual requirements, (e.g., as may be required by a particular jurisdictional domain or desired to provide a good, service and/or right in a particular market). One needs the ability to distinguish, the specification of scenarios, scenario components, and their semantics, in the context of making commitments, between:

  a) the use of unique, unambiguous and linguistically neutral identifiers (often as composite identifiers) at the information technology interface level among the IT systems of participation parties on the one hand; and, on the other,

  b) their multiple human interface equivalent (HIE) expressions in a presentation form appropriate to the Persons involved in the making of the resulting commitments.

Figure 2 (copied from ISO/IEC 15944-1) shows an integrated view of these business operational requirements.

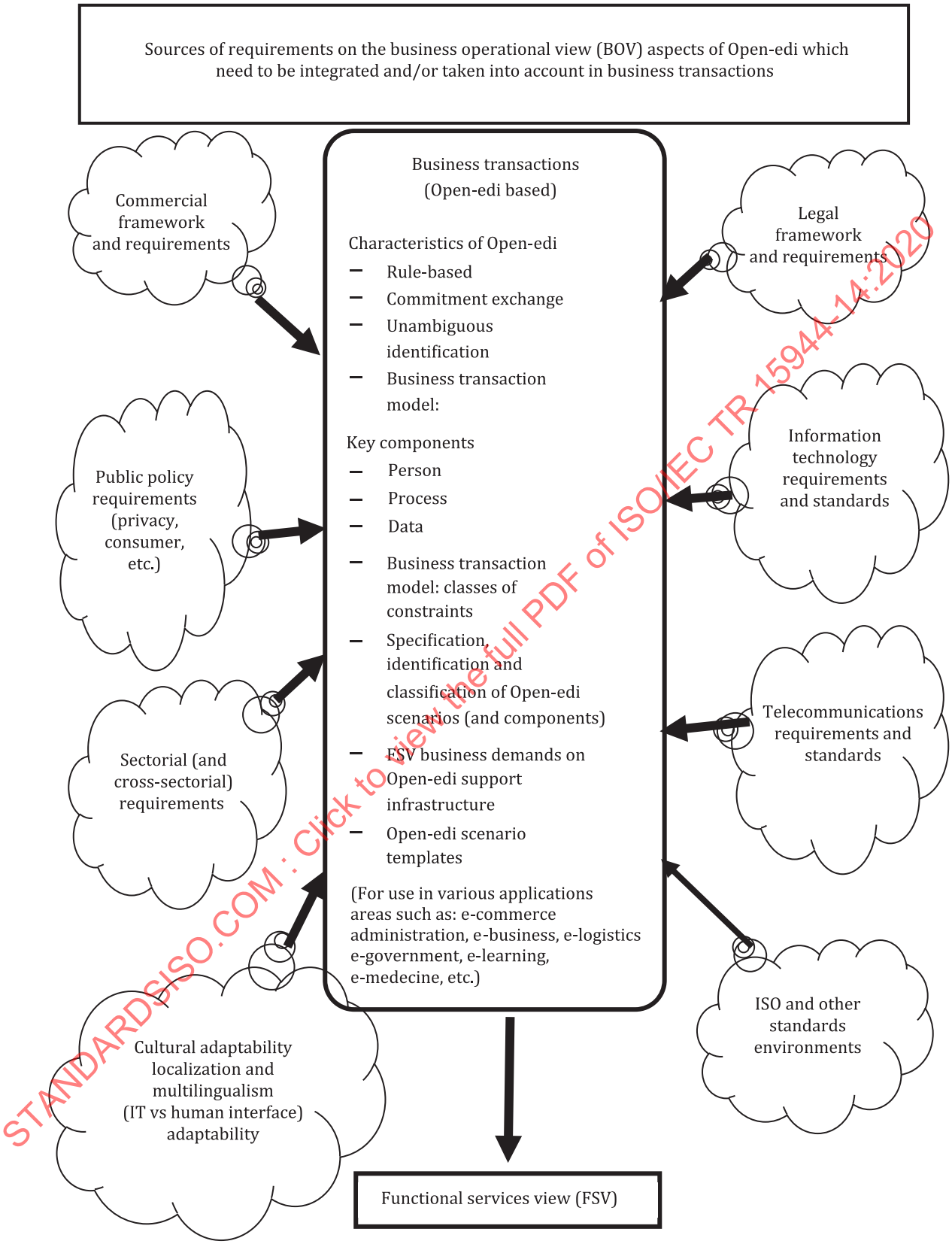

Figure 2 — Integrated view of business operational requirements

In electronic business transactions, whether undertaken on a for profit or not-for-profit basis, the key element is commitment exchange among Persons made through their decision-making applications (DMAs) of their information technology systems (IT systems) accessibility (see further

in ISO/IEC 14662:2010, 5.2) acting on behalf of Persons. Persons are the only entities able to make commitments.

The **business operational view (BOV)** was therefore defined as:

> *"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**".*
>
> [ISO/IEC 14662:2010, 3.3]

There are three categories of Person as a role player in Open-edi, namely:

1) the Person as individual,

2) the Person as organization, and

3) the Person as public administration[2)].

There are also three basic (or primitive) roles of Persons in business transactions, namely: buyer, seller, and regulator. When modelling business transactions, jurisdictional domains prescribe their external constraints in the role of regulator and execute them as public administration.

0.3 Importance of and role of terms and definitions

The ISO/IEC 15944 series sets out the processes for achieving a common understanding of the business operational view (BOV) from commercial, legal, ICT, public policy and cross-sectoral perspectives. It is therefore important to check and confirm that a common understanding in any one of these domains is also unambiguously understood as identical in the others.

This subclause is included in each part of the ISO/IEC 15944 series to emphasize that harmonized concepts and definitions (and assigned terms) in its Parts are essential to the continuity of the overall standard.

In order to minimize ambiguity in the definitions and their associated terms, each definition and its associated term has been made available in at least one language other than English in the document in which it is introduced. In this context it is noted that ISO/IEC 15944-7 already also contains human interface equivalents (HIEs) in ISO Chinese, ISO French, and ISO Russian[3)].

0.4 Based on rules and guidelines

Open-edi is based on rules which are predefined and mutually agreed to. They are precise criteria and agreed upon requirements of business transactions representing common business operational practices and functional requirements.

These rules also serve as a common set of understanding bridging the varied perspectives of the commercial framework, the legal framework, the information technology framework, standardizers, consumers, etc.

This document does not introduce any new rules or guidelines in addition to those that are already found in the ISO/IEC 15944 series.

0.5 Use of Person, organization, individual and party in the context of business transaction and commitment exchange

2) While public administration is one of the three distinct sub-types of Person, most of the rules in ISO/IEC 15944-1 applicable to organization also apply to public administration. In addition, an unincorporated seller is also deemed to function as an organization. Consequently, the use of organization throughout this document also covers public administration. Where it is necessary to bring forward rules, constraints, properties, etc., which apply specifically to public administration, this is stated explicitly.

3) The designation ISO before a natural language refers to the use of that natural language in ISO standards.

Throughout this document:

— the use of Person with a capital "P" represents Person as a defined term, i.e., as the entity within an Open-edi Party that carries the legal responsibility for making commitment(s);

— individual, organization, and public administration are defined terms representing the three common sub-types of Person; and,

— the use of the words person(s) and party (ies) without a capital "P" indicates their use in a generic context independent of Person, as a defined concept in ISO/IEC 14662 and the ISO/IEC 15944 series.

NOTE A party to a business transaction has the properties and behaviours of a Person.

0.6 Organization and description of this document

This document identifies the key concepts of open-edi reference model and cloud computing reference architecture relevant to each other by transforming them into concept models.

Following Clauses 0,1, 2, 3 and 4, which have a common approach and similar content in the ISO/IEC 15944 series, Clause 5 summarizes the Open-edi reference model together with the business operational view and functional service view.

Clause 6 summarizes the cloud computing reference architecture with user view and functional view.

Clause 7 provides concept models of both open-edi reference model and cloud computing reference architecture with ORM2 notations.

Clause 8 analyses and discusses the relationship between the two models and gives a summary of cloud computing and roles of an agent acting on behalf of a seller, and that of a"third party acting on behalf of a seller in executing business transaction with a buyer.

Annex A is a consolidated list of the definitions and their associated terms introduced in this document in ISO English and ISO French. (For the complete set of ISO French (and ISO Russian and ISO Chinese) equivalents of the entries in Clause 3, see ISO/IEC 15944-7.) As stated in the main body of this document, the issue of semantics and their importance of identifying the correct interpretation across official aspects is critical.

Annex B identifies rules stated in the other parts of the ISO/IEC 15944 series that are applicable to this document.

Annex C provides a mapping of key relevant cloud computing concepts and their definitions into an eBusiness context.

Annex D gives a brief introduction to fact-based modelling.

Annex E discusses definitions of role in ISO/IEC 14662 and ISO/IEC 17789.

Annex F lists titles of all parts of the ISO/IEC 15944 series.

Information technology — Business operational view —

Part 14: Open-edi reference model and cloud computing architecture

1 Scope

This document:

— examines the basic concepts that have been developed for both cloud computing and Open-edi;

— identifies key Open-edi concepts relevant to cloud computing;

— identifies key cloud computing concepts relevant to Open-edi;

— compares Open-edi model and cloud computing architecture and identifies mappings (similarities in whole or in part) between them using formal semantic modelling techniques.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
agent
Person (3.39) acting for another *Person* in a clearly specified capacity in the context of a *business transaction* (3.4)

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 Service View (FSV) where they are defined as an "Information Processing Domain (IPD)".

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

3.2
business
series of processes, each having a clearly understood purpose, involving more than *Person* (3.39), realised through the exchange of information and directed towards some mutually agreed upon goal, extending over a period of time

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

3.3
business operational view
BOV
perspective of *business transactions* (3.4) limited to those aspects regarding the making of *business* (3.2) decisions and *commitments* (3.16) among *Persons* (3.39), which are needed for the description of a *business transaction*

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

3.4
business transaction
predefined set of activities and/or processes of *Persons* (3.39) which is initiated by a *Person* to accomplish an explicitly shared *business* (3.2) goal and terminated upon recognition of one of the agreed conclusions by all the involved *Persons* although some of the recognition might be implicit

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

3.5
buyer
Person (3.39) 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

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

3.6
cloud computing
paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand

Note 1 to entry: Examples of resources include servers, operating systems, networks, software, applications, and storage equipment.

[SOURCE: ISO/IEC 17788:2014, 3.2.5]

3.7
cloud service
one or more capabilities offered via *cloud computing* (3.6) invoked using a defined interface

[SOURCE: ISO/IEC 17788:2014, 3.2.8]

3.8
cloud service broker
cloud service partner (3.12) that negotiates relationships between *cloud service customers* (3.9) and *cloud service providers* (3.13)

[SOURCE: ISO/IEC 17788:2014, 3.2.9]

3.9
cloud service customer
party (3.38) which is in a business relationship for the purpose of using *cloud services* (3.7)

Note 1 to entry: A business relationship does not necessarily imply financial agreements.

[SOURCE: ISO/IEC 17788:2014, 3.2.11]

3.10
cloud service customer data
class of data objects *under the control* (3.49), by legal or other reasons, *of* the *cloud service customer* (3.9) that were input to the *cloud services* (3.7), or resulted from exercising the capabilities of the *cloud services* by or on behalf of the *cloud service customer* via the published interface of the *cloud services*

Note 1 to entry: An example of legal controls is copyright.

Note 2 to entry: It may be that the cloud service contains or operates on data that is not cloud service customer data; this might be data made available by the cloud service providers, or obtained from another source, or it might be publicly available data. However, any output data produced by the actions of the cloud service customer using the capabilities of the cloud service on this data is likely to be cloud service customer data, following the general principles of copyright, unless there are specific provisions in the cloud service agreement to the contrary.

[SOURCE: ISO/IEC 17788:2014, 3.2.12]

3.11
cloud service derived data
class of data objects under *cloud service provider* (3.13) control that are derived as a result of interaction with the *cloud services* (3.7) by the *cloud service customer* (3.9)

Note 1 to entry: Cloud service derived data includes log data containing records of who used the service, at what times, which functions, types of data involved and so on. It can also include information about the numbers of authorized users and their identities. It can also include any configuration or customization data, where the cloud service has such configuration and customization capabilities.

[SOURCE: ISO/IEC 17788:2014, 3.2.13]

3.12
cloud service partner
party (3.38) which is engaged in support of, or auxiliary to, activities of either the *cloud service provider* (3.13) or the *cloud service customer* (3.9), or both

[SOURCE: ISO/IEC 17788:2014, 3.2.14]

3.13
cloud service provider
party (3.38) which makes *cloud services* (3.7) available

[SOURCE: ISO/IEC 17788:2014, 3.2.15]

3.14
cloud service provider data
class of data objects, specific to the operation of the *cloud services* (3.7), *under the control of* (3.50) the *cloud service provider* (3.13)

Note 1 to entry: Cloud service provider data includes but is not limited to resource configuration and utilization information, cloud service specific virtual machine, storage and network resource allocations, overall data centre configuration and utilization, physical and virtual resource failure rates, operational costs and so on.

[SOURCE: ISO/IEC 17788:2014, 3.2.16]

3.15
cloud service user
natural person, or entity acting on their behalf, associated with a *cloud service customer* (3.9) that uses *cloud services* (3.7)

Note 1 to entry: Examples of such entities include devices and applications.

[SOURCE: ISO/IEC 17788:2014, 3.2.17]

3.16
commitment
making or accepting of a right, obligation, liability or responsibility by a *Person* (3.39) that is capable of enforcement in the jurisdictional domain in which the commitment is made

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

3.17
constraint
rule (3.45), explicitly stated, that prescribes, limits, governs or specifies any aspect of a *business transaction* (3.4)

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

Note 2 to entry: For constraints to be registered for implementation in Open-edi they 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]

3.18
data portability
ability to easily transfer data from one system to another without being required to re-enter data

Note 1 to entry: It is the ease of moving the data that is the essence here. This might be achieved by the source system supplying the data in exactly the format that is accepted by the target system. But even if the formats do not match, the transformation between them may be simple and straightforward to achieve with commonly available tools. On the other hand, a process of printing out the data and rekeying it for the target system could not be described as "easy".

[SOURCE: ISO/IEC 17788:2014, 3.2.21]

3.19
decision-making application
DMA
model of that part of an *Open-edi system* (3.35) which makes decisions corresponding to the *role(s)* (3.44) that the *Open-edi party* (3.31) plays as well as the originating, receiving and managing data values contained in the instantiated *Information Bundles* (3.25), and which is not required to be visible to the other *Open-edi party(ies)*

[SOURCE: ISO/IEC 14662:2010, 3.6]

3.20
decision-making application interface
DMA interface
set of requirements that permit a *decision-making application* (3.19) to interact with the *Open-edi Support Infrastructure* (3.34)

[SOURCE: ISO/IEC 14662:2010, 3.7]

3.21
electronic data interchange
EDI
automated exchange of any predefined and structured data for *business* (3.2) purposes among information systems of two or more *Persons* (3.39)

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

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

3.22
external constraint
constraint (3.17) which takes precedence over internal constraints in a *business transaction* (3.4), i.e. is external to those agreed upon by the parties to a *business transaction*

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

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

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

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

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 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 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]

3.23
functional services view
FSV
perspective of *business transactions* (3.4) limited to those information technology interoperability aspects of *information technology systems* (3.27) needed to support the execution of *Open-edi transactions* (3.36)

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

3.24
individual
Person (3.39) 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]

3.25
information bundle
IB
formal description of the semantics of the *recorded information* (3.41) to be exchanged by *Open-edi parties* (3.31) playing *roles* (3.44) in an *Open-edi scenario* (3.32)

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

3.26
information processing domain
IPD
information technology system (3.27) which includes at least either a *decision-making application* (3.19) and/or one of the components of an *Open-edi support infrastructure* (3.34)(or both), and acts/executes on behalf of an *Open-edi party* (3.31)(either directly or under a delegated authority)

[SOURCE: ISO/IEC 14662:2010, 3.12]

3.27
information technology system
IT system
set of one or more computers, associated software, peripherals, terminals, human operations, physical processes, information transfer means, that form an autonomous whole, capable of performing information processing and/or information transfer

[SOURCE: ISO/IEC 14662:2010, 3.13]

3.28
interoperability
the ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged

[SOURCE: ISO/IEC 17788:2014, 3.1.5]

3.29
jurisdictional domain
jurisdiction, recognized in law as a distinct legal and/or regulatory framework, which is a source of *external constraints* (3.22) on *Persons* (3.39), their behaviour and the making of *commitments* (3.16) among *Persons* including any aspect of a *business transaction* (3.4)

Note 1 to entry: 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 to entry: Jurisdictional domains can combine to form new jurisdictional domains, (e.g., through bilateral, multilateral and/or international treaties).

EXAMPLE The European Union (EU), NAFTA, WTO, WCO, ICAO, WHO, Red Cross, the ISO, the IEC, the ITU, etc.

Note 3 to entry: Several levels and categories of jurisdictional domains may exist within a jurisdictional domain.

Note 4 to entry: 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 an interchange of commitments is conducted on a for-profit or not-for-profit basis and/or includes monetary values.

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

[SOURCE: ISO/IEC ISO/IEC 15944-5:2008, 3.67, modified – Note 2 to entry and the EXAMPLE have been separated.]

3.30
Open-edi
electronic data interchange (3.21) among multiple autonomous *Persons* (3.39) to accomplish an explicit shared *business* (3.2) goal according to *Open-edi standards* (3.33)

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

3.31
Open-edi party
OeP
Person (3.39) that participates in *Open-edi* (3.30)

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]

3.32
Open-edi scenario
OeS
formal specification of a class of *business transactions* (3.4) having the same *business* (3.2) goal

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

3.33
Open-edi standard
standard that complies with the Open-edi reference model

[SOURCE: ISO/IEC 14662:2010, 3.19]

3.34
Open-edi support infrastructure
OeSI
model of the set of functional capabilities for *Open-edi systems* (3.35) which, when taken together with the *decision-making applications* (3.19), allows *Open-edi parties* (3.31) to participate in *Open-edi transactions* (3.36)

[SOURCE: ISO/IEC 14662:2010, 3.20]

3.35
Open-edi system
information technology system (3.27) which enables an *Open-edi party* (3.31) to participate in *Open-edi transactions* (3.36)

[SOURCE: ISO/IEC 14662:2010, 3.22]

3.36
Open-edi transaction
business transaction (3.4) that is in compliance with an *Open-edi scenario* (3.32)

[SOURCE: ISO/IEC 14662:2010, 3.23]

3.37
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 document 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.

[SOURCE: ISO/IEC 15944-1:2011, 3.44]

3.38
party
natural person or legal person, whether or not incorporated, or a group of either

[SOURCE: ISO/IEC 17788:2014, 3.1.6]

3.39
Person
entity, i.e. a natural or legal person, recognized by law as having legal rights and duties, able to make *commitment(s)* (3.16), assume and fulfil 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 sub-types of Person, namely "individual", "organization", and "public administration".

[SOURCE: ISO/IEC 14662:2010, 3.24]

3.40
public administration
entity, i.e., a *Person* (3.39), which is an *organization* (3.37) and has the added attribute of being authorized to act on behalf of a *regulator* (3.42)

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

3.41
recorded information
any information that is recorded on or in a medium irrespective of form, recording medium or technology used, 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: i) any form of recorded information, means of recording, and any medium on which information can be recorded; and ii) all types of recorded information including all data types, instructions or software, databases, etc.

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

3.42
regulator
Person (3.39) who has authority to prescribe *external constraints* (3.22) which serve as principles, policies or *rules* (3.45) governing or prescribing the behaviour of *Persons* involved in a *business transaction* (3.4) as well as the provisioning of goods, services, and/or rights interchanged

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

3.43
reversibility
process for *cloud service customer* (3.9) to retrieve their *cloud service customer data* (3.10) and application artefacts and for the *cloud service provider* (3.13) to delete all *cloud service customer data* as well as contractually specified *cloud service derived data* (3.11) after an agreed period

[SOURCE: ISO/IEC 17788:2014, 3.2.35]

3.44
role
specification which models an external intended behaviour (as allowed within a scenario) of an *Open-edi Party* (3.31)

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

3.45
rule
statement governing conduct, procedure, conditions and relations

Note 1 to entry: Rules specify conditions that must be complied with. These may include relations among objects and their attributes.

Note 2 to entry: Rules are of a mandatory or conditional nature.

Note 3 to entry: 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: a) content of the information flows in the form of precise and computer-processable meaning, i.e. the semantics of data; and (b) the order and behaviour of the information flows themselves.

Note 4 to entry: 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 to entry: Specification of rules in an Open-edi business transaction should be compliant with the requirements of ISO/IEC 15944-3.

[SOURCE: ISO/IEC 15944-2:2015, 3.101]

3.46
seller
Person (3.39) who aims to hand over voluntarily or in response to a demand, a good, service, and/or right to another *Person* (3.39) 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]

3.47
semantic component
SC
unit of *recorded information* (3.41) unambiguously defined in the context of the *business* (3.2) goal of the *business transaction* (3.4)

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

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

3.48
service level agreement
SLA
documented agreement between the service provider and customer that identifies services and service targets

Note 1 to entry: A service level agreement can also be established between the service provider and a supplier, an internal group or a customer acting as a supplier.

Note 2 to entry: A service level agreement can be included in a contract or another type of documented agreement.

[SOURCE: ISO/IEC 17788:2014, 3.1.7]

3.49
third party
Person (3.39) besides the two primarily concerned in a *business transaction* (3.4) who is *agent* (3.1) of neither and who fulfils a specified *role* (3.44) or function as mutually agreed to by the two primary *Persons* or as a result of *external constraints* (3.22)

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]

3.50
under the control of
set of requirements on an *organization* (3.37), especially those of *external constraint* (3.22) nature, i.e., privacy protection and related information law requirements, requiring full and complete information life cycle management (ILCM) of personal information as set(s) of *recorded information* (3.41) (SRIs) related to the agreed upon goal of the instantiated *business transaction* (3.4), including state changes to the content of the SRIs with respect to their creation/collection, recording processing, organization, storage, use, retrieval, disclosure, retrieval, aggregation, dissemination, disposition (including expungement), *electronic data interchange (EDI)* (3.21), etc., and in particular that of any and all state changes in the *decision-making application (DMAs)* (3.19) of the *organization* and any of its *agents* (3.1) and/or *third parties* (3.48) (as well as any other parties) to the *business transaction*

Note 1 to entry: The fact that a Person responsible for the control of a SRI(s), especially SPI(s), delegates or contracts out physical custody of the SRI(s) to an agents or third party does not take away from the responsibility of that Person for ensuring ILCM management aspects in support of privacy protection requirements remain fully supported and executed.

Note 2 to entry: If and where a disposition or expungement of SPIs pertaining to a business transaction involves the transfer of the related SPIs to another organization the applicable ILCM requirements of a privacy protection nature continue to apply to the organization to which the SPIs are being transferred to.

[SOURCE: ISO/IEC 15944-12:2020, 3.142]

4 Abbreviated terms

CCRA	cloud computing reference architecture
FBM	Fact-based modelling
HIE	human interface equivalent
ICT	information communications technology
ILCM	information life cycle management

ORM	object-role modelling
SPI	set of personal information
SRI	set of recorded information

5 Brief summary of Open-edi reference model

5.1 Open-edi reference model overview

Open-edi is defined as electronic data interchange (EDI) among multiple autonomous Persons to accomplish an explicit shared business goal" according to Open-edi standards.The characteristics by which Open-edi is recognized and defined are:

— actions based on following predefined rules;

— commitment of the parties involved;

— communications among parties are automated;

— parties control and maintain their states;

— parties act autonomously;

— multiple simultaneous transactions can be supported.

The Open-edi reference model provides a reference framework for the identification, development and coordination of Open-edi standards. This framework addresses two perspectives of business transactions: the business operational view (BOV) captures the business users aspects and the (functional service view) FSV captures the information technology aspects.

Each view of the Open-edi reference model corresponds to standards. One set of standards associated with the BOV in the Open-edi reference model addresses the business issues of Open-edi. Another set of standards associated with the FSV in the Open-edi reference model addresses information technology (IT) issues.

Figure 1 (copied from ISO/IEC 14662) sets out the relationship between the model and these.

5.2 Business operational view

The BOV addresses the business requirements for inter-working among Open-edi parties, as well as demands on supporting IT products and services. These business requirements include business conventions, agreements and rules among organizations.

The BOV addresses the aspects of:

a) the semantics of business data in business transactions and associated data interchanges;

b) the rules for business transactions, including

— operational conventions,

— agreements, and

— mutual obligations, which apply to the business needs of Open-edi.

The BOV-related standards provide a specification of how to model the business and associated requirements as an Open-edi scenario.

Open-edi scenarios include the following components:

— roles;

— information bundle(s);

— scenario attribute(s).

5.3 Functional service view

Within the FSV, the interoperability addresses the interactions between the IT systems supporting the Open-edi parties. Interoperability implies that two or more IT systems, conforming to the standards related to the FSV, are able to co-operate and support the execution of business transactions that are in compliance with Open-edi scenarios. FSV-related standards address information technology interoperability aspects which are generic to business transactions.

The FSV addresses the supporting services meeting the mechanistic needs of Open-edi.

It focuses on the information technology aspects of:

a) functional capabilities;

b) service interfaces;

c) protocols.

Such functional capabilities, service interfaces and protocols include:

— capability of initiating, operating and tracking the progress of Open-edi transactions;

— user application interface;

— transfer infrastructure interface;

— security mechanism handling;

— protocols for interworking of information technology systems of different organizations;

— translation mechanisms.

The FSV identifies and models the generic functional capabilities of IT systems which are needed to support the execution of Open-edi transactions. In addition, it provides the basic concepts which will allow the FSV-related standards to accommodate different configurations of organizations and IT systems to provide these functional capabilities. For example, the FSV-related standards will accommodate the need for Open-edi parties to delegate a part of the execution of Open-edi transactions to service providers.

An Open-edi system may be considered as containing two functions. The first is a decision-making application function. The second is the function of an Open-edi support infrastructure needed to support the carrying out of Open-edi transactions for an OeP.

The concept of IPD is used in the implementation of Open-edi scenarios. An OeP may encompass all the functional components (DMA and OeSI) into a single IPD or may delegate the provision of some functional components of an IPS to different service providers. Different OePs may play the same role. An OeP may play different roles of an Open-edi scenario. These roles may be played by the same IPD or different IPDs of the OeP.

Figure 3 (copied from ISO/IEC 14662) shows a possible relationship among the functional components of two sample Open-edi systems. The goal of these relationships is to support the interaction between DMAs of the Open-edi parties. For this interaction, DMAs use, through their DMA interface, the services of the OeSI.

Although Figure 3 shows two Open-edi systems, the concept is extended to more than two Open-edi systems.

The configuration of Open-edi systems may reflect the delegation of parts of OeSI to other Open-edi parties. Whenever this situation occurs, an IPD will be configured with OeSI. This IPD will support other IPD(s) within the same Open-edi system, and may be shared by different Open-edi systems.

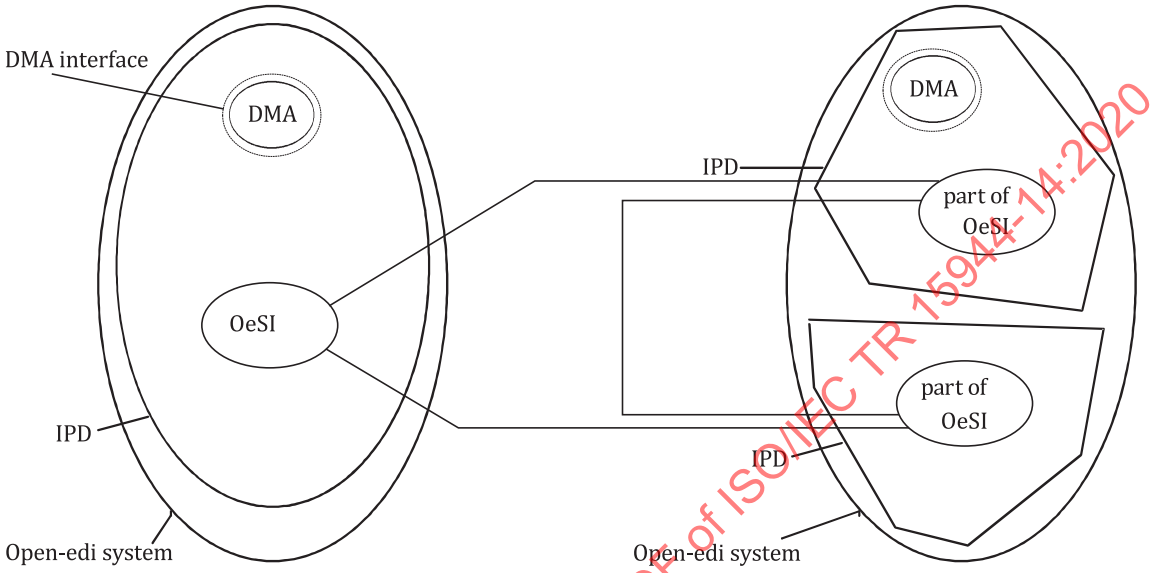

Figure 3 — Open-edi system relationships

6 Brief summary of cloud computing reference architecture

6.1 Cloud computing overview

Cloud computing is a paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand. The cloud computing paradigm is composed of key characteristics, cloud computing roles and activities, cloud capabilities types and cloud service categories, cloud deployment models and cloud computing cross cutting aspects.

Key characteristics of cloud computing are:

— broad network access;

— measured service;

— multi-tenancy;

— on-demand self-service;

— rapid elasticity and scalability;

— resource pooling.

Within the context of cloud computing, it is often necessary to differentiate requirements and issues for certain parties. These parties are entities that play roles (and sub-roles). Roles, in turn, are sets of activities and activities themselves are implemented by components. All cloud computing related activities can be categorized into three main groups: activities that use services, activities that provide services and activities that support services. It is important to note that a party may play more than one role at any given point in time and may only engage in a specific subset of activities of that role.

The major roles of cloud computing are:

— cloud service customer;

— cloud service partner;

— cloud service provider.

There are three different cloud capabilities types: application capabilities type, infrastructure capabilities type, and platform capabilities type.

Representative cloud service categories are:

— communications as a service (CaaS);

— compute as a service (CompaaS);

— data storage as a service (DSaaS);

— infrastructure as a service (IaaS);

— network as a service (NaaS);

— platform as a service (PaaS);

— software as a service (SaaS).

Cloud deployment models represent how cloud computing can be organized based on the control and sharing of physical or virtual resources.

The cloud deployment models include:

— public cloud;

— private cloud;

— community cloud;

— hybrid cloud.

Cross cutting aspects are behaviours or capabilities which need to be coordinated across roles and implemented consistently in a cloud computing system.

Key cross cutting aspects include:

— auditability;

— availability;

— governance;

— interoperability;

— maintenance and versioning;

— performance;

— portability;

— protection of PII;

— regulatory;

— resiliency;

— reversibility;

— security;

— service levels and service level agreement.

6.2 Cloud computing reference architecture (CCRA)

The cloud computing reference architecture presented in ISO/IEC 17789 provides an architectural framework that is effective for describing the cloud computing roles, sub-roles, cloud computing activities, cross-cutting aspects, as well as the functional architecture and functional components of cloud computing.

Cloud computing systems can be described using a viewpoint approach. Figure 4 (copied from ISO/IEC 17789) shows the transition from the user view to the functional view[4].

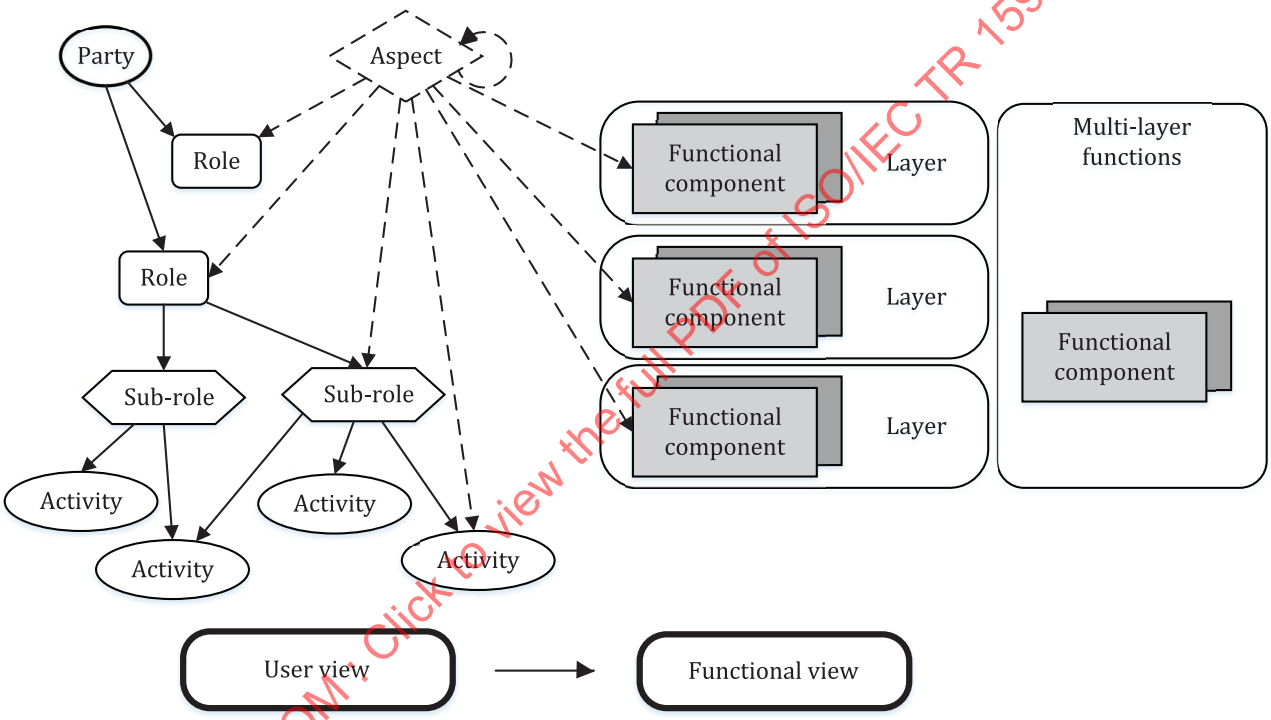

Figure 4 — Transition from the user view to the functional view

The user view addresses the following cloud computing concepts:

— cloud computing activities;

— roles and sub-roles;

— parties;

— cloud services;

— cloud deployment models;

— cross-cutting aspects.

4) Four distinct viewpoints are used in the CCRA. While details of the user view and functional view are addressed within ISO/IEC 17789, the implementation and deployment views are related to technology and vendor-specific cloud computing implementations and actual deployments, and are therefore out of the scope.

The functional view addresses the following cloud computing concepts:

— functional components;

— functional layers; and

— multi-layer functions.

7 Semantic models of the Open-edi reference model and the cloud computing architecture

In this document, the FBM notation and methodology has been used as a description technique to define semantic models abstracted from the cloud computing and Open-edi standards (see Annex D for the introduction of FBM as a formal semantic modelling technique that this document uses to compare and contrast the cloud computing architecture with Open-edi reference model).

7.1 Open-edi reference model in FBM

This subclause describes Open-edi concepts and reference model with FBM notation and methodology.

Figure 5 represents the FBM model of the Open-edi reference model, exhibiting the main perspectives of business operational view and functional service view.

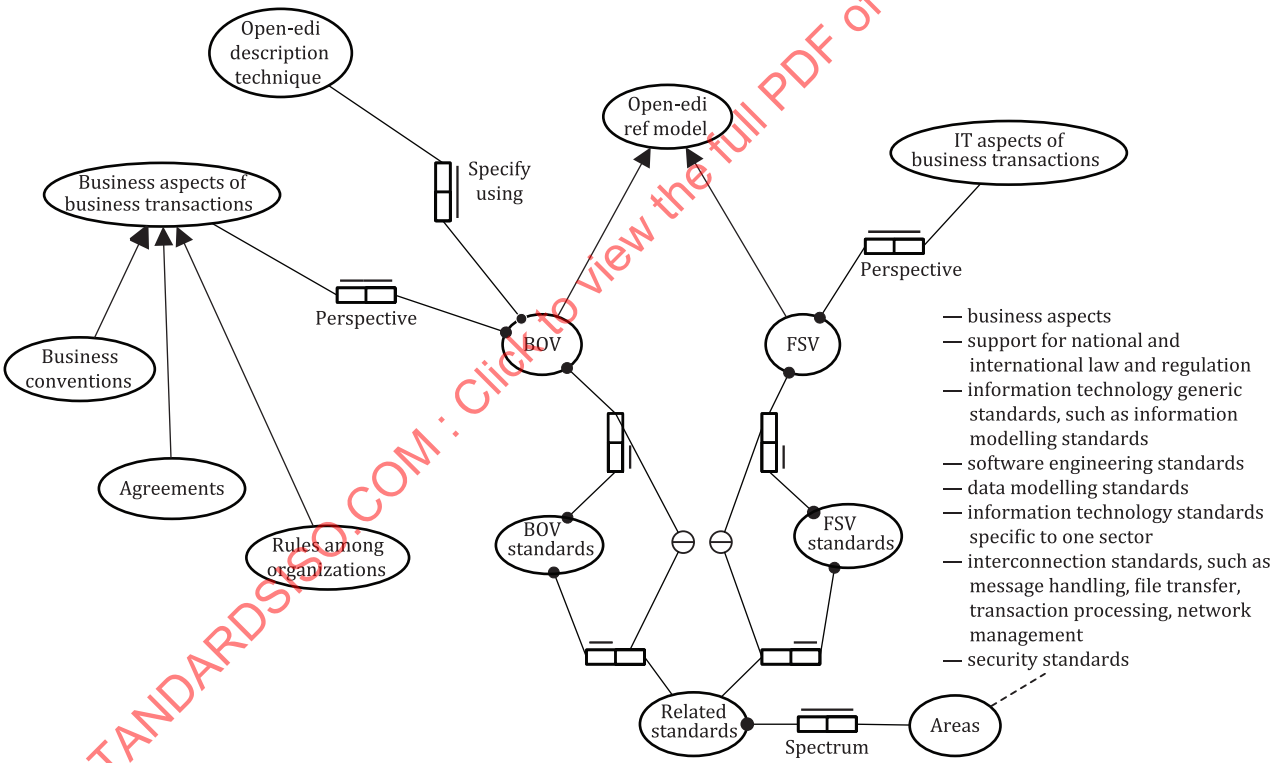

Figure 5 — Open-edi reference model and basic concepts from ISO/IEC 14662

Figure 6 portrays the main concepts of the BOV as to how it addresses and defines business semantics and uses the concept of an Information Bundle.

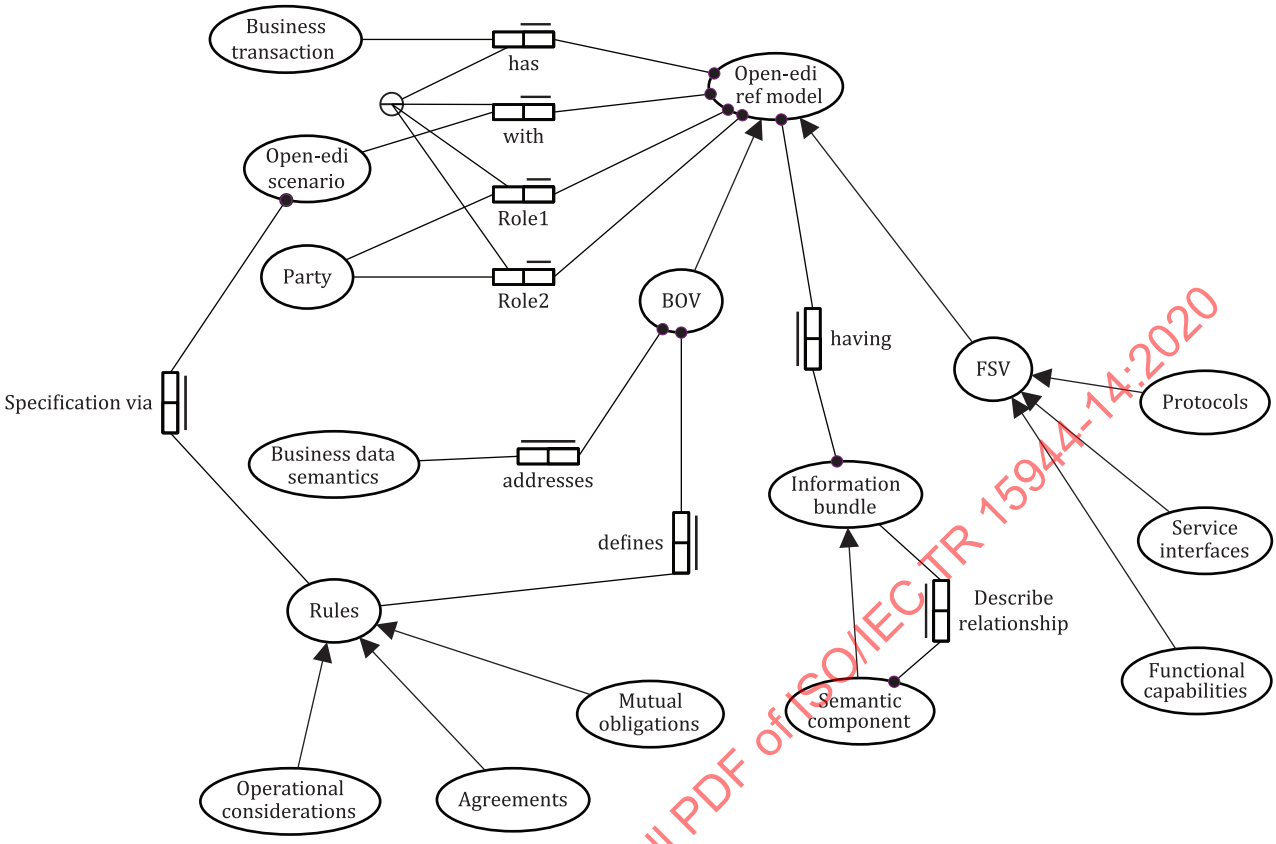

Figure 6 — Open-edi business operational view and functional service view from ISO/IEC 14662

Figure 7 discusses Open-edi scenarios, the establishing of profiles and functional capabilities for the BOV.

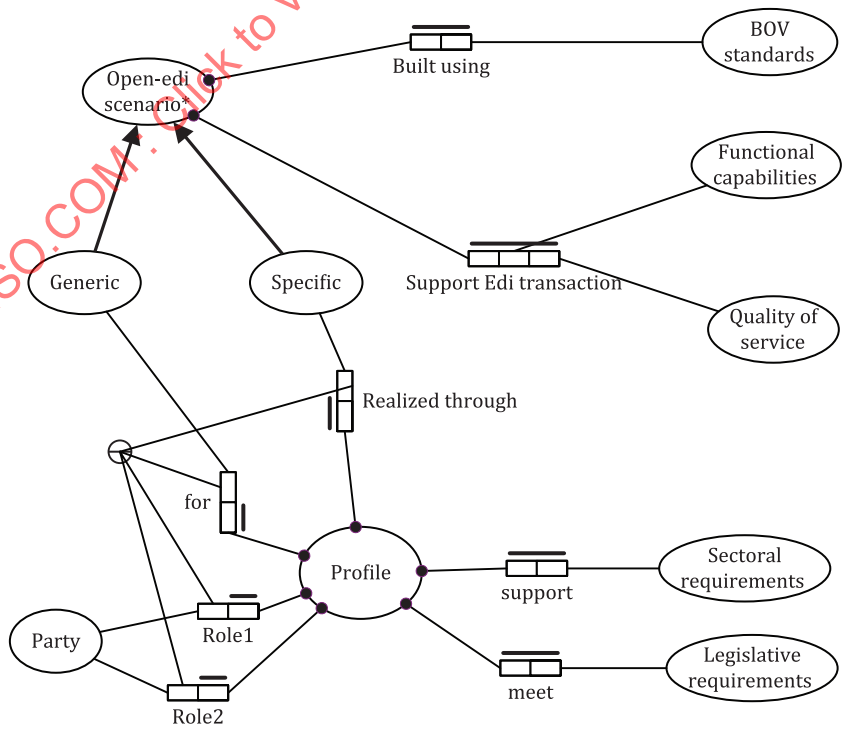

Figure 7 — Open-edi scenarios, profiles and functional capabilities in BOV from ISO/IEC 14662

Figure 8 portrays the Open-edi scenarios, characteristics and measures relating to roles, Information Bundles, and scenario attributes.

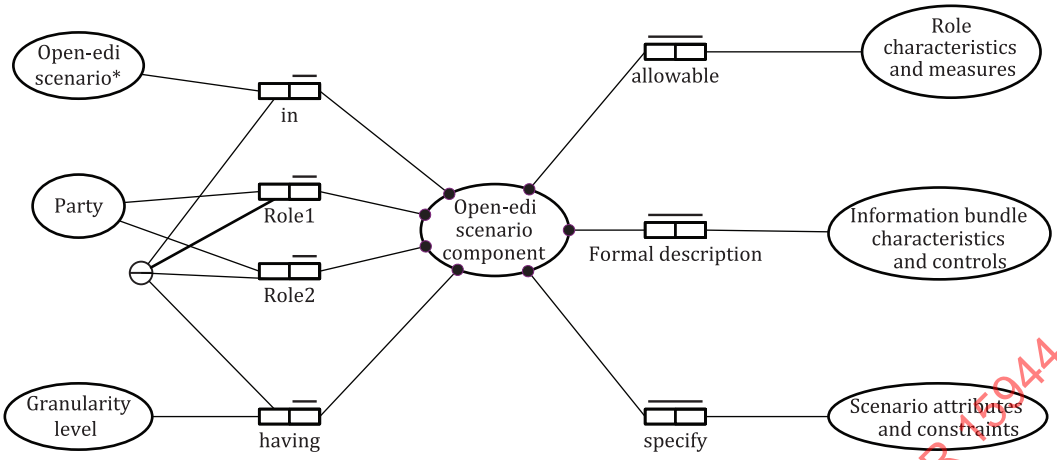

Figure 8 — Open-edi scenarios and components in BOV from ISO/IEC 14662

Figure 9 addresses the functional service view that provides the perspective of business transactions limited to those information technology interoperability aspects of IT systems needed to support the execution of Open-edi transactions. A word of caution: the FSV also discusses functional capabilities in the IT context that is not the same as BOV functional capabilities.

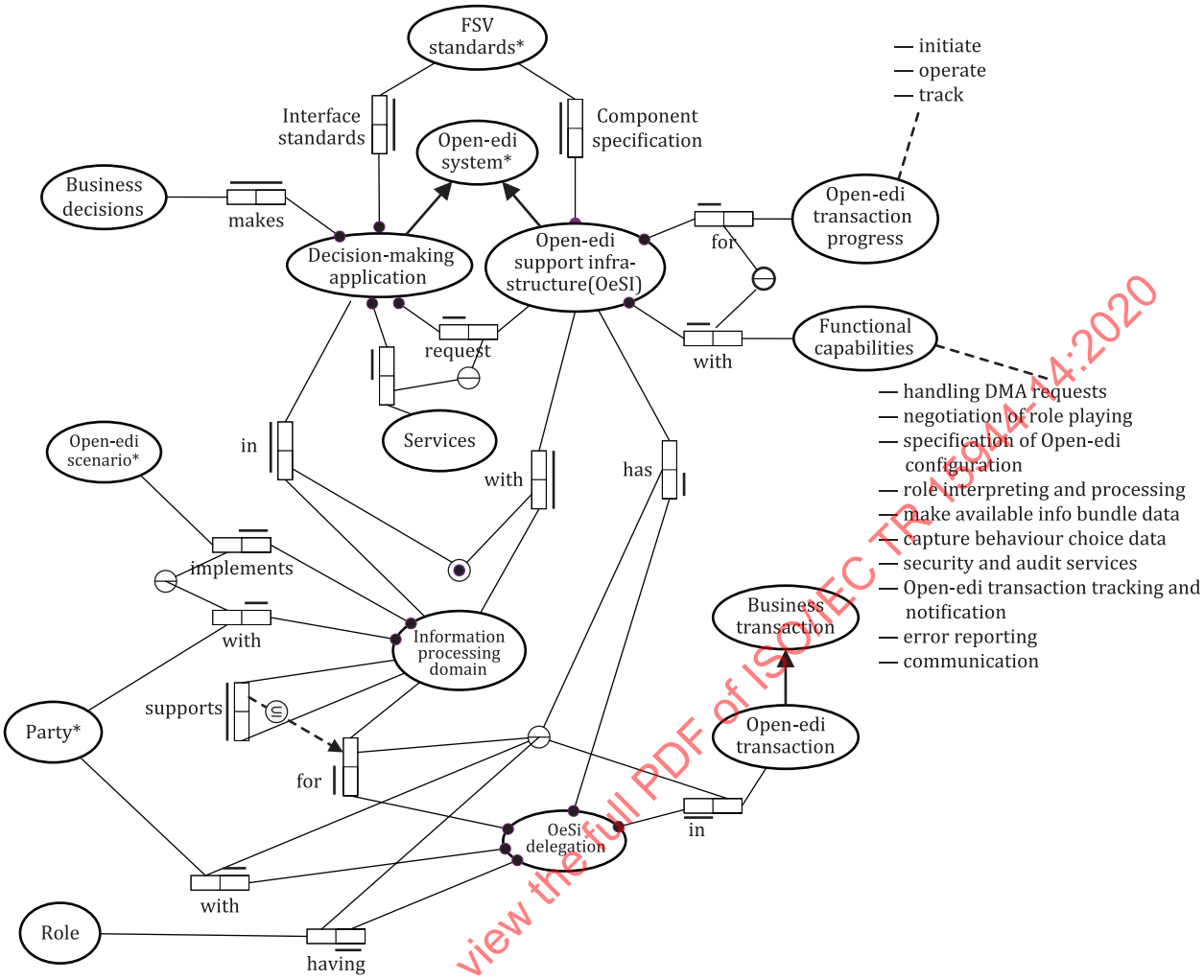

Figure 9 — Open-edi functional concepts and capabilities in FSV from ISO/IEC 14662

7.2 Cloud computing architecture in FBM

This subclause describes cloud computing concepts and architecture with FBM notation and methodology.

Figure 10[5] depicts the main cloud computing concepts using FBM, along with examples, as defined in ISO/IEC 17788. The concepts are defined in terms of the cloud services that are available to cloud service customers and the cloud deployment models that describe how the computing infrastructure that delivers these services can be provided and shared by users.

It is interesting to note that the cloud computing vocabulary and concepts were developed prior to an agreed upon architecture. The architecture itself takes its basis from the approach used in the ISO open distributed reference model by utilizing the user view and functional view.

The cloud paradigm is composed of key characteristics, roles and activities, service capabilities and service categories, deployment models, and cross cutting aspects as shown. The concept relationships generally appear in the cloud computing reference architecture.

5) Modelling labels in Figure 10 are not necessarily from ISO/IEC 17788. ISO/IEC 17788:2014, 6.3 identifies the three main CC activity groups: activities that use services, activities that provide services and activities that support services. 17788:2014, 6.5 describes hybrid cloud as "a cloud deployment model using at least two different cloud deployment models", which implies that other cloud deployment models are non-hybrid.

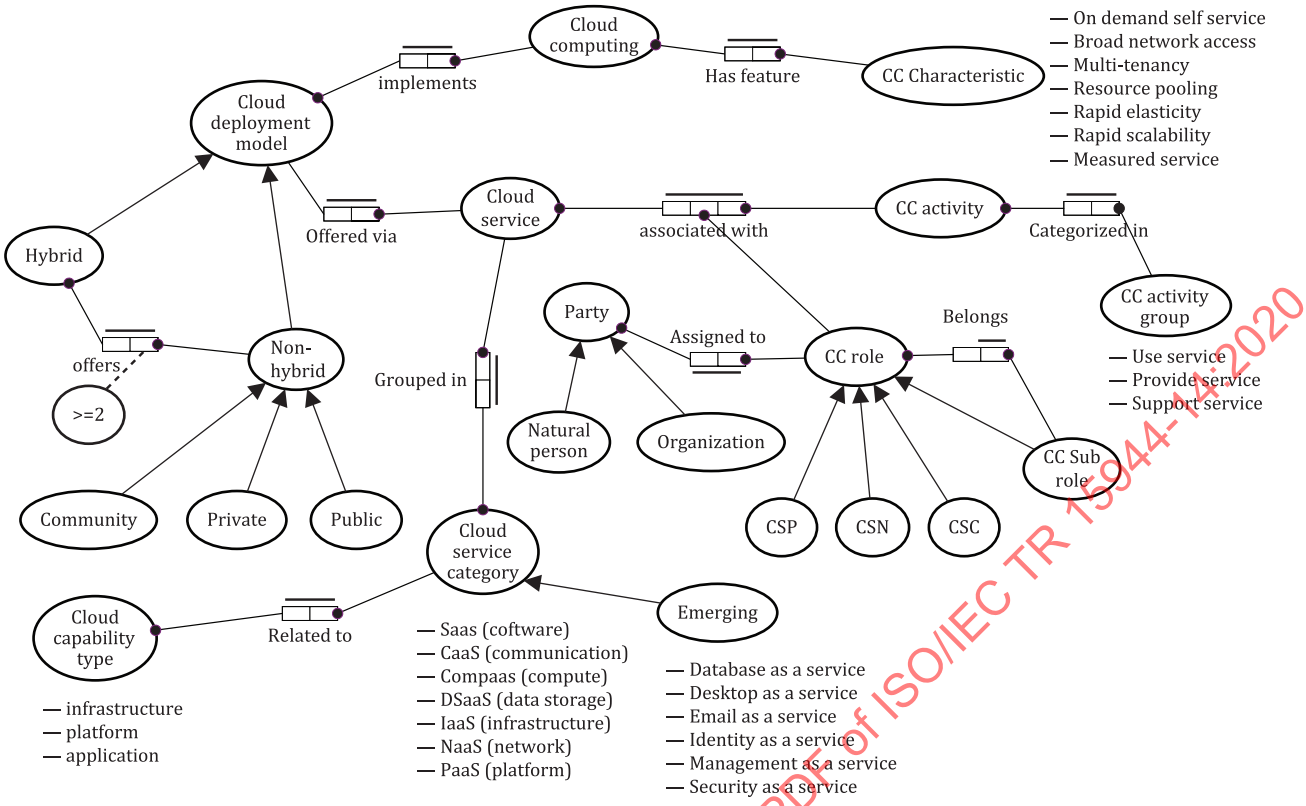

Figure 10 — FBM schema of cloud computing vocabulary (ISO/IEC 17788)

A fact-based model (FBM) for the cloud computing reference architecture (CCRA) is shown in Figure 11[6].

The CCRA focuses only on the user and functional views but does not address the implementation and deployment views because there are various and wider implementations for cloud computing. The user view is the ecosystem (or system context) including the parties, the roles, the sub-roles and the activities. The functional view is the distribution of functions necessary for the support of cloud computing activities.

The fact-based models in this paper represent the distillation and transforms as interpreted from the Open-edi text and the CCRA text. The purpose of the FBM grammar diagrams is being able to compare them using a formal methodology to represent the involved semantics represented by facts, relationships and constraints as opposed to comparing syntax based text paragraphs.

6) X-layer is used as a modelling label in this figure to cover all the functional components that provide capabilities that are used across multiple functional layers.

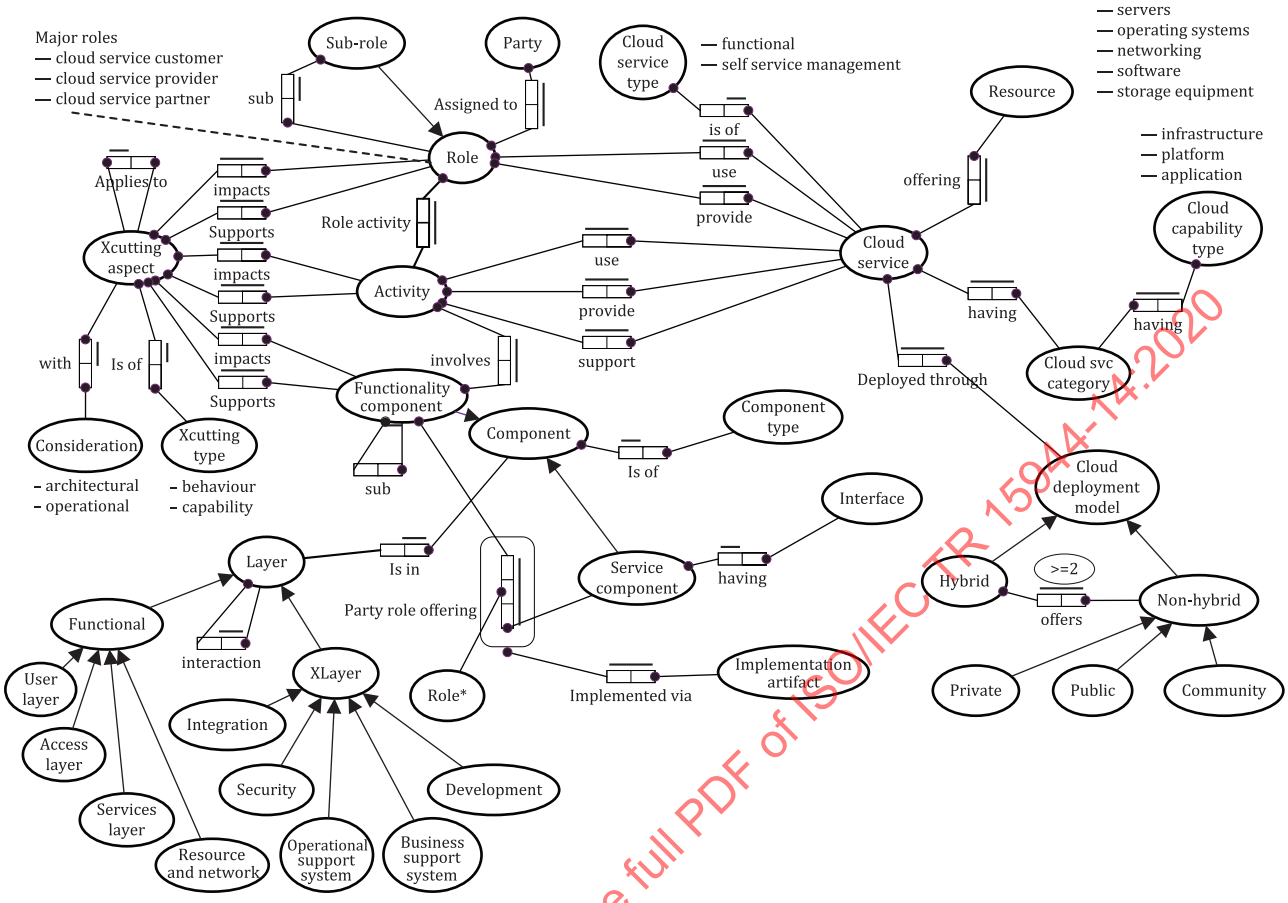

Figure 11 — Cloud computing reference architecture model from ISO/IEC 17789

8 Analysis of Open-edi and cloud computing

8.1 General discussion

By transforming each of the Open-edi and cloud computing concepts, terminology and architectures using fact-based modelling, it is possible to distill the salient object types, relationships and some of the business rules to enable a comparative analysis of the two architectures.

It immediately becomes apparent that, cloud computing uses the term "cloud service" so as to not be confused with a "service" in Open-edi. Both the architectures address interoperability

Cloud computing is defined as a paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand. ISO/IEC 17788 and ISO/IEC 17789 provide a starting point for understanding of different types of interoperability and portability and leading to definition of facets, and relationships with activities and roles, and capabilities types.

Open-edi addresses a focused interchange of Business-to-Business limited set of Open-edi transactions based on established scenarios.

Both documents involve Party and Roles – albeit in a different sense. Roles in Open-edi are buyer and seller, whereas in cloud computing the role includes other actors.

Both documents use controls and measures – cloud computing calls these as service level agreements, whereas Open-edi declares these as Open-edi scenario components.

These are just a few examples of items that appear not to be not in sync between the two sets of documents. Cloud computing has distinctly identified the various roles of the various providers, brokers, auditors and users of the cloud services and has a wide platform of seamless expandability across platforms, software, infrastructure etc. Open-edi includes protocols and limited bi-directional roles of buyer and seller.

Cloud computing stays away from the physical implementation and deployment area, whereas Open-edi includes the FSV as addressing the physical aspects of interchange.

8.2 Summary of cloud computing and roles of an agent or a third party and a seller in executing business transactions

When ISO/IEC 14662 was first published (1997), the concepts and use of value-added networks (VANs) as well as outsourcing were well known and in use by many organizations using EDI to conduct their business transactions. Today, in the context of the extensive and widespread use of the Internet and world wide web (www) in support of ICT services, the concept and use of cloud computing has replaced that of VANs.

Open-edi refers to electronic data interchange among multiple autonomous Persons to accomplish an explicitly shared business goal. This is also a key characteristic of cloud computing. As such, cloud computing is (should be) viewed as an Open-edi activity.

A key aspect of the Open-edi reference model is the introduction and provision for two modelling perspectives of a business transaction; namely:

— the business operational view (BOV); and

— the functional services view (FSV) (see ISO/IEC 14662:2010, Clause 4).

The ISO/IEC 15944 series focuses on the business operational view (BOV) of business transactions. ISO/IEC 15944-1 took into account that both the buyer and the seller often engaged another organization to assist in the completion of a business transaction, i.e., as either in the role of an agent or the role of a third party.

This is because an organization can either execute all the IT systems and EDI-based activities in support of its role as a seller (or provider) of a good, service or right, or both, to a buyer:

a) all by itself; or,

b) make use of an agent or third party or both.

With respect to the engagement of a third party in a business transaction, it is already stated in ISO/IEC 15944-1:2011, 6.2.5, that a third party is not an agent of either the buyer or seller but is one who fulfils a specific role or function in the execution of a business transaction as mutually agreed to by the two primary Persons or as a result of applicable external constraints.

One current approach to offering supporting ICT-based services to an organization (or public administration) as a seller in a business transaction is now known as cloud computing.

A seller or a buyer in conducting (electronic) business transactions is free, on the whole[7], to decide whether or not either wants to conduct these based solely on the use of their own IT systems or delegate part of their role to an agent or a third party (further information can be found in ISO/IEC 15944-1:2011, 6.2.4 through 6.2.6). These two concepts have been defined as follows:

> ***agent***
>
> ***Person*** *acting for another* ***Person*** *in a clearly specified capacity in the context of a* ***business transaction***

7) The use of the phrase "on the whole" recognizes the fact that the nature of the good, service or right, or both, which is the goal of a business transaction may a) require the involvement of the added role of a regulator; b) require the involvement of a specified type of third party; c) not allow for the use of an agent or a third party.

NOTE 1 Excluded here are agents as "automata" (or robots, bobots, etc.). In ISO/IEC 14662 "automata" are recognized and provided for but as part of the functional services (FSV) where they are defined as an information processing domain (IPD).

third party

Person *besides the two primary parties to a* ***business transaction*** *who is an* ***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***[8)]

NOTE 2 It is understood that more than two Persons can at times be primary parties in a business transaction.

The ISO/IEC 15944 series takes a rule-based approach which means that any constraints are identified, defined and explicitly stated in the form of rules (enumerated along with guidelines as need be). As such based on existing applicable ISO/IEC standards, the rules which apply to the use of cloud computing in a business transaction are summarized in Annex B.

Understanding of eBusiness rules in a cloud computing architecture requires a mapping of key relevant cloud computing concepts and their definitions into an eBusiness context, and the mapping is given in Annex C.

8) Examples of external constraints are legal and regulatory requirements, which take precedence over other constraints on a business transaction.

Annex A
(informative)

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

A.1 General

This document maximizes the use of existing standards where and whenever possible including relevant and applicable existing terms and definitions. These are presented in Clause 3. This annex contains only those new concepts and their definitions introduced in this document, i.e. as ISO English and ISO French language HIEs.

ISO/IEC 15944-7:2009, Annex E already contains the consolidated ISO English and ISO French language equivalents for all the other concepts and definitions found in Clause 3. ISO/IEC 15944-7 also contains ISO Russian and ISO Chinese langue HIEs for all the concepts and their definitions.

A.2 ISO English and ISO French

This document 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 jurisdictional domains).

Consequently, the terms "ISO English" and "ISO French" are used 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 JTC 1 has "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 JTC 1 standards are being provided in more than one language (in addition to "ISO English,").

This annex supports cultural adaptability by ensuring that if a document is developed in one ISO/IEC official language only, at the minimum the terms and definitions are made available in more than one language.

Translating terms and definitions:

— Adds a level of 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.

— Enhances the widespread adoption and use of standards worldwide, especially by users of this document who include those in various industry sectors, within a legal perspective, policymakers and consumer representatives, other standards developers, IT hardware and service providers, etc.

A.4 Organization of Annex A — Consolidated list in matrix form

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

Table A.1 — Columns in Table A.2

Col. No.	Use
	IT-interface – identification
1	eBusiness vocabulary ID (as assigned in ISO/IEC 15944-7)[a]
2	Source. International standard referenced or that of this document itself.
	Human interface equivalent (HIE) components
3	ISO English language – term
4	Gender of ISO English language term[b]
5	ISO English language – definition
6	ISO French language - term[c]
7	Gender of the ISO French language term[b]
8	ISO French language - definition

[a] eBusiness Vocabulary IDs are assigned in ISO/IEC 15944-7 based on the next available Dnnn sequential number.

[b] The codes representing gender of terms in natural languages are those found in ISO/IEC 15944-5:2008, 6.2.6, and ISO/IEC 15944-5: 2008, Table 1: — ISO English, in Column 4, the gender code = "99" since the English language does not have gender in its grammar; and — ISO French, in Column 7, the gender codes are 01 = masculine, 02 = feminine and 03 = neuter.

[c] The use of French language equivalents, required in Column (8) means that these also serve as inputs into ISO/IEC 15944-7:2009, Annex D.

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 and Chinese (see ISO/IEC 15944-7).

A.5 List of added terms and definitions with cultural adaptability: ISO English and ISO French

Table A.2 contains entries for those definitions and terms found in Clause 3 which are new to the existing ISO/IEC 14662 and ISO/IEC 15944 series. This is because ISO/IEC 15944-7 already contains all the concept/definitions and associated terms found in ISO/IEC 14662 and the ISO/IEC 15944 series and with their ISO English, ISO French, ISO Russian and ISO Chinese equivalents.

Table A.2 — List of added terms and definitions with cultural adaptability of: ISO English and ISO French language equivalency

IT-Interface		Human interface equivalent (HIE) components					
Identification		ISO English			ISO French		
eBus. vocab. ID	Source ref. ID	Term	G	Definition	Term	G	Definition
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D329	ISO/IEC 17788: 2014, 3.2.5	cloud computing	99	paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand Note 1 to entry: Examples of resources include servers, operating systems, networks, software, applications, and storage equipment.	informatique en nuage	02	paradigme pour habiliter l'accès réseau à un groupement souple de ressources physiques ou virtuelles partageables avec disposition de libre-service et administration à la demande Note: Exemples de ressources: serveurs, systèmes d'exploitation, logiciels, applications, et équipement de stockage.
D330	ISO/IEC 17788: 2014, 3.2.8	cloud service	99	one or more capabilities offered via *cloud computing* invoked using a defined interface	service infonuagique	01	une ou plusieurs capacités offertes à travers l'*informatique en nuage* invoquée en utilisant une interface définie
D331	ISO/IEC 17788: 2014, 3.2.9	cloud service broker	99	*cloud service partner* that negotiates relationships between *cloud service customers* and *cloud service providers*	courtier de service infonuagique	01	*partenaire de service infonuagique* qui négocie les relations entre les clients de service infonuagique et les *fournisseurs de service infonuagique*
D332	ISO/IEC 17788: 2014, 3.2.11	cloud service customer	99	*Party* which is in a business relationship for the purpose of using *cloud services* Note 1 to entry: A business relationship does not necessarily imply financial agreements.	client de service infonuagique	01	*Partie* qui est en une relation d'affaires dans le but d'utiliser des *services infonuagiques* Note: Une relation d'affaires n'implique pas nécessairement des accords financiers.

Table A.2 *(continued)*

IT-Interface		Human interface equivalent (HIE) components					
Identification		ISO English			ISO French		
eBus. vocab. ID	Source ref. ID	Term	G	Definition	Term	G	Definition
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D333	ISO/IEC 17788: 2014, 3.2.12	cloud service customer data	99	class of data objects *under the control*, by legal or other reasons, *of* the *cloud service customer* that were input to the *cloud services*, or resulted from exercising the capabilities of the *cloud services* by or on behalf of the *cloud service customer* via the published interface of the *cloud services* Note 1 to entry: An example of legal controls is copyright. Note 2 to entry: It may be that the cloud service contains or operates on data that is not cloud service customer data; this might be data made available by the cloud service providers, or obtained from another source, or it might be publicly available data. However, any output data produced by the actions of the cloud service customer using the capabilities of the cloud service on this data is likely to be cloud service customer data, following the general principles of copyright, unless there are specific provisions in the cloud service agreement to the contrary.	donnée de client de service infonuagique	02	classe d'objets de données sous le contrôle, légal ou autre, du *client de service infonuagique*, qui ont été entrés dans les *services infonuagiques*, ou résultant de l'exercice des capacités des *services infonuagiques* par le (ou au nom du) *client de service infonuagique* à travers l'interface publiée des *services infonuagiques* Note 1: Le droit d'auteur est un exemple de contrôle légal. Note 2: Il se peut que le service infonuagique contienne ou exploite des données qui ne sont pas des données de client de service infonuagique; ce peut être des données rendues disponibles par les fournisseurs de service infonuagique, ou obtenues d'une autre source, ou ce peut être des données disponibles publiquement. Cependant, toute donnée de sortie produite par les actions du client de service infonuagique utilisant les capacités du service infonuagique pour cette donnée, est probablement une donnée de client de service infonuagique, suivant les principes généraux du droit d'auteur, à moins qu'il n'y ait des dispositions spécifiques contraires dans l'accord de service infonuagique.

Table A.2 *(continued)*

IT-Interface		Human interface equivalent (HIE) components					
Identification		ISO English			ISO French		
eBus. vocab. ID	Source ref. ID	Term	G	Definition	Term	G	Definition
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D334	ISO/IEC 17788: 2014, 3.2.13	cloud service derived data	99	class of data objects under *cloud service provider* control that are derived as a result of interaction with the *cloud services* by the *cloud service customer* Note 1 to entry: Cloud service derived data includes log data containing records of who used the service, at what times, which functions, types of data involved and so on. It can also include information about the numbers of authorized users and their identities. It can also include any configuration or customization data, where the cloud service has such configuration and customization capabilities.	donnée dérivée de service infonuagique	02	classe d'objets de donnée sous le contrôle du *fournisseur de service infonuagique,* qui sont dérivés du résultat de l'interaction avec les *services infonuagiques* par le *client de service infonuagique* Note: Les données dérivées de service infonuagique incluent les données stockées contenant les fichiers des utilisateurs du service, l'horaire, les fonctions, les types de données concernées, etc. Elles peuvent aussi inclure de l'information sur le nombre d'utilisateurs autorisés et leur identité, toute donnée de configuration ou de personnalisation, selon les possibilités du service infonuagique.
D335	ISO/IEC 17788: 2014, 3.2.14	cloud service partner	99	*party* which is engaged in support of, or auxiliary to, activities of either the *cloud service provider* or the *cloud service customer*, or both	partenaire de service infonuagique	01	*partie* engagée dans le soutien d' (ou auxiliaire à des) activités du *fournisseur de service infonuagique* ou du *client de service infonuagique*, ou des deux
D336	ISO/IEC 17788: 2014, 3.2.15	cloud service provider	99	*party* which makes *cloud services* available	fournisseur de service infonuagique	01	*partie* qui rend disponibles des *services infonuagiques*

Table A.2 *(continued)*

IT-Interface		Human interface equivalent (HIE) components					
Identification		ISO English			ISO French		
eBus. vocab. ID	Source ref. ID	Term	G	Definition	Term	G	Definition
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D337	ISO/IEC 17788: 2014, 3.2.16	cloud service provider data	99	class of data objects, specific to the operation of the *cloud services*, *under the control of* the *cloud service provider* Note 1 to entry: Cloud service provider data includes but is not limited to resource configuration and utilization information, cloud service specific virtual machine, storage and network resource allocations, overall data centre configuration and utilization, physical and virtual resource failure rates, operational costs and so on.	donnée de fournisseur de service infonuagique	02	classe d'objets de donnée spécifique à l'exploitation des *services infonuagiques* sous le contrôle du *fournisseur de service infonuagique* Note: les données de fournisseur de service infonuagique incluent (mais ne sont pas limitées à) la configuration des ressources et l'information sur l'utilisation, la machine virtuelle spécifique au service infonuagique, les allocations de stockage et de ressources réseau, la configuration et l'utilisation globales du centre de données, les taux de défaillance des ressources physiques et virtuelles, les frais d'exploitation, etc.
D338	ISO/IEC 17788: 2014, 3.2.17	cloud service user	99	natural person, or entity acting on their behalf, associated with a *cloud service customer*that uses *cloud services* Note 1 to entry: Examples of such entities include devices and applications.	utilisateur de service infonuagique	01	personne naturelle ou entité agissant en son nom, associée à un *client de service infonuagique* qui utilise des *services infonuagiques* Note: Les dispositifs et les applications en sont un exemple.

Table A.2 *(continued)*

IT-Interface		Human interface equivalent (HIE) components					
Identification		ISO English			ISO French		
eBus. vocab. ID	Source ref. ID	Term	G	Definition	Term	G	Definition
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D339	ISO/IEC 17788: 2014, 3.2.21	data portability	99	ability to easily transfer data from one system to another without being required to re-enter data Note 1 to entry: It is the ease of moving the data that is the essence here. This might be achieved by the source system supplying the data in exactly the format that is accepted by the target system. But even if the formats do not match, the transformation between them may be simple and straightforward to achieve with commonly available tools. On the other hand, a process of printing out the data and rekeying it for the target system could not be described as "easy".	portabilté de donnée	02	capacité de transférer facilement des données d'un système à un autre sans avoir à réentrer des données Note: L'important ici est la facilité de déplacer des données. Le système source peut réaliser cela en fournissant les données dans exactement le même format accepté par le système cible. Mais même si les formats ne sont pas identiques, la transformation entre eux peut être simple et droite grâce à des outils communément disponibles. En revanche, l'impression des données et leur retranscription dans le système cible ne sont pas forcément « faciles ».
D340	ISO/IEC 17788: 2014, 3.1.5	interoperability	99	the ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged	interopérabilté	02	capacité de deux ou de plusieurs systèmes ou applications d'échanger de l'information et d'utiliser mutuellement l'information échangée
D341	ISO/IEC 17788: 2014, 3.1.6	party	99	natural person or legal person, whether or not incorporated, or a group of either	partie	02	personne naturelle ou personne légale, incorporée ou non, ou un groupe de l'une d'elles

Table A.2 *(continued)*

IT-Interface		Human interface equivalent (HIE) components					
Identification		ISO English			ISO French		
eBus. vocab. ID	Source ref. ID	Term	G	Definition	Term	G	Definition
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D342	ISO/IEC 17788: 2014, 3.2.35	reversibility	99	process for *cloud service customer* to retrieve their *cloud service customer data* and application artefacts and for the *cloud service provider* to delete all *cloud service customer data* as well as contractually specified *cloud service derived data* after an agreed period	réversibilité	02	processus pour un *client de service infonuagique* de récupérer ses *données de client de service infonuagique* et artéfacts d'application, et pour le *fournisseur de service infonuagique* de supprimer toutes les *données de client de service infonuagique,* ainsi que les *données dérivées de service infonuagique* spécifiées par contrat après une période convenue
D343	ISO/IEC 17788: 2014, 3.1.7	service level agreement(SLA)	99	documented agreement between the service provider and customer that identifies services and service targets Note 1 to entry: A service level agreement can also be established between the service provider and a supplier, an internal group or a customer acting as a supplier. Note 2 to entry: A service level agreement can be included in a contract or another type of documented agreement.	accord de niveau de service	01	accord documenté entre le fournisseur de service et le client, qui identifie les services et les cibles de service Note 1: Un accord de niveau de service peut aussi être établi entre le fournisseur de service et un prestataire, un groupe interne ou un client agissant à titre de prestataire. Note 2: Un accord de niveau de service peut être inclus dans un contrat ou un autre type d'accord documenté.

Annex B
(informative)

Consolidated set of key rules in the ISO/IEC 15944 series of particular relevance to cloud computing architecture

B.1 General

This annex provides a consolidated selection of rules in the ISO/IEC 15944 series which are particularly relevant to cloud computing architecture. These are presented in Table B.2. Only the rules and associated guidelines are presented. For related text, see the relevant clauses in the documents identified in the matrixes.

In the ISO/IEC 15944 series, all the requirements are stated in the form of rules. These rules are stated from a business operational view (BOV), i.e., as the "whats" (and not the "how to"), and are designed to be able to support general applicable legal and regulatory requirements as well as those of a public policy nature apply, (e.g., consumer protection, privacy protection, individual accessibility, etc.). Where the buyer in a business transaction is an individual, this involves "personal information" and thus privacy protection requirements apply.

B.2 Key rules pertaining to external constraints relevant to cloud computing

With respect to the engagement of a third party in a business transaction, it is already stated in ISO/IEC 15944-1:2011, 6.2.5 that a third party is not an agent of either the buyer or seller but is one who fulfils a specific role or function in the execution of a business transaction as mutually agreed to by the two primary Persons or as a result of applicable external constraints.

One current approach to offering supporting ICT-based services to an organization (or public administration) as a seller in a business transaction is now known as cloud computing.

B.3 Organization of Table B.2 in matrix form

The rules and associated references are presented in matrix form. The rules are presented in the numeric order in which they are presented in the ISO/IEC 15944 series. The columns in the matrix are listed in Table B.1

Table B.1 — Columns in Table B.2

Column	Use
1	Number of part in ISO/IEC 15944 series.
2	Number of rule as per part in ISO/IEC 15944 series referenced in Annex B.
3	Clause ID in ISO/IEC 15944-1 of which the rule is part.
4	Rule statement as per ISO/IEC 15944. NOTE Only text of the rule and associated guidelines is presented in this column. For associated requirements and text see the relevant clauses in the document identified.

B.4 Consolidated list of rules in ISO/IEC 15944 pertaining to external constraints relevant to cloud computing architecture

NOTE In the rules in Table B.2, terms representing concepts (given in **bold**) are those which are directly relevant to this document and are found in Clause 3. For those which are not, but are directly relevant to other parts of the ISO/IEC 15944 series, their definitions are found in Clause 3 of that document, as well as in ISO/IEC 15944-7.

Table B.2 — Consolidated lists of rules and associated guidelines

Part of 15944 series	Rule no.	Clause ID	Rule statement
(1)	(2)	(3)	(4)
1	29	6.2.5	Rights or obligations arising from **commitments** in a **business transaction** shall be fulfilled either directly by the **Person** as the end entity or by an **agent** acting on its behalf.
1	30	6.2.5	The ability to delegate a **role** to an **agent** shall be explicitly stated; and if **constraints** must be satisfied before such delegation can take place, they shall be explicitly stated.
1	31	6.2.5	Where delegation of a **role** cannot take place this shall be explicitly stated.
1	32	6.2.5	A **business transaction** takes place primarily between two **Persons**, i.e., a **buyer** and a **seller**. Other **Persons**, i.e., **third parties**, may fulfil specified **role(s)** or functions(s) on mutual agreement of the two primary **Persons**, or as a result of **external constraints**.
1	33	6.2.6	**External constraints** exist on the provisioning of goods and services and the behaviour of **Persons** as players in **business transactions** including those provided via electronic commerce.
1	52	7.2	It is necessary to specify whether or not any of the **commitments** among the primary **parties** involved in a **business transaction**, i.e., the **seller** and **buyer**, can be delegated to an **agent** and/or a **third party**.
12	094	10.1	The **rules** governing the delegation to an **agent** and/or **third party** by either the **seller**, **buyer** and/or **regulator** of any aspect of the **commitment** exchange(s) among **parties** to a **business transaction** as stated in ISO/IEC 15944-1:2011, Clause 6.2.6 apply.
12	095	10.1	Any delegation by a **seller**, a **buyer** and/or **regulator** of any aspect of the instantiation of a **business transaction** to an **agent** or **third party** shall include identification of applicable ILCM requirements, and in particular applicable personal information requirements.
12	096	10.1	Where the delegation by a **seller** or **regulator** of any aspect of the instantiation of a **business transaction** involves an **individual** as **buyer**, the **organization** or **public administration** in its **role** as a **seller** (or a **regulator**) shall ensure that such delegation is conformant with applicable **external constraints** of the **jurisdictional domain** of the location of the **buyer**, as an **individual**: a) pertaining to whether or not the specific **role** or sub-role(s) can be delegated in the first place depending on the good, service and/or right being provided; and, b) if so, also ensure that the **individual** provides explicit and informed consent with respect to such a delegation by the **seller** to an **agent** or **third party**.

Table B.2 *(continued)*

Part of 15944 series	Rule no.	Clause ID	Rule statement
(1)	(2)	(3)	(4)
12	097	10.1	Irrespective of the location of the SRIs/SPIs pertaining to a **business transaction** and the use of **agents** and/or **third parties**, the **organization** that is the **seller** is and remains solely and uniquely responsible for ensuring privacy protection for **personal information** including all associated ILCM requirements.
12	098	10.2	Where a **seller** uses an **agent**, the seller shall ensure that before interchanging any personal information (PI) with an agent (and its IT system), the seller ensures that the agent (and its IT systems) support applicable **privacy protection** requirements. *Guideline 098G1:* *Prior to an organization delegating part (or all) of the instantiation of a business transaction to an agent via EDI, the organization should obtain (written) assurance of the "agent's compliance with privacy protection requirements and particularly in the DMAs in the IT systems of the agent. This includes the agent having a designated privacy protection officer (PPO) and a personal information controller (PIC).*
12	099	10.2	Where a state change occurs to **personal information** pertaining to a **business transaction**, and the seller has interchanged such **personal information** to its **agent(s)**, the **seller** shall notify the **agent** of such a state change(s) and the **agent** shall acknowledge receipt of the same and verify that it has made the same state change in its IT systems.
12	100	10.2	Where a **seller** uses an **agent** and interchanges **personal information** pertaining to a **business transaction**, the **seller** shall ensure that the **agent** in its IT Systems supports applicable records retention and disposal scheduling of that **personal information**. *Guideline 100G1:* *A seller can ensure that records retention and disposal requirements pertaining to personal information of a seller in a business transaction are maintained by its agent(s) through the use of state changes.*
12	101	10.2	At the completion of a **business transaction**, where the **buyer** is an **individual** and the **seller** does not dispose of all related SPIs but instead transfer those SPIs to an archive for added temporal or permanent retention, the **seller** shall inform the **individual** of the same along with (new) access and use provisions which may apply, and where applicable the name and coordinates of the **agent**, i.e., another party.
12	102	10.3	Where a **seller** uses a **third party**, the **seller** shall ensure that before interchanging any **personal information** with a **third party** (and its IT System), the **seller** ensures that the **agent** (and its IT systems) support applicable **privacy protection** requirements.
12	103	10.3	Where a state change occurs to **personal information** pertaining to a **business transaction**, and the **seller** has interchanged such **personal information** to its **third party (ies)**, the **seller** shall notify the **agent** of such a state change(s) and the **third party** shall acknowledge receipt of the same and verify that it has made the same state change in its IT systems.