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Douglas Mann, Secretariat, ISO/IEC JTC 1/SC 32

Pacific Northwest National Laboratory *, 901 D Street, SW., Suite 900, Washington, DC, 20024-2115,
United States of America

Telephone: +1 703 575 2114; Facsimile: +1 703 681 9180; E-mail: MannD@battelle.org

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SC32/ WG1 STANDARDIZATION WORK

AND

**ISO/IEC IS 14662 OPEN-EDI REFERENCE
MODEL**

**Presented at the
Group Tutorial, ISO/IEC JTC1/SC32
Meeting**

**Friday, 21 May, 1999
Matsue, Japan**

Outline of Tutorial Presentation

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in 14662 - English & French)
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1.0 SCOPE OF SC32 / WG1

The scope of SC32/WG1 Open-edi is [Reference: JTC1/SC32 N0192]

Scope: Standardization in the field of generic information technology standards for open electronic data interchange needed to attain global interoperability among the information technology systems used by organizations. Such interoperability is viewed from both business and information technology perspective.

The scope includes:

- methodology and framework for identification and modelling of business activities through business scenarios and their components, such as roles, information bundles, semantic components;
- identification and specification of formal description techniques for describing classes of business requirements and their contextual and semantic specification;
- identification and specification of formal description techniques for developing business scenarios and their components;
- identification and specification of information technology services and service interfaces for accomplishing business transactions;
- identification and specification of facilities to manage business scenarios and their components.

Note: Priority is on work required to support the needs of electronic commerce, electronic administration, electronic business etc. The basis of work is the Open-edi Reference Model (ISO/IEC 14662)

2.0 ISO/IEC 14662:1997 OPEN-EDI REFERENCE MODEL

2.1 Field of Application

The field of application of Open-edi is the electronic processing of business transactions among autonomous multiple organizations within and across sectors, (e.g., public/private, industrial, geographic). It includes business transactions which involve multiple data types such as numbers, characters, images, and sound.

The Open-edi Reference Model has been developed primarily in order to provide standards required for the inter-working of organizations, through interconnected information technology systems.

2.2 Scope of ISO/IEC 14662

This International Standard specifies the framework for co-ordinating the integration of existing standards and the development of future standards for the inter-working of organisations via Open-edi and provides a reference for those standards. As such it serves to guide the standards work necessary to accomplish Open-edi by providing the context to be used by developers of standards to ensure the coherence and integration of related standardised modelling and descriptive techniques, services, service interfaces, and protocols.

This International Standard describes, through two perspectives of business transactions, significant aspects relevant to the interoperability of information technology systems used by organisations engaging in Open-edi. The perspectives are:

- (a) business aspects such as business information, business conventions, agreements and rules among organisations;
- (b) information technology aspects which are necessary in the Open-edi systems to support the execution of business transactions.

This International Standard is not an implementation specification nor is it a basis for appraising the conformance of implementations.

2.3 Open-edi Environment: BOV and FSV

The Open-edi Reference Model uses two views to describe the relevant aspects of business transactions:

- the Business Operational View (BOV);
- the Functional Service View (FSV).

These perspectives are defined as follows:

- **Business Operational View (BOV):** a perspective of business transactions limited to those aspects regarding the making of business decisions and commitments among organisations, which are needed for the description of a business transaction;
- **Functional Service View (FSV):** a perspective of business transactions limited to those information technology interoperability aspects of IT Systems needed to support the execution of Open-edi transactions.

2.3 Open-edi Environment: BOV and FSV

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;
 - mutual obligations,

which apply to the business needs of Open-edi

2.3 Open-edi Environment: BOV and FSV

The FSV addresses the supporting services meeting the mechanistic needs of Open-edi.
It focuses on the Information Technology aspects of:

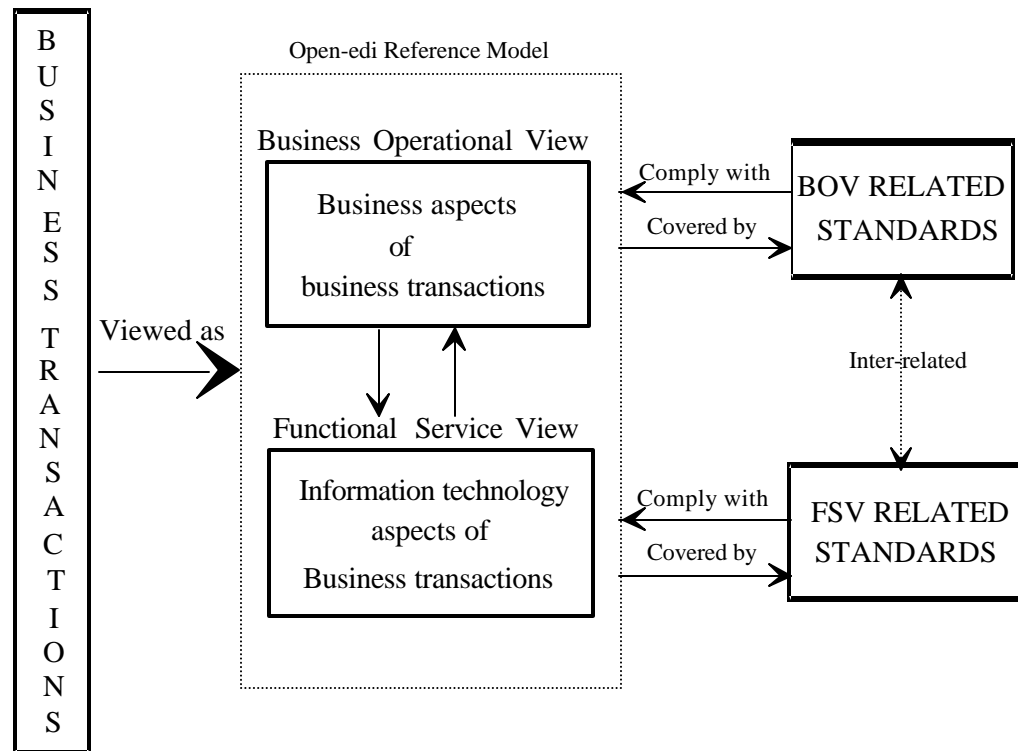
- (a) functional capabilities;
- (b) service interfaces;
- (c) protocols.

Such functional capabilities, services 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 inter working of information technology systems of different organisations;
- translation mechanisms.

2.0 ISO/IEC 14662:1997 OPEN-EDI REFERENCE MODEL

Figure 1 sets out the relationship between the model and these views.



2.4 Key Definitions in ISO/IEC 14662 (1 / 4)

business: a series of processes, each having a clearly understood purpose, involving more than one *organisation*, realised through the exchange of information and directed towards some mutually agreed upon goal, extending over a period of time. (3.1.2)

business transaction: a predefined set of activities and/or processes of *organisations* which is initiated by an *organisation* to accomplish an explicitly shared *business* goal and terminated upon recognition of one of the agreed conclusions by all the involved *organisations* although some of the recognition may be implicit. (3.1.4)

Electronic Data Interchange (EDI): the automated exchange of any predefined and structured data for *business* purposes among information systems of two or more *organisations*. (3.1.5)

Open-edi: *electronic data interchange* among multiple autonomous *organisations* to accomplish an explicit shared *business* goal according to *Open-edi standards*. (3.1.9)

2.4 Key Definitions in ISO/IEC 14662 (2/4)

Information Technology System (IT System): a 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. (3.1.8)

Open-edi Party (OeP): an *organisation* that participates in *Open-edi*. (3.1.11)

Open-edi scenario: a formal specification of a class of *business transactions* having the same *business goal*. (3.1.12)

Open-edi transaction: a *business transaction* that is in compliance with an Open-edi scenario. (3.1.13)

Organisation:{ISO/IEC 6523}: unique framework of authority within which a person or persons act, or are designed to act, toward some purpose (3.1.14)

Note: Person includes natural and/or legal person

2.4 Key Definitions in ISO/IEC 14662 (3/4)

Open-edi Description Technique (OeDT): a 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 processible form. (4.1.1)

Role: a specification which models an external intended behaviour (as allowed within a scenario) of an *Open-edi Party*. (4.1.2.1)

Information Bundle (IB): the formal description of the semantics of the information to be exchanged by *Open-edi Parties* playing *roles* in an *Open-edi scenario*. (4.1.2.2)

Semantic Component (SC): a unit of information unambiguously defined in the context of the business goal of the *business transaction*. (4.1.2.2)

A SC may be atomic or composed of other SCs.

Scenario Attribute: the formal specification of information, relevant to an *Open-edi scenario* as a whole, which is neither specific to *roles* nor to *information bundles*. (4.1.2.3)

- -

Open-edi System: an information technology system which enables an Open-edi Party to participate in Open-edi transactions.(4.2.1)

Decision Making Application(DMA): the model of that part of an Open-edi system that makes decisions corresponding to the role(s) the the Open-edi Party plays, as well as originating, receiving and managing data values contained in instantiated information bundles, which is not required to be visible to other Open-edi Parties.(

Open-edi Support Infrastructure(OeSI): a model of the set of functional capabilities for Open-edi systems which, when taken together with the Decision Making Applications, allows Open-edi Parties to participate in Open-edi transactions.

Decision Making Application Interface(DMA) Interface: the set of requirements that permit a Decision Making Application to interact with the Open-edi Support Infrastructure.

Information Processing Domain(IPD): an Information Technology System which includes at least either a Decision Making Application and/or one of the components of an Open-edi Support Infrastructure, and acts/executes on behalf of an Open-edi Party (either directly or under a delegated authority).

A Possible Relationship among 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

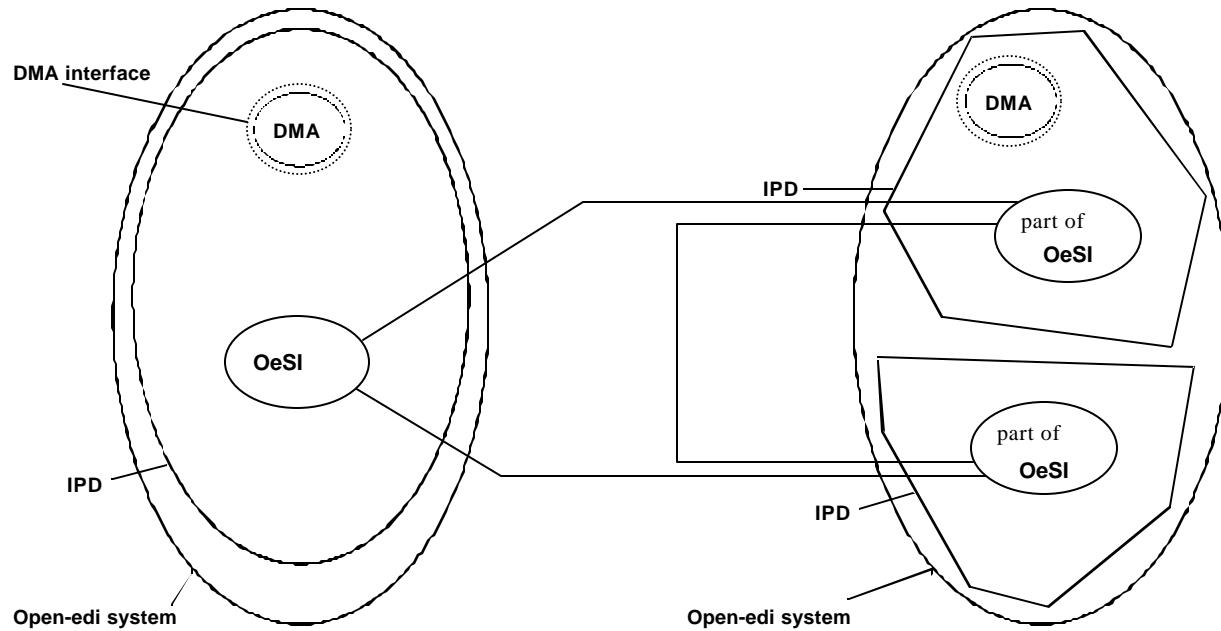
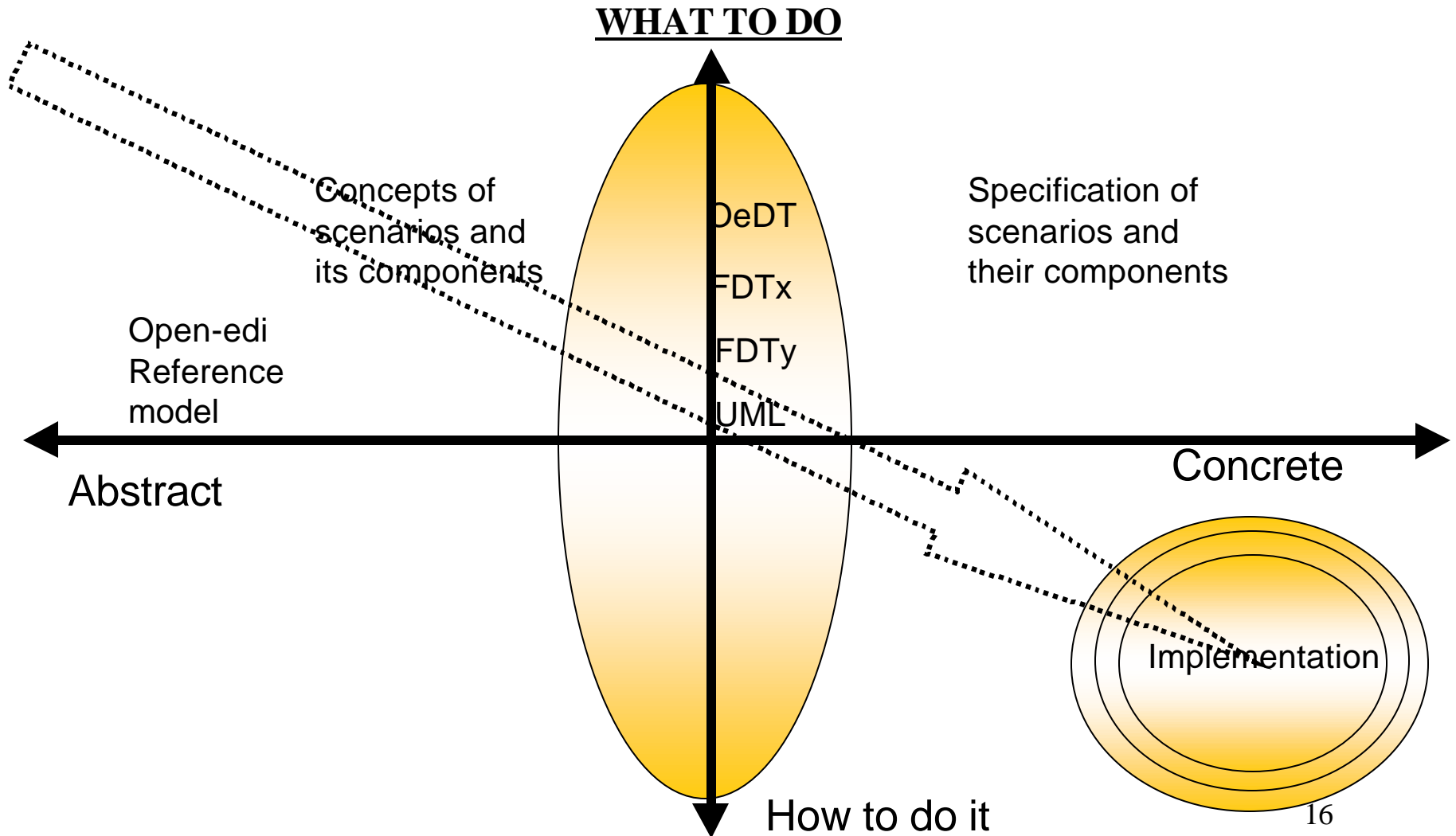


Figure 3 - Open-edi system relationships

2.5 SC32/WG1 Approach to Work

The work of SC32/WG1 on the Business Operational View (BOV) is currently focused on "what to do" versus "how to do"

Top down versus bottom up



2.7 Six Key Characteristics of Open-edi

There are six (6) key characteristics by which Open-edi is recognized and defined and thus bounded. They are:

- 1) Rules-Based
- 2) Commitment-Based
- 3) Automated Interchanges
- 4) Autonomy of Parties
- 5) Parties Control Their States
- 6) Multiple Simultaneous Transactions

2.7 Six Key Characteristics of Open-edi

1) Rules-Based

Actions are based on the interworking of sets of rules. These rules which are predefined formally specify the role(s) of the parties, i.e. persons, involved in Open-edi and expected, i.e. possible, behaviour(s) of the parties as seen by others engaging in Open-edi. The rules are applied to both (a) the content, i.e. unambiguous semantics, of the data flows; and (b) the data flows themselves. The combinations of (a) and (b) provides a complete definition of the relationships among the parties since it requires them to have a common (complete) understanding of the data interchanged.

2.7 Six Key Characteristics of Open-edi

(2) Commitment-Based

Open-edi is a class of electronic information flows which involves predefined types and states of commitments of the parties concerned. They involve tasks or functions to be carried out, obligations to be entered into, concomitant rights, associated responsibilities to be fulfilled, etc.

In Open-edi, all commitments must be clearly stated and unambiguously understood. Obligations arising from commitments can be fulfilled either by the parties themselves, or through agents acting on their behalf.

2.7 Six Key Characteristics of Open-edi

3) Automated Interchanges

Open-edi activities take place automatically among the information systems of the parties involved. That is not to say that interaction between persons (natural and legal) and information systems do not take place but these are part of the internal behaviour of a party and do not concern the external behaviour, i.e. as that seen by other autonomous parties.

4) Autonomy of Parties

Open-edi supports and preserves the autonomy of parties as they engage in business transactions. The characteristic of **autonomy is crucial** from several perspectives including the ability to commit from a business/operational operational perspective, legal, audit, technical, etc. Just as commitment can exist at several levels, so autonomy can exist at several levels.

2.7 Six Key Characteristics of Open-edi

5) Parties Control Their States

The use of Open-edi means that an Open-edi party always has a state description of/for its information system(s) engaged in a business transaction. A state description is the characteristic of a party at a given point in time (in a process) which allows the prediction of its behaviour (or possible ranges of behaviour). A state description is defined in terms of those characteristics which must be available to other parties engaged in the business transaction.

6) Multiple Simultaneous Transactions

In most cases a business transaction involves more than two Open-edi parties simultaneously. Further Open-edi parties need to be enabled to participate in multiple distinct business transactions simultaneously.

3.0 LINK TO "ELECTRONIC COMMERCE" (2/3)

The JTC1 BT-EC Report states that there are many definitions of “electronic commerce” and recognizes this. SC32/WG1 standardization work supports common generic requirements of electronic commerce, electronic administration, electronic business, etc. insofar as such uses of information technology involve:

- *"business" as "a series of processes, each having a clearly understood purpose, involving more than one organization, realized through the exchange of information and directed towards some mutually agreed upon goal, extending over time";*
- *"business transaction" as "a predefined set of activities and/or processes of organizations which is initiated by an organization to accomplish an explicitly shared business goal and terminated upon recognition of one of the agreed conclusions by all the involved organizations although some of the recognition may be implicit";*
- *"Electronic Data Interchange (EDI)" as "the automated exchange of predefined and structured data for business purposes among information systems among two or more organizations"; and,*
- *the application and use in e-commerce, e-administration, e-business, etc. of "Formal Description Technique(s) (FDTs), i.e. "specification method based on a description language using rigorous and unambiguous rules both with respect to developing expressions in the language (formal syntax) and interpreting the meaning of these expressions (formal semantics)*

[Note: The above are definitions found in ISO/IEC IS 14662]

3.0 LINK TO "ELECTRONIC COMMERCE"

Interpretations, definitions , perceptions, etc. of the concepts/terms “*electronic commerce, electronic administration, electronic business,*” etc., which do NOT require,

- (1) a clearly understood purpose, mutually agreed upon goal(s), explicitness and unambiguity;
- (2) pre-definable set(s) of activities and/or processes, pre-definable and structured data, as well as electronic data interchange;
- (3) computational integrity and related characteristics;
- (4) the above to be specifiable through FDTs and executable through information technology systems for use in real world actualizations/instantiations

are deemed not to be a priority for standardization work of SC32/WG1 and likely to be outside its scope of work as well (and likely all JTC1 SCs).

4.0 LINKAGES AND COMPLEMENTARITY OF WORK OF SC32/WG1 OPEN-EDI AND SC32/WG2 METADATA

4.1 Data Elements and "Semantic Components" and "Information Bundles"

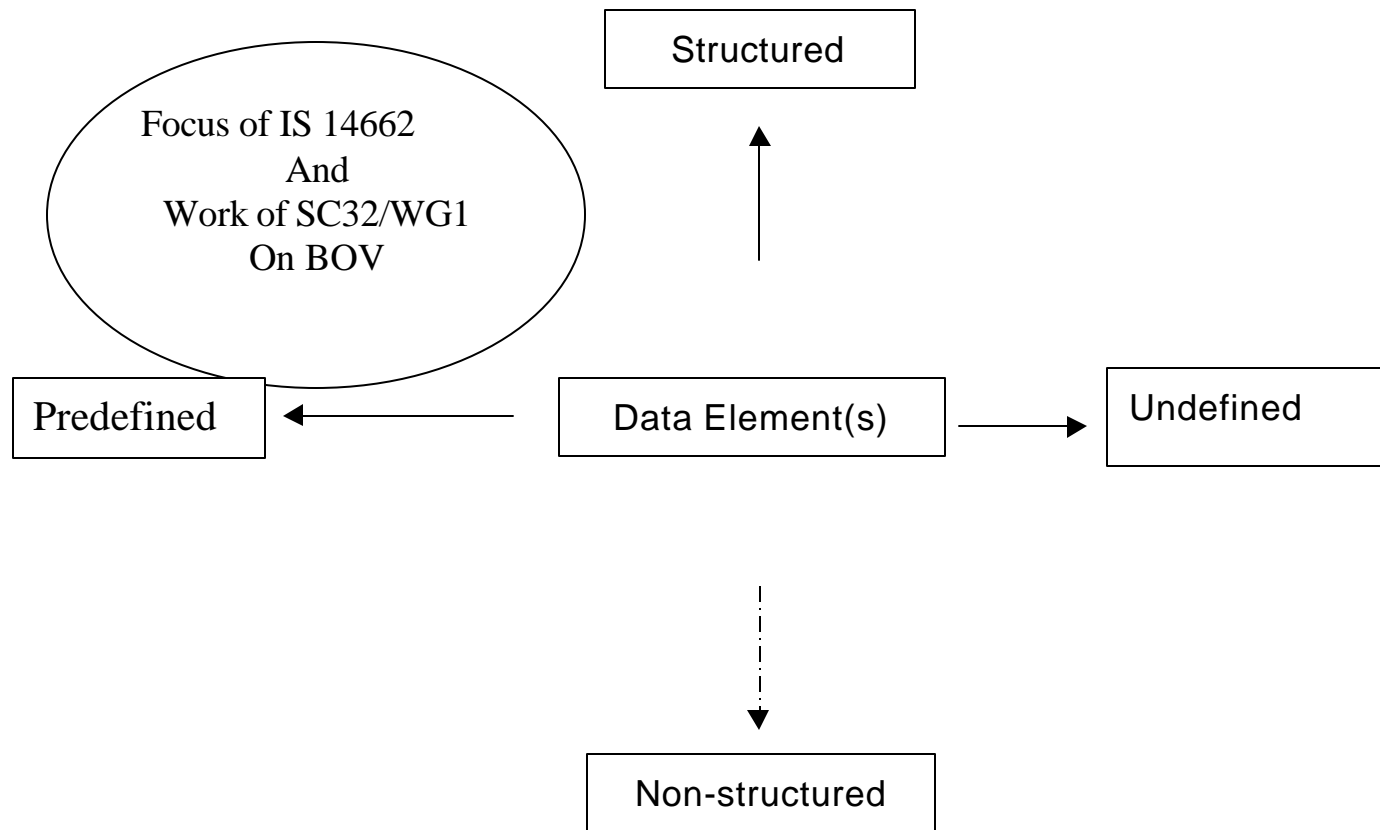
All scenario components, i.e., roles, information bundles (IBs) and semantic components (SCs) must have unique, unambiguous and linguistically neutral identifiers for referencing and use, i.e., mandatory attribute. Similar identification and referencing as well as registration requirements should apply to data elements and data element components.

[Note: *name*: designation of an object by a linguistic expression (ISO 1087) Consequently, any object is likely to have multiple equally valid names.]

Semantic component as a unit of information can be considered a data element or set of “interworking” data elements, (e.g., data structure), within a contextual specification, i.e., the business goal of the business transaction (or peculiar activity or process thereof).

Information Bundle couples/binds Semantic Components to Roles. These SCs can be very simple (e.g. timers) or complex data elements in the context of a Role, i.e., expected (or required) behaviour or possible actions.

4.2 Spectrum: Predefined and Structured Data to Undefined and Non-Structured Data (and Metadata)



4.3 ROLES, SCENARIOS AND FDTs (1/5)

*Note: This slides and those which follow are taken from Annex C(Informative),
ISO/IEC 14662, Open-edi Reference Model*

FDTs are needed to be able to specify role behavior in a formal and abstract manner. Use of FDTs will provide unambiguous role descriptions. As most FDTs are supported by CASE tools this will facilitate modelling and implementations or “role specifications and descriptions”. IS 14662 does not mandate any specific FDT technique. Examples of one particular scenario (or part thereof) were used to illustrate the validity of alternate methods and modelling techniques.

A “simple” example from the health sector was chosen in which an organization acts as a centre or agency of acquiring organs for those that need organ transplants. The roles to be modelled are the organ requester, the organ centre, the organ donor. In this example only one organ requester, organ centre and organ donor are shown, while in general there are several requesters and donors connected to a centre while such centres themselves are interconnected.

Several concepts of role behaviour can be distinguished This is illustrated in Figure C.1. *{For a description of the different roles see IS 14662,Annex C}*.

4.3 ROLES, SCENARIOS AND FDTs (2/5)

Several concepts of role behaviour can be distinguished. This is illustrated in figure C.1

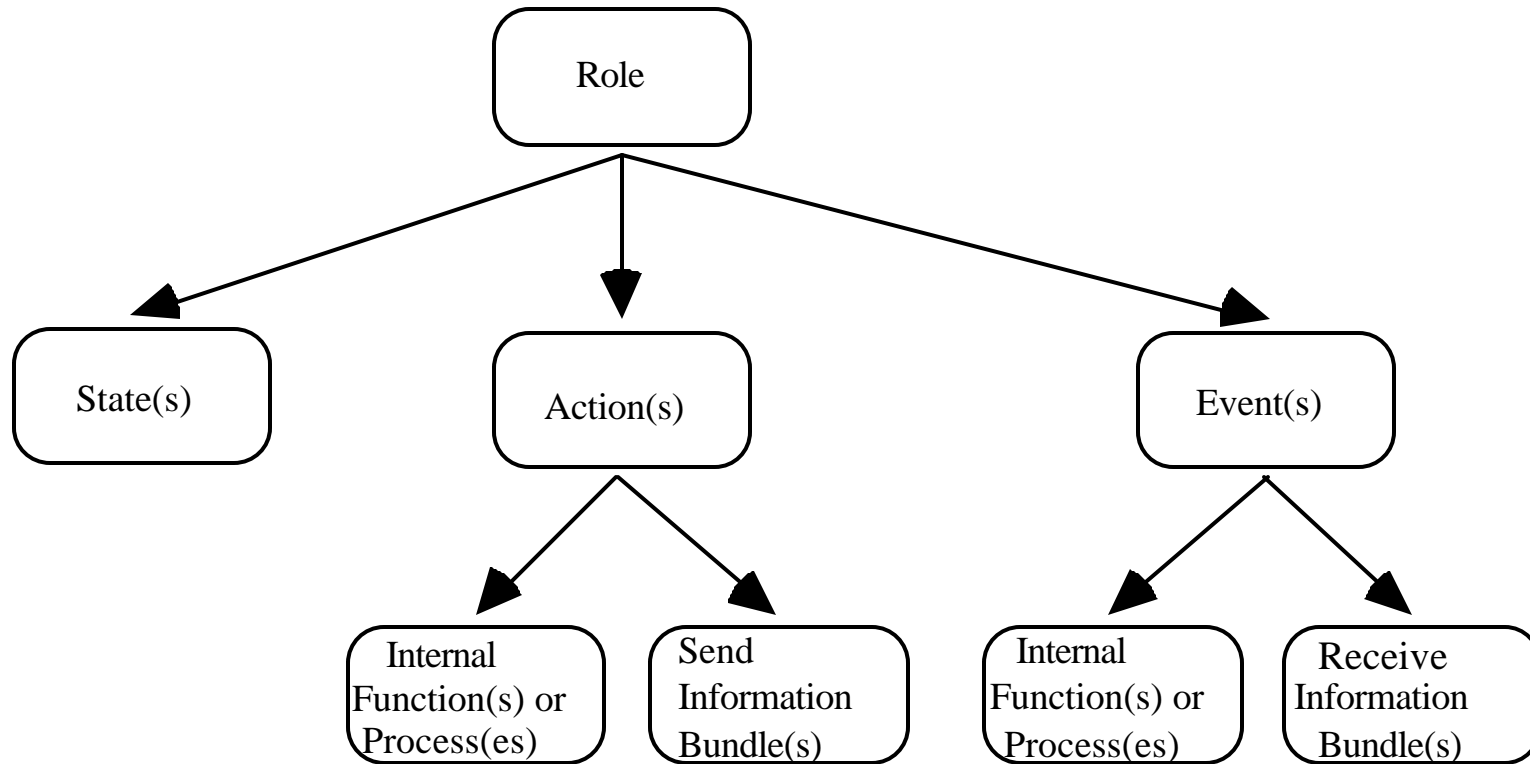


Figure C.1 - Concepts of role behaviour

4.3 ROLES, SCENARIOS AND FDTs (3/5)

[Based on State Transition FDT]

Business Operational View Ordering of possible Information Bundle Exchanges

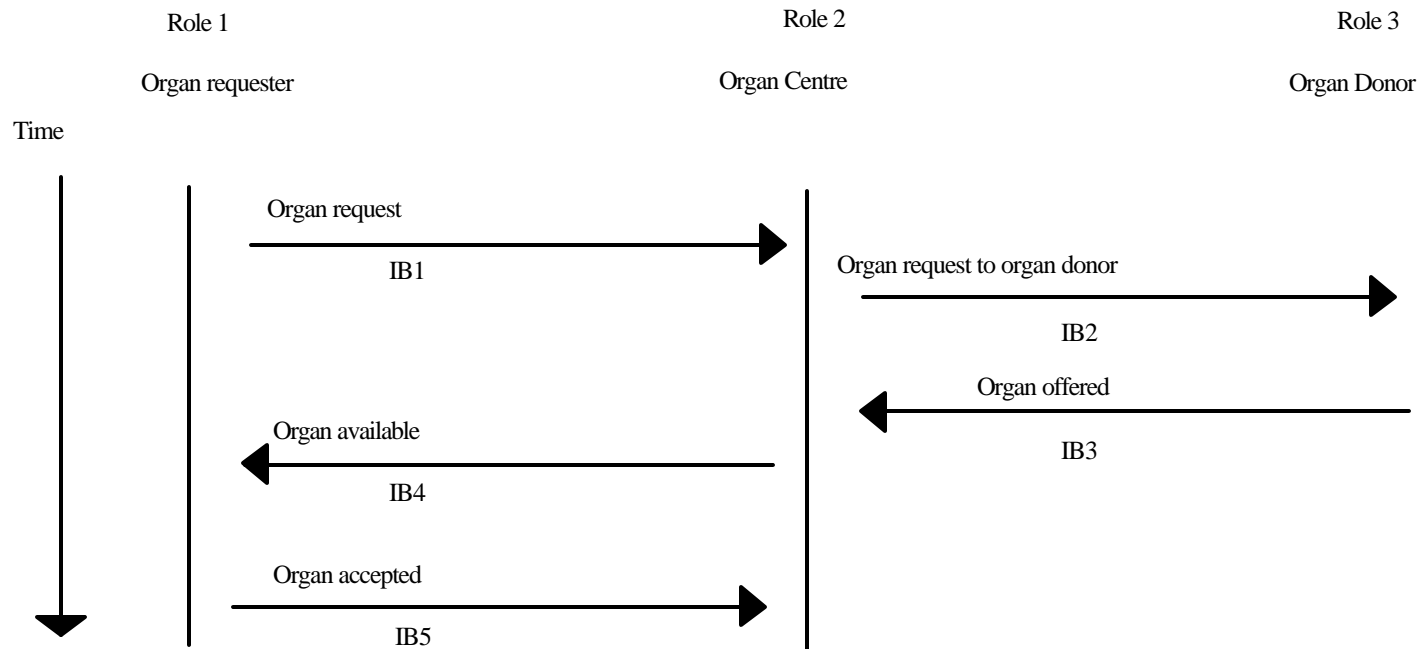


Figure C.2 - Information Bundle sequence chart

(State Transition tables not included here)

4.3 ROLES, SCENARIOS AND FDTs (4/5)

[Aspects of Role Behaviour based on Petri Net FDT]

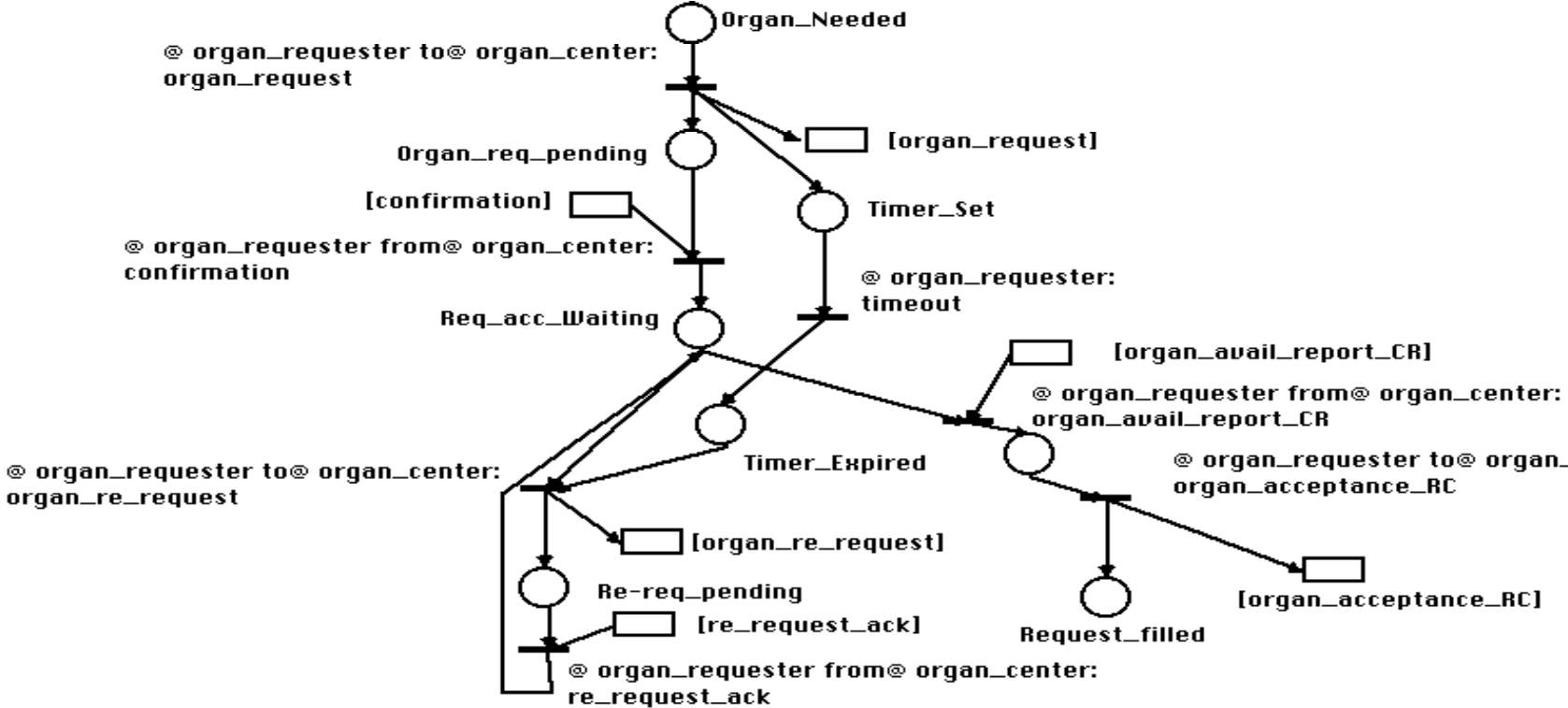


Figure C.3 - The Organ-Requester role

4.3 ROLES, SCENARIOS AND FDTs (5/5)

[Aspects of Role Behaviour based on Petri Net FDT]

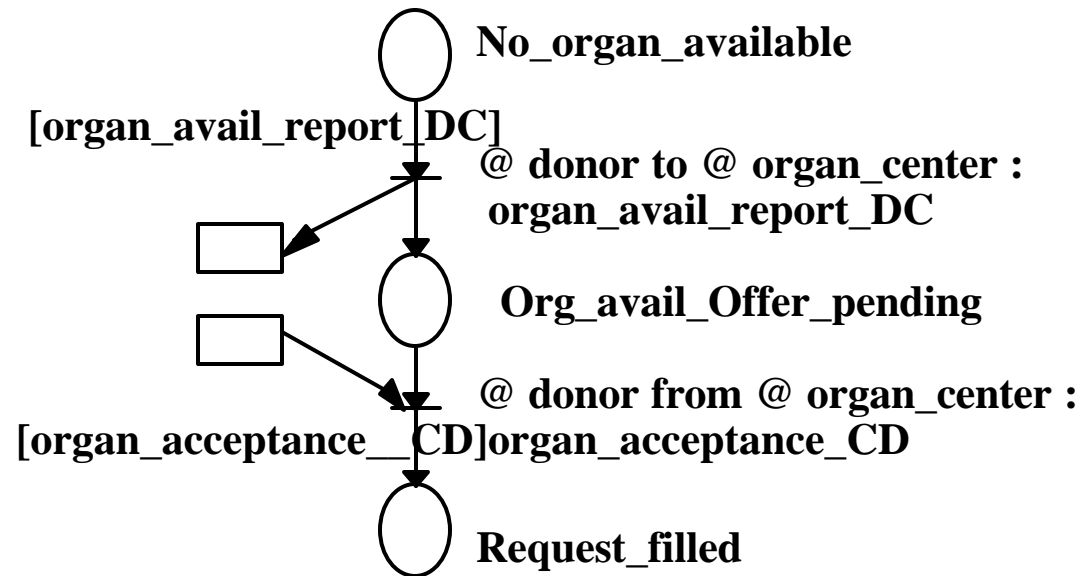


Figure C.4 - The Donor role

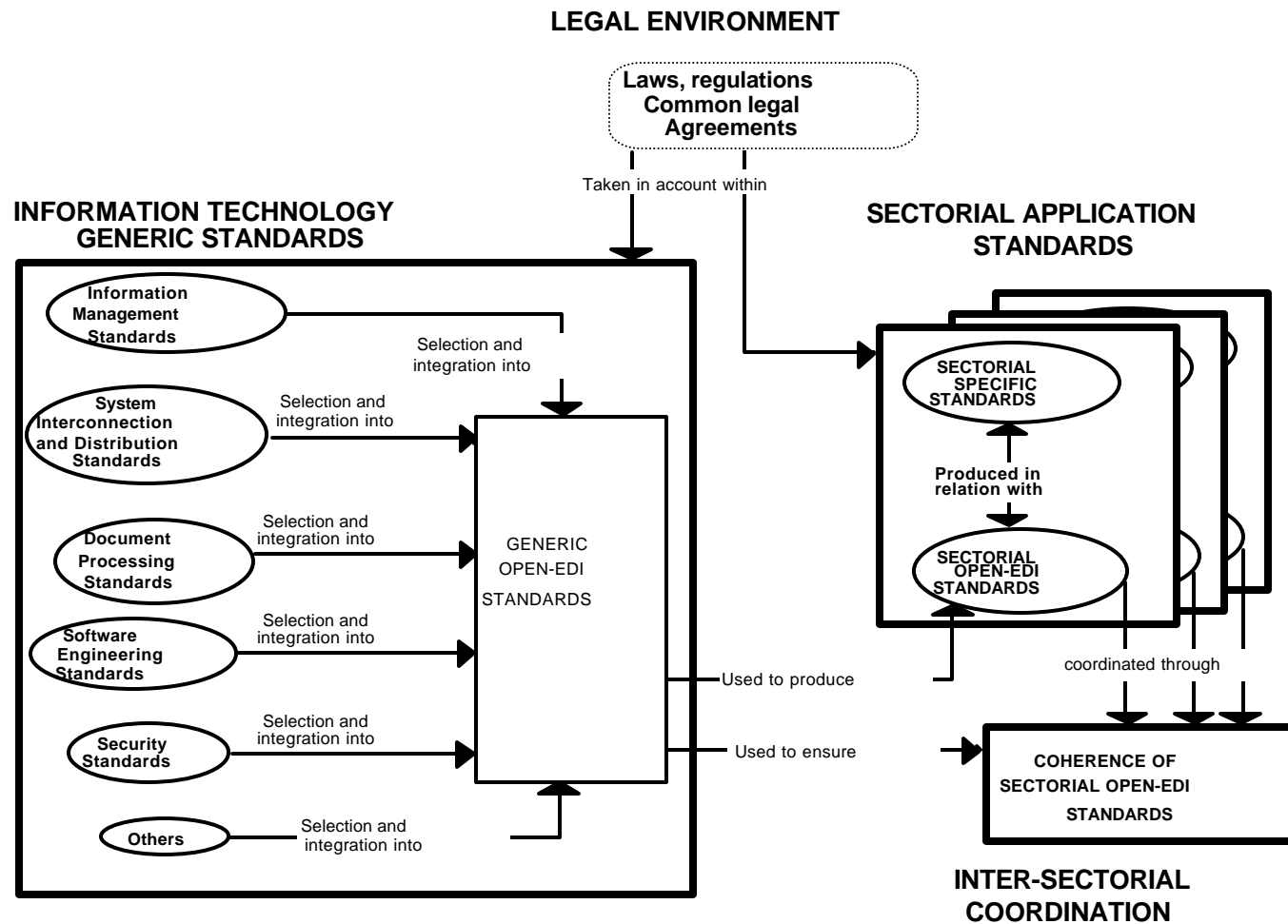


Figure A.1 - Relationships of Open-edi standardisation areas with other standards and impact of the legal environment.

Legal Environment = framework of requirements, (e.g. provisions, procedures, constraints, etc.) arising from laws and regulations which govern business transactions