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eBusiness

TITLE   : First working draft of TR 15944-6 Information Technology - Business Agreement Semantic Descriptive Techniques - Part 6: Technical Introduction of eBusiness Modelling

SOURCE   : Katsuhiro Morita (editor)

STATUS   : To serve as basis of discussion and development. SC32/WG1 decided to split 15944-4 into two separate projects in its Berlin meeting in April 2005. The rationale for the project split was that the major contribution (this document) to 15944-4 could not easily be fitted to 15944-4 but it was felt that the contribution could serve as basis of another part of 15944. The idea is to make a technical report based on this contribution. SC32 agreed on the suggested project split in its Berlin meeting in April 2005.

ACTION   :

First WD of TR 15944-6 Information Technology - Business Agreement Semantic Descriptive Techniques - Part 6: Technical Introduction of eBusiness Modelling

Table of Contents

6. Principles of e-Business Ontology Model

An e-Business scenario is a specification of collaboration aspects of business transaction between the relevant parties, which are particularly focused on the external behaviour of the involved parties.

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

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

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

One of the most considerable things when discussing e-Business scenarios is to establish a common framework, i.e. a reference ruler, for analysing and understanding the external business process between relevant parties in a formal manner from the overall viewpoint of business context including economics and jurisdictional aspects but not restricted to those two. **Fig. 6-1** illustrates the high-level e-Business Ontology Model giving grand perspectives of the external business processes between relevant parties.
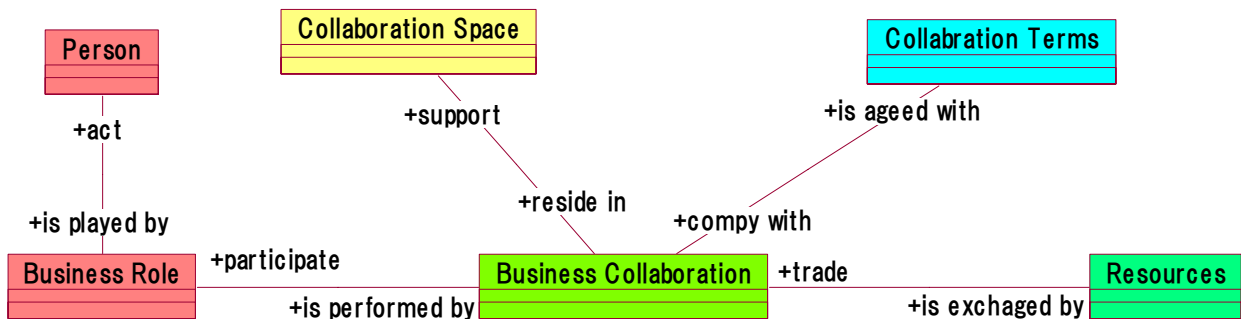
Fig. 6-1 High-level e-Business Ontology Model

The high-level e-Business Ontology Model consists of five modelling components as follows:

- Business Role (<Who>, Actor)

- Resources (<Why>, Value)

- Collaboration Space (<Where>, Space)

- Business Collaboration (<What>, Event)

- Collaboration Terms (<How/When>, Manner)

Business collaboration is performed by business roles in a collaboration space for trading resources, complying with collaboration terms.

6.1 Business Role (Actor)

The business roles in a business transaction are represented by specific persons or organizations relevant to the business transaction. The most essential roles in a business transaction are partners, i.e. buyer and seller. Agent may act behalf of buyer or seller. Some type of business transaction may require third party independent from buyer and seller to mediate the business transaction. **Fig. 6-2** is an illustration focused on the business role aspects of the e-Business Ontology Model.
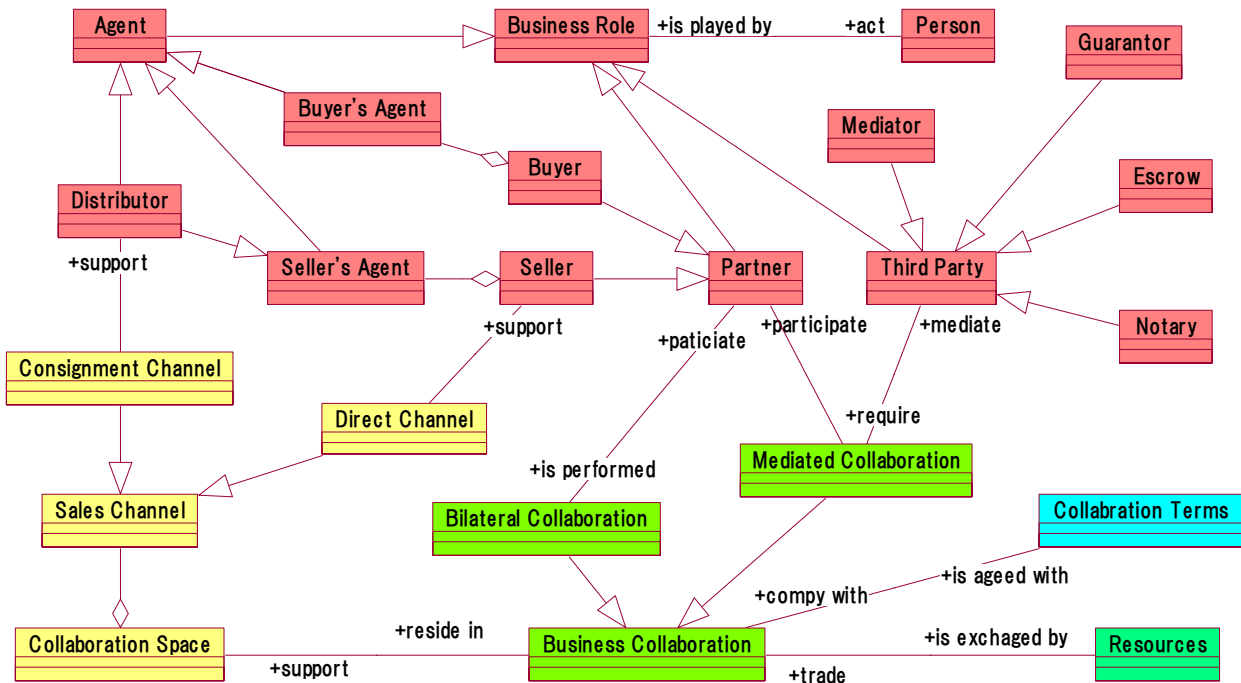

Fig. 6-2 e-Business Ontology Model focused on Business Role

6.2 Resources (Value)

Business transaction is performed by the relevant parties to exchange their resources. The resources are a specific product for the buyer and an expected amount of money as a legal tender for the seller. The product is classified into various types. The legal tender may be various currencies. **Fig. 6-3** is the illustration focused on the business objectives of the e-Business Ontology Model.
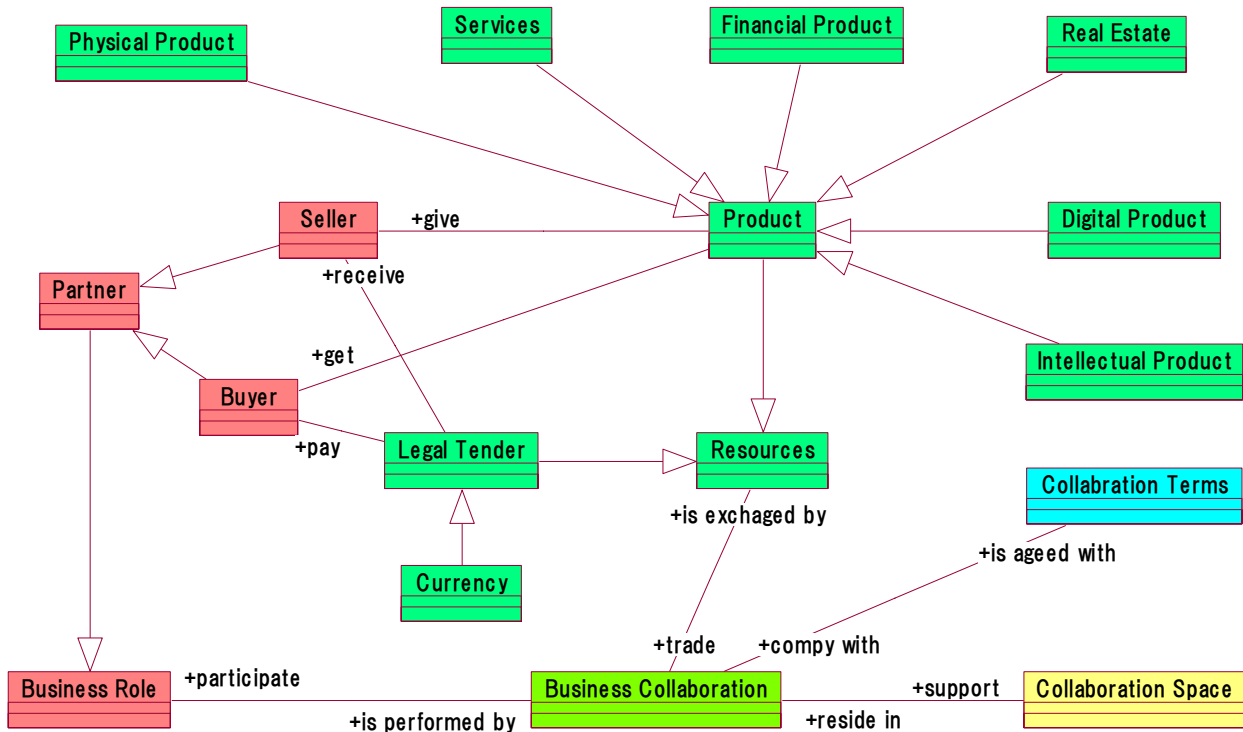
Fig. 6-3 e-Business Ontology Model focused on Resources

6.3 Collaboration Space (Space)

A business transaction is performed in a specific collaboration space, which consist of market, community and sales channel. Market may or may not be explicitly defined with a certain statement or regulation. Community is governed by a specific jurisdictional environment including legal, geopolitics and cultural aspects but not restricted to those. **Fig. 6-4** is the illustration focused on the business collaboration space of the e-Business Ontology Model.

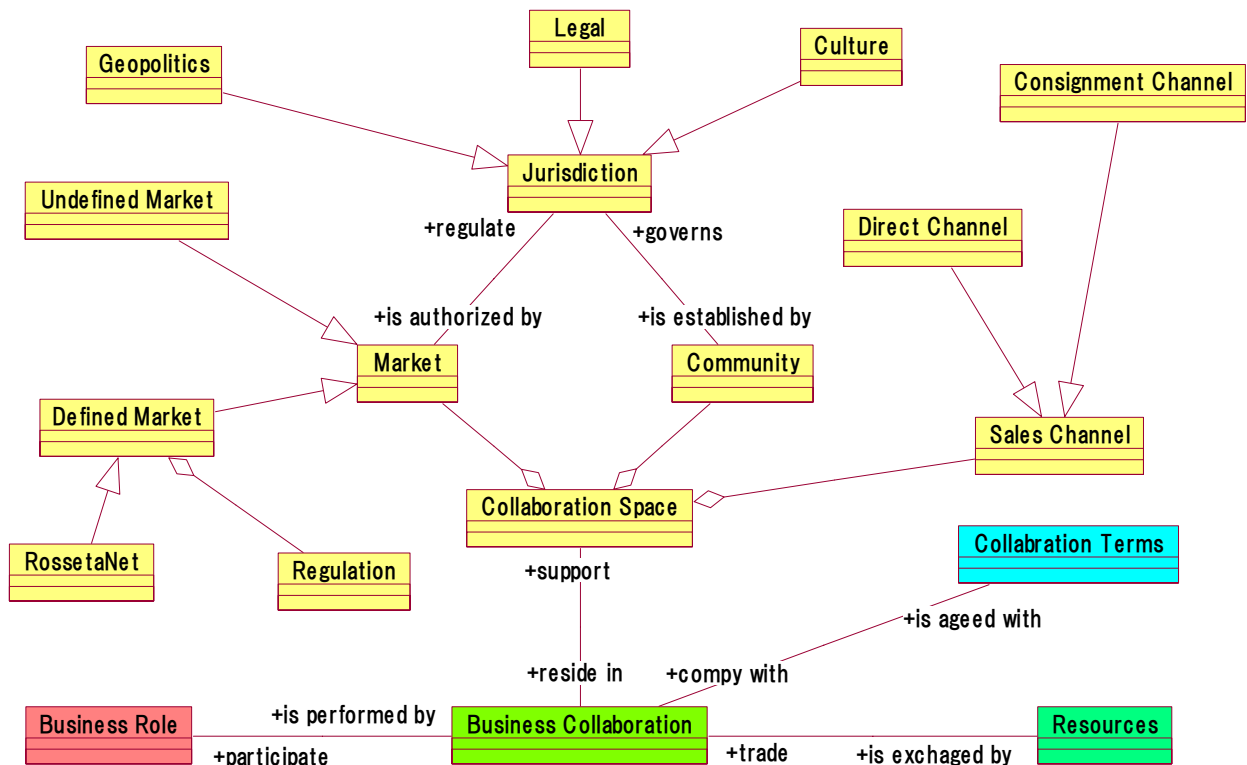**Fig. 6-4 e-Business Ontology Model focused on Collaboration Space**

6.4 Business Collaboration (Event)

Business transaction consists of a series of business collaborations of which sequence varies depending on the nature of particular business transaction type and agreement of the relevant parties. Planning, Identification, Negotiation, Actualization and Post-actualization are conceptually essential business collaborations of a business transaction, although some of them may be physically absorbed or eliminated in an actual business transaction. In negotiation process collaboration terms is agreed. The sequence of actualization is aligned by settlement terms upon agreed between partners. The business collaboration of pricing, order, delivery, payment and warranty are performed complying with the corresponding condition and terms respectively. Identification may require mandatory and/or preferred qualification. Negotiation is initiated buyer or seller. Agreement has a particular offer type of purchase, contract, rental, lease or consignment. There are various pricing methods including matching, bid and auction. Order is either of ad-hoc and repeating. **Fig. 6-5** is the illustration focused on the business collaboration of the e-Business Ontology Model.

Fig. 6-5 e-Business Ontology Model focused on Business Collaboration

6.5 Collaboration Terms

Business collaboration terms are established upon agreement of the relevant parties involved in the business transaction through the negotiation process of business collaboration. The actualization is performed along with the business collaboration terms. The business collaboration terms includes many components such as settlement terms, pricing terms, order terms, delivery terms, payment terms and warranty terms. The settlement terms align the sequence of actualization. Order terms may include pricing terms, manufacturing type, delivery terms and payment terms. Delivery terms include various items of delivery condition and terms such as delivery date, packaging, delivery method, delivery lot, delivery responsibility and delivery location. Payment terms include various items of payment condition and terms such as payment timing, payment lot, payment due date and payment method. **Fig. 6-6** is the illustration focused on the business collaboration terms of the e-Business Ontology Model.
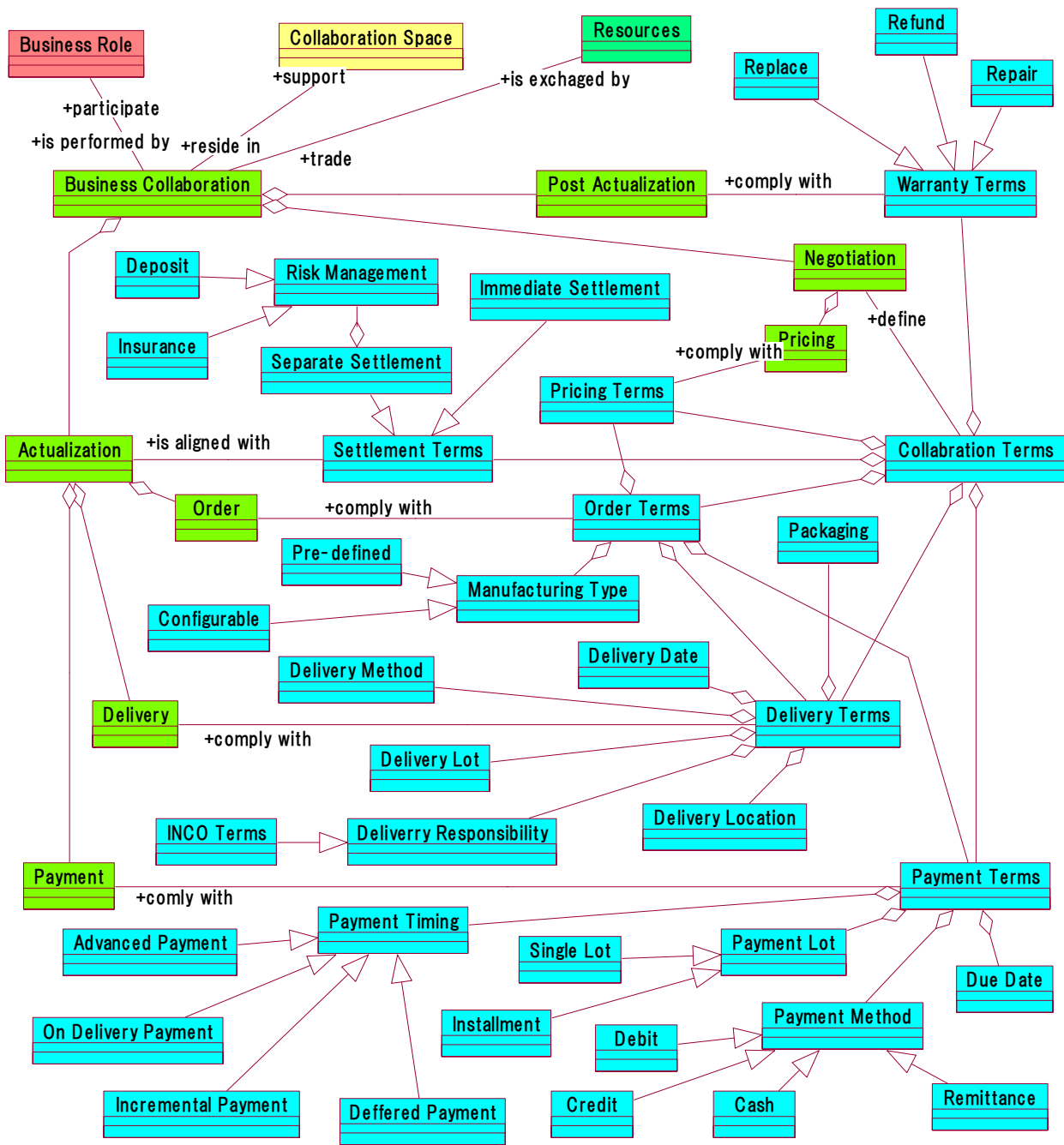
Fig. 6-6 e-Business Ontology Model focused on Collaboration Terms

8. Classification of e-Business Scenarios based on Ontology Model

This part is still under construction.

Annex C ： ANNEX C WILL BE RETAINED AS AN INFORMATIVE ANNEX, EVENTUALLY TO BE IN PART 4, ONCE ANNEX X IS IN PLACE, REVISIONS AS MARKED BELOW ARE RECOMMENDED

It is desired to be able to commence E-Commerce by simply choosing a particular one from the standardized set of scenarios and applying it to the intended business transaction. In the context, the standard Open-edi scenario is supposed to be a generic class of various specific scenarios. In addition, if the generic scenario class were successfully obtained, it could consist of a small number of mandatory attributes and many conditional and/or optional attributes.

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

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

C.1 Classification idea of open-edi scenarios

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

Simplicity: the classification is plainly and unambiguously defined.

Selectivity: the classification is disjoint and non-redundant.

Inclusiveness: the classification is an all-inclusive of Open-edi scenarios.

Stability: the classification is stable for the environmental changes.

Reality: the classification is realistic for the real business world.

According to the requirements mentioned above, the classification scheme should be conceived from the fundamentals of business transactions in the real world such as market, party, merchandise and payment, not being tied to the existing classification ideas. For the purpose, the following three factors are considered as the typical example of key attributes for the classification of Open-edi scenarios. This classification approach could be extensively applied to complex scenarios in real business world when additional classification factors are taken into account.

C.1.1 Market Type on business boundary

In the real business world, the typical E-Commerce transactions consist of the following business processes.

A buyer finds a relevant seller(s) through the network by using a certain services and/or tools, such as a portal site and/or a search engine.

The buyer negotiates the business terms and conditions with the seller(s).

The buyer receives the merchandise and pays the amount of price to the seller(s) according to the business terms and conditions.

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

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

C.1.2 Settlement Type in business process

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

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

C.1.3 Participation Type of role (business party)

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

C.2 Trade model based on the classification ideas

The simplest business process shown in Fig.C.2-1 is the basic trade model, from which we start the discussion of trade models derived from the classification ideas mentioned in C.2.1.
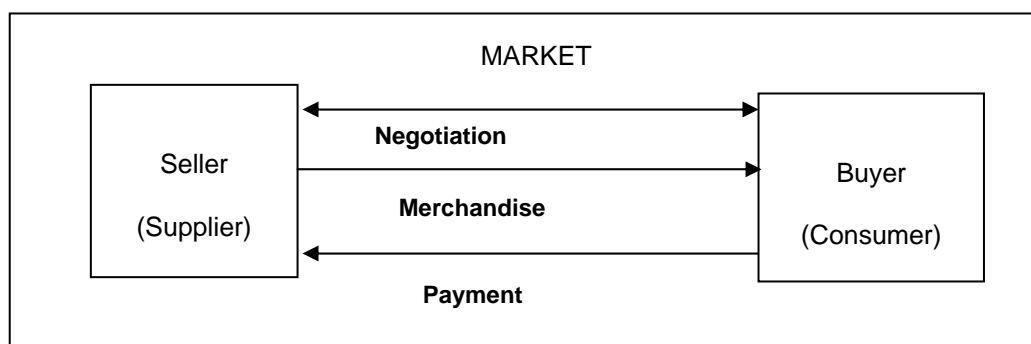
Fig. C.2-1 Basic Trade Model

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

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

Trade Scenario: either or both buyer and seller show explicitly or implicitly an acceptable scenario to the counter party, and negotiate the terms and conditions of the business transaction. In general, the way of acceptance of a particular scenario may be a part of the terms and conditions.

Completion of Trade: the trade will complete when both the delivery of merchandise and payment are successfully finished.

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

C.2.1 Trade model by Market Type

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

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

In this trade model, the buyer and seller begin the business transaction from seeking their counter party by appropriate services and/or tools such as a portal site and search engine. The business scenario to be applied to the transaction is decided upon the individual case. The buyer or seller may simply accept the scenario proposed by the counter party, or they are mutually negotiating.

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

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

Market administrator ;
a role that is responsible for the administration of defined market for Open-edi transactions.

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

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

C.2.2 Trade model by Settlement Type

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

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

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

Separate Settlement Model:
a trade model where the business transaction is performed under the Open-edi environment, and where the delivery of merchandise and/or payment are separated from the agreement process.

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

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

C.2.3 Trade model by Participation Type

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

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

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

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

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

C.3 Classification of open-edi scenarios

The classification attributes mentioned in the previous section, Market Type, Payment Type and Participation Type are mutually disjoint. Applying each of them to an axis of three dimensions, the classification of Open-edi scenarios is obtained such that the requirement of scenario constructs is summarized in Table C.2-1.

Table C.2-1   Scenario Classification and Constructs

Class	Classification Attributes			3.1 Scenario Construct
	Market	**Settlement**	**Participation**	
O-I-B	Open	Immediate	Bilateral	-Basic Bilateral Trade Scenario
O-I-M	Open	Immediate	Mediated	-Basic Mediated Trade Scenario
O-S-B	Open	Separate	Bilateral	-Bilateral Agreement Scenario -Separate Delivery Scenario -Separate Payment Scenario -Authentication Scenario
O-S-M	Open	Separate	Mediated	-Mediated Agreement Scenario -Separate Delivery Scenario -Separate Payment Scenario -Authentication Scenario
C-I-B	Closed	Immediate	Bilateral	-Membership Registration Scenario -Defined Bilateral Trade Scenario
C-I-M	Closed	Immediate	Mediated	-Membership Registration Scenario -Defined Mediated Trade Scenario
C-S-B	Closed	Separate	Bilateral	-Membership Registration Scenario -Defined Bilateral Agreement Scenario

				-Separate Delivery Scenario
				-Separate Payment Scenario
				-Defined Authentication Scenario
C-S-M	Closed	Separate	Mediated	-Membership Registration Scenario
				-Defined Mediated Agreement Scenario
				-Separate Delivery Scenario
				-Separate Payment Scenario
				-Defined Authentication Scenario

O-I-B Class:
a scenario class of business transactions, which is attributed by Open Market, Immediate Settlement and Bilateral Participation.

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

O-I-M Class:
a scenario class of business transactions, which is attributed by Open Market, Immediate Settlement and Mediated Participation.

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

O-S-B Class:
a scenario class of business transactions, which is attributed by Open Market, Separate Settlement and Bilateral Participation.

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

O-S-M Class:
a scenario class of business transactions, which is attributed by Open Market, Separate Settlement and Mediated Participation.

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

C-I-B Class:
a scenario class of business transactions, which is attributed by Closed Market, Immediate Settlement and Bilateral Participation.

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

C-I-M Class:
a scenario class of business transactions, which is attributed by Closed Market, Immediate Settlement and Mediated Participation.

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

C-S-B Class:
a scenario class of business transactions, which is attributed by Closed Market, Separate Settlement and Bilateral Participation.

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

C-S-M Class:
a scenario class of business transactions, which is attributed by Closed Market, Separate Settlement and Mediated Participation.

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

C.3.1 Scenario components

As mentioned in Table C.2-1, the scenario components are quite different depending on scenario classes. Those scenario components are described as follows:

Basic Bilateral Trade Scenario:

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

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

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

The trade will complete when both the delivery of merchandise and payment are coincidentally and successfully finished.

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

Basic Mediated Trade Scenario:

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

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

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

The trade will complete when both the delivery of merchandise and payment are coincidentally and successfully finished and confirmed by the participants according to the terms and conditions agreed upon the business transaction.

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

Closed Bilateral Trade Scenario:

This scenario is the core of C-I-B scenario and includes all processes of a transaction to begin and complete a Closed Bilateral Trade of which the principal terms and conditions the participants accepted in advance.

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

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

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

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

Closed Mediated Trade Scenario:

This scenario is the core of C-I-M scenario and includes all processes of a transaction to begin and complete a Closed Mediated Trade of which the principal terms and conditions the participants accepted in advance.

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

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

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

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

Bilateral Agreement Scenario:

This scenario is the agreement part of O-S-B scenario, which precedes the delivery of merchandise and/or payment of the transaction.

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

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

separately. And, the identification should be unique in the global scope because the open market could not have a well-defined boundary.

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

Closed Bilateral Agreement Scenario:

This scenario is the agreement part of C-S-B scenario, which precedes the delivery of merchandise and/or payment of the transaction.

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

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

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

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

Mediated Agreement Scenario:

This scenario is the agreement part of O-S-M scenario, which precedes the delivery of merchandise and/or payment of the transaction.

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

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

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

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

Closed Mediated Agreement Scenario:

This scenario is the agreement part of C-S-M scenario, which precedes the delivery of merchandise and/or payment of the transaction.

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

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

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

Separate Delivery Scenario:

This scenario is the delivery part of O-S-B, O-S-M, C-S-B and C-S-M scenarios, which is separately performed after the agreement of transaction.

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

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

Separate Payment Scenario:

This scenario is the payment part of O-S-B, O-S-M, C-S-B and C-S-M scenarios, which is separately performed after the agreement of transaction.

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

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

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

Authentication Scenario:

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

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

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

Closed Authentication Scenario:

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

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

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

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

C..3.2 Assumption for scenario classification

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

Continuous Transaction:
a series of transactions of which the terms and conditions are constant.

No discrimination is supposed between a continuous transaction and a spot transaction. The continuous transaction is considered as a repetition of spot transactions of which the terms and conditions are constant or only a variable part is changing.

Services Transaction:
a business transaction where services are procured.

The business transaction of services is assumed to be basically same as of goods even if it may have different attributes relevant to the delivery procedure and the status confirmation.

Auction Transaction:
a business transaction relevant to auction.

An auction transaction is supposed to be a variation of mediated transaction, which requires the competitive participation of two or more buyers for a sale of merchandise.

Bidding Transaction:
a business transactions relevant to biddingt.

A bidding transaction is supposed to be a variation of bilateral transaction, which requires the competitive participation of two or more sellers for a procurement of merchandise.

Credit Payment Transaction:
a business transaction that is settled by a credit card or debit card.

A transaction settled by a credit card requires a provision of credit and the authentication of buyer. Thus the transaction type is differed from the transaction by cash, and is supposed to be a kind of Separate Payment Model.

Regulatory Constraints:

Actual business transactions may have many types of regulatory constraints than the normative rules explicitly or implicitly involved in the transactions. Each of them is partially or entirely applied to a specific market type, participant type, merchandise type, delivery type and/or payment type. In addition, some of them are particularly effective in a certain country or region and/or in a certain period. However, the scenario classification is considered to be independent from the regulatory constraints.