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THE DNA OF B2B

*E-business UML Style  
Guide*

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## Executive Summary

Business process models specify interoperable business processes that allow business partners to collaborate. These models are specified using the Unified Modeling Language (UML) and the Object Constraint Language (OCL).

This document provides the specific layout, documentation, and style conventions that should be applied consistently in E-business Collaboration Modeling based on employment of the e-business collaboration modeling methodology and the metamodel.

Modelers using the metamodel defined in the “E-business Collaboration Modeling Metamodel” will find that the conventions found in this document will make their work easier to integrate with the efforts of other modelers. It will be easier to understand, and more importantly, easier to integrate into automated and semi-automated system specification development processes.

A style guide dictates the physical appearance of a document. This document begins with the general rules and syntax for naming and description of typical modeling elements. It follows with a section on the conventions applied to typically used diagrams. Finally it concludes with a description of the rules that apply specifically to the model of an individual commercial transaction as a UML activity model.

## Preface

Business process models specify interoperable business processes that allow business partners to collaborate. These models are specified using the Unified Modeling Language (UML) and the Object Constraint Language (OCL). A separate document (BCF#7, “E-business Collaboration Modeling Metamodel”) describes the UML metamodel extension for specifying business process models.

There are a number of reasons to use the UML and the OCL to specify these models:

- The UML provides a visual language that eases the construction and interpretation of e-business process models.
- The UML provides an extension mechanism so that domain specific, object-oriented metamodels can be easily defined.
- The OCL is a method independent of programming language for expressing integrity and well-formedness constraints in metamodels and models.
- The UML can be persisted using XMI—an XML application. Models are easy to share and translate using tools that provide XML support.

Even if a model is consistent with the metamodel there can be inconsistencies of layout, documentation and other aspects of modeling style that make integration of modeling efforts difficult across a given environment. This is especially true when trying to build automated specifications from those models. Accordingly, specific style guidance is needed.

### **Purpose of the Document**

The purpose of this document is to provide the specific layout, documentation, and style conventions that should be applied consistently in E-business Collaboration Modeling based on employment of the e-business collaboration modeling methodology and metamodel (BCF#7, “E-business Collaboration Modeling Metamodel”).

### **Intended Audience**

Modelers employing any of the steps included in the e-business collaboration modeling process in accordance with the metamodel defined in the “E-business Collaboration Modeling Metamodel” will find that the conventions found in this document will make their work easier to integrate with the efforts of other modelers. It will be easier to understand, and more importantly, easier to integrate into automated and semi-automated system specification development processes.

## Prerequisites

It is assumed that the audience will be familiar with or have knowledge of the following technologies and techniques:

- Business process modeling techniques and principles.
- The UML syntax and semantics, the UML metamodel and the UML extension mechanism.
- The OCL syntax and semantics.
- The specific process (or appropriate subset) used in developing e-business collaboration models.

## Scope of the Document

This document specifies style conventions for layout and documentation of business process models built in accordance with the "E-Business Collaboration Modeling Metamodel."

## Style Conventions

This document uses typographical and language conventions to convey specific meanings.

## Typographical Conventions

The use of a *bold/italic font* indicates a UML or business process metamodel entity name.

## Language Conventions

This specification adopts the conventions expressed in the IETF's<sup>1</sup> RFC 2119 "Key Words for Use in RFCs to Indicate Requirement Levels." The key words "MUST," "MUST NOT," "REQUIRED," "SHALL," "SHALL NOT," "SHOULD," "SHOULD NOT," "RECOMMENDED," "MAY," and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

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## Acknowledgments

Edifecs<sup>2</sup>: Edifecs is administering the creation of the Business Collaboration Framework (BCF). The BCF is a collection of documents that prescribe the policy, architecture and specifications for executing business collaborations for e-business.

- For general questions send mail to: [support@edifecs.com](mailto:support@edifecs.com)

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<sup>1</sup> <http://www.ietf.org/>

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## 1 Introduction

A style guide dictates the physical appearance of a document. Business models are no different from other documents in this sense. This document begins with the general rules and syntax for naming and description of typical modeling elements. It follows with a section on the conventions applied to typically used diagrams. Finally it concludes with a description of the rules that apply specifically to the model of an individual commercial transaction as a UML activity model.

The style guide is complete in the sense that it covers rules for layout and naming that will work as stated. It is incomplete, at this point, in that all examples have not been exhaustively covered. Additionally, processes themselves change over time to adjust to changing requirements and newly discovered insights. This style guide will also adapt to such changes. Following the style guide will help to make any changes to defined processes less capricious in reasoning and more consistent in application.

## 2 General Naming and Syntax Rules

The following general rules apply to all business modeling products:

### Font

- All lettering on UML diagrams must be formatted to use the Arial 8pts, black font. For example: **Arial 8pts, black font**

### Notation Coloring

- Notation colors must have no semantic meaning with respect to the model.

### General Syntax

- All Business Operations View (BOV), Functional Service View (FSV), and Implementation Service View (ISV) names must be syntactically compliant with the OCL version 1.0 specification. This rule may be relaxed for readability and user understanding for the Business Operations Map (BOM) and Business Requirements View (BRV).
- Abbreviations (including acronyms) must not be used for naming any elements of the model except for well-known standards (e.g., ID).

### Operations

- The first letter of an operation name is small. The rest of the name is compacted proper names (i.e. no white space or special character delimiters) e.g. *createQuickerly*. (Applies to BOV, FSV, and ISV.)
- Operation names must be verbs, e.g. *add()*.
- Operation argument names (when needed) must be nouns, e.g. *PurchaseOrder*.

### Conditional statements

- Preconditions, post-conditions and invariant constraints must be expressed using text and the OCL. (Applies at all models levels. May be relaxed for BOM. Should be applied for BRV.)



## Roles and Role Names

- A role name must not be a partner type.
- A role description must be the approved description corresponding to the selected role name.
- The role description cannot be changed or extended without first being approved by the modeling lead.
- Roles must be defined to be one of the following role types:
  1. Organizational: Authority to perform on a company level. Use when it is required to authenticate the entire business document.
  2. Employee: Authority to perform on an individual level. Use to authenticate a role (digital signature). Also use to authorize specific data.
  3. Functional: Can be either an organizational or an employee role.

## Associations

- The first letter of an association name is small. The rest of the name is compacted proper names (i.e. no white space or special character delimiters) e.g. *businessProcessFlow*. (Applies to BOV, FSV, and ISV. May be relaxed for BOM and BRV.)
- Use singular names for associations with singular cardinality.
- Use plural names for associations with multiple cardinality.
- Association naming phrases. If a name is associated with a specific UML role then the phrase must start with the word "the." If the name is associated with the general role then do not use the word "the" to precede the phrase.
- All associations must have cardinality specified on the role of the association.

## Stereotypes

- Stereotype names must syntactically match the e-business process metamodel stereotype names or the UML stereotype names. The UML stereotype names are all lowercase. The e-business metamodel stereotype names are compacted proper names. (Applies at all model levels.)

## Naming of Classes and Properties

- No use of "type" or "class" for names of entities and properties.
- No properties must have "yes," "no" values.
- Use the word "Identifier" to prefix all fundamental business data entities that are used to identify real world concepts, e.g. ProprietaryProductIdentifier. Identifiers are not enumerated as values for a fundamental business data entity.
- Use the word "Code" to prefix all fundamental business data entities that are used to identify real world concepts with a literal (symbol), e.g. GlobalPartnerClassificationCode. A codes list is enumerated as the values for a Fundamental Business Data Entity.
- Use the word "Global" to precede globally administered entities.
- Use the word "National" to precede nationally administered entities.
- Use the word "Proprietary" to precede proprietary administered entities.
- Use "is" to prefix business properties that are Boolean (True/False) valued, e.g. *isOnSale*.
- Keep tense out of business property names, e.g. use "priceChangeDate" and not "PriceChangedDate" as the property can then be used for both past and future business events.
- All non-global, e.g. proprietary, national, regional, geographic, identifiers and codes must be business data entities. They must comprise two fundamental business data entities. One specifying the administering authority and one specifying the identifier.
- Do not use "yes," "no," "true," "false," etc. as state transitions out of conditional states. Use active verbs, e.g. accepted, not accepted, verified, not verified, etc.
- Only name business properties if they are used to differentiate between associations to the same target class, or when they provide context but no attributes to a more general class.

- Using the name of a Class with a lowercase first letter to reference objects that have un-named roles. This is specified in section 2.3, page 15 of *The Object Constraint Language*.<sup>3</sup>
- All business properties of type "CountableAmount" must start with the words "numberOf," e.g. "numberOfProducts."
- Class names must comprise compacted proper names (i.e. no white space or special character delimiters), e.g. **BusinessRole**. The first letter of each name must be capitalized. This rule does not apply to association class stereotypes in the metamodel. These class names must follow the syntax for associations. (Applies to BOV, FSV, and ISV. May be relaxed for BOM and BRV.)

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<sup>3</sup> Warmer, Jos B., and Anneke G. Kleppe. *The Object Constraint Language: Precise Modeling With UML* (Addison-Wesley Object Technology Series) Reading, MA: Addison-Wesley Publishing Co., 1999.

### 3 Diagram Layout Rules and Conventions

#### Class Diagrams

- For unidirectional navigational aggregation roles the name of the role must be the name of the "A" role. Do not name the general role. This is particularly true for Business Data Entities.
- Business data entity attributes must not be specified in attribute compartments. All attributes must be specified as unidirectional aggregation associations. (Note: Modeling as association facilitates management of optional properties and the automatic generation of specifications.)
- Hide operation compartments when there are no operations defined for a class.
- Hide attribute compartments since there will be no attributes defined for a class.

#### Activity Diagrams

- Activity diagrams may span multiple vertical pages.
- Layout activity diagrams on portrait-oriented pages.
- It is recommended that multiple transitions with guard conditions be shown from activities rather than using decision activities. This reduces clutter in the diagrams.
- Activity diagrams must have one initial state and can have multiple final states.
- Asynchronous commercial transactions in activity diagrams must be represented a single object flow.

## Sequence Diagrams

- Sequence diagrams may span multiple pages. It is recommended that they do not span multiple vertical pages.
- Layout sequence diagrams on landscape-oriented pages.
- Interactions must be indicated as simple interactions.
- Response interactions must be indicated as simple interactions.
- A sequence diagram must have all the network component interactions that implement one commercial transaction. This includes all agent and service interactions.

## 4 Commercial Transactions and Commercial Transaction Activity Diagrams

Rules in sections 2 and 3 apply for all commercial transaction activity models. There are several other specific rules and conventions that make consistent commercial transaction modeling possible. These are outlined below:

### **Initiator/Responder (Applied to Roles):**

- The initiator is the role that is responsible for managing the start state.
- The initiator is on the left by convention for readability and diagramming.

### **Activity and Business Document Names**

- The activity names must always be in the form <Verb><Noun>.
- Business Document names must be in the form <Noun><Verb>.
- The verbs should be selected from the following table. A new verb can be used if the business requirement is semantically different from any of the existing verbs.

	Initiating Business Activity	Responding Business Activity	Business Document Request	Business Document Response
Business Transaction	1. Cancel 2. Change 3. Create	Accept	1. Cancellation 2. Request 3. Change	Acceptance
Request /Confirm	Request		Request	Confirmation
Query /Response	Query	Process	Query	Response
Notification	1. Notify 2. Transfer	Process	1. Notification 2. Notification	NA
Information Distribution	Distribution	Receive	Notification	NA

**Table 4.1 Verbs for Document Names**

**Process Flow Patterns for Commercial Transactions**

- A Business Document must always be in the same swimlane as the Business Activity that creates it.
- The process flow is always counterclockwise. The design rationale for this is so that it more closely models the flow of a transaction as opposed to an interaction.
- There must always be exactly two swimlanes.
- There must always be exactly one initial state named START.
- There must always be exactly two final states named FAILED and END.
- The guards on the two end states are always named SUCCESS and FAILED.
- The names of Activities, Business Documents, and Role Names must be in proper case. This allows us to easily read OCL compliant names when we use them to create business constraints.
- Guards must be in uppercase so that they can be used as values in OCL syntax.

### Initial and Final States

- The initial and final states describe the state of the business process support system
- States conditions are named in the form <Noun><Property><Verb>:
  - ? The <Noun> can be a Business Data Entity and the property is named "Status" in the form BDE Status <Verb>, e.g. Purchase Order Status Exists.
  - ? The <Noun> can be a Business Data Entity with no named property in the form BDE <verb>, e.g. Purchase Order Exists.
  - ? The <Property> can be the name of a business process support system with no <Noun> in the form <Property><Verb>, e.g. Signature Authorized.
- All states on the diagrams must be in the same swimlane as the initiating activity. This is because a process cannot start or terminate on the responding role's swimlane.