



Creating A Single Global Electronic Market

1 Business Process and Business 2 Information Analysis Overview

3

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7 1 *Status of this Document*

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18

19

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83 4 *Introduction*

84 4.1 Summary

85 The vision of ebXML is to create a single global electronic marketplace where enterprises of any size
86 and in any geographical location can meet and conduct business with each other through the
87 exchange of XML based messages. ebXML enables anyone, anywhere, to do electronic business with
88 anyone else, however, it is anticipated that compliance with and adoption of the various ebXML
89 components will be incremental, over time.

90 In order for enterprises to conduct electronic business with each other, they must first discover each
91 other and the products and services they have to offer. They then must determine which business
92 processes and documents are necessary to obtain those products and services. After that, they need
93 to determine how the exchange of information will take place and then agree on contractual terms and
94 conditions. Once all of this is accomplished, they can then exchange information and products/services
95 according to these agreements.

96 To facilitate this, ebXML provides an infrastructure for data communication interoperability, a semantic
97 framework for commercial interoperability, and a mechanism that allows enterprises to find, establish a
98 relationship, and conduct business with each other.

99 Data communication interoperability is ensured by a standard message transport mechanism with a
100 well-defined interface, packaging rules, and a predictable delivery model, as well as an interface to
101 handle incoming and outgoing messages at either end.

102 Commercial interoperability is provided by means of a specification schema for defining business
103 processes and a core components and context model for defining Business Documents. ebXML
104 recommends a methodology and provides a set of worksheets and guidelines for creating those
105 models. A business library (catalog) of business process and information models promotes business
106 efficiency by encouraging reuse of business processes or parts of predefined business processes.

107 In order for the actual conduct of business to take place, ebXML provides a shared repository where
108 businesses can discover each other's business offering by means of partner profile information, a
109 process for establishing an agreement to do business (Collaboration Protocol Agreement, or CPA), and
110 a shared repository for company profiles, business-process-specifications, and relevant business
111 messages.

112 4.2 Scope and Audience

113 This document deals with aspects of commercial interoperability, specifically the process by which
114 enterprises can analyze, identify, and define those business processes and business documents
115 necessary for the conduct of electronic business with other enterprises, within the ebXML framework.

116 The audience for this document will typically comprise representatives of any of a number of different
117 functional areas within an enterprise, including marketing, business development, executive
118 management, procurement, software development, IT, etc.

119 4.3 Related Documents

120 ebXML Technical Architecture Specification. Version 1.0.4. 16 February 2001. ebXML Technical
121 Architecture Project Team.

122 UN/CEFACT Modelling Methodology. CEFACT/TMWG/N090R9. February 2001. UN/CEFACT
123 Technical Modeling Working Group.

124 Information Technologies - Open-EDI Reference Model. ISO/IEC 14662:1997(E). International
125 Organization for Standardization (ISO) and International Electrotechnical Commission (IEC).

126 ebXML Business Process Analysis Worksheets and Guidelines. WORK-IN-PROGRESS. Version 0.9.
127 March 10, 2001. ebXML Business Process Project Team.

128 ebXML Catalog of Business Processes. Version 0.9. Date March 17, 2001. ebXML Business Process
129 Project Team.

130 ebXML E-Commerce and Simple Negotiation Patterns. Version .3. Date March 17, 2001. ebXML
131 Business Process Project Team.

132 ebXML Business Process Specification Schema. Version 0.90. 01/17/2001. *Context/Meta Model*
133 Group of the CC/BP Joint Delivery Team.

134 ebXML Methodology for the Discovery and Analysis of Core Components. DRAFT. Version 1.0.1.
135 February 16, 2001. ebXML Core Components Project Team.

136 ebXML The role of context in the re-usability of Core Components and Business Processes ebXML
137 Core Components. Version 1.01. February 16, 2001. ebXML Core Components Project Team.

138 ebXML specification for the application of XML based assembly and context rules. Version 1.01. 16
139 February 2001. ebXML Core Components.

140 ebXML TA Glossary. Version 0.95 . 12 February 2001. Technical Architecture Project Team.

141 ebXML Registry Information Model. Version 0.56. Working Draft. 2/28/2001. ebXML Registry Project
142 Team.

143 ebXML Registry Services. Version 0.85. Working Draft. 2/28/2001. ebXML Registry Project Team.

144 ebXML Collaboration-Protocol Profile and Agreement Specification. Version 0.95

145 ebXML Technical Architecture Risk Assessment Report. Version 0.36

146 4.4 Document Conventions

147 The keywords MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHALL NOT,
148 RECOMMENDED, MAY, and OPTIONAL, when they appear in this document, are to be interpreted as
149 described in RFC 2119 [Bra97].

150 When the term *Meta Model* is used, it refers to the e-Business Process *Meta Model* as defined in the
151 *UN/CEFACT Modeling Methodology* .

152 When the term *Specification Schema* is used, it refers to the *Meta Model* and its DTD form as defined
153 in the *ebXML Business Process Specification Schema* .

154 5 *Goal and Objectives*

155 5.1 Goal

156 The goal of this document is describe the analysis process in such a way that the audience will have a
157 general understanding of how to conduct business process and documentation definition and
158 identification, within the ebXML framework, and how that relates to the overall development of
159 electronic business relationships with other enterprises.

160 5.2 Objectives

161 In order to accomplish the goal, as set for in 5.1 above, this document will:

- 162 • Provide an overview of electronic business collaboration
- 163 • Discuss the role and use of business process modeling
- 164 • Describe the analysis process
- 165 • Discuss economic elements in Business Processes
- 166 • Establish the relationship of core components to business processes

167 5.3 Caveats and Assumptions

168 The intent of this document is to provide a general overview of business process and business
169 document analysis. It is not intended to be a specification.

170 It is assumed that the audience has some general understanding of the ebXML framework and is
171 particularly familiar with the *ebXML Technical Architecture Specification*.

172 To better understand the concepts of economic elements in business processes, it is helpful to have a
173 familiarity with the Resource-Event-Agent (REA) Enterprise Ontology.

174 6 *Business Collaboration Overview*

175 6.1 ebXML Electronic Business Collaboration

176 The strength of the ebXML technical architecture is that it provides a framework for electronic business
177 collaboration. The architecture enables businesses to work together to specify business process,
178 discover each other, negotiate collaboration agreements, and execute business processes. The
179 significant activities implementing and executing this ebXML electronic business collaboration are
180 shown in Figure 6.1-1.

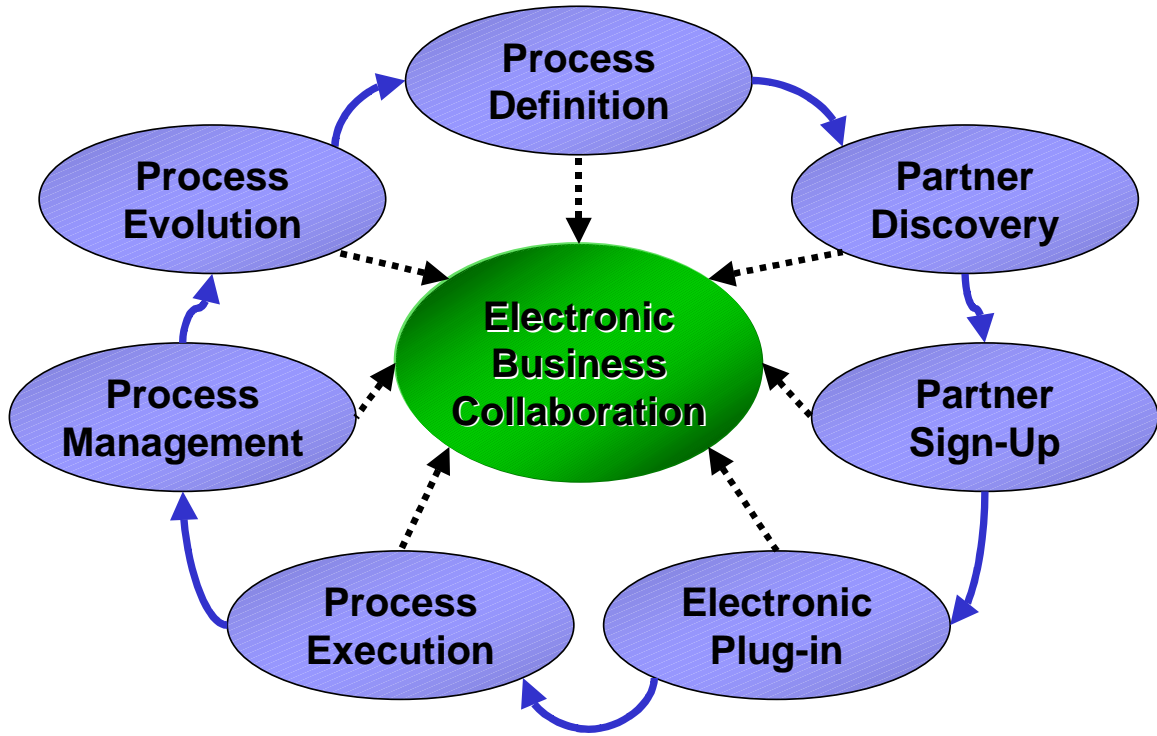
181 The overall process starts with Process Definition, utilizing Business Process and Business Document
182 Analysis and logically progresses to Partner Discovery, Partner Sign-Up, Electronic Plug-in, Process
183 Execution, Process Management, Process Evolution.

- 184 • **Process Definition:** Utilizing Business Process and Business Document Analysis, an
185 enterprise determines and defines which processes will be necessary for electronic
186 commerce. In some cases, a community of trading partners – for example AIAG¹ or
187 RosettaNet² – may define the business processes to be used in the community. These
188 business processes are defined according to a well known model and described in agreed
189 upon formats.
- 190 • **Partner Discovery:** Enterprises identify potential electronic trading partners through a search
191 of company profiles held in ebXML compliant registries.
- 192 • **Partner Sign-up:** Trading partners then negotiate agreements that will serve as the terms and
193 conditions of their collaboration.
- 194 • **Electronic Plug-in:** The trading partners then configure their electronic interfaces and
195 business services according to their agreements.
- 196 • **Process Execution:** Businesses exchange documents and complete commercial
197 transactions in accordance with their agreements and carry out the agreed upon business
198 processes.
- 199 • **Process Management:** The business processes defined in the Process Definition phase and
200 agreed to in the Partner Sign-Up phase are monitored for compliance with trading partner
201 agreements and successful execution.
- 202 • **Process Evolution:** Participants in the electronic marketplace will evaluate their existing
203 processes, improve them through process re-engineering, and create new processes to meet
204 the needs of the market.

205

¹ The AIAG is the Automotive Industry Action Group (<http://www.aiag.org/>).

² RosettaNet is “a consortium of major Information Technology, Electronic Components and Semiconductor Manufacturing companies” (<http://www.rosettanet.org/>).



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Figure 6.1-1, ebXML Business Collaboration Process

209 The following table shows the relationship between ebXML Project Teams, significant ebXML
210 documents, and the activities in Figure 6.1-1:

Activity	ebXML Project Team	ebXML Document
Process Definition	Business Process, CC/BP Analysis sub-team, Registry	<i>UN/CEFACT Modeling Methodology³, ebXML Business Process Specification Schema, Business Process and Business Document Analysis Overview, ebXML Business Process Analysis Worksheets and Guidelines, ebXML Catalog of Business Processes, ebXML The role of context in the re-usability of Core Components and Business Processes, and ebXML specification for the application of XML based assembly and context rules, ebXML Registry Services, ebXML Registry Information Model</i>
Partner Discovery	Technical Architecture, Trading Partner, Registry	<i>ebXML Technical Architecture Specification, Collaboration-Protocol Profile and Agreement Specification, ebXML Registry Services, ebXML Registry Information Model.</i>

³ The UMM is not an ebXML document; however, it is a significant document which is administered by the UN/CEFACT.

211

Partner Sign-up	Trading Partner, Technical Architecture	<i>Collaboration-Protocol Profile and Agreement Specification, and Business Collaboration Patterns.</i>
Electronic Plug-in	Technical Architecture, Trading Partner	<i>Collaboration-Protocol Profile and Agreement Specification, ebXML Technical Architecture Specification, Information Technologies - Open-EDI Reference Model [ISO 14662E], Transport, Routing and Packaging Message Services</i>
Process Execution	Trading Partner, Technical Architecture, Transport, Routing and Packaging (TRP)	<i>Collaboration-Protocol Profile and Agreement Specification, ebXML Technical Architecture Specification, Information Technologies - Open-EDI Reference Model [ISO 14662E], Transport, Routing and Packaging Message Services</i>
Process Management	None	<i>Information Technologies - Open-EDI Reference Model [ISO 14662E] (Section Open-EDI Support Infrastructure)⁴, Transport, Routing and Packaging Message Services,</i>
Process Evolution	None	<i>None – not in scope of ebXML.</i>

212

213 **6.2 Economic Elements in Business Processes**

214 The most common ebXML business collaborations will be resource exchanges between companies:
 215 buying and selling products and services. The most common collaboration pattern for these
 216 exchanges will probably be order-fulfillment-payment. The ebXML *Meta Model* provides Economic
 217 Modeling Elements for specifying these collaborations in business and economic terms rather than in
 218 technical terms. The Economic Elements include:

- 219 • Economic Contracts: ranging from simple orders to long-term component contracts
- 220 • Economic Resources: including products, services, and cash
- 221 • Economic Events: including product or service deliveries, and payments
- 222 • Partner Types: including the parties and roles authorized to commit and exchange resources
 223 in business collaborations

224 Using these elements, it will be possible to determine in a business collaboration:

- 225 • When an Economic Contract is formed
- 226 • When an Economic Event SHOULD be recognized

⁴ The *Information Technologies - Open-EDI Reference Model [ISO 14662E]* is not an ebXML document. It is a significant document for the UMM and the ebXML Technical Architecture Specification.

- 227 • When an Economic Resource or a claim to a resource SHOULD be recognized in accordance
228 with generally accepted accounting principles (GAAP)
- 229 • Whether or not a delivery fulfills a commitment
- 230 • What events MAY follow if a delivery does not fulfill an order
- 231 • When an exchange is complete from a business point of view
- 232 • Many other aspects of typical business relationships

233 Using the ebXML Economic Modeling Elements, these typical business collaboration patterns can be
234 designed once and re-used in many situations⁵. Figure 6.2-1 provides an overview of the REA
235 economic elements in a typical product-oriented Order-Fulfillment Business Process.

236 The above concepts and relationships are specified in the UMM, but there is no programmatic support
237 for them in the first version of the *ebXML Business Process Specification Schema* [BPSS]. They could,
238 however, be implemented in business collaboration management software based on the UMM *Meta*
239 *Model*.

240 The Business Process is composed of several Business Collaborations, taken directly from the Catalog
241 of Common Business Processes [CCBP] and other business libraries.

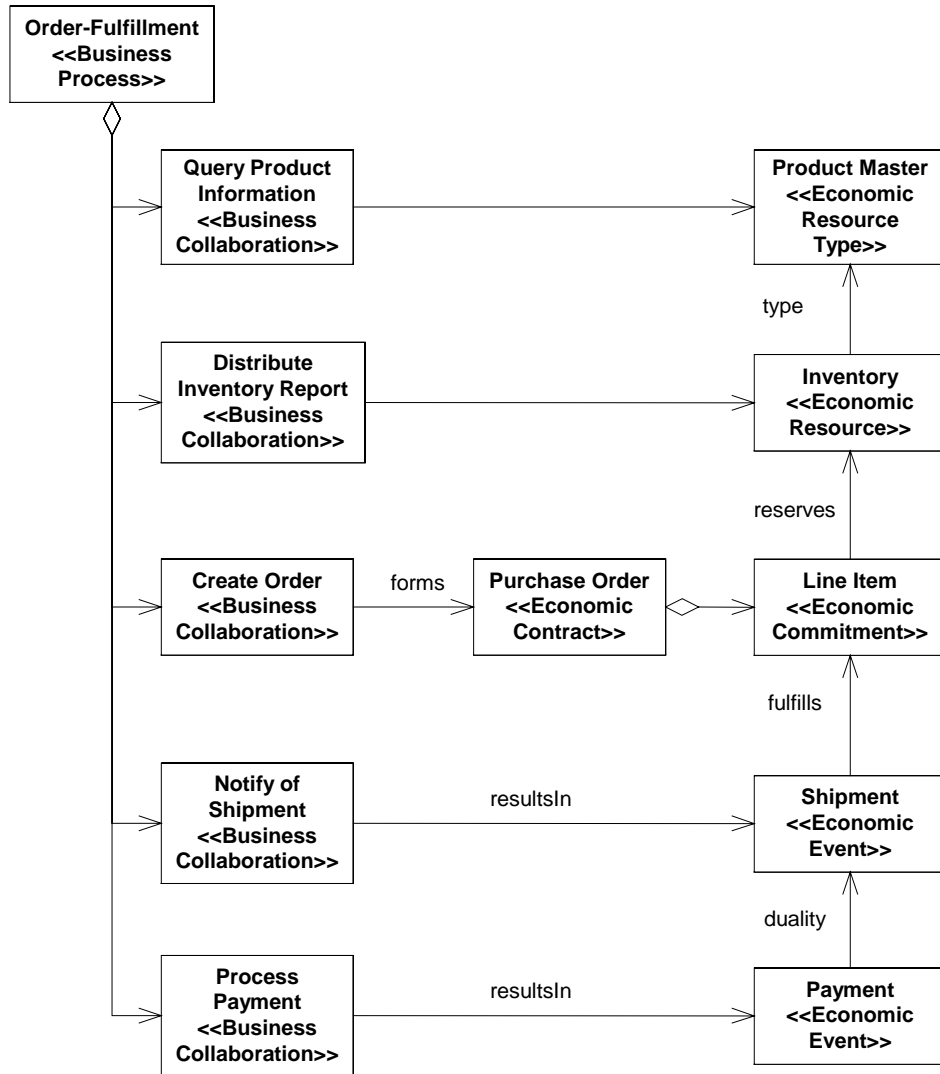
- 242 • Query Product Information receives Product Master or Catalog information about the products
243 that can be ordered. In REA, products are Economic Resource Types.
- 244 • Distribute Inventory Report receives information about products that are currently available.
245 This purpose could also be accomplished through a Query Availability process. In REA,
246 inventory is an Economic Resource. Each inventory element is typed by a Product Master
247 (Economic Resource Type).
- 248 • Create Order forms a Purchase Order (an Economic Contract) composed of Line Items
249 (Economic Commitments). Each Line Item reserves the committed quantity of the ordered
250 product type, due at the committed date and time.
- 251 • Notify of Shipment results in a Shipment (an Economic Event) which SHOULD fulfill one or
252 more of the Purchase Order Line Items.
- 253 • Process Payment results in a Payment (an Economic Event) which pays for the Shipment (the
254 REA "duality" relationship).

255 When all of the Line Items have been fulfilled, and all the Shipments have been paid, the Business
256 Process is complete. The contract terms in this simple example specified "pay on receipt". Otherwise
257 the business process might have another step, e.g. Process Invoice.

258 If something goes wrong, and the shipments do not fulfill the commitments, and the payments do not
259 compensate for the shipments, or some economic event is late or otherwise incorrect, the problem can
260 be expressed using the REA concepts and relationships explained above.

261

⁵ The ebXML Economic Modeling Elements are based on the Resource-Event-Agent (REA) Enterprise Ontology -- a well accepted, well reviewed, and published economic modeling framework for business enterprises of all sizes. REA component descriptions are available at <http://www.reamodel.org/>.



262

263 Figure 6.2-1, overview of the REA economic elements in a typical product-oriented Order-Fulfillment Business Process.

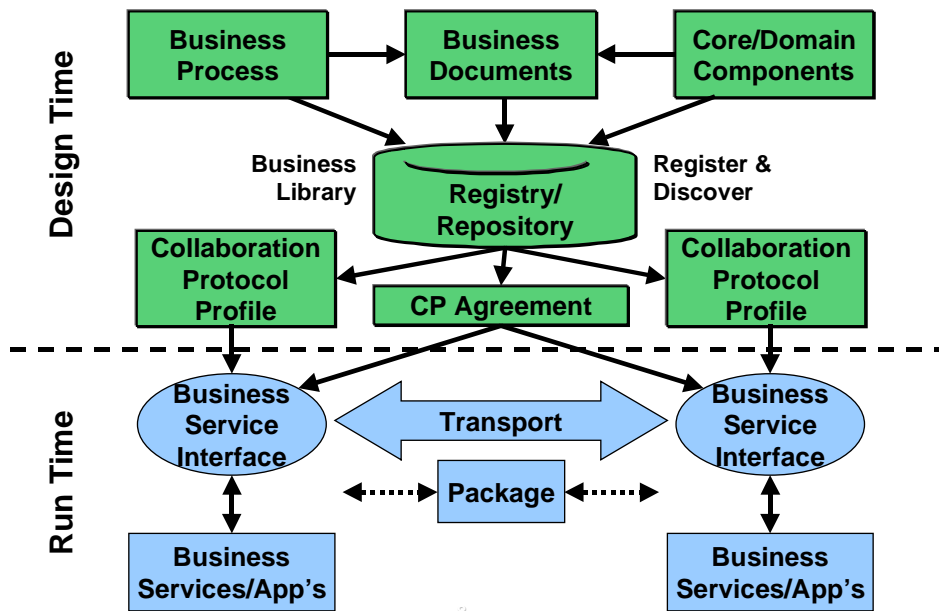
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265 6.3 ebXML Design Time and Run Time Reference Model

266 In order to put Business Process and Business Information Analysis on its proper context, it is useful to
 267 consider the ebXML Technical Architecture. ebXML Technical Architecture is comprised of two basic
 268 components: Design Time and Run Time. Business Process and Business Information Analysis is a
 269 part of Design Time component. The Design Time component deals with the procedures for creating
 270 an application of the ebXML infrastructure, as well as the actual discovery and enablement of ebXML-
 271 related resources required for business transactions to take place. Business Process and Business
 272 Information Analysis is one way accomplishing the Design Time component of the Technical
 273 Architecture.

274 The Run Time component covers the execution of an ebXML scenario with the actual associated
 275 ebXML transactions.

276 The Design Time and Run Time components of the ebXML Technical Architecture are found in Figure
 277 6.3-1.



278

279 Figure 6.3-1, ebXML Design Time and Runtime Reference Model

280 The Design Time artifacts enable the Run Time systems to execute the agreed business processes.
 281 Business processes and business documents are defined during the Business Process and Business
 282 Information Analysis activity. Core Components and Domain Components are the reusable information
 283 building blocks used to specify document content and structure. They can be identified and defined
 284 using the *ebXML Methodology for the Discovery and Analysis of Core Components*. The Business
 285 Process Specifications for the defined Business Processes and Business Documents are stored and
 286 registered in Business Libraries which contain catalogs of Business Processes and Business

287 Information Objects (document components). These catalogs reside in ebXML compliant
288 registries/repositories.

289 The business process modeling results in an ebXML Business Process Specification, which MAY be
290 referenced in the Collaboration Protocol Profiles (CPPs), of businesses and form the basis for
291 Collaboration Protocol Agreements (CPAs) established between business parties. Ultimately, the
292 business processes specified in the CPAs drive the business service interfaces to execute those
293 processes and send the REQUIRED documents.

294 7 *Business Process and Information Modeling*

295 7.1 Overview

296 Business process models define how business processes are described. Business processes
297 represent the “verbs” of electronic business and can be represented using modeling tools. The
298 specification for business process definition enables an enterprise to express its business processes so
299 that they are understandable by other enterprises. This enables the integration of business processes
300 within an enterprise or between enterprises.

301 Business process models specify business processes that allow business partners to collaborate.
302 While business practices vary from one organization to another, most activities can be decomposed
303 into business processes that are more generic to a specific type of business. This analysis, utilizing
304 business modeling, will identify business processes and business information *Meta Models* that can
305 likely be standardized. The ebXML approach looks for standard reusable components from which to
306 construct interoperable processes.

307 7.2 Business Process and Information *Meta Model*

308 The UMM *Meta Model* is a mechanism that allows *Trading Partners* to capture the details for a specific
309 business scenario using a consistent modeling methodology. A *Business Process* describes in detail
310 how *Trading Partners* take on roles, relationships and responsibilities to facilitate interaction with other
311 *Trading Partners* in shared collaborations. The interaction between roles takes place as a
312 choreographed set of business transactions. Each business transaction is expressed as an exchange
313 of electronic *Business Documents*. *Business Documents* MAY be composed from re-useable *Business*
314 *Information Objects* (see “Relationships to Core Components” under 8.2.3 “*Interfaces*” below). At a
315 lower level, *Business Processes* can be composed of re-useable *Core Processes*, and *Business*
316 *Information Objects* can be composed of re-useable *Core Components*.

317
318 The UMM *Meta Model* supports a set of business process viewpoints that provide a set of semantics
319 (vocabulary) for each viewpoint and forms the basis of specification of the artifacts that are
320 recommended to facilitate *Business Process* and information integration and interoperability.

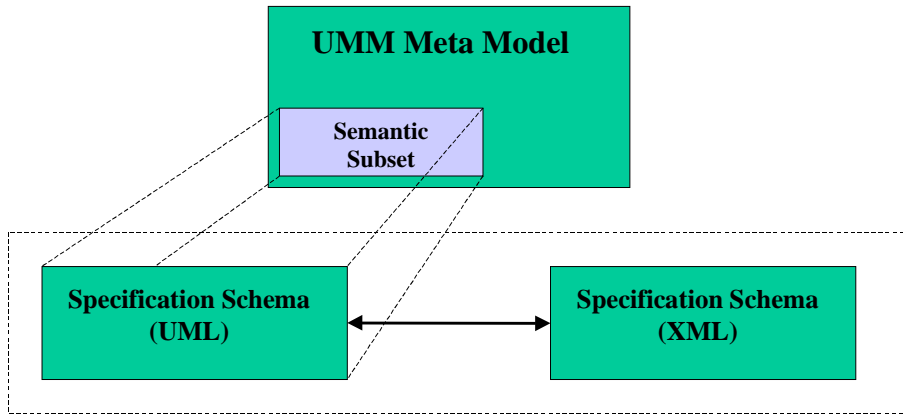
321
322 An additional view of the UMM *Meta Model*, the ebXML *Business Process Specification Schema* , is
323 also provided to support the direct specification of the set of elements required to configure a runtime
324 system in order to execute a set of ebXML business transactions. By drawing out modeling elements
325 from several of the other views, the ebXML *Business Process Specification Schema* forms a semantic
326 subset of the UMM *Meta Model*. The ebXML *Business Process Specification Schema* is available in
327 two stand-alone representations, a UML version, and an XML version.

328
329 The only part of the UMM *Meta Model* that is currently mandatory for use in ebXML is the semantic
330 subset represented by the ebXML Business Process Specification Schema. As UN/CEFACT finalizes
331 and evolves the UMM, it is anticipated that other parts of the UMM *Meta Model* may also become
332 mandatory.

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340 The relationship between the *UMM Meta Model* and the *ebXML Business Process Specification*
 341 *Schema* can be shown as follows:
 342

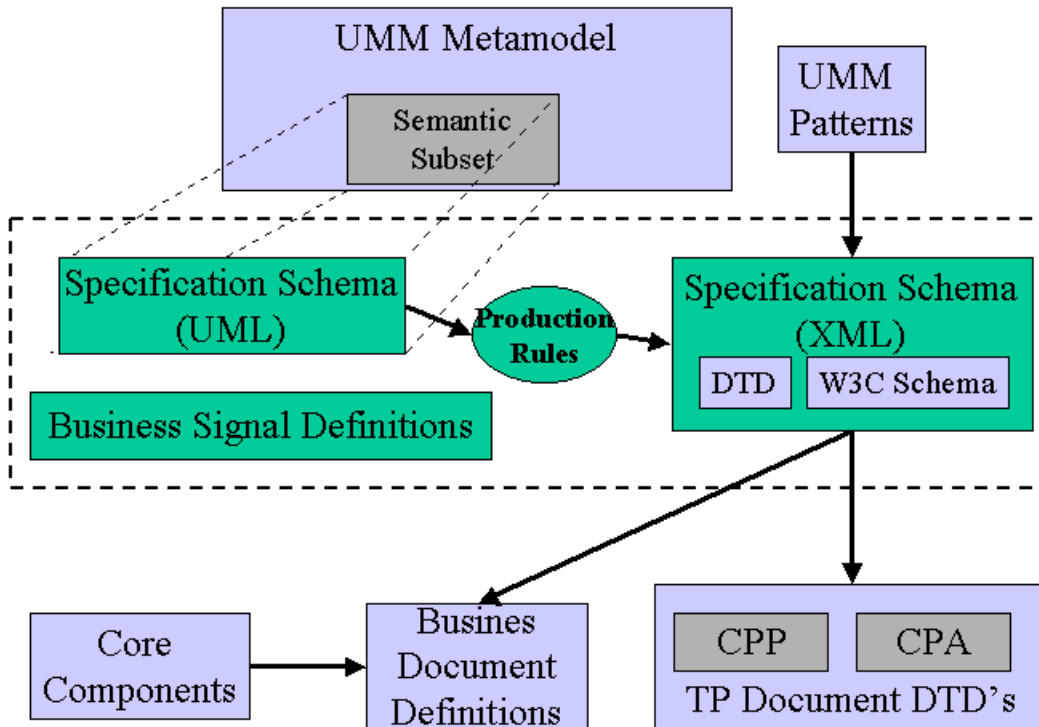


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Figure 7.2-1 *UMM Meta Model* and the *ebXML Business Process Specification Schema*

346 The ebXML *Business Process Specification Schema* supports the specification of business
 347 transactions and the choreography of business transactions into *Business Collaborations*. Each
 348 *Business Transaction* can be implemented using one of many available standard patterns. These
 349 patterns determine the actual exchange of Business Documents and signals between *Trading Partners*
 350 to achieve the required electronic transaction. To help specify the patterns the UMM provides a set of
 351 standard patterns, and *the ebXML Business Process Specification Schema* provides a set of modeling
 352 elements in support of those patterns. The ebXML specification of a *Business Process* is referred to as
 353 a *Business Process Specification*. The Business Process Specification serves as primary input for the
 354 formation of *Collaboration Protocol Profiles (CPP's)* and *Collaboration Protocol Agreements (CPA's)*.
 355

356 This can be shown as follows:



357 Figure 7.2-2 Relationship of Business Process Specification and CPP/CPA
 358
 359

360 One of the key benefits of using a single consistent modeling methodology is that it is possible to
 361 compare models to avoid duplication of existing *Business Processes*.
 362

363 To further facilitate the creation of consistent *Business Process and information models*, ebXML will
 364 define a common set of *Business Processes* in parallel with a *Core Library*. It is possible that users of
 365 the ebXML infrastructure may wish to extend this set or use their own *Business Processes*.

366 8 The Analysis Process

367 8.1 Introduction

368 The process described below is intended to assist enterprises with the analysis of business process
369 and business documents necessary for engaging in electronic commerce with other enterprises. The
370 analysis of business processes is concerned with the elaboration of the higher-level processes that are
371 required to conduct electronic business. The analysis of business information and documents activity
372 identifies the business documents involved in the business transactions of the business processes.
373 The outputs of the analysis activities are business-process-specifications and business document
374 definitions.

375 The analysis effort is best carried out by a cross-functional analysis team of experts from IT, marketing,
376 software development, business analysis, procurement, etc. When applying the analysis processes
377 described herein, it is RECOMMENDED that the analysis team be staffed with people experienced in
378 business process analysis or process re-engineering. It is also assumed that the analysts understand
379 the challenges associated with business process analysis such as trying to analyze a business process
380 with ill-defined requirements and objects.

381 Such a team is encouraged to use the *ebXML Business Process Analysis Worksheets*, UML modeling
382 tools, or business process editors that provide similar functionality (see Section 10). The team will be
383 able to develop an ebXML Business Process Specification that can be reviewed and verified by the
384 entire enterprise, plus all necessary information to populate models based on the *Meta Model* and *The*
385 *Specification Schema*. The analysis process supports analyzing new processes and process re-
386 engineering as well as supporting the analysis and documentation of existing processes.

387 8.2 Recommended Business Process and Business Information Analysis 388 Methodology and Meta Model

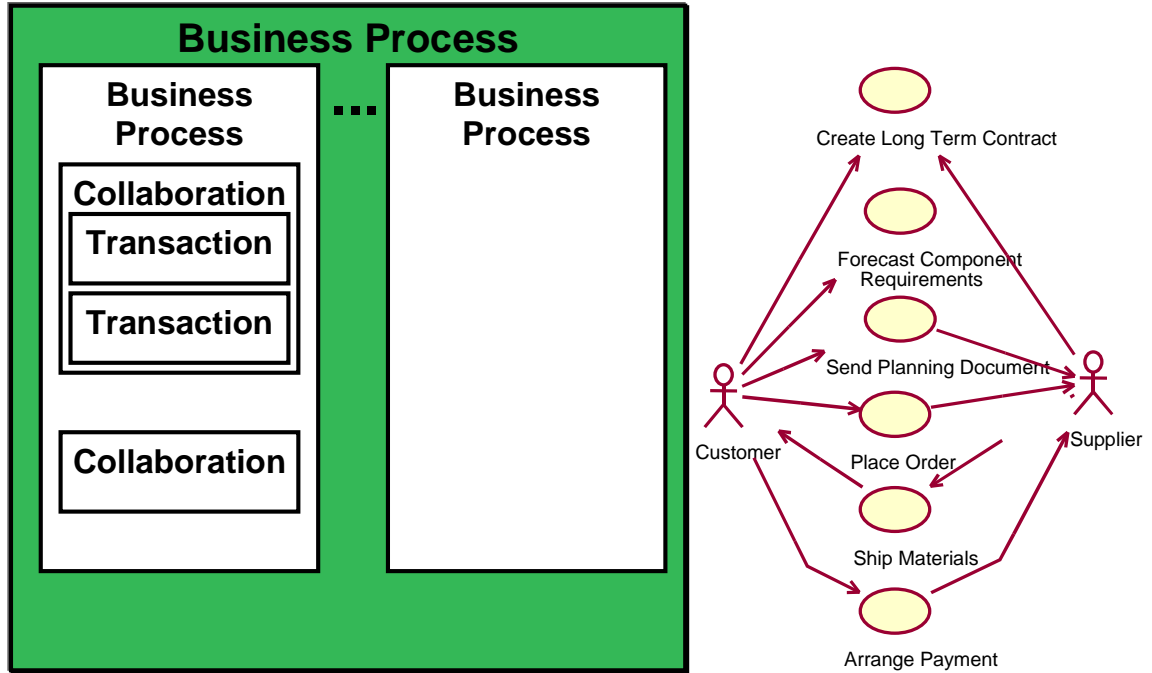
389 Analysis teams will use methodologies and meta models to specify the business processes in an
390 electronic business community. An analysis methodology prescribes the overall process and sub-
391 processes by which teams should proceed when defining business processes. The semantics of the
392 meta model define the information that needs to be discovered and documented during the analysis
393 process. Methodologies often include patterns to expedite the “design” of the model and help achieve
394 common expression of similar concepts.

395
396 ebXML recommends (but does not require) that analysis teams use the methodology specified by the
397 UN/CEFACT Modeling Methodology. If an alternative methodology is used, it is highly recommended
398 that it be compliant with the UN/CEFACT Modeling Methodology so as to have the best opportunity of
399 creating business process models that are compatible with business process models created using the
400 UN/CEFACT Modeling Methodology.

401
402 ebXML requires that the business process and business information artifacts generated as a result of
403 the analysis effort be conformant to the semantics defined by the UN/CEFACT Modeling Methodology
404 eBusiness Process *Meta Model* and other semantics defined in the UN/CEFACT Modeling
405 Methodology. This is necessary to give the best assurance of compatibility between business process
406 models and model sub-components. This semantic conformance is necessary to meet the
407 requirement that the models to be usable and re-usable, and be capable of being compared and
408 contrasted. With models that are eBusiness Process *Meta Model* conformant, users and tools can
409 generate ebXML Business Process Specification Schema XML instances of the model. Furthermore,
410 the models can be freely shared among ebXML-compliant modeling tools, including, but not limited, to
411 UML tools.

412 8.3 Business Processes and Business Documents

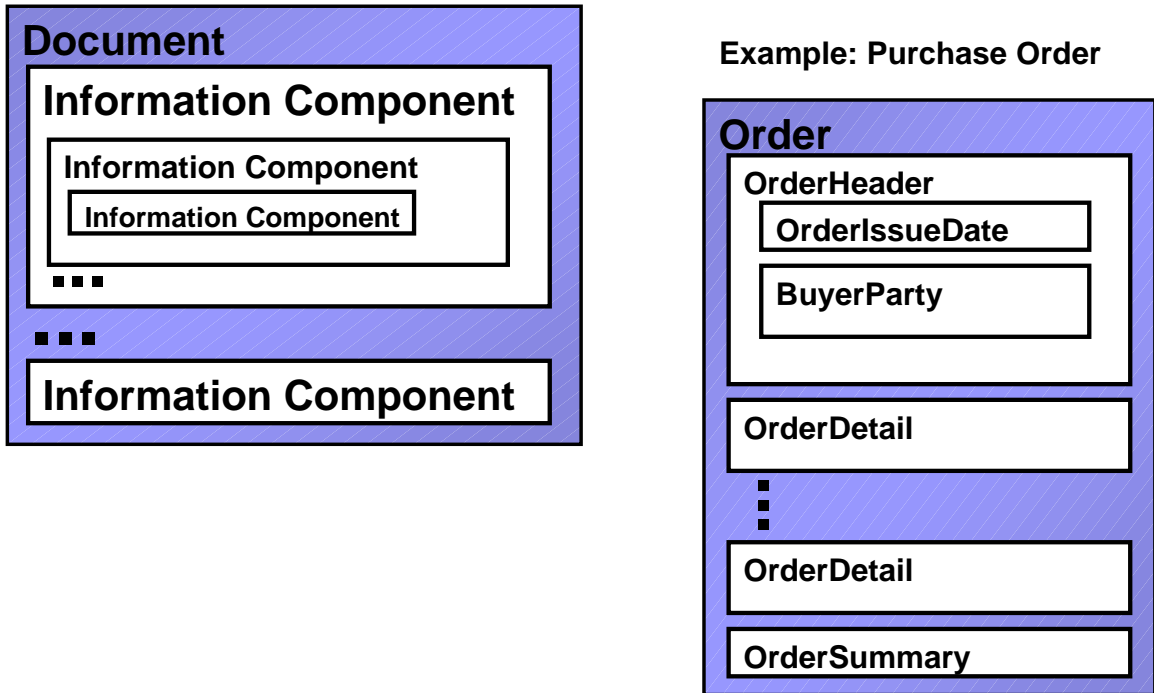
413 At a very basic level, a business process is the means by which one or more activities are
414 accomplished in the conduct of business. Within the business process there could be one or more
415 collaborations, each consisting of one or more transactions. Figure 8.3-1, below is a simple
416 representation of a business process and an illustration of the types of business processes which might
417 be needed between Customer and Supplier to complete an order for materials.



418
419

Figure 8.3-1, Business Process, Collaborations, and Transactions Conceptual View

420 Business document definitions are the specifications for the business document schemas and the
421 information components that compose the business document and contained information components.
422 A schematic representation of a business document can be seen in Figure 8.3-2, below.

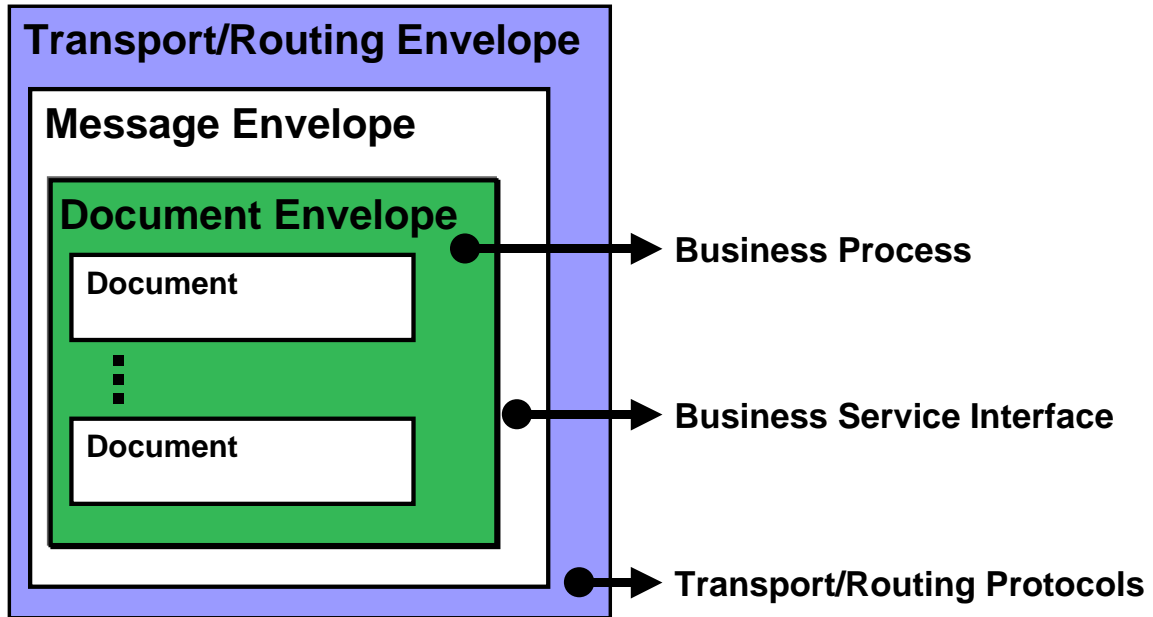


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424

Figure 8.3-2, Document Conceptual View

425 Documents such as Purchase Orders, Invoices, etc., exist at the business process level and are
 426 exchanged in business transactions. Documents are put into document envelopes. They are
 427 addressed with the business identifier (e.g. DUNS number) of the recipient and sender. This is
 428 analogous to the "Attention:" line on a standard mailing address. A document envelope is placed into a
 429 message envelope and is exchanged between business service interfaces. The message envelope
 430 might be addressed with the URN of the destination business service interface. Messages have
 431 timeouts and other transaction control mechanisms associated with them. Message envelopes are
 432 placed into a transport/routing envelope for low level transmission across an e-business network. The
 433 target address on message envelope might be the URL of the destination's message-in-box service. A
 434 logical view of the nested envelope structure is shown in Figure 8.3-4.

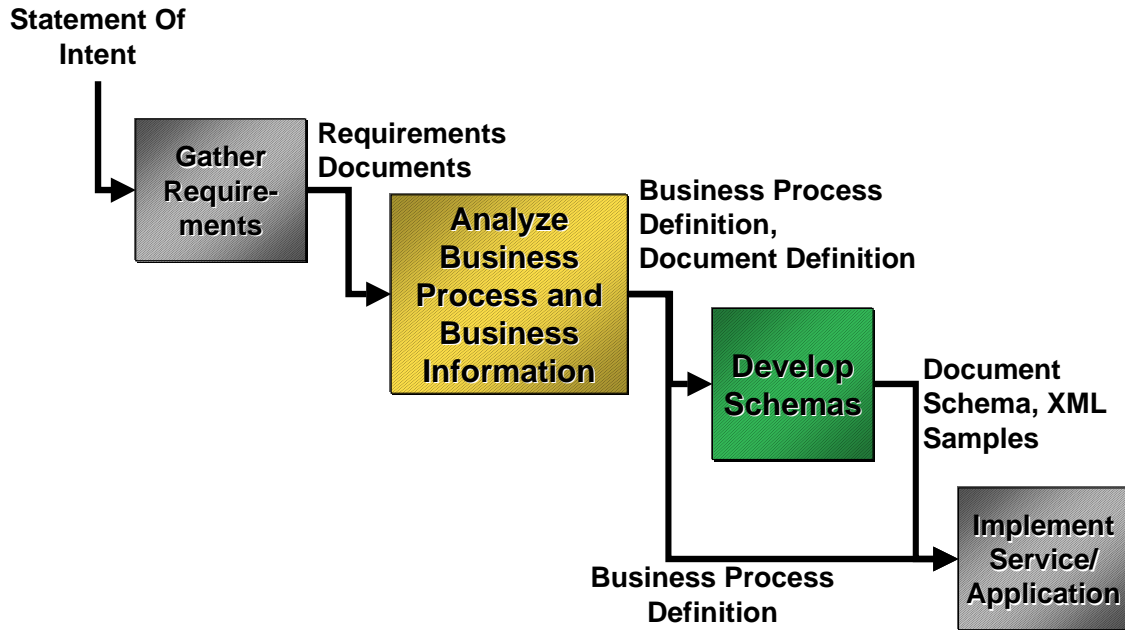


435
 436

Figure 8.3-4, Messaging and Enveloping Conceptual View

437 8.4 The Analysis Process

438 The high-level activities related to business process and business information analysis is shown in
 439 Figure 8.4-1.



440

441 Figure 8.4-1, Activities Related to Analyzing Business Processes and Business Information

442 As a first step, it is useful to develop a Statement of Intent, which clearly identifies the scope and
 443 purpose of the analysis activity and serves to focus the efforts of the team.

444 The next step involves the gathering of requirements based on the Statement of Intent. Marketing and
 445 product management teams often perform this requirement gathering activity. The output of this
 446 activity may be a marketing requirements document or a product requirements document. In any case,
 447 the result SHOULD be a set of clearly defined requirements for the analysis.

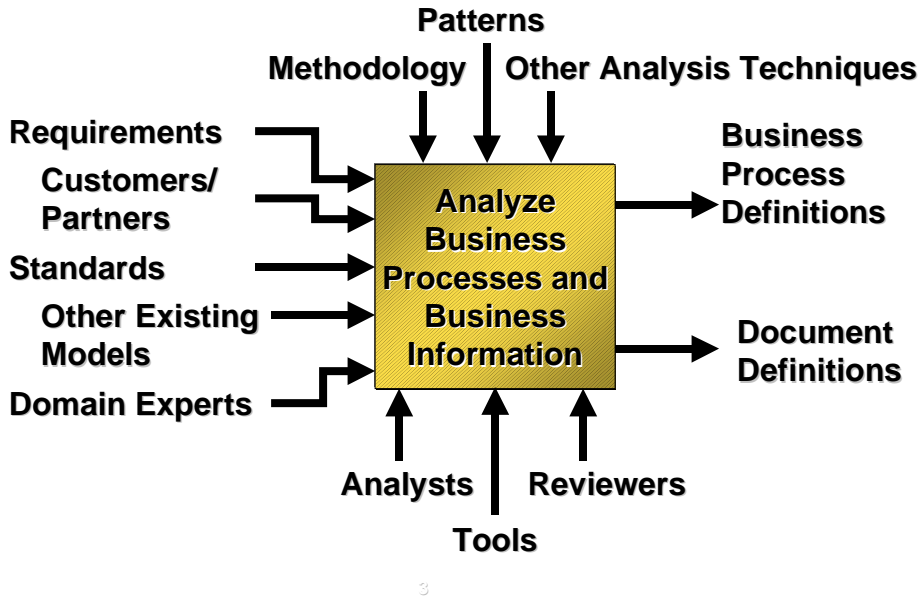
448 After the requirements have been defined and agreed, the actual analysis can begin. As illustrated by
 449 Figure 8.4-2, there can be many inputs to and aspects of the process required to produce the desired
 450 output. Inputs to the analysis process can come from requirements, customers and partners,
 451 standards, other existing models, and domain experts. Requirements MAY be in the form of product
 452 requirement documents, statements of work, customer change requests, etc. Customers, partners,
 453 and domain experts provide their input when they are being consulted during the requirement
 454 elaboration process and during documentation reviews. Existing standards (cross industry and industry
 455 specific) and other existing models (e.g. EDI message implementation guides) are also consulted.

456 The controls⁶ for the analysis activities are the methodology (UMM), *Meta Model*, patterns, and other
 457 analysis techniques. These controls specify the process and information model REQUIRED for the
 458 business process and information analysis process to produce correct outputs. Patterns include
 459 transaction patterns and collaboration patterns.

⁶ The definition of control conforms to the definition in the Integration Definition For Function Modeling (IDEF0), Federal Information Processing Standards Publication 183,1993 December 21.

460 The mechanisms for the analysis activities are the analysts, tools, and reviewers. Analysts are the
 461 people who are defining the processes and documents based on the *Meta Model*.

462 One of the key tools to assist with the analysis is the ebXML Business Process Analysis Worksheets,
 463 discussed in Section10, *Analysis Aids: Worksheets and Tools*.



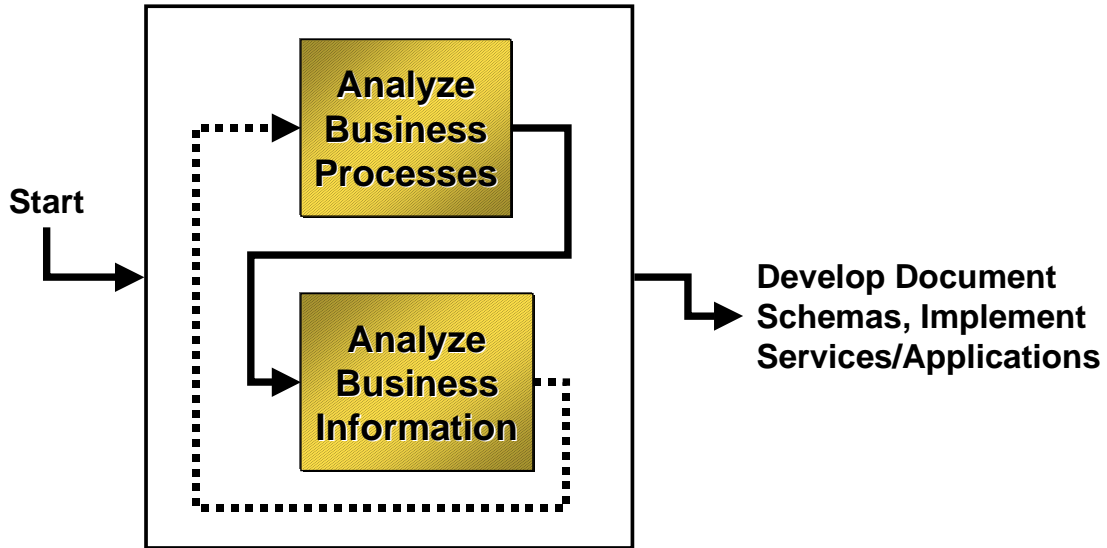
464

465

Figure 8.4-2, Analyze Business Processes and Business Information

466 The Analyze Business Processes and Business Information Activity can be logically partitioned into
 467 two separate but interrelated activities: analyze business processes and analyze business
 468 information, shown here in Figure 8.4-3:

469



470

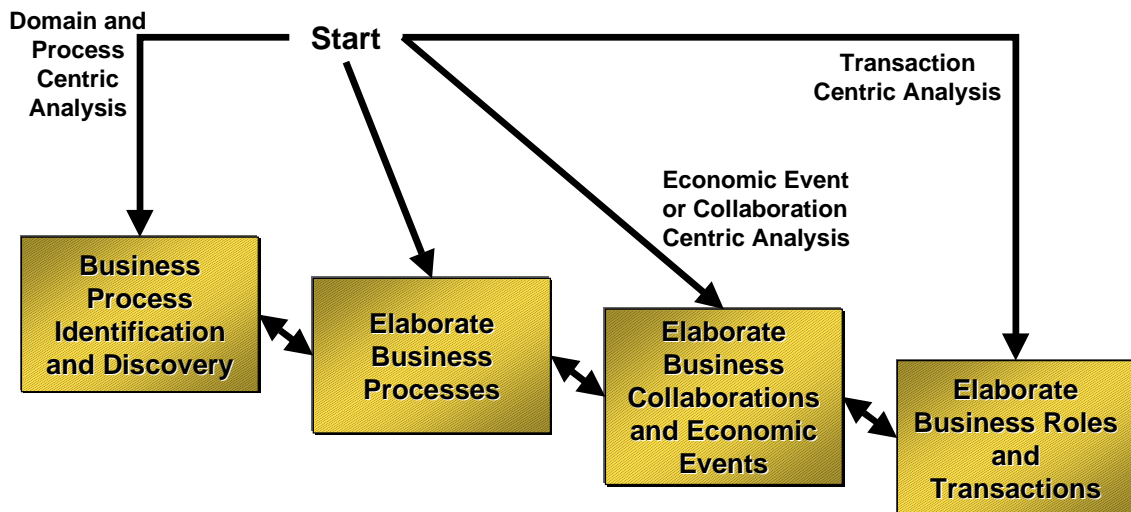
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Figure 8.4-3, Analyze Business Process and Business Information Activities

473 The overall analysis process will generally be more effective if the analysis of the business processes
 474 and associated business information happens at the same time. Business information analysts will
 475 need to be familiar with the business process and will want to be co-participants during the business
 476 process analysis. Otherwise, the business information analysts MAY need to re-interview domain
 477 experts, customers, and partners, to get clarification on matters that could have been more effectively
 478 addressed during the analysis of the business process. Furthermore, business information analysts will
 479 likely have the background that will help identify the key business information elements that effect the
 480 business processes.

481 The analyze business processes activity can proceed along different paths depending on the focus of
 482 the modeling effort. For example, if the goal is to establish a business reference model for an industry,
 483 the process will likely proceed as discussed in the UMM, from the beginning to the end of the UMM
 484 documentation. However, if the effort is to model existing X12 or EDIFACT documents and their
 485 associated business processes, the process will more naturally start with the elaboration of business
 486 transaction and roles. In this case, there is usually a strong implicit understanding of the associated
 487 business process by domain experts. Business process analysis can be partitioned into four high-level
 488 activities⁷ as shown in Figure 8.4-4:



489

490 Figure 8.4-4, Analyze Business Process Activities

491 Once the business process and business information analysis is complete, the next activities are the
 492 Develop Schemas activity and the Implement Services activity. Development of schemas involves the
 493 creation of the document and information component schemas (XML schema/DTD or EDI message
 494 and data element definitions) and sample documents. Implementing the service/application involves
 495 coding or configuring business service interfaces and services/applications (such as back-end systems)
 496 in accordance to the business process definitions and the document schemas.

497 Once the analysis is complete and the business processes and documents have been full defined and
 498 developed, the specifications SHOULD be registered in a Business Library, e.g., an ebXML Registry.
 499 A Business Library is a repository of business process specifications and business information objects
 500 within an industry or shared by multiple industries. There will be many business libraries, public and
 501 private, moderated and non-moderated. A public library is one that is available for public access.
 502 Typically the content of these will be owned by standard's efforts, such as ebXML or UN/EDIFACT, and

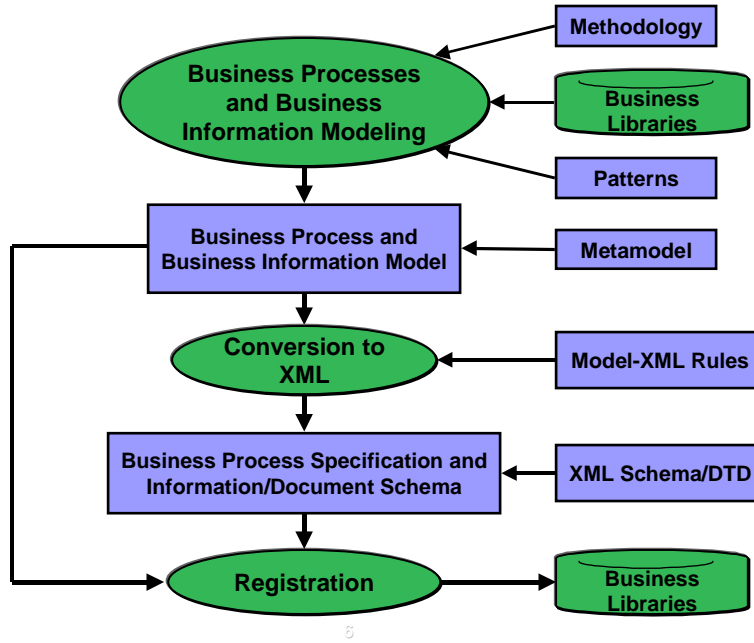
⁷ It is recognized that the analyze business process activity MAY be partitioned in different ways to suit the sensibilities of the participants in the analysis process.

503 large electronic communities (such as automotive marketplaces). A private library is one that does not
504 have public access. These are for private exchanges where the participating parties do not wish to
505 disclose the nature of their business processes. Obviously, the public access business libraries will be
506 the most useful in promoting interoperability between trading partners in different electronic
507 communities. For example, it MAY be necessary for the e-business systems of a trading partner in the
508 automotive community to access business processes registered in a chemical community.

509 A moderated business library is one whose content is administered by some organization, such as
510 standards body or electronic community. Business process and business information specifications
511 WILL be submitted to a working group or other supervising activity for the controlled business library.
512 The working group WILL review the submissions for quality and accuracy. The specifications MAY be
513 put to public or community voting for approval. Approved specifications are then registered in the
514 business library. At such time, key model elements - such as Business Process, Business
515 Collaboration, and Business Transaction - are officially assigned their identifiers according to the
516 Business Identifier Naming Scheme. These identifiers facilitate re-use and interoperability by providing
517 unique identifiers that can be referenced by business process specifications, Core Component's
518 contextual categories, CPPs and CPAs. Moderated business libraries will typically have more
519 credibility than ones that are not moderated will. A business library that is not moderated will allow
520 anyone in the community to register specifications. The quality and accuracy of the specifications will
521 be suspect. However, these types of libraries could result in significant business process
522 specifications. Business process specifications that get significant usage will become more widely
523 adopted over time.

524 The format in which these specifications are stored is an important consideration, as the key to an
525 enterprise's ability to utilize these specifications in their analysis process is that they are stored in a
526 format that is interoperable with business modeling tools. It would appear RDF offers the opportunity to
527 encapsulate business process models during the analysis, design and 'record for posterity' stage in
528 business process life cycles. In addition, the use of RDF will also help achieve one of the original goals
529 of UN/CEFACT for ebXML, which was assuring that model specifications could be interexchanged
530 between standards organizations, so as to further promote business process modeling globally and to
531 promote reuse of common solutions. The advantage of RDF over other formats such as XMI is that
532 RDF can be restricted by use of namespaces to a specific problem domain, whereas others typically
533 conform to the more general UML domain. The ability to express a metastructure in RDF and validate it
534 means better control on the applicability of model content. When using models in a constricted domain
535 like B2B, it is attractive to be able to validate model content according to a metastructure. From a
536 business information standpoint, It is particularly useful that RDF allows association to BusinessAction
537 elements, i.e., placing a message in the context of a business process.
538

539 A summary of the entire analysis effort and its results is shown in Figure 8.4-5 below:



540

541 Figure 8.4-5, Modeling, Conversion to XML, and Registration Activity Flow

542 The overall effort starts with the analysis and modeling of business processes and business
 543 information. The UMM Methodology can be employed directly or indirectly through the use of the
 544 Business Process Analysis Worksheets or business process editors. Re-usable business process and
 545 information components from Business Libraries are applied, as well as collaboration and transaction
 546 patterns. The analysis effort results in business process models and business information models that
 547 are based on the *Meta Model*. The models are then converted into XML based Business Process
 548 Specifications and Information/Document schemas according to a set of production rules. The
 549 specifications and schemas are then registered and stored in Business Libraries for re-use and
 550 reference by CPAs.

551 9 *Relationship Between Business Process and Core* 552 *Components*

553 9.1 Introduction

554 As previously stated, business process models define how business processes are described and
555 represent the “verbs” of electronic business. Information models define reusable components that can
556 be applied in a standard way within a business context. Core Components and domain components
557 represent the “nouns and adjectives” of electronic business. They are defined using identity items that
558 are common across all businesses. This enables users to define data that is meaningful to their
559 businesses while also maintaining interoperability with other business applications.

560 9.2 Business Information Objects

561 Business Information Objects MAY be composed of Core Components, domain components, and
562 other business information objects. The component and business information object definitions are
563 stored in business libraries. Core Components can be stored in the specially named Core Library.
564 Business document definitions are constructed of business information objects, domain components
565 and Core Components. The following steps describe how to develop business document definitions.

- 566 1. Search Business Library for REQUIRED attributes available in business information objects.
- 567 2. If business information objects with appropriate attributes are not available, new business
568 information objects MUST be created.
- 569 3. Domain components in the business libraries and core components in the Core Library
570 COULD be candidates for business information object attributes, assuming the context is
571 appropriate.
- 572 4. Add the new attributes to existing business information objects, or introduce new business
573 information objects through a registration process that manages changes to the Business
574 Library.
- 575 5. Use the new attributes, now in the Business Library, to create the business documents.

576 In summary, the primary sources for creating business documents in a business process and
577 information model, are business information objects in a Business Library. The secondary sources are
578 domain components in business libraries and the core components in the Core Library, when
579 appropriate business information objects cannot be found. Until the Business Library is constructed, or
580 imported from a credible sources, core components are likely to be utilized frequently, first to add to the
581 repertoire of business information objects in the Business Library, and second, to create business
582 documents.

583 9.3 Core Components Analysis

584 The *ebXML Methodology for the Discovery and Analysis of Core Components* describes the process
585 for identifying information components that are re-usable across industries (hence the term “core
586 components”). Core components are used to construct domain components and business information
587 objects. Business libraries, which contain libraries of business process specifications (such as the

588 *ebXML Catalog of Common Business Processes*) are instrumental in the discovery and analysis of
 589 core components and domain components.

590 The business process specifications contain values that describe the contextual use of core
 591 components and the elements within core components. This is discussed further in Section 9.4, Core
 592 Component Contextual Classification. Business library cross-references, such as the cross-reference
 593 in the *ebXML Catalog of Common Business Processes*, assist the core component analysis effort by
 594 identifying related business processes, transactions, and documents from various initiatives such as be
 595 EDIFACT, X12, xCBL, RosettaNet, CII, and OAG.

596 **9.4 Core Component Contextual Classification**

597 The *Meta Model* specifies the information to be captured when modeling a business process. The
 598 model contains a number of elements and attributes that are considered to be significant in effecting
 599 the interrelated conditions of the other elements in business process and document models. It is useful
 600 to understand this contextual dependency between the various model elements during the analysis
 601 process. Furthermore, in the future, it MAY be possible to apply these contextual dependencies at
 602 runtime⁸.

603 The contextual dependency concept – referred to as simply “Context” – has been given in-depth
 604 consideration by the ebXML Core Components Project Team as it has a significant role in the analysis
 605 of reusable information components. When a business process is taking place, the context in which it
 606 is taking place can be specified by a set of contextual categories and their associated values. For
 607 example, if an auto manufacturer is purchasing paint from a chemical manufacturer, the context values
 608 might be as follows:

Contextual Category	Value
Process	Procurement
Product Classification	Paint
Region	U.S.
Industry (buyer)	Automotive
Industry (seller)	Chemical

609 Figure 9.4-1, Example Context Values

610 The contextual categories, identified in *The role of context in the re-usability of Core Components and*
 611 *Business Processes* simply map to existing elements and attributes within a business process model
 612 that is conformant to the UMM Business Process *Meta Model*. For example, the contextual Category
 613 “Process” maps to the *Meta Model* elements BusinessProcess, ProcessArea, and BusinessArea. A
 614 mapping of Context Categories to *Meta Model* elements is provided in Appendix A.

⁸ For further discussion on this topic with respect to document elements (core components), see *ebXML The role of context in the re-usability of Core Components and Business Processes*.

615 9.5 Context and Common Business Processes

616 The role of Context with respect to business process models has not been formally addressed by
617 ebXML as it is out of scope for the ebXML effort. However, it is generally accepted that common
618 business process models can be extended or constrained based on their contextual usage. For
619 example, business process X could have constrained (or extended) behavior XY if the industry is
620 "Automotive" and constrained (or extended) behavior XX if the industry is "Retail." The context of the
621 business process is defined by the values of such modeling elements such as business area, process
622 area, industry, role, and, perhaps, the economic events and resources. This is analogous to the
623 concept of Context as it applies to core components and document specification. Refer to *ebXML The*
624 *role of context in the re-usability of Core Components and Business Processes* for more information on
625 Context and core components.

626 *10 Analysis Aids: Worksheets and Tools*

627 People without the expertise in analysis and modeling will likely find that the UMM will be useful as a
628 reference manual. These people will use UMM compliant approaches or, even, alternative
629 methodologies during the analysis of business processes. Practical experience tells us that it will be
630 more useful to the electronic business community to have an approach that does not require such
631 analysis and modeling expertise. An approach that a businessperson can apply would be most useful.
632 *The Business Process Analysis Worksheets and Guidelines* provide such an approach.

633 10.1 Analysis Worksheets and Guidelines

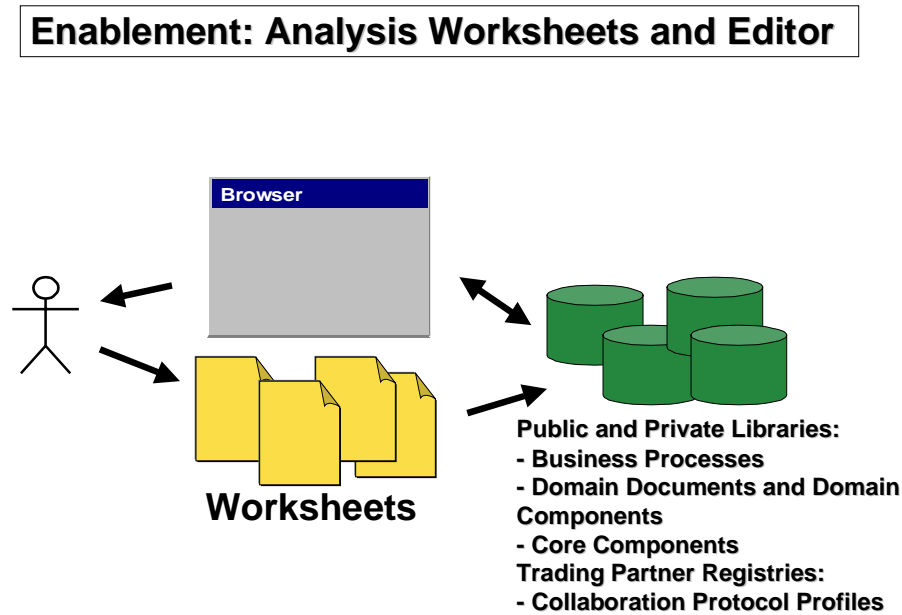
634 *The ebXML Business Process Analysis Worksheets* are a set of business process analysis design
635 aids to be used with the UMM as a reference. The Worksheets allow users to capture all the
636 information that is REQUIRED to completely describe a business process. This description can be
637 used to drive software, and can be registered, classified, discovered and reused.

638 10.1.1 Analysis Worksheets and Editor

639 It is intended that the Worksheets be used in conjunction with a browser that lets the user search
 640 business libraries (registries/repositories containing catalogs of business process specifications) for
 641 items that have already been defined. This is shown in Figure 10.1.1-1. The items (e.g. business
 642 processes, business collaborations, document schemas, etc.) can be referenced (re-used as is) or
 643 copied to the worksheets and changed as needed. Over time, business process libraries will become
 644 populated with a sufficiently large number of business processes. When this happens, the analysis
 645 process will often be a simple matter of validating pre-defined business processes against
 646 requirements.

647

648



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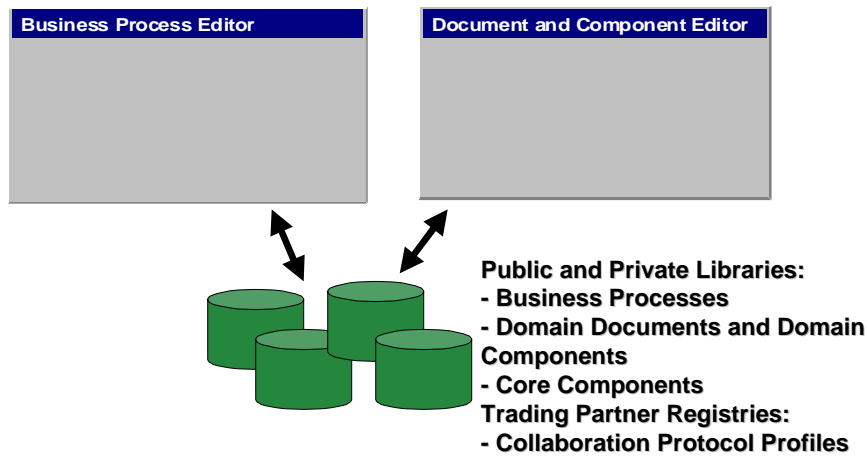
649 Figure 10.1.1-1, Business Process Analysis Worksheets Usage

650

651 10.1.2 Business Process Editor and Document Editor

652 Business Process Editors and Document & Component Editors are the electronic versions of Business
 653 Process Analysis Worksheets. They provide an effective means for business process and information
 654 modeling since they can connect directly to business libraries and trading partner directories. See
 655 Figure 10.1.2-1. The tools will support discovery, user friendly forms-based modeling, business
 656 process and business information comparison, documentation and help on the analysis process, and
 657 capabilities for submitting specifications to controllers of the business libraries. Tool suites of business
 658 process editors, document & component editors, and CPP/CPA editors will be instrumental in enabling
 659 ebXML based e-commerce.

Business Process and Document Editor



9

660

Figure 10.1.2-1, Tool Interaction

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691 necessarily those of their employers. The authors and their employers specifically disclaim
692 responsibility for any problems arising from correct or incorrect implementation or use of this design.

693

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712 Appendix A: Context Category – *Meta Model* Cross-
 713 reference

714 The following table cross-references Core Component’s contextual categories with *Meta Model*
 715 elements.

Contextual Category	Definition	Meta Model Element	Sources of Resources	Comments
Industry	The industry or sub-industry in which the information exchange takes place.	BusinessOperationalMap	UN/CEFACT, etc.	<p>Hierarchical values</p> <p>The BOM provides a logical categorization of a set of processes, these processes MAY be organized in more than one way (scheme) or from more than one view including industry.</p> <p>Domain and industry are not the same: an industry is a type of domain which is not necessarily industry specific.</p>
Business Process	The business process enabled by the information exchange.	BusinessProcess	<p><i>ebXML Catalog of Common Business Processes</i></p> <p>UN Industry Classes</p> <p>RosettaNet</p> <p>BPAWG (UN/Cefact process group)</p> <p>Business Process patterns</p>	<p>Hierarchical values.</p> <p>Cross-enterprise situations can be accommodated since Business Processes are defined in context of Trading Partner Types.</p> <p>Multiple values in a single context category is permitted.</p>
Product	The goods or services that the exchange of information describes or enables	EconomicResource	<p>UN/SPCP</p> <p>General Classifications from the UN and general classifications from domains.</p>	<p>Hierarchical values.</p> <p>Use standard classifications or define your own. The <i>Meta Model</i> permits this. It is likely that various industry forums will define these.</p> <p>The kind of product influences the kind of product information.</p>

Contextual Category	Definition	Meta Model Element	Sources of Resources	Comments
Physical Geography /Conditions /Region	The physical geography and conditions (weather, altitude, climate) geographical context of the information exchange (not geo-political)	Geographic and regional categorization MAY be defined by the category schema in the BOM.	GPS, Aerospace, ISO	Hierarchical values. Range of conditions are specified as constraints on the category element.
Temporal	The time-based context of the information exchange	EconomicCom mitment.due	It is a conditional expression that MAY be evaluated against a multiplicity of criteria.	Not hierarchical. This can be a range of dates.
Geo-Political Legislative/ Regulatory/ Cultural	Political Rules (usually defined by Geography) and Regulatory Organizations which are used. NOTE: External influence to business conversation	Geopolitical and regulatory categorization MAY be defined by the category schema in the BOM.	ATA, DOD, FAA, AECMA, UN/Cefact. ISO	Hierarchical values - stop at high level (province, state or city level) - do not specify body of regulation.
Application Processing	The application and/or system context of the information exchange There is some agreed-upon level of support.	Business Service	UN economic activity and/or OAG: this is hierarchical. (Applications within applications). - *Broad* definition of "application". Self-registered by external bodies.	Supports vendor and industry sub-standards values.
Business Purpose /Domain	A business purpose context unrelated to the	BOM		Business Purpose and domain MAY be defined and scoped by the BOM categorization

Contextual Category	Definition	Meta Model Element	Sources of Resources	Comments
	business process. This is the "purpose" of the recipient(s) of the business information.			schema.
Partner Role	Particular role that a party plays in a process.	Partner Role		Non-hierarchical. Is it defined in commercial collaboration
Service Level (profiles – not preferences.)	Service level attached to agreements of either the provider or receiver of products.	Agreement	OTA, Credit agencies	Hierarchical.
Virtual marketplace	An environment in which to do business	Marketplace categorization MAY be defined by the category schema in the BOM.		A market place and community are synonymous.
Info. Structural Context	[The "element" context of information in an XML sense]	Business Document, InformationEntity	Self-referential, MAY be hierarchical.	
Contracts/Agreements		Agreement, EconomicContract.		

716

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