



Creating A Single Global Electronic Market

1 **Business Process and Business** 2 **Information Analysis Overview**

3 Analysis to Deployment of Business Process 4 and Business Information Definitions 5

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9 **1 Status of this Document**

10 This document specifies an ebXML WORK IN PROGRESS – NOT FOR IMPLEMENTATION for
11 the electronic business community.

12 Distribution of this document is unlimited.

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103 **4 Introduction**

104 **4.1 Summary**

105 The vision of ebXML is to create a single global electronic marketplace where enterprises of any
106 size and in any geographical location can meet and conduct business with each other through the
107 exchange of XML based messages. ebXML enables anyone, anywhere, to do business with
108 anyone else on the internet.

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

115 To facilitate this, ebXML provides an infrastructure for data communication interoperability, a
116 semantics framework for commercial interoperability, and a mechanism that allows enterprises to
117 find, establish a relationship, and conduct business with each other.

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

121 Commercial interoperability is provided by means of a metamodel for defining business processes
122 and information models. ebXML recommends a methodology and provides a set of worksheets
123 and guidelines for creating those models. A business library (catalog) of business process and
124 information models promotes business efficiency by encouraging reuse of business processes or
125 parts of predefined business processes.

126 In order for the actual conduct of business to take place, ebXML provides a shared repository
127 where businesses can discover each other's products/services by means of partner profile
128 information, a process for establishing an agreement to do business (Collaboration Protocol
129 Agreement, or CPA), and a shared repository for company profiles, business process models, and
130 relevant business messages.

131 **4.2 Scope and Audience**

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

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

139 **4.3 Related Documents**

- 140 ebXML Technical Architecture Specification. Version 1.0.4. 16 February 2001. ebXML Technical
141 Architecture Project Team.
- 142 UN/CEFACT Modelling Methodology. CEFACT/TMWG/N090R9. February 2001. UN/CEFACT
143 Technical Modeling Working Group.
- 144 Information Technologies - Open-EDI Reference Model. ISO/IEC 14662:1997(E). International
145 Organization for Standardization (ISO) and International Electrotechnical Commission (IEC).
- 146 ebXML Business Process Analysis Worksheets and Guidelines. WORK-IN-PROGRESS. Version
147 0.9. March 10, 2001. ebXML Business Process Project Team.
- 148 ebXML Catalog of Business Processes. Version 0.9. Date March 17, 2001. ebXML Business
149 Process Project Team.
- 150 ebXML E-Commerce and Simple Negotiation Patterns. Version .3. Date March 17, 2001. ebXML
151 Business Process Project Team.
- 152 ebXML Business Process Specification Schema. Version 0.90. 01/17/2001. Context/Metamodel
153 Group of the CC/BP Joint Delivery Team.
- 154 ebXML Methodology for the Discovery and Analysis of Core Components. DRAFT. Version 1.0.1.
155 February 16, 2001. ebXML Core Components Project Team.
- 156 ebXML The role of context in the re-usability of Core Components and Business Processes
157 ebXML Core Components. Version 1.01. February 16, 2001. ebXML Core Components Project
158 Team.
- 159 ebXML specification for the application of XML based assembly and context rules. Version 1.01. 16
160 February 2001. ebXML Core Components.
- 161 ebXML TA Glossary. Version 0.95 (TBD). 12 February 2001 (TBD). Technical Architecture Project
162 Team.
- 163 ebXML Registry Information Model. Version 0.56. Working Draft. 2/28/2001. ebXML Registry
164 Project Team.
- 165 ebXML Registry Services. Version 0.85. Working Draft. 2/28/2001. ebXML Registry Project Team.

166 **4.4 Document Conventions**

- 167 The keywords MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT,
168 RECOMMENDED, MAY, and OPTIONAL, when they appear in this document, are to be
169 interpreted as described in RFC 2119 [Bra97].
- 170 Heretofore, when the term *Metamodel* is used, it refers to the e-Business Process Metamodel as
171 defined in the *UN/CEFACT Modelling Methodology* [UMM].
- 172 Heretofore, when the term *Specification Schema* is used, it refers to the metamodel and its DTD
173 form as defined in the *ebXML Business Process Specification Schema* [BPSS].

174 **5 Goal and Objectives**

175 **5.1 Goal**

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

180 **5.2 Objectives**

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

- 182 ■ Provide an overview of electronic business collaboration
- 183 ■ Discuss the role and use of business process modeling
- 184 ■ Describe the analysis process
- 185 ■ Discuss economic elements in Business Processes
- 186 ■ Establish the relationship of core components to business processes

187 **5.3 Caveats and Assumptions**

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

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

192 **6 Business Collaboration Overview**

193 **6.1 ebXML Electronic Business Collaboration**

194 The strength of the ebXML technical architecture is that it provides a framework for electronic
195 business collaboration. The architecture enables businesses to work together to specify business
196 process, discover each other, negotiate collaboration agreements, and execute business
197 processes. The significant activities in this ebXML electronic business collaboration are shown in
198 Figure 6.1-1.

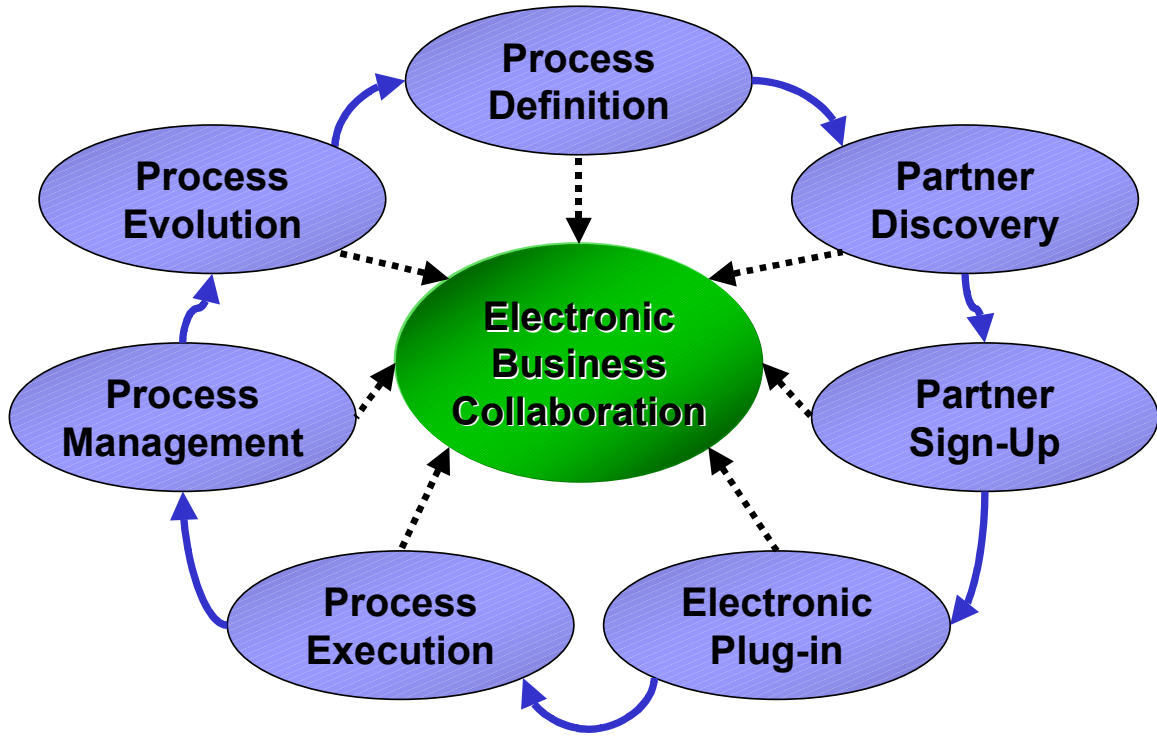
199 The overall process starts with Process Definition, utilizing Business Process and Business
200 Document Analysis and logically progresses to Partner Discovery, Partner Sign-Up, Electronic
201 Plug-in, Process Execution, Process Management, Process Evolution and then finally back to
202 Process Definition.

- 203 ■ **Process Definition:** Utilizing Business Process and Business Document Analysis, an
204 enterprise determines and defines which processes will be necessary for electronic

- 205 commerce. In some cases, a community of trading partners – for example AIAG¹ or
206 RosettaNet² – MAY define the business processes to be used in the community. These
207 business processes are defined according to a well known model and described in agreed
208 upon formats.
- 209 ■ **Partner Discovery:** Enterprises identify potential electronic trading partners through a search
210 of company profiles held in ebXML compliant registries.
- 211 ■ **Partner Sign-up:** Trading partners then negotiate agreements that will serve as the terms and
212 conditions of their collaboration.
- 213 ■ **Electronic Plug-in:** The trading partners then configure their electronic interfaces and
214 business services according to their agreements.
- 215 ■ **Process Execution:** Businesses exchange documents and complete commercial
216 transactions in accordance with their agreements and carry out the agreed upon business
217 processes.
- 218 ■ **Process Management:** The business processes defined in the Process Definition phase and
219 agreed to in the Partner Sign-Up phase are monitored for compliance with trading partner
220 agreements and successful execution.
- 221 ■ **Process Evolution:** Participants in the electronic marketplace will evaluate their existing
222 processes, improve them through process re-engineering, and create new processes to meet
223 the needs of the market.
- 224 Process Evolution is followed by Process Definition, which begins the cycle again. This model of
225 the business collaboration process provides a very simplistic view. To further understand this
226 process from a technical perspective, it MAY be helpful to put it in the context of what the
227 UN/CEFACT Modeling Methodology (UMM) calls the Functional Service View (FSV) of business
228 transactions.

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

232

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

233

Activity	ebXML Project Team	ebXML Document
Process Definition	Business Process, CC/BP Analysis sub-team, Registry	<i>UN/CEFACT Modelling 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>
Partner Sign-up	Trading Partner,	<i>Collaboration-Protocol Profile and Agreement Specification, and Business Collaboration</i>

³ The UMM is not an ebXML document; however, it is a significant document which is administered by the UN/CEFACT. Business Process and Business Document Analysis Overview

	Technical Architecture	<i>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 [ISO14662E]</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 [ISO14662E]</i>
Process Management	None	<i>Information Technologies - Open-EDI Reference Model [ISO14662E] (Section Open-EDI Support Infrastructure)⁴</i>
Process Evolution	None	<i>None – not in scope of ebXML.</i>

234

235 **6.2 Economic Elements in Business Processes**

236 The most common ebXML business collaborations will be resource exchanges between
 237 companies: buying and selling products and services. The most common collaboration pattern for
 238 these exchanges will probably be order-fulfillment-payment. The ebXML Metamodel provides
 239 Economic Modeling Elements for specifying these collaborations in business and economic terms
 240 rather than in technical terms. The Economic Elements include:

- 241 ■ Economic Contracts: ranging from simple orders to long-term component contracts;
- 242 ■ Economic Resources: including products, services, and cash;
- 243 ■ Economic Events: including product or service deliveries, and payments;
- 244 ■ Partner Types: including the parties and roles authorized to commit and exchange resources
 245 in business collaborations.

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

- 247 ■ when an Economic Contract is formed;
- 248 ■ when an Economic Event should be recognized;
- 249 ■ when an Economic Resource or a claim to a resource should be recognized in accordance
 250 with generally accepted accounting principles (GAAP);
- 251 ■ whether or not a delivery fulfills a commitment;

⁴ The *Information Technologies - Open-EDI Reference Model [ISO14662E]* is not an ebXML document. It is a significant document for the UMM and the ebXML Technical Architecture Specification.

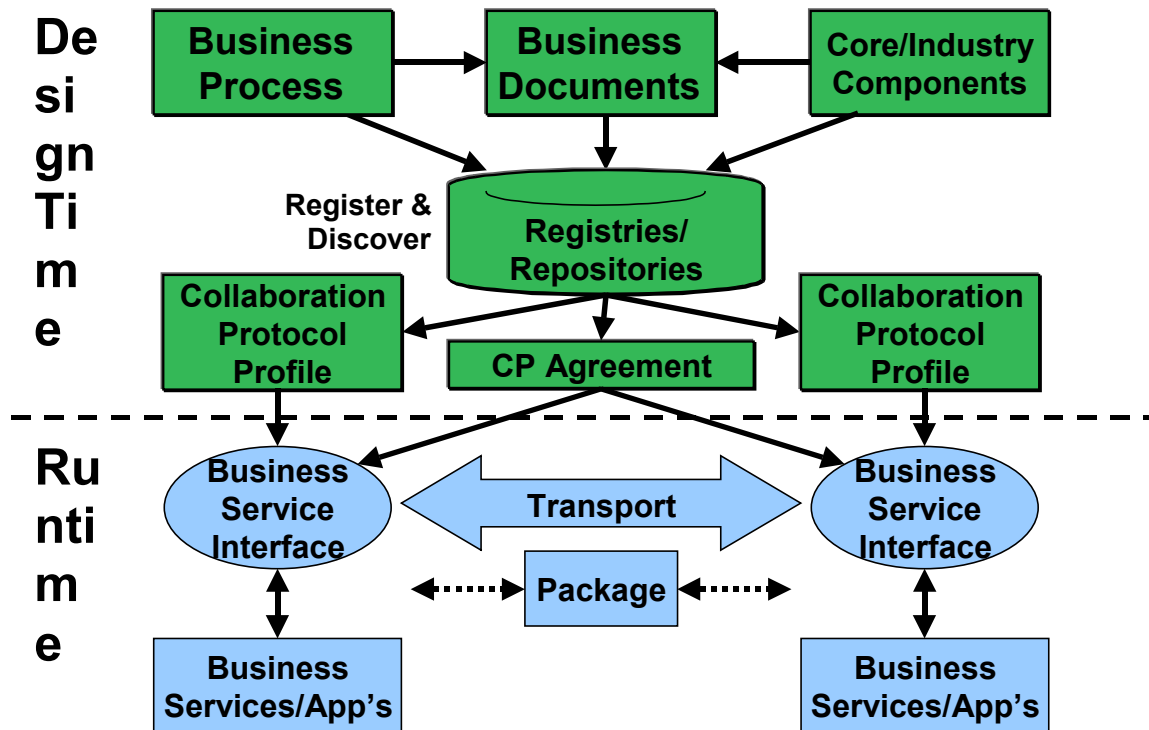
- 252 ■ what events may follow if a delivery does not fulfill an order;
- 253 ■ when an exchange is complete from a business point of view;
- 254 ■ and many other aspects of typical business relationships.

255 Using the ebXML Economic Modeling Elements, these typical business collaboration patterns can
 256 be designed once and re-used in many situations⁵. Figure 8.3-2 provides an overview of the REA
 257 economic elements in a typical product-oriented Order-Fulfillment Business Process.

258 The above concepts and relationships are specified in the UMM, but there is no programmatic
 259 support for them in the first version of the *ebXML Business Process Specification Schema* [BPSS].
 260 They could, however, be implemented in business collaboration management software based on
 261 the UMM Metamodel.

262 6.3 ebXML Design Time and Runtime Reference Model

263 Design Time and Runtime components of the ebXML architecture are found in Figure 6.3-1



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265

266

267

268

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

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/>.

269 The design time artifacts enable the runtime systems to execute the agreed business processes.
270 Business processes and business documents are defined during the Business Process and
271 Business Information Analysis activity. Core Components and Domain Components are the
272 reusable information building blocks used to specify document content and structure. They can be
273 identified and defined using the *ebXML Methodology for the Discovery and Analysis of Core*
274 *Components*. The specifications/models for the defined business processes and business are
275 stored and registered in Business Libraries which contain catalogs of business processes and
276 business information objects (document components). These catalogs are contained using
277 ebXML compliant registries/repositories.

278 The modeled business processes are referenced in the Collaboration Protocol Profiles (CPPs) of
279 businesses and form the basis for Collaboration Protocol Agreements (CPAs) established between
280 business parties. Ultimately, the business processes specified in the CPAs drive the business
281 service interfaces to execute those processes and send the required documents.

282 For further information, see the [TAS], Section 6.3, ebXML Functional Service View, and Section 7,
283 ebXML Functional Phases.

284 **7 Business Process Modeling**

285 **7.1 Overview**

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

291 Business process models specify interoperable business processes that allow business partners to
292 collaborate. While business practices vary from one organization to another, most activities can be
293 decomposed into business processes that are more generic to a specific type of business. This
294 analysis, utilizing business modeling, will identify business processes and business information
295 metamodels that can likely be standardized. The ebXML approach looks for standard reusable
296 components from which to construct interoperable processes and components.

297 **7.2 Business Process and Information Metamodel**

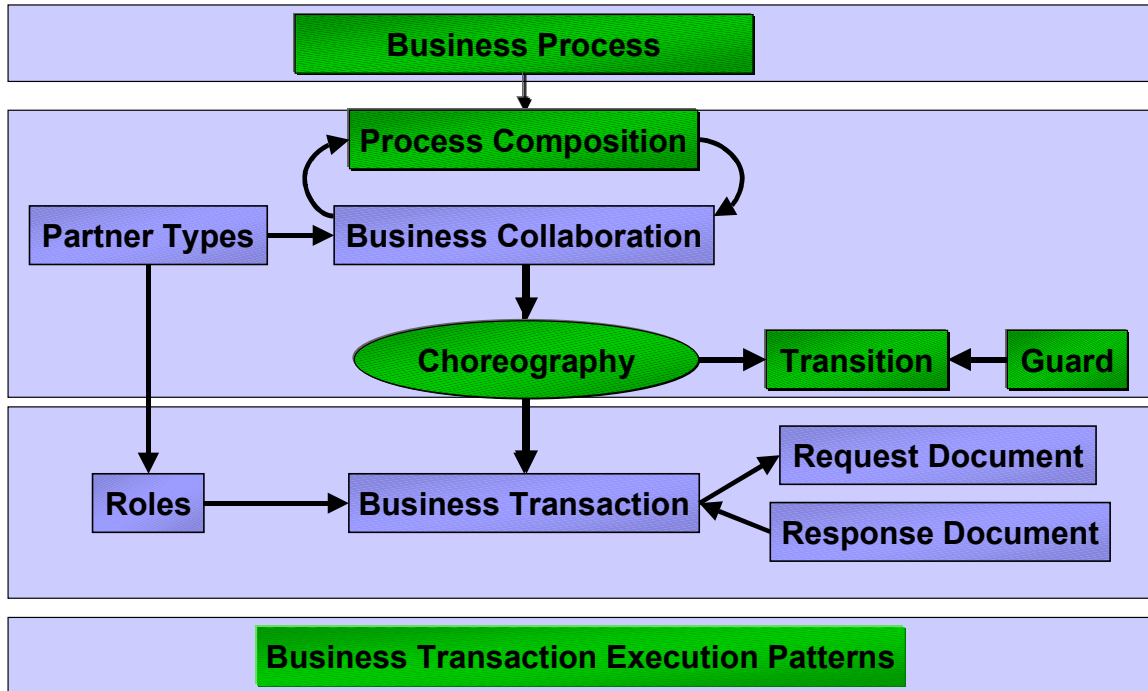
298 The Metamodel is a description of business semantics that allows Trading Partners to capture the
299 details for a specific business scenario using a consistent modeling methodology. A Business
300 Process describes in detail how Trading Partners take on roles, relationships and responsibilities to
301 facilitate interaction with other Trading Partners in shared Business Process. The interaction
302 between roles takes place as a choreographed set of Business Transactions. Each Business
303 Transaction is expressed as an exchange of electronic Business Documents. The sequence of the
304 exchange is defined by the Business Process, messaging and security considerations. Business
305 Documents are composed from re-useable business information components. At a lower level,
306 Business Processes can be composed of re-useable Common Business Processes, and Business
307 Information Objects can be composed of re- useable Business Information Objects that may be
308 composed of core components and domain components.

309 The Metamodel supports requirements, analysis and design viewpoints that provide a set of
310 semantics (vocabulary) for each viewpoint and forms the basis of specification of the semantics

311 and artifacts that are required to facilitate business process and information integration and
 312 interoperability.

313 An additional view of the Metamodel, The Specification Schema, is also provided to support the
 314 direct specification of the nominal set of elements necessary to configure a runtime system in order
 315 to execute a set of ebXML business transactions. By drawing out modeling elements from several
 316 of the other views, the Specification Schema forms a semantic subset of the Metamodel.

317 The Specification Schema is available in two stand-alone representations, a UML profile, and a
 318 DTD. Figure 7.2-1 shows the high-level elements of The Specification Schema.



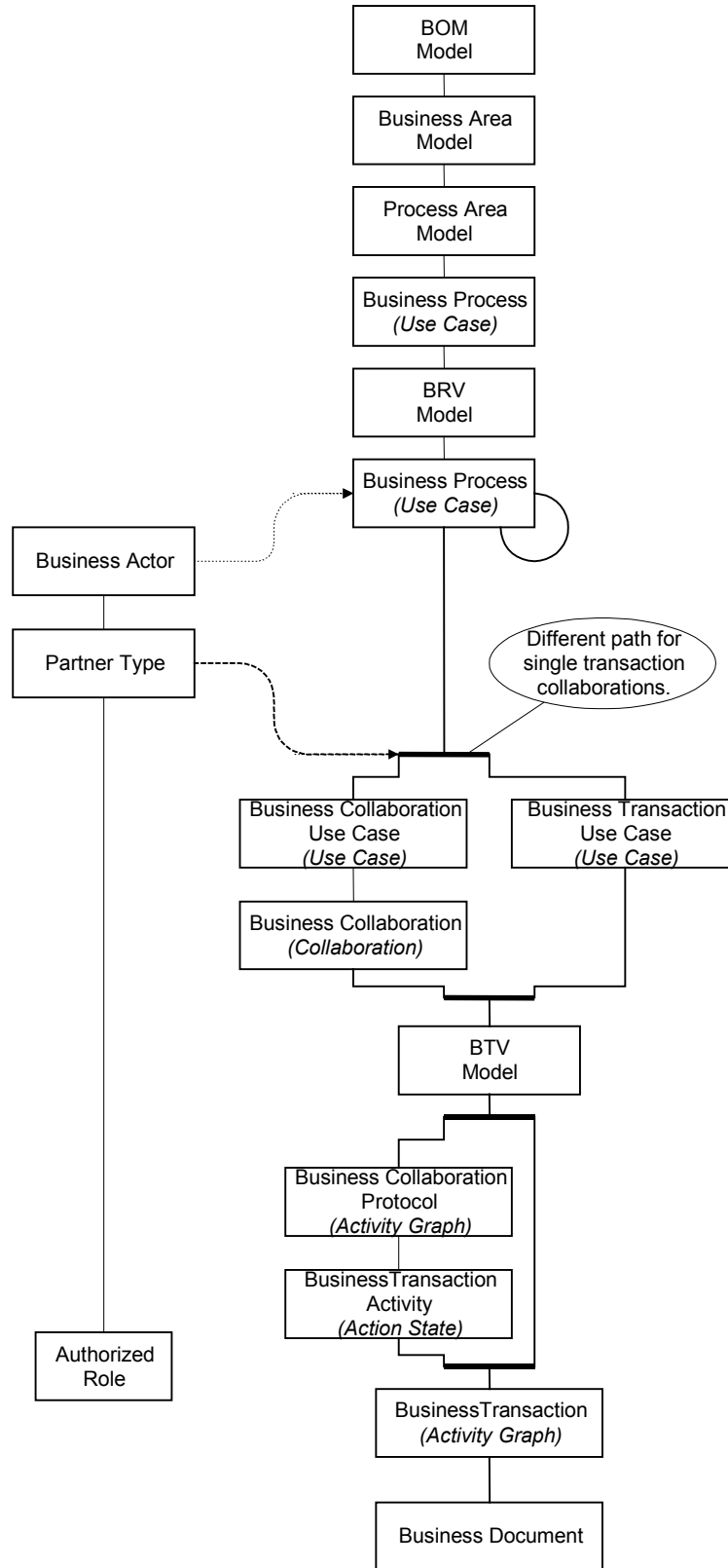
319
 320

Figure 7.2-1, Specification Schema Elements Overview

321 The Specification Schema supports the specification of business transactions and the
 322 choreography of business transactions into Business Collaborations. Each Business Transaction
 323 can be implemented using one of many available standard patterns⁶. These patterns determine the
 324 actual exchange of Messages and signals between Trading Partners to achieve the required
 325 electronic transaction. To help specify the patterns The Specification Schema is accompanied by a
 326 set of standard patterns, and a set of modeling elements common to those patterns.

327 The full specification of a Business Process is defined by the Metamodel. This information serves
 328 as the primary input for the formation of Collaboration Protocol Profiles (CPP's) and CPA's. An
 329 overview of the Metamodel is shown in Figure 7.2-2:

⁶ "Candidate transaction patterns include Commercial Transaction, Request/Confirm, Query/Response, Request/Response, Notification, and Information Distribution [UMM]".



330
331

Figure 7.2-2, UMM e-Business Process Metamodel Overview

332 There are no formal requirements to mandate the use of a modeling language to compose new
333 Business Processes, however, if a modeling language is used to develop Business Processes, it
334 SHOULD be the Unified Modeling Language (UML). This ensures that a single, consistent
335 modeling methodology is used to create new Business Processes. One of the key benefits of using
336 a single consistent modeling methodology is that it is possible to compare models to avoid
337 duplication of existing Business Processes. To further facilitate the creation of consistent Business
338 Processes and information models, ebXML will define a common set of Business Processes in
339 parallel with a Core Library. It is possible that users of the ebXML infrastructure MAY wish to
340 extend this set or use their own Business Processes.

341 **8 The Analysis Process**

342 **8.1 Introduction**

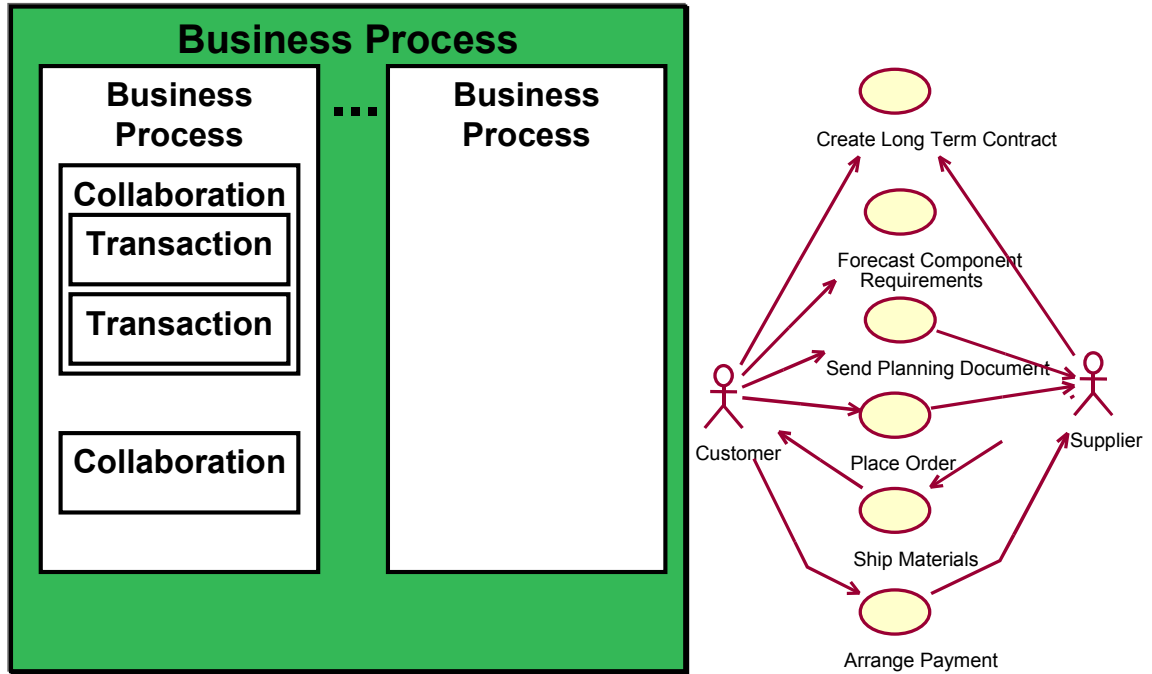
343 The process described below is intended to assist enterprises with the analysis of business
344 process and business documents necessary for engaging in electronic commerce with other
345 enterprises. The analysis of business processes is concerned with the elaboration of the higher-
346 level processes that are required to conduct electronic business. The analysis of business
347 information and documents activity identifies the business documents involved in the business
348 transactions of the collaborations of the business processes. The outputs of the analysis activities
349 are business process definitions and business document definitions.

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

356 The team is encouraged to use the ebXML Business Process Analysis Worksheets [BPAWAG],
357 UML modeling tools, or business process editors that provide similar functionality (see Section,10).
358 The team will be able to develop an ebXML Business Process Specification that can be reviewed
359 and verified by the entire enterprise, plus all necessary information to populate models based on
360 the *Metamodel* and *The Specification Schema*. The analysis process supports analyzing new
361 processes and processes re-engineering as well as supporting the analysis and documentation of
362 existing processes.

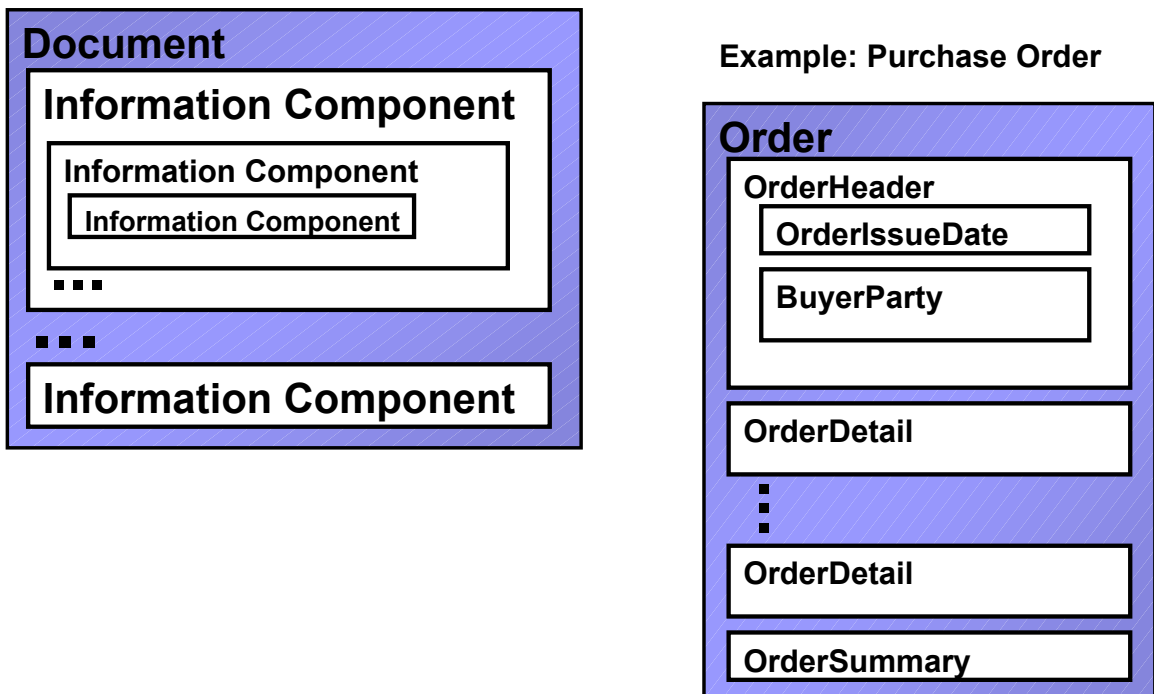
363 **8.2 Business Processes and Business Documents**

364 At a very basic level, a business process is “the means by which one or more activities are
365 accomplished in operating business practices” [UMM]. Within the business process there could be
366 one or more collaborations, each consisting of one or more transactions. Figure 8.2-1, below is a
367 simple representation of a business process.



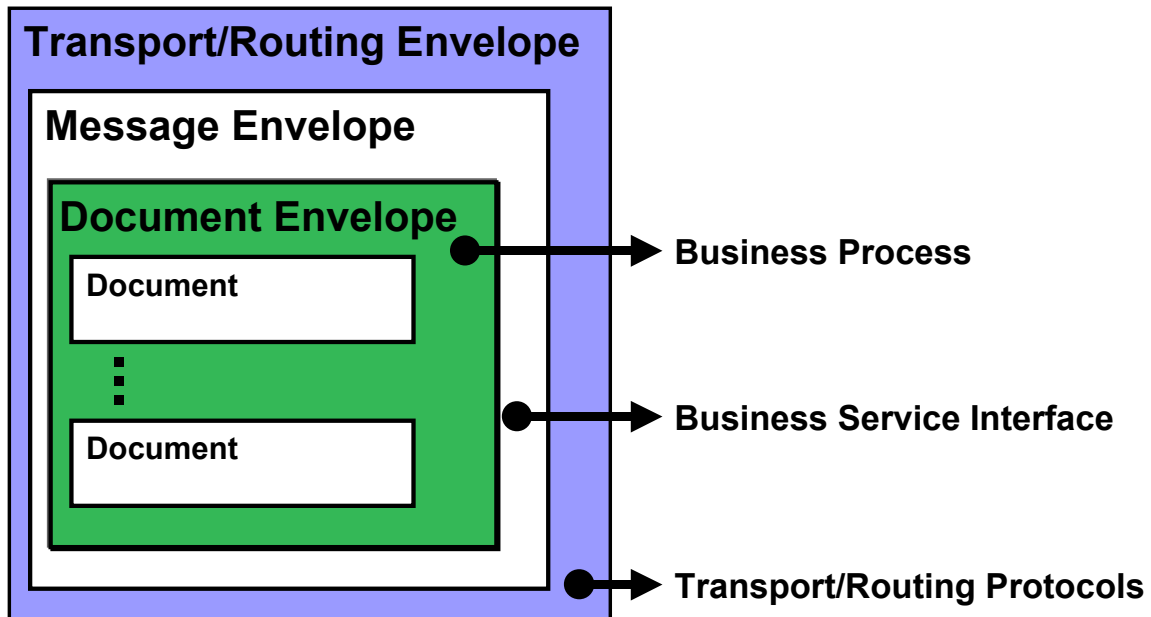
368
369 Figure 8.2-1, Business Process, Collaborations, and Transactions Conceptual View

370 Business document definitions are the specifications for the business document schemas and the
371 information components that compose the business document and contained information
372 components. A schematic representation of a business document can be seen in Figure 8.2-2,
373 below.



374
375 Figure 8.2-2, Document Conceptual View

376 Documents such as Purchase Orders, Invoices, etc., exist at the business process level and are
 377 exchanged in business transactions. Documents are put into document envelopes. They are
 378 addressed with the business identifier (e.g. DUNS number) of the recipient and sender. This is
 379 analogous to the "Attention:" line on a standard mailing address. A document envelope is placed
 380 into a message envelope and is exchanged between business service interfaces. The message
 381 envelope might be addressed with the URN of the destination business service interface.
 382 Messages have timeouts and other transaction control mechanisms associated with them.
 383 Message envelopes are placed into a transport/routing envelope for low level transmission across
 384 an e-business network. The target address on message envelope might be the URL of the
 385 destination's message-in-box service. A logical view of the nested envelope structure is shown in
 386 Figure 8.2-3.

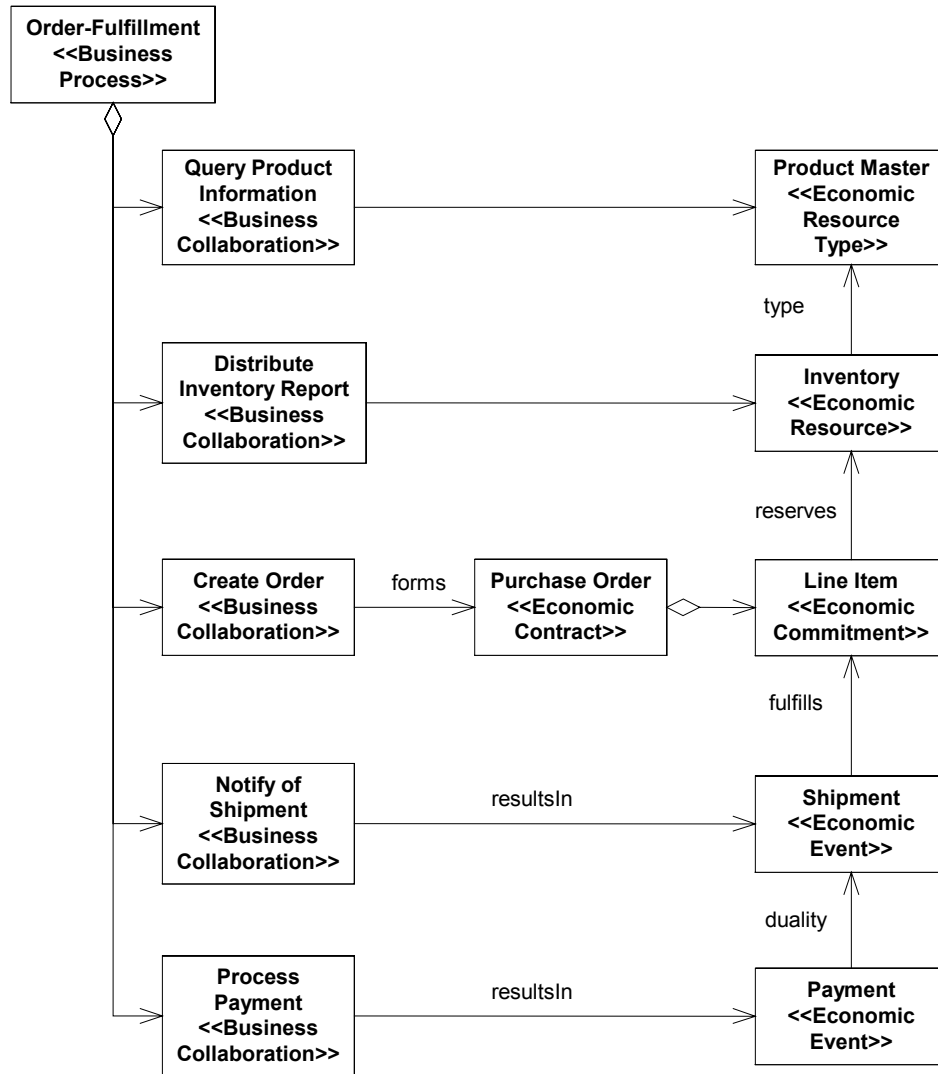


387
 388 Figure 8.2-3, Messaging and Enveloping Conceptual View

389 **8.3 Economic Elements in Business Processes**

390 The most common ebXML business collaborations will be resource exchanges between
 391 companies: buying and selling products and services. The most common collaboration pattern for
 392 these exchanges will probably be order-fulfillment-payment. The *Metamodel* provides Economic
 393 Modeling Elements for specifying these collaborations in business and economic terms rather than
 394 in technical terms. Using the UMM Economic Modeling Elements, these typical business
 395 collaboration patterns can be designed once and re-used in many situations⁷. Figure 8.3-1
 396 provides an overview of the REA economic elements in a typical product-oriented Order-Fulfillment
 397 Business Process..

⁷ 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/>.



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399

Figure 8.3-1, REA Overview for Order-Fulfillment

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

- 402 ■ Query Product Information receives Product Master or Catalog information about the products
403 that can be ordered. In REA, products are Economic Resource Types.
- 404 ■ Distribute Inventory Report receives information about products that are currently available.
405 This purpose could also be accomplished through a Query Availability process. In REA,
406 inventory is an Economic Resource. Each inventory element is typed by a Product Master
407 (Economic Resource Type).
- 408 ■ Create Order forms a Purchase Order (an Economic Contract) composed of Line Items
409 (Economic Commitments). Each Line Item reserves the committed quantity of the ordered
410 product type, due at the committed date and time.

411 ■ Notify of Shipment results in a Shipment (an Economic Event) which should fulfill one or more
 412 of the Purchase Order Line Items.

413 ■ Process Payment results in a Payment (an Economic Event) which pays for the Shipment (the
 414 REA "duality" relationship).

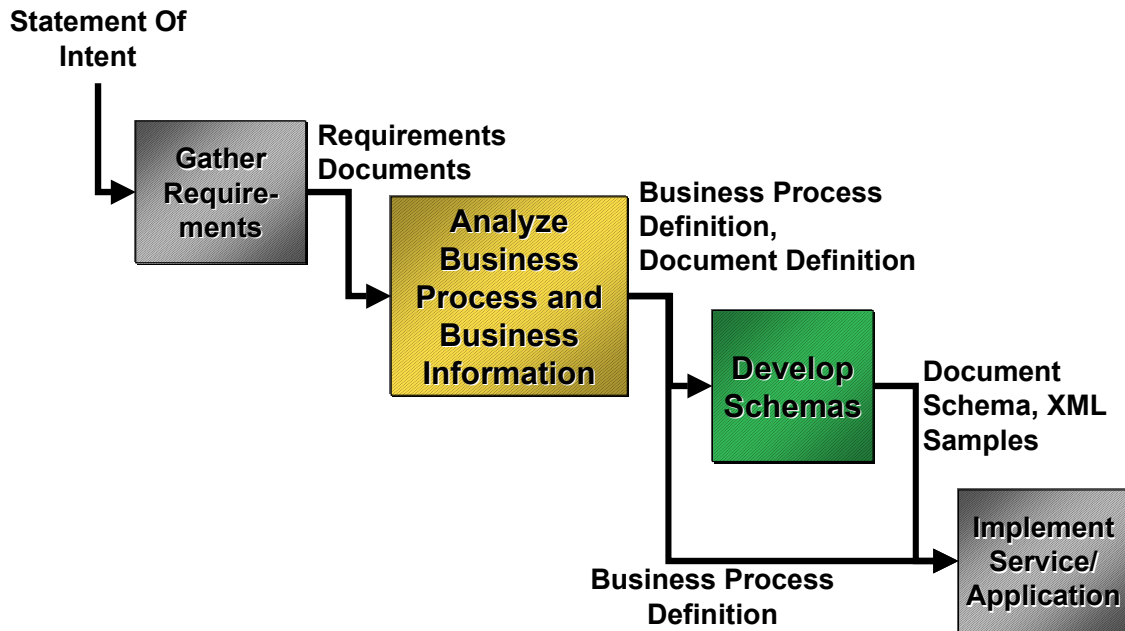
415 When all of the Line Items have been fulfilled, and all the Shipments have been paid, the Business
 416 Process is complete. The contract terms in this simple example specified "pay on receipt".
 417 Otherwise the business process might have another step, e.g. Process Invoice.

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

421 The above concepts and relationships are specified in the UMM, but there is no programmatic
 422 support for them in the first version of the *ebXML Business Process Specification Schema*. They
 423 could, however, be implemented in business collaboration management software based on the
 424 *Metamodel*.

425 **8.4 The Analysis Process**

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



428

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

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

432 The next step involves the gathering of requirements based on the Statement of Intent. Marketing
 433 and product management teams often perform this requirement gathering activity. The output of

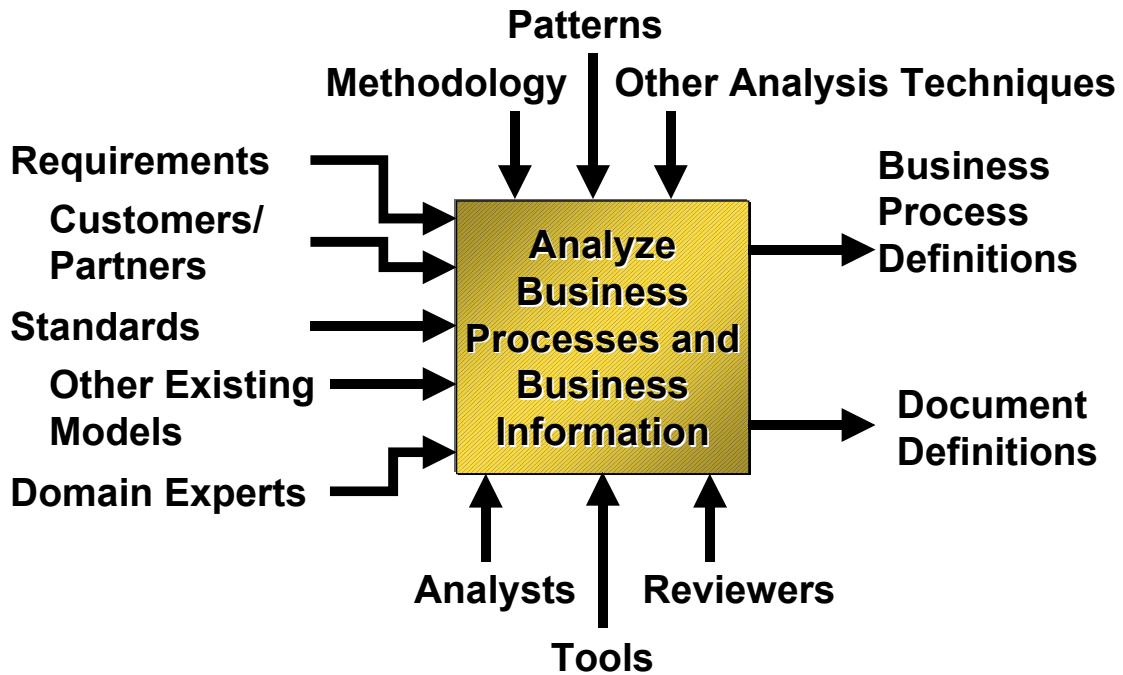
434 this activity MAY be a marketing requirements document or a product requirements document. In
 435 any case, the result should be a set of clearly defined requirements for the analysis.

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

445 The controls⁸ for the analysis activities are the methodology (UMM), *Metamodel*, patterns, and
 446 other analysis techniques. These controls specify the process and information model required for
 447 the business process and information analysis process to produce correct outputs. Patterns
 448 include transaction patterns [UMM] and collaboration patterns [ECPAT].

449 The mechanisms for the analysis activities are the analysts, tools, and reviewers. Analysts are the
 450 people who are defining the processes and documents based on the *Metamodel*.

451 One of the key tools to assist with the analysis is the ebXML Business Process Analysis
 452 Worksheets, discussed in Section 10, Analysis Aids: Worksheets and Tools.

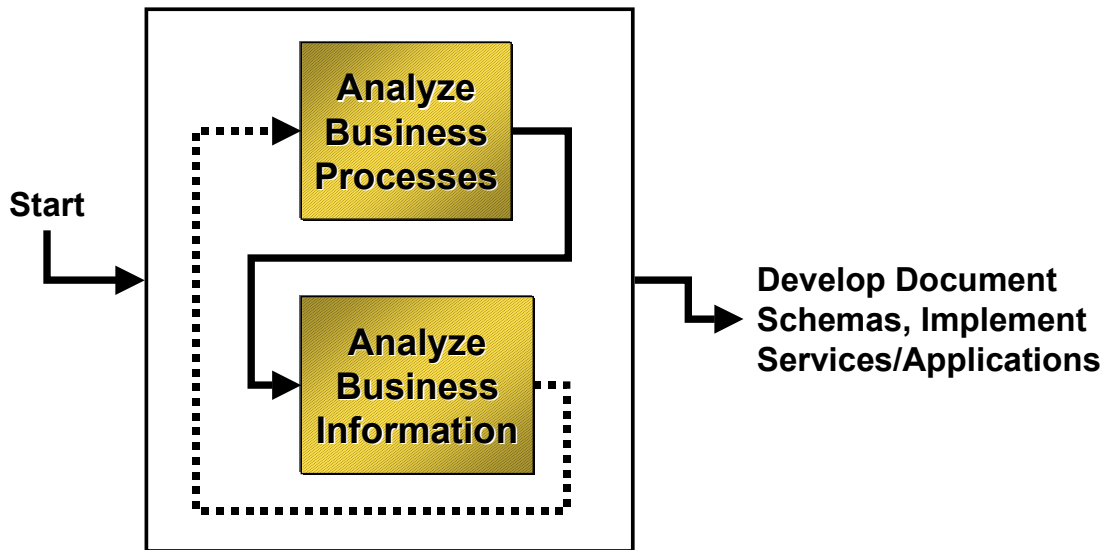


453

454 Figure 8.4-2, Analyze Business Processes and Business Information

⁸ 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.

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



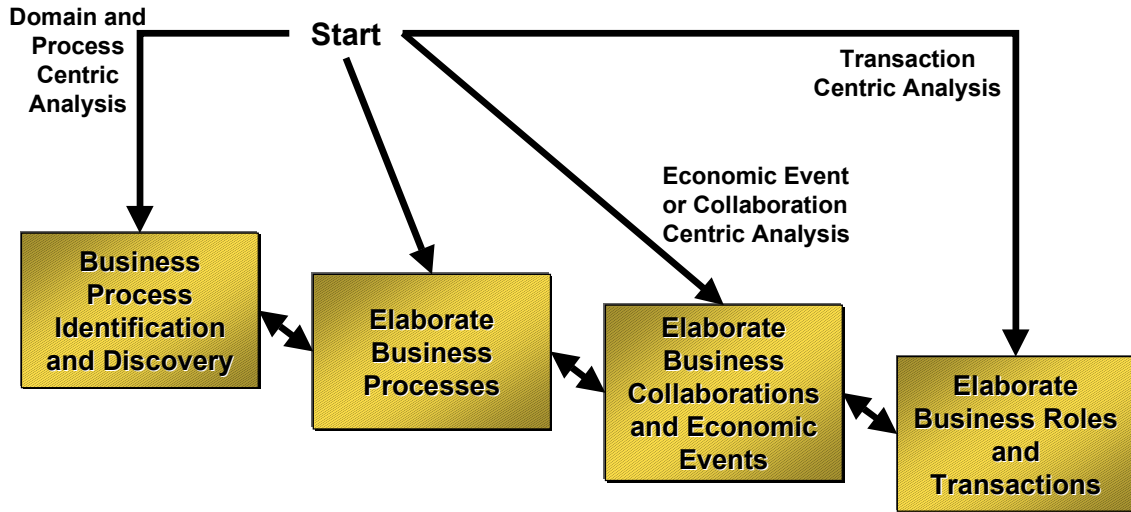
458

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

460 The overall analysis process will generally be more effective if the analysis of the business
 461 processes and associated business information happens at the same time. Business information
 462 analysts will need to be familiar with the business process and will want to be co-participants during
 463 the business process analysis. Otherwise, the business information analysts MAY need to re-
 464 interview domain experts, customers, and partners, to get clarification on matters that could have
 465 been more effectively addressed during the analysis of the business process. Furthermore,
 466 business information analysts will likely have the background that will help identify the key business
 467 information elements that effect the business processes.

468 The analyze business processes activity can proceed along different paths depending on the focus
 469 of the modeling effort. For example, if the goal is to establish a business reference model for an
 470 industry, the process will likely proceed as discussed in the UMM, from the beginning to the end of
 471 the UMM documentation. However, if the effort is to model existing X12 or EDIFACT documents
 472 and their associated business processes, the process will more naturally start with the elaboration
 473 of business transaction and roles. In this case, there is usually a strong implicit understanding of
 474 the associated business process by domain experts. Business process analysis can be partitioned
 475 into four high-level activities⁹ as shown in Figure 8.4-4:

⁹ 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.



476

477 Figure 8.4-4, Analyze Business Process Activities

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

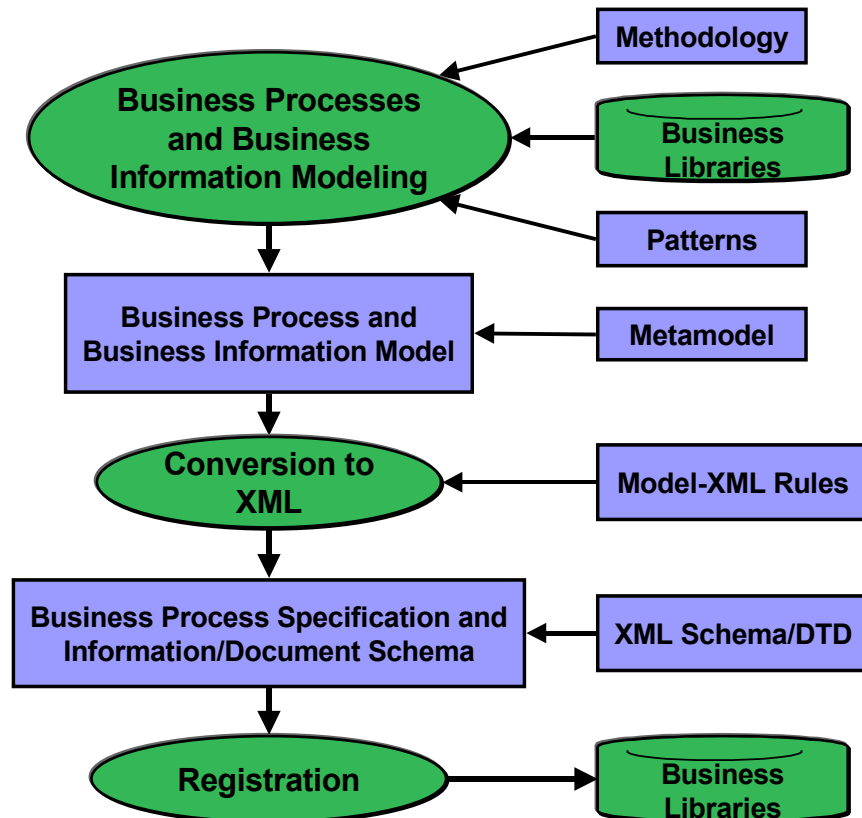
485 Once the analysis is complete and the business processes and documents have been full defined
 486 and developed, the specifications SHOULD be registered in a Business Library [TAS]. A Business
 487 Library is a repository of business process specifications and business information objects within
 488 an industry or shared by multiple industries. There will be many business libraries, public and
 489 private, controlled and not controlled. A public library is one that is available for public access.
 490 Typically the content of these will be owned by standard's efforts, such as ebXML and
 491 UN/EDIFACT, and large electronic communities (such as automotive marketplaces). A private
 492 library is one that does not have public access. These are for private exchanges where the
 493 participating parties do not wish to disclose the nature of their business processes. Obviously, the
 494 public access business libraries will be the most useful in promoting interoperability between
 495 trading partners in different electronic communities. For example, it may be necessary for the e-
 496 business systems of a trading partner in the automotive community to access business processes
 497 registered in a chemical community.

498 A controlled business library is one whose content is administered by some organization, such as
 499 standards body or electronic community. Business process and business information
 500 specifications WILL be submitted to a working group or other supervising activity for the controlled
 501 business library. The working group WILL review the submissions for quality and accuracy. The
 502 specifications MAY be put to public or community voting for approval. Approved specifications are
 503 then registered in the business library. At such time, key model elements - such as Business
 504 Process, Business Collaboration, and Business Transaction - are officially assigned their identifiers
 505 according to the Business Identifier Naming Scheme [BPAWAG]. These identifiers facilitate re-use
 506 and interoperability by providing unique identifiers that can be referenced by business process
 507 specifications, Core Component's contextual categories, CPPs and CPAs. Controlled business
 508 libraries will typically have more credibility than ones that are not controlled. A business library that
 509 is not controlled will allow anyone in the community to register specifications. The quality and

510 accuracy of the specifications will be suspect. However, these type of libraries could result in
 511 significant business process specifications. Business process specifications that get significant
 512 usage will be recognized over time.

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

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



530
 531

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

532 The overall effort starts with the analysis and modeling of business processes and business
 533 information. The UMM Methodology can be employed directly or indirectly through the use of the
 534 Business Processes Analysis Worksheets or business process editors. Re-usable business process

535 and information components from Business Libraries are applied, as well as collaboration and
536 transaction patterns. The analysis effort results in business process models and business
537 information models that are based on the Metamodel. The models are then converted into XML
538 based Business Process Specifications and Information/Document schemas according to a set of
539 production rules. The specifications and schemas are then registered and stored in Business
540 Libraries for re-use and reference by CPAs.

541 **9 Relationship Between Business Process and Core** 542 **Components**

543 **9.1 Introduction**

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

551 **9.2 Business Information Objects**

552 Business Information Objects MAY be composed of Core Components, domain components, and
553 other business information objects. The component and business information object definitions are
554 stored in business libraries. Core Components can be stored in the specially named Core Library.
555 Business document definitions are constructed of business information objects, domain
556 components and Core Components. The following steps describe how to develop business
557 document definitions.

- 558 1. Search Business Library for required attributes available in business information objects.
- 559 2. If business information objects with appropriate attributes are not available, new business
560 information objects must be created.
- 561 3. Domain components in the business libraries and core components in the Core Library
562 COULD be candidates for business information object attributes, assuming the context is
563 appropriate.
- 564 4. Add the new attributes to existing business information objects, or introduce new business
565 information objects through a registration process that manages changes to the Business
566 Library.
- 567 5. Use the new attributes, now in the Business Library, to create the business documents.

568 In summary, the primary sources for creating business documents in a business process and
569 information model, are business information objects in a Business Library. The secondary sources
570 are domain components in business libraries and the core components in the Core Library, when
571 appropriate business information objects cannot be found. Until the Business Library is
572 constructed, or imported from a credible sources, core components are likely to be utilized
573 frequently, first to add to the repertoire of business information objects in the Business Library, and
574 second, to create business documents.

575 **9.3 Core Components Analysis**

576 The *ebXML Methodology for the Discovery and Analysis of Core Components* describes the
 577 process for identifying information components that are re-usable across industries (hence the term
 578 “core components”). Core components are used to construct domain components and business
 579 information objects. Business libraries, which contain libraries of business process specifications
 580 (such as the *ebXML Catalog of Common Business Processes*) are instrumental in the discovery
 581 and analysis of core components and domain components.

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

588 **9.4 Core Component Contextual Classification**

589 The *Metamodel* specifies the information to be captured when modeling a business process. The
 590 model contains a number of elements and attributes that are considered to be significant in
 591 effecting the interrelated conditions of the other elements in business process and document
 592 models. It is useful to understand this contextual dependency between the various model elements
 593 during the analysis process. Furthermore, in the future, it MAY be possible to apply these
 594 contextual dependencies at runtime¹⁰.

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

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

601 Figure 9.4-1, Example Context Values

¹⁰ 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*.

602 The contextual categories, identified in *“The role of context in the re-usability of Core Components*
603 *and Business Processes”* simply map to existing elements and attributes within a business process
604 model that is conformant to the UMM Business Process Metamodel. For example, the contextual
605 Category “Process” maps to the Metamodel elements BusinessProcess, ProcessArea, and
606 BusinessArea. A mapping of Context Categories to Metamodel elements is provided in Appendix
607 A.

608 **9.5 Context and Common Business Processes**

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

10 Analysis Aids: Worksheets and Tools

619

620 People without the expertise in analysis and modeling will likely find that the UMM will be useful as
 621 a reference manual. These people will use UMM complaint approaches or, even, alternative
 622 methodologies during the analysis of business processes. Practical experience tells us that it will
 623 be more useful to the electronic business community to have an approach that does not require
 624 such analysis and modeling expertise. An approach that a business person can apply would be
 625 most useful. *The Business Process Analysis Worksheets and Guidelines* provide such an
 626 approach.

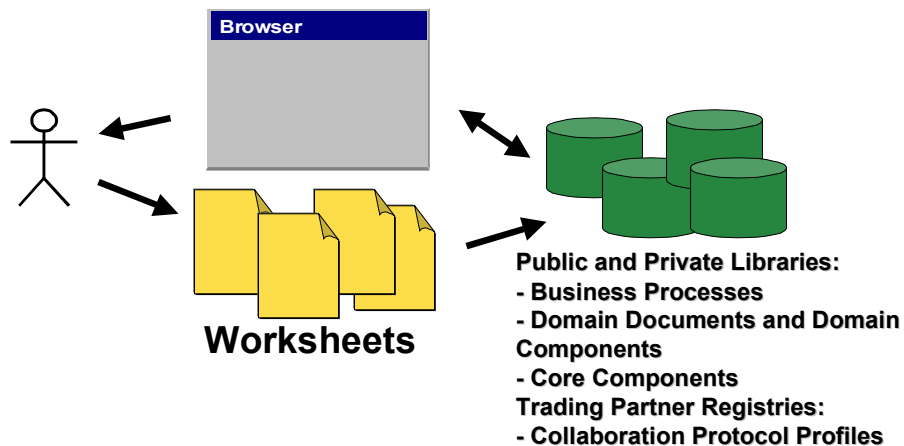
10.1 Analysis Worksheets and Guidelines

628 *The ebXML Business Process Analysis Worksheets* [BPAWAG] are a set of business process
 629 analysis design aids to be used with the UMM as a reference. The Worksheets allow users to
 630 capture all the information that is required to completely describe a business process. This
 631 description can be used to drive software, and can be registered, classified, discovered and
 632 reused.

633 It is intended that the Worksheets be used in conjunction with a browser that lets the user search
 634 business libraries (registries/repositories containing catalogs of business process specifications) for
 635 items that have already been defined. This is shown in

636 Figure 10.1-1. The items (e.g. business processes, business collaborations, document schemas,
 637 etc.) can be referenced (re-used as is) or copied to the worksheets and changed as needed. Over
 638 time, business process libraries will become populated with a sufficiently large number of business
 639 processes. When this happens, the analysis process will often be a simple matter of validating

Enablement: Analysis Worksheets and Editor



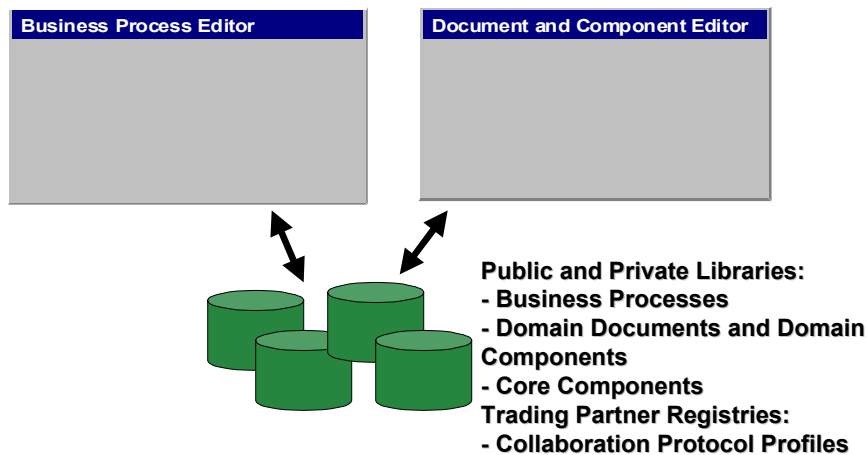
640 pre-defined business processes against requirements.

641 Figure 10.1-1, Business Process Analysis Worksheets Usage

642 **10.2 Business Process Editor and Document Editor**

643 Business Process Editors and Document & Component Editors are the electronic versions of
 644 Business Process Analysis Worksheets. They provide an effective means for business process
 645 and information modeling since they can connect directly to business libraries and trading partner
 646 directories. See Figure 10.2-1. The tools will support discovery, user friendly forms-based modeling,
 647 business process and business information comparison, documentation and help on the analysis
 648 process, and capabilities for submitting specifications to controllers of the business libraries. Tool
 649 suites of business process editors, document & component editors, and CPP/CPA editors will be
 650 instrumental in enabling ebXML based e-commerce.

Business Process and Document Editor



9

651 Figure 10.2-1, Tool Interaction

652 Business Process Editors and Document & Component Editors are the electronic versions of
 653 Business Process Analysis Worksheets. They provide an effective means for business process
 654 and information modeling since they can connect directly to business libraries and trading partner
 655 directories. See Figure 10.2.1. The tools will support discovery, user friendly forms-based
 656 modeling, business process and business information comparison, documentation and help on the
 657 analysis process, and capabilities for submitting specifications to controllers of the business
 658 libraries. Tool suites of business process editors, document & component editors, and CPP/CPA
 659 editors will be instrumental in enabling ebXML based e-commerce.

660

11 Glossary

Term	Definition	Source
Business Information Object		
Business Library	A repository of business process specifications and business information objects within an industry, and of common business process specifications and common business information objects that are shared by multiple industries.	[TAS]
Business Process		
Business Service Interface	A service that exposes an interface for one or more rules in an ebXML collaboration. Also referred to as Business Service.	
Business Transaction	A set of business information and business signal exchanges between two business partners that must occur in an agreed format, sequence and time period.	[UMM]

661

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689		UN/CEFACT Technical Modeling Working Group.

13 Disclaimer

690

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

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695

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714

Appendix A Context Category – Metamodel Cross-reference

715

The following table cross-references Core Component’s contextual categories with Metamodel elements.

716

Contextual Category	Definition	Metamodel Element	Sources of Resources	Comments
Industry	The industry or sub-industry in which the information exchange takes place.	BusinessOperationalMap.industry	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 Metamodel 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>
Physical	The physical	Geographic	GPS,	Hierarchical values.

Contextual Category	Definition	Metamodel Element	Sources of Resources	Comments
Geography /Conditions /Region	geography and conditions (weather, altitude, climate) geographical context of the information exchange (not geo-political)	and regional categorization may be defined by the category schema in the BOM.	Aerospace, ISO	Range of conditions are specified as constraints on the category element.
Temporal	The time-based context of the information exchange	EconomicCommitment.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 business	BOM		Business Purpose and domain may be defined and scoped by the BOM categorization schema.

Contextual Category	Definition	Metamodel Element	Sources of Resources	Comments
	process. This is the "purpose" of the recipient(s) of the business information.			
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.		

717

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