



Creating A Single Global Electronic Market

1 Business Process and Business Information 2 Analysis Overview v1.0

3
4 Business Process Team

5 11 May 2001
6

7 1 *Status of this Document*

8 This Technical Report document has been approved by the Business Process Project Team and
9 has been accepted by the ebXML Plenary.

10 This document contains information to guide in the interpretation or implementation of ebXML
11 concepts.

12 Distribution of this document is unlimited.

13 The document formatting is based on the Internet Society's Standard RFC format.

14 This version:

15 <http://www.ebxml.org/specs/bpOVER.pdf>

16 Latest version:

17 <http://www.ebxml.org/specs/bpOVER.pdf>
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 [ebTA] ebXML Technical Architecture Specification. Version 1.0.4. 16 February 2001. ebXML
121 Technical 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 [bpWS] ebXML Business Process Analysis Worksheets and Guidelines v1.0. May 11, 2001. ebXML
127 Business Process Project Team.
- 128 [bpPROC] ebXML Catalog of Business Processes. Version 1.0. Date May 11, 2001. ebXML Business
129 Process Project Team.
- 130 [bpPATT] ebXML Business Process and Simple Negotiation Patterns. Version 1.0, May 11 2001.
131 ebXML Business Process Project Team.
- 132 [ebBPSS] ebXML Business Process Specification Schema. Version 1.0 May 11 2001. *Context/ Meta*
133 *Model* Group of the CC/BP Joint Delivery Team.
- 134 [ebCCD&A] ebXML Methodology for the Discovery and Analysis of Core Components. V1.0, May 11
135 2001. ebXML Core Components Project Team.
- 136 [enCNTXT] ebXML The role of context in the re-usability of Core Components and Business Processes
137 ebXML Core Components. Version 1.0, May 11 2001. ebXML Core Components Project Team.
- 138 [ebCCDOC} ebXML specification for the application of XML based assembly and context rules. Version
139 1.0, May 11 2001. ebXML Core Components.
- 140 [ebGLOSS] ebXML TA Glossary. Version 1.0, May 11 2001. Technical Architecture Project Team.
- 141 [ebRIM] ebXML Registry Information Model. Version 1.0, 11 May 2001. ebXML Registry Project Team.
- 142 [ebRS] ebXML Registry Services. Version 1.0, May 11 2001. ebXML Registry Project Team.
- 143 [ebCPP] ebXML Collaboration-Protocol Profile and Agreement Specification. Version 1.0, May 11 2001
- 144 [secRISK] ebXML Technical Architecture Risk Assessment Report. Version 1.0, May 11 2001

145 4.4 Document Conventions

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

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

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

153

153 5 *Goal and Objectives*

154 5.1 Goal

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

159 5.2 Objectives

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

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

166 5.3 Caveats and Assumptions

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

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

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

173

173 6 Business Collaboration Overview

174 6.1 ebXML Electronic Business Collaboration

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

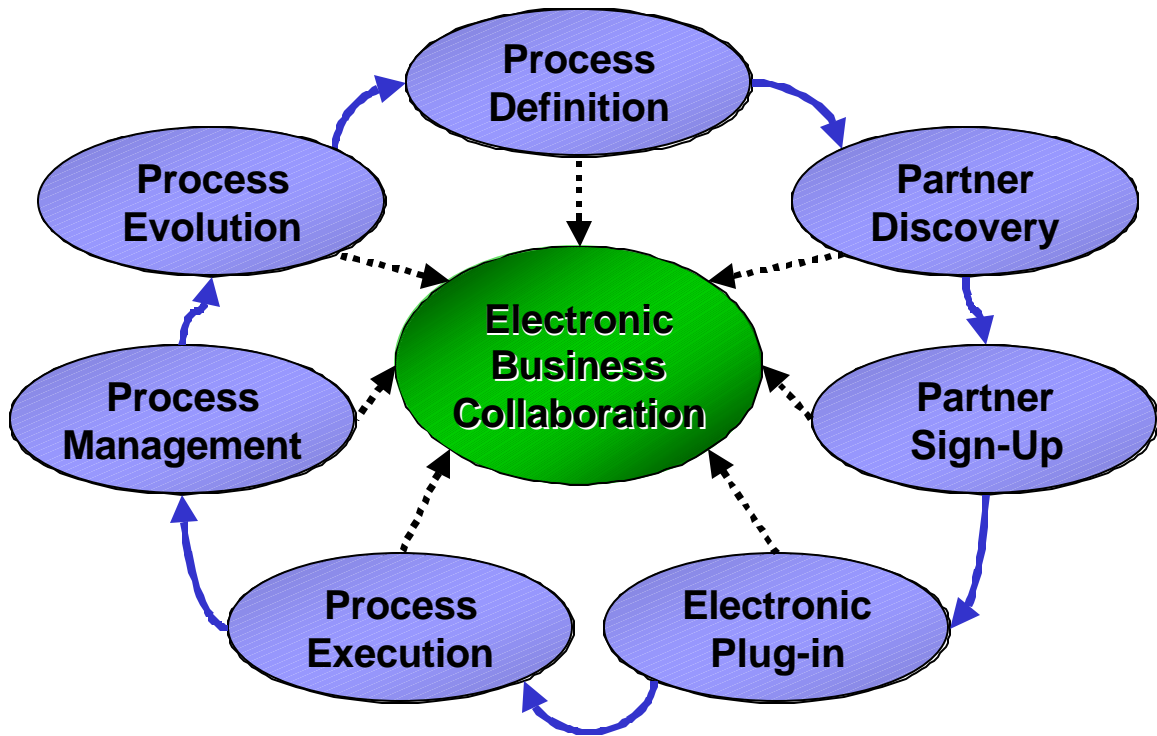
180 The overall process starts with Process Definition, utilizing Business Process and Business Document
181 Analysis and logically progresses to Partner Discovery, Partner Sign-Up, Electronic Plug-in, Process
182 Execution, Process Management, Process Evolution.

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

202

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/>).



203

204

205

Figure 6.1-1, ebXML Business Collaboration Process

206

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

207

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>

208

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 Information Analysis Overview

208

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 [ISO14662E], 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 Arc hitecture Specification, Information Technologies - Open-EDI Reference Model [ISO14662E], Transport, Routing and Packaging Message Services</i>
Process Management	None	<i>Information Technologies - Open-EDI Reference Model [ISO14662E] (Section Open-EDI Support Infrastructure)⁴, Transport, Routing and Packaging Message Services,</i>
Process Evolution	None	<i>None – not in scope of ebXML.</i>

209

210 6.2 Economic Elements in Business Processes

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

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

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

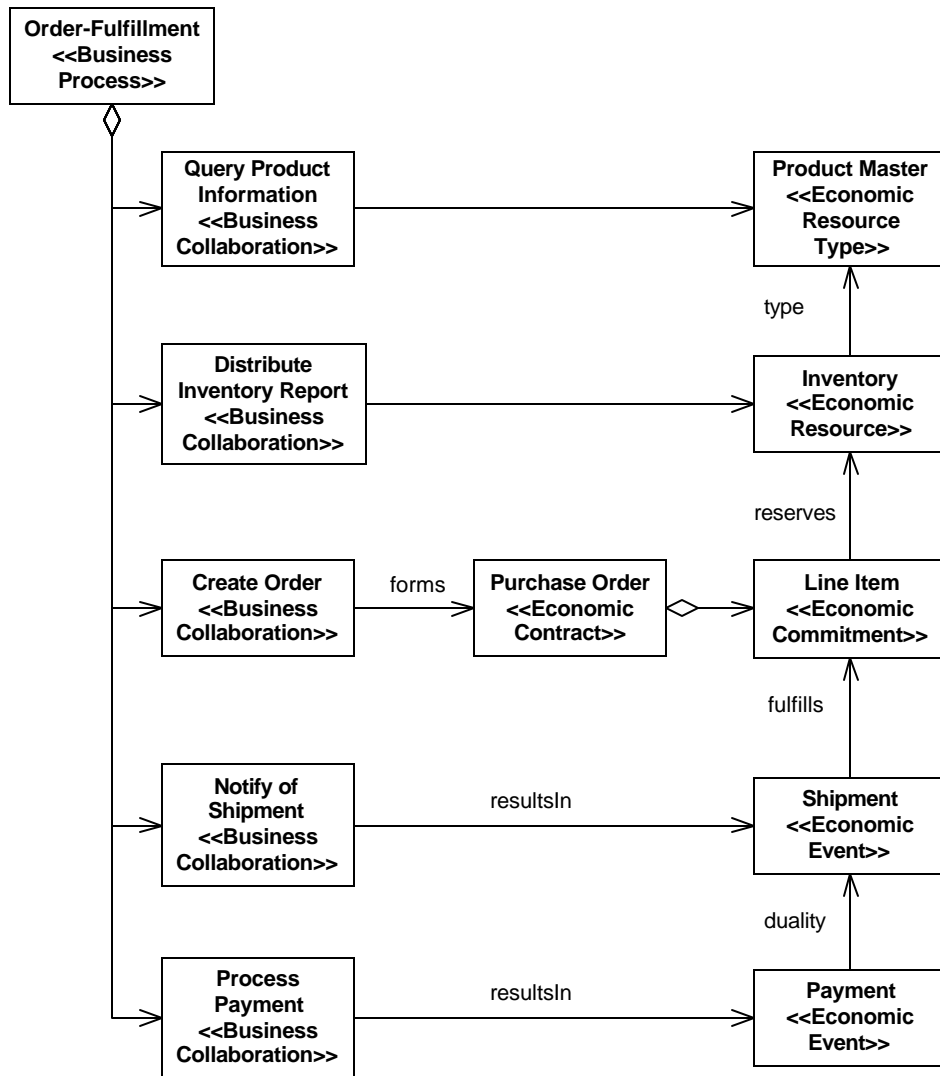
- 222 • When an Economic Contract is formed
- 223 • When an Economic Event SHOULD be recognized

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.

- 224 • When an Economic Resource or a claim to a resource SHOULD be recognized in accordance with
225 generally accepted accounting principles (GAAP)
- 226 • Whether or not a delivery fulfills a commitment
- 227 • What events MAY follow if a delivery does not fulfill an order
- 228 • When an exchange is complete from a business point of view
- 229 • Many other aspects of typical business relationships
- 230 Using the ebXML Economic Modeling Elements, these typical business collaboration patterns can be
231 designed once and re-used in many situations⁵. Figure 6.2-1 provides an overview of the REA
232 economic elements in a typical product-oriented Order-Fulfillment Business Process.
- 233 The above concepts and relationships are specified in the UMM, but there is no programmatic support
234 for them in the first version of the *ebXML Business Process Specification Schema* [BPSS]. They could,
235 however, be implemented in business collaboration management software based on the UMM *Meta*
236 *Model*.
- 237 The Business Process is composed of several Business Collaborations, taken directly from the Catalog
238 of Common Business Processes [CCBP] and other business libraries.
- 239 • Query Product Information receives Product Master or Catalog information about the products that
240 can be ordered. In REA, products are Economic Resource Types.
- 241 • Distribute Inventory Report receives information about products that are currently available. This
242 purpose could also be accomplished through a Query Availability process. In REA, inventory is an
243 Economic Resource. Each inventory element is typed by a Product Master (Economic Resource
244 Type).
- 245 • Create Order forms a Purchase Order (an Economic Contract) composed of Line Items (Economic
246 Commitments). Each Line Item reserves the committed quantity of the ordered product type, due at
247 the committed date and time.
- 248 • Notify of Shipment results in a Shipment (an Economic Event) which SHOULD fulfill one or more of
249 the Purchase Order Line Items.
- 250 • Process Payment results in a Payment (an Economic Event) which pays for the Shipment (the
251 REA "duality" relationship).
- 252 When all of the Line Items have been fulfilled, and all the Shipments have been paid, the Business
253 Process is complete. The contract terms in this simple example specified "pay on receipt". Otherwise
254 the business process might have another step, e.g. Process Invoice.
- 255 If something goes wrong, and the shipments do not fulfill the commitments, and the payments do not
256 compensate for the shipments, or some economic event is late or otherwise incorrect, the problem can
257 be expressed using the REA concepts and relationships explained above.

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/>.

258



259

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

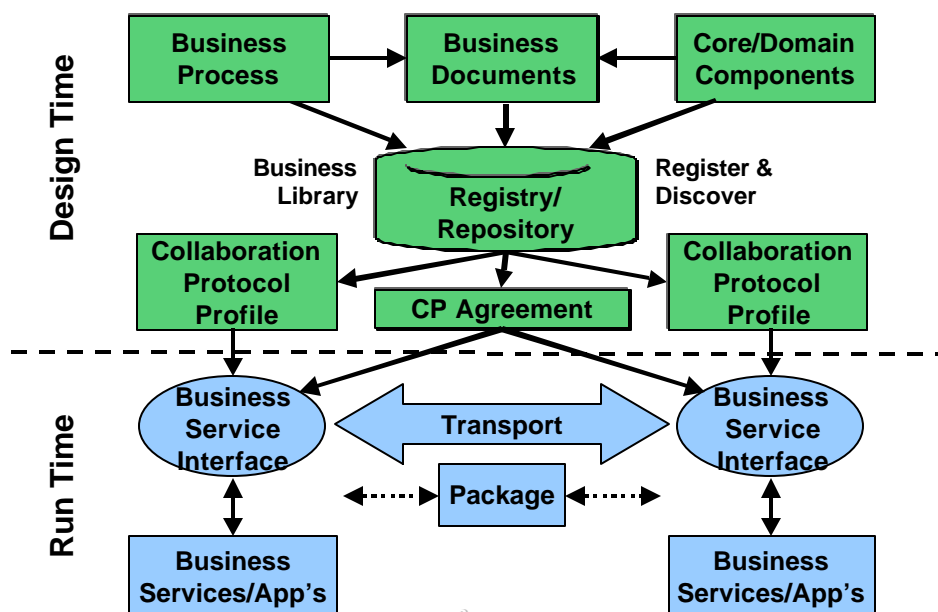
261

262 6.3 ebXML Design Time and Run Time Reference Model

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

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

273 The Design Time and Run Time components of the ebXML Technical Architecture are found in Figure
 274 6.3-1.



275

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

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

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

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

291 7 Business Process and Information Modeling

292 7.1 Overview

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

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

304 7.2 Business Process and Information *Meta Model*

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

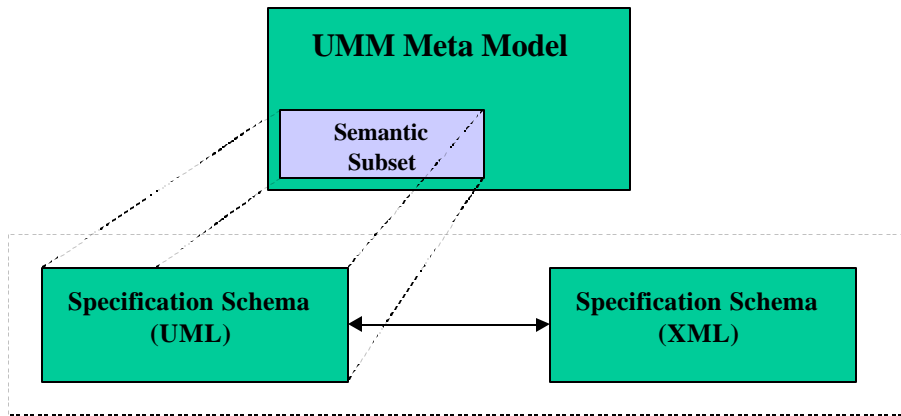
314
315 The UMM *Meta Model* supports a set of business process viewpoints that provide a set of semantics
316 (vocabulary) for each viewpoint and forms the basis of specification of the artifacts that are recommended
317 to facilitate *Business Process* and information integration and interoperability.

318
319 An additional view of the UMM *Meta Model*, the ebXML *Business Process Specification Schema*, is also
320 provided to support the direct specification of the set of elements required to configure a runtime system in
321 order to execute a set of ebXML business transactions. By drawing out modeling elements from several of
322 the other views, the ebXML *Business Process Specification Schema* forms a semantic subset of the UMM
323 *Meta Model*. The ebXML *Business Process Specification Schema* is available in two stand-alone
324 representations, a UML version, and an XML version.

325
326 The only part of the UMM *Meta Model* that is currently mandatory for use in ebXML is the semantic subset
327 represented by the ebXML Business Process Specification Schema. As UN/CEFACT finalizes and evolves
328 the UMM, it is anticipated that other parts of the UMM *Meta Model* may also become mandatory.

335

336 The relationship between the *UMM Meta Model* and the *ebXML Business Process Specification Schema*
 337 can be shown as follows:
 338

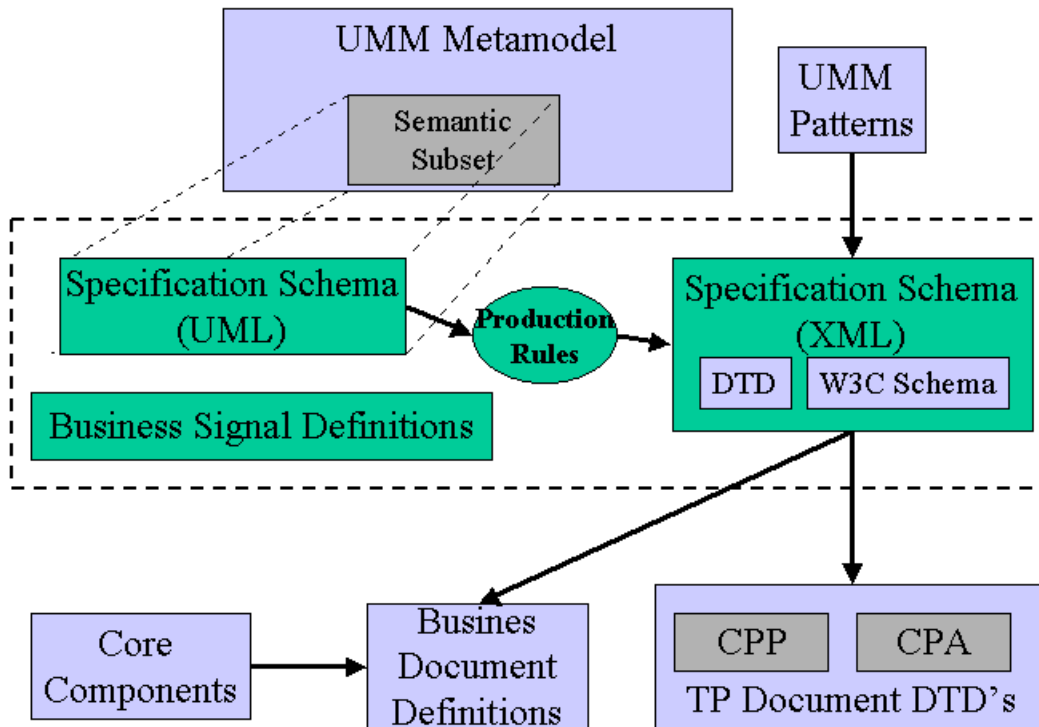


339
 340
 341
 342

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

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

351
 352 This can be shown as follows:



353
 354 Figure 7.2-2 Relationship of Business Process Specification and CPP/CPA
 355

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

358
 359 To further facilitate the creation of consistent *Business Process and information models*, ebXML will
 360 define a common set of *Business Processes* in parallel with a *Core Library*. It is possible that users of the
 361 ebXML infrastructure may wish to extend this set or use their own *Business Processes*.

362

8 The Analysis Process

362

8.1 Introduction

363

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

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

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

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

383

384

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

391

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

397

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

407 8.3 Business Processes and Business Documents

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

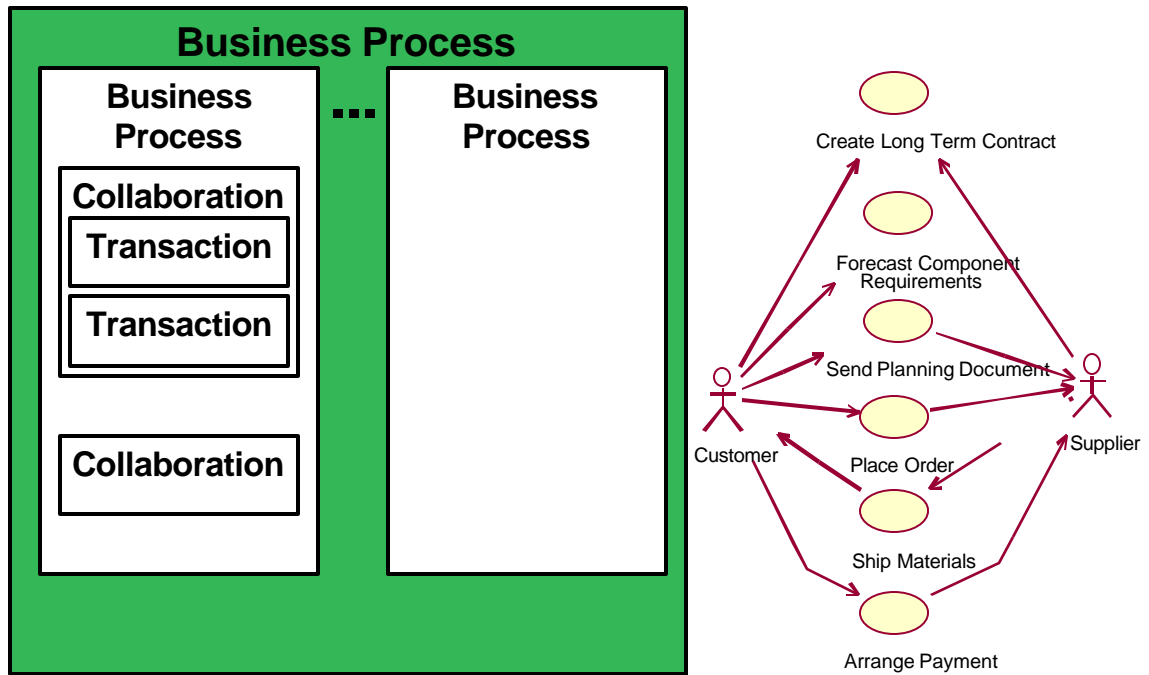
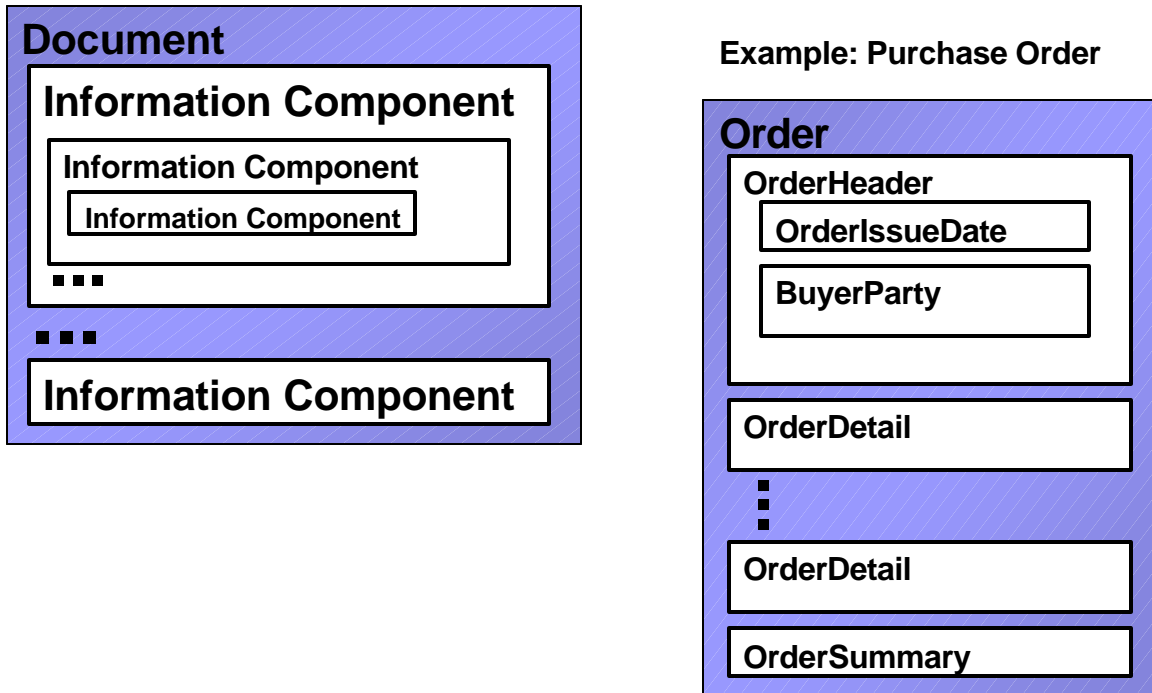


Figure 8.3-1, Business Process, Collaborations, and Transactions Conceptual View

413
 414
 415

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



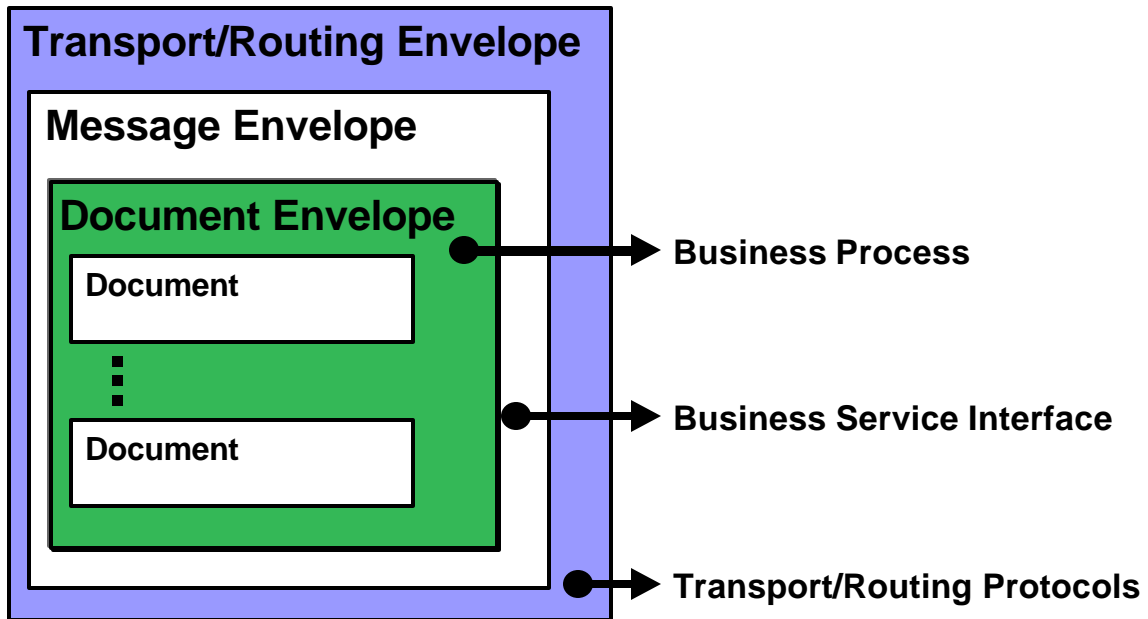
418

419

420

Figure 8.3-2, Document Conceptual View

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

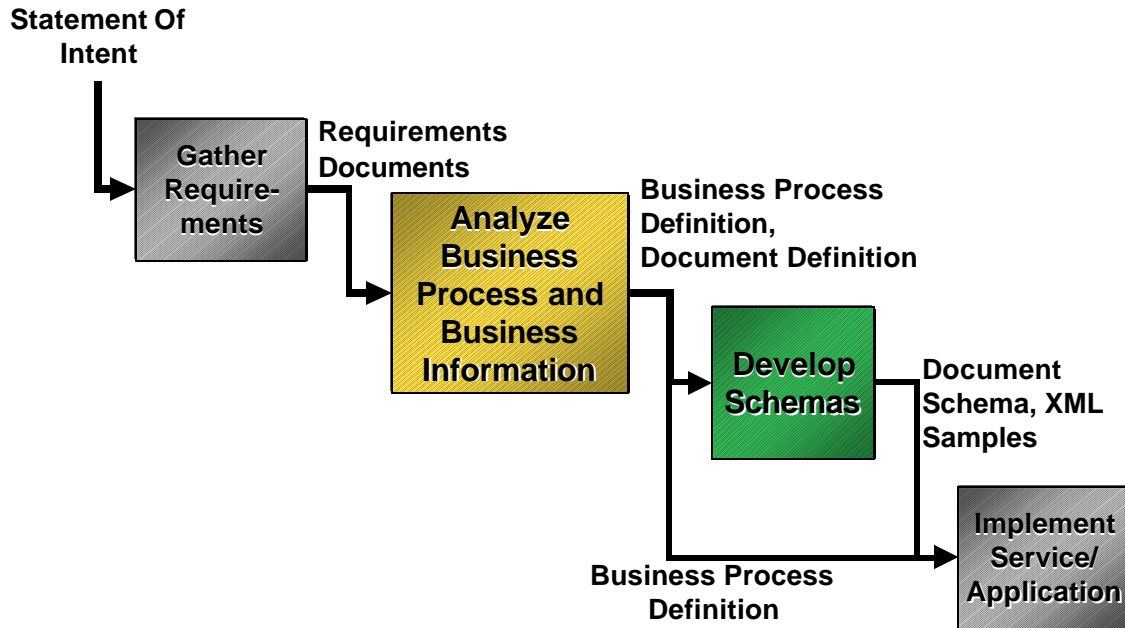


431
 432

Figure 8.3-4, Messaging and Enveloping Conceptual View

433 8.4 The Analysis Process

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



436

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

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

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

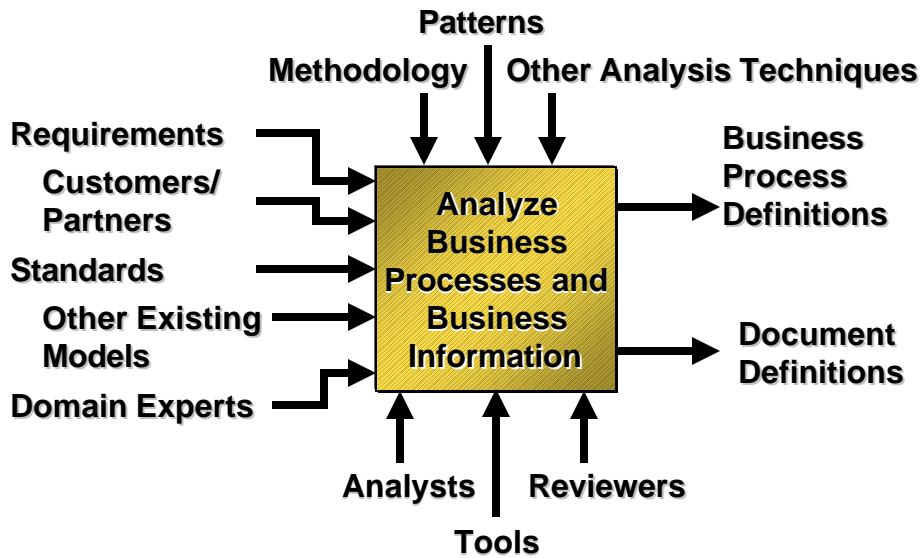
444 After the requirements have been defined and agreed, the actual analysis can begin. As illustrated by
 445 Figure 8.4-2, there can be many inputs to and aspects of the process required to produce the desired
 446 output. Inputs to the analysis process can come from requirements, customers and partners,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

452 The controls⁶ for the analysis activities are the methodology (UMM), *Meta Model*, patterns, and other
 453 analysis techniques. These controls specify the process and information model REQUIRED for the
 454 business process and information analysis process to produce correct outputs. Patterns include
 455 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.

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

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

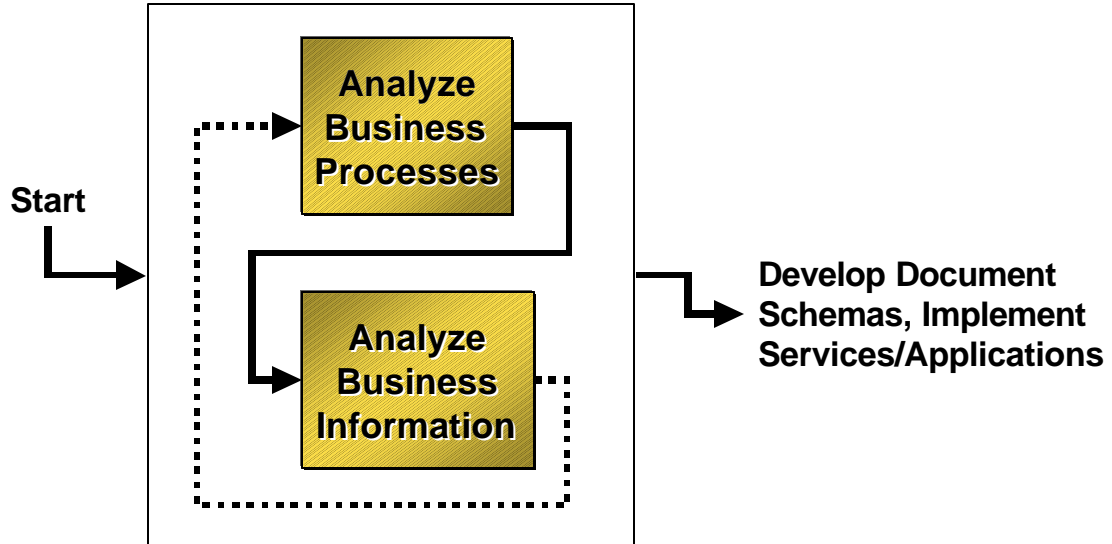


460

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

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

465



466

467

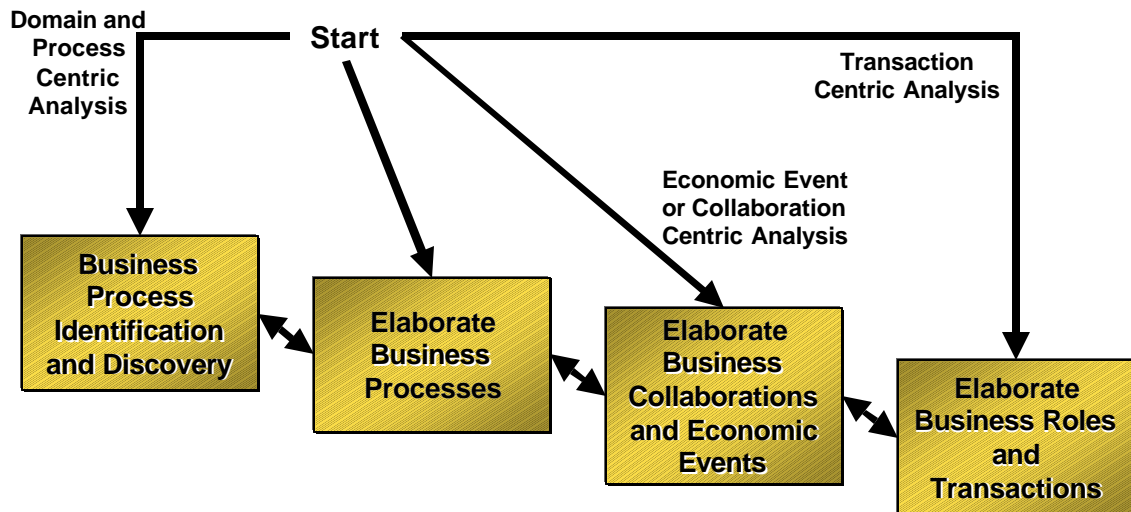
468

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

469

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

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



485

486 Figure 8.4-4. Analyze Business Process Activities

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

493 Once the analysis is complete and the business processes and documents have been full defined and
 494 developed, the specifications SHOULD be registered in a Business Library, e.g., an ebXML Registry.
 495 A Business Library can be either generic or business domain specific. A business library is a repository
 496 of business process specifications and business information objects within an industry or shared by
 497 multiple industries. There will be many business libraries, public and private, moderated and non-
 498 moderated. A public library is one that is available for public access. Typically the content of these will

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.

499 be owned by standard's efforts, such as ebXML or UN/EDIFACT, and large electronic communities
500 (such as automotive marketplaces). A private library is one that does not have public access. These
501 are for private exchanges where the participating parties do not wish to disclose the nature of their
502 business processes. Obviously, the public access business libraries will be the most useful in
503 promoting interoperability between trading partners in different electronic communities. For example, it
504 MAY be necessary for the e-business systems of a trading partner in the automotive community to
505 access business processes registered in a chemical community.

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

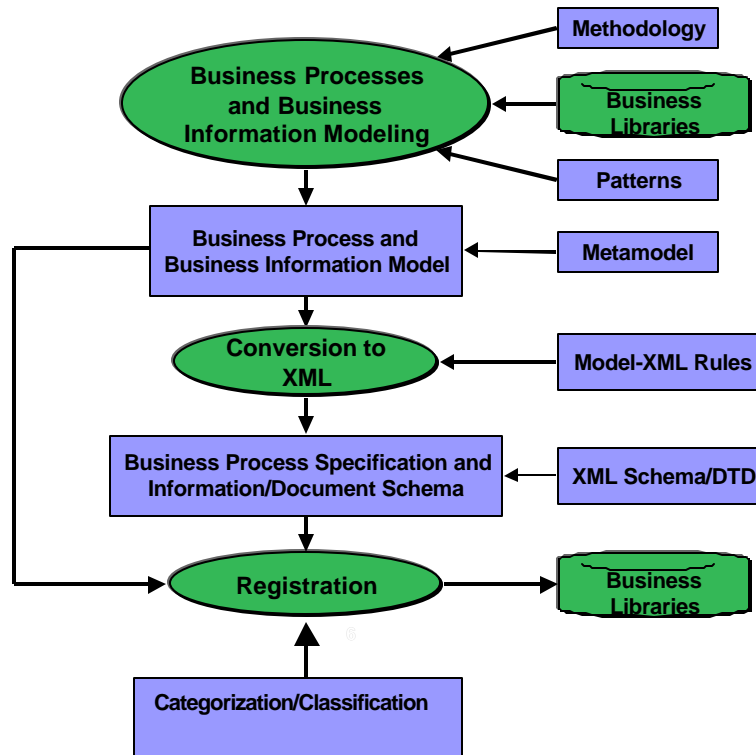
520 The format in which these specifications are stored is an important consideration, as the key to an
521 enterprise's ability to utilize these specifications in their analysis process is that they are stored in a
522 format that is interoperable with business modeling tools. It would appear RDF offers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

535
536

536

A summary of the entire analysis effort and its results is shown in

537 Figure 8.4-5 below:



538

539

540

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

541

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

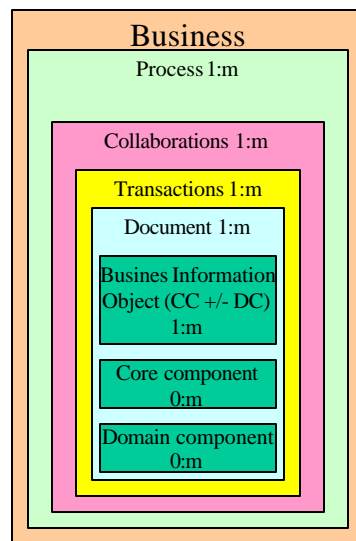
550

550 **9 Relationship Between Business Process and Core**
 551 **Components**

552 **9.1 Introduction**

553 As previously stated, business process models define how business processes are described and
 554 represent the “verbs” of electronic business. Information models define reusable components that can
 555 be applied in a standard way within a business context. Core Components and domain components
 556 represent the “nouns and adjectives” of electronic business. They are defined using identity items that
 557 are common across all businesses. This enables users to define data that is meaningful to their
 558 businesses while also maintaining interoperability with other business applications. Figure 9.1-1
 559 illustrates how reusable information components fit within a business process.

Components used in modeling a Business Scenario



560

561 Figure 9.1-1 Relationship between Business Process and Core Component

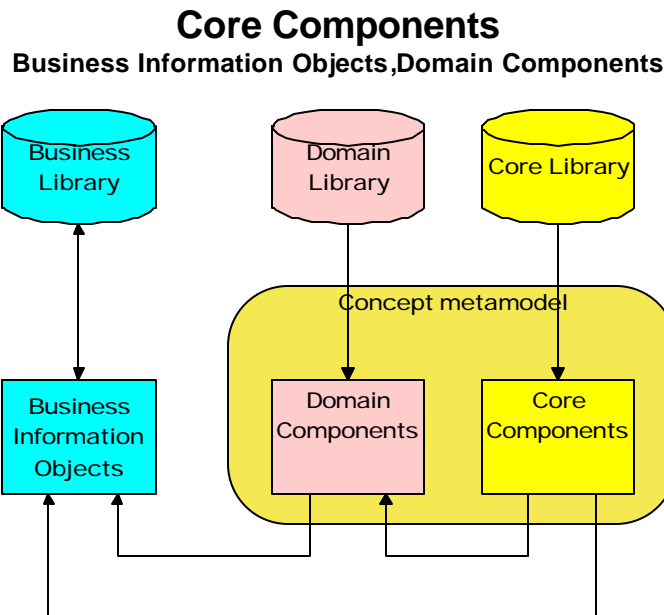
562 **9.2 Business Information Objects**

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

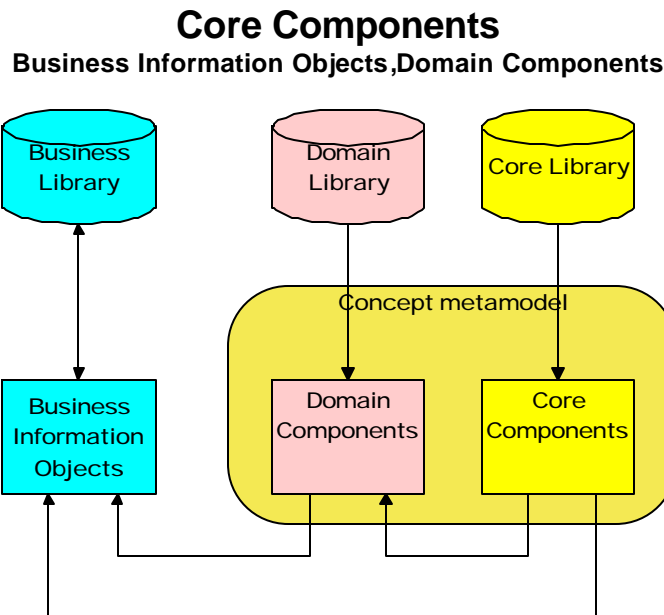
- 568 1. Search Business Library for REQUIRED attributes available in business information objects.

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

578 In summary, Figure 9.2.-1 illustrates that the primary sources for creating business documents in a
579 business process and information model are business information objects in a Business Library. The
580 secondary sources are domain components in business libraries and the core components in the Core
581 Library, when appropriate business information objects cannot be found. Until the Business Library is
582 constructed, or imported from a credible sources, core components are likely to be utilized frequently,
583 first to add to the repertoire of business information objects in the Business Library, and second, to
584 create business documents.



585



586 Figure 9.2-1 Composition of Business Information Object

587

588 **9.3 Core Components Analysis**

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

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

601 **9.4 Core Component Contextual Classification**

602 The *Meta Model* specifies the information to be captured when modeling a business process. The
 603 model contains a number of elements and attributes that are considered to be significant in effecting
 604 the interrelated conditions of the other elements in business process and document models. It is useful
 605 to understand this contextual dependency between the various model elements during the analysis

606 process. Furthermore, in the future, it MAY be possible to apply these contextual dependencies at
 607 runtime⁸.

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

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

614 Figure 9.4-1, Example Context Values

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

620 **9.5 Context and Common Business Processes**

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

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*.

631 *10 Analysis Aids: Worksheets and Tools*

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

638 **10.1 Analysis Worksheets and Guidelines**

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

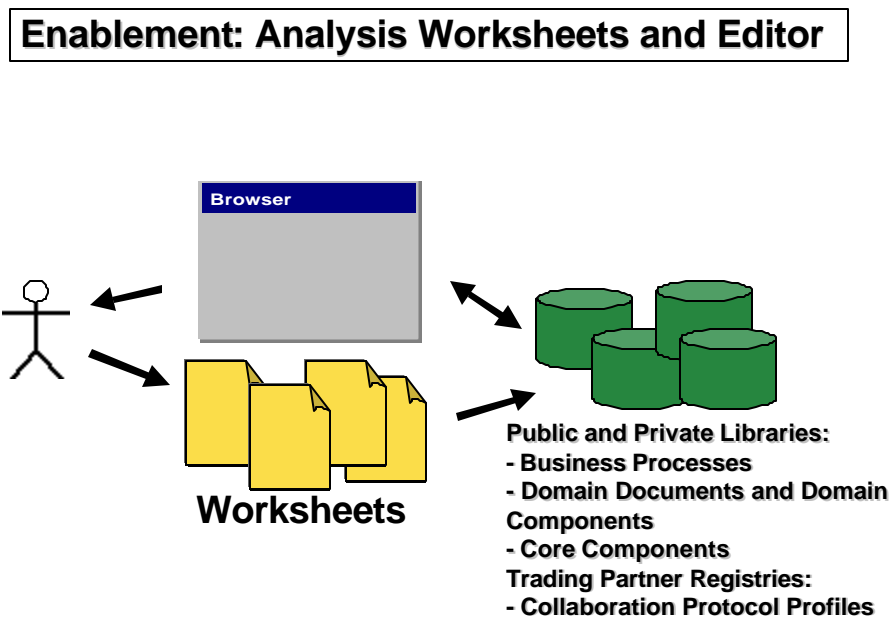
643

643 10.1.1 Analysis Worksheets and Editor

644 It is intended that a browser-based form will be used to build the worksheets. The user can populate
 645 the worksheets through searches of the business libraries (Registries/Repositories containing catalogs
 646 of business process specifications) for items that have already been defined. This is shown in Figure
 647 10.1.1-1. The items (e.g. business processes, business collaborations, document schemas, etc.) can
 648 be referenced (re-used as is) or copied to the worksheets and changed as needed. Over time,
 649 business process libraries will become populated with a sufficiently large number of business
 650 processes. When this happens, the analysis process will often be a simple matter of validating pre-
 651 defined business processes against requirements.

652

653



7

654 Figure 10.1.1-1, Business Process Analysis Worksheets Usage

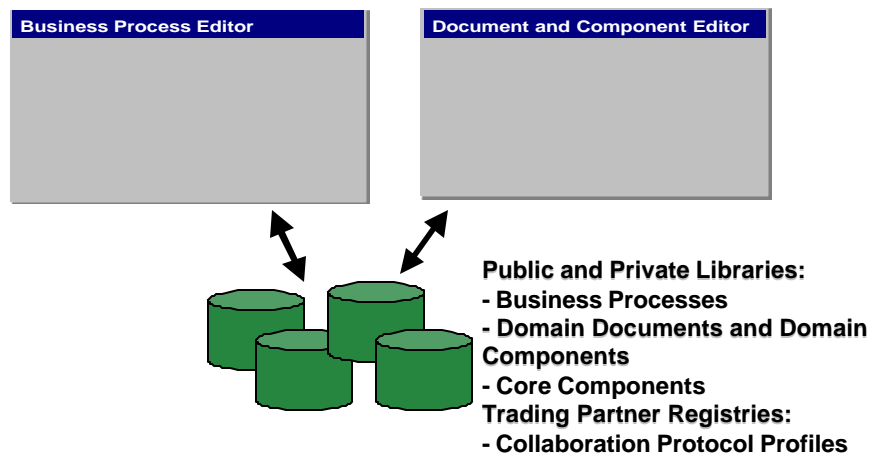
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656

656 10.1.2 Business Process Editor and Document Editor

657 The creation and maintenance of the Business Process Analysis Worksheets and Business Process
 658 and Component Modeling/Analysis are provided in a business person friendly manner by application
 659 tools like Business Process Editors and Document Component Editors. These tools provide an
 660 effective means for business process and information modeling since they can connect directly to
 661 business libraries and trading partner directories. See Figure 10.1.2-1. The tools will support discovery,
 662 user friendly forms-based modeling, business process and business information comparison,
 663 documentation and help on the analysis process, and capabilities for submitting specifications to
 664 controllers of the business libraries. Tool suites of business process editors, document & component
 665 editors, and CPP/CPA editors will be instrumental in enabling ebXML based e-commerce.

Business Process and Document Editor



666 Figure 10.1.2-1, Tool Interaction

667

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667

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12 Disclaimer

694

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

698

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717 **Appendix A: Context Category – Meta Model Cross-**
 718 **reference**

719 The following table cross-references Core Component's contextual categories with *Meta Model*
 720 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.	Hierarchical values 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. Domain and industry are not the same: an industry is a type of domain which is not necessarily industry specific.
Business Process	The business process enabled by the information exchange.	BusinessProcess	ebXML Catalog of Common Business Processes UN Industry Classes RosettaNet BPAWG (UN/Cefact process group) Business Process patterns	Hierarchical values. Cross-enterprise situations can be accommodated since Business Processes are defined in context of Trading Partner Types. Multiple values in a single context category is permitted.
Product	The goods or services that the exchange of information describes or enables	EconomicResource	UN/SPCP General Classifications from the UN and general classifications from domains.	Hierarchical values. Use standard classifications or define your own. The <i>Meta Model</i> permits this. It is likely that various industry forums will define these. The kind of product influences

Contextual Category	Definition	Meta Model Element	Sources of Resources	Comments
				the kind of product information.
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	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	A business purpose context	BOM		Business Purpose and domain MAY be defined and expressed by

Contextual Category	Definition	Meta Model Element	Sources of Resources	Comments
Purpose /Domain	purpose context unrelated to the business process. This is the "purpose" of the recipient(s) of the business information.			MAY be defined and scoped by the BOM categorization 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.		

721

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