Enhanced Telecom Operations Map® (eTOM)

The Business Process Framework

TeleManagement FORUM™

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Direct inquiries to the TM Forum office:
240 Headquarters Plaza,
East Tower – 10th Floor,
Morristown, NJ 07960 USA
Tel No. +1 973 944 5100
Fax No. +1 973 944 5110
TM Forum Web Page: www.tmforum.org

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Preface

eTOM Business Process Framework

The eTOM Business Process Framework is a reference framework for categorizing all the business activities that a service provider will use. This is done through definition of each area of business activity, in the form of process components or Process Elements that can be decomposed to expose progressive detail. These process elements can then be positioned within a model to show organizational, functional and other relationships, and can be combined within process flows that trace activity paths through the business.

The eTOM can serve as the blueprint for standardizing and categorizing business activities (or process elements) that will help set direction and the starting point for development and integration of Business and Operations Support Systems (BSS and OSS respectively). An important additional application for eTOM is that it helps to support and guide work by TM Forum members and others to develop NGOSS solutions. For service providers, it provides a Telco industry-standard reference point, when considering internal process reengineering needs, partnerships, alliances, and general working agreements with other providers. For suppliers, the eTOM framework outlines potential boundaries of process solutions, and the required functions, inputs, and outputs that must be supported by process solutions.

1. Introduction

While eTOM is the global de facto Business Process Framework at the Enterprise Level for the Telecommunications Industry, specific process frameworks and good practice guides have also been developed for use between enterprises in other industries. Examples include the Supply Chain Council, RosettaNet, Electronic Business XML (ebXML) process frameworks and the Balanced Scorecard.

This document is part of a set of documents showing how the frameworks and best practices developed and used by other industry sectors can be used together with the eTOM Business Process Framework to provide a richer and more complete Enterprise Business Process Framework.

The key business problem addressed by this document is to provide an answer to the question:

> 'What processes does an organization have to put in place in order to deliver automated Business to Business interfaces with its trading partners?'

The key business technical and business issue is:

> 'How to define the internal processes within an organizations' jurisdiction, and practically link them to public industry B2B processes defined by industry groups?'

This document introduces e-business, what it is, and the impact that its emergence is having on Service Providers.

A simple model is presented in Chapter 2 that helps clarify the main concepts that relate to e-business. Chapter 3 introduces some of the standardization related activities that have emerged in response to this phenomenon. Chapter 4 summarizes the main consideration in extending the eTOM Business Process Framework to support inter-enterprise integration using B2B.

2. The emergence of E-BUSINESS within the ICT Market

The application of the latest technologies is transforming access to information, which in turn is revolutionizing the ways enterprises can share the information, and can use it to interact with their customers and suppliers. This enhanced ability to share information is resetting customer expectations; and, as they experience and adapt to this new way of conducting business, with its improvements in both service and levels of control, they are becoming increasingly intolerant of enterprises that are incapable of delivering to these new standards.

In this new paradigm, success depends on creating new 'product offerings and experiences' in which customers see value. Value is now defined in terms of the whole customer experience including things such as fulfillment and repair times. Customers value one-stop shopping, selection choices, personalization of service, and the empowerment gained from self-service. The common denominator is making life easier, simpler and complete for the customer.

To meet and deliver against these new customer expectations, information-centric business designs have to be developed and investment in technology is required to support their implementation. Priorities include the need to integrate and share data with partners and suppliers to give both a better integration of the supply chain, and a unified approach to processes such as order entry, fulfillment delivery, support, and billing.

What is e-business?

E-business is understood as the interaction amongst business partners with the help of information technologies. It refers not only to buying and selling over the Internet (or other computer network), but also to servicing customers and collaborating with business partners.

The term e-business has often been interchanged with the term e-commerce. However, it is becoming increasingly accepted that the use of e-commerce should be restricted to referring to just the subset of web transactions (mainly business-to-consumer) which are used whilst buying and selling services and goods over the Internet.

An e-business enterprise is an enterprise that utilizes Internet and related technologies to compete effectively in its business space. The technologies enable it to act more efficiently and effectively by facilitating better customer interactions, streamlining interfaces with partners and suppliers and in general, improving the quality and competitiveness of their offerings.

E-business's can be characterized as communities of complementary enterprises linked together to create unique virtual business entities that are easy to re-configure in response to evolving customer needs. The central theme of e-business becomes the delivery of "value" by creating and utilizing end-to-end value streams that are based on an integrated and customer-centric technological foundation. Communities of complementary enterprises are tied by these streams and form an extended enterprise that is transparent to the customer.

A core focus for e-business is therefore on automating relationships between enterprises[1], in part, because relationships that were previously not possible, are now economically and technically feasible; but also because it also makes possible the streamlining and automation of the existing value network, resulting in significant productivity gains for all parties.

In this document value network represents the end-end set of processes and transactions, established between the various suppliers and partners, to create, deliver, bill and support the "product" offered to the customer.

Implications of e-business for Service Providers

As new technologies and markets emerge, enterprises have to adapt or die. Technologies affect customer needs, while customer needs influence business designs. As new business designs emerge, they affect processes. In turn processes influence customer expectation, and thus the demands on the next generation of technology.

In response to this new paradigm, it is imperative that enterprises integrate business activities, technology and processes. They must redefine the way in which they operate by using new technology-based business organizational designs and processes, creating new inter-enterprise processes, and integrating these with operational processes to support changing customer requirements. A Service Provider's business management team has to understand what can be enabled by the application of technology to their business processes and then realize a strategy that can underpin the indicated transition. Failure to do so will result in an inability to meet changing customer demands, offerings that lack in quality and perception of value by the customers, and ever increasing costs. Competition from more agile and efficient rivals will lead to the enterprise's demise.

The three principal reasons Service Providers must integrate e-business with traditional business processes are therefore:

- **Customer expectations** and the need to move to an approach that focuses on the management of Customer Relationships and the importance of improving customer retention and increasing the value customers attribute to the enterprise;

[1] These methods may also be used to form relationships between organizational units within an enterprise where distinct business roles are performed, such as occurs between retails and wholesale businesses of a regulated Service Provider.

- **Productivity gains** and the need to ensure that these can continue to be obtained; and
- **Provision of a broader range of products and services** to customers - this, for the Information and Communications Technology industry (more than almost any other industry) requires a focus on better collaboration between suppliers and partners and integration of the end-end processes.

The capabilities and performance requirements of the end-end processes required in an e-business environment are fundamentally different from those in a traditional business environment. An enterprise that is to transition successfully to e-business must determine the processes they implement based on criteria such as:

- Their relevance to their customers' needs;
- The contribution they make to providing an integrated and unique identity for the enterprise; and
- How critical they are to the enterprise's operational performance.

Other considerations that should influence process design include:

- Exceptions should be handled excellently. I.e. process problems are identified in real time, and actions to support the customer are taken real time;
- Business rules should be easily configured and applied automatically; and
- The ability to treat a process as an asset that can be assessed, replaced, and outsourced, as appropriate, to improve the operation of the enterprise.

How can a Service Provider migrate towards e-business?

There are several alternative approaches to implementing e-business:

- Some enterprises are managing e-business (and e-commerce) aspects within separate units;
- Some are overlaying e-business on traditional business operations; and
- Yet other enterprises are approaching e-business as a replacement of traditional business channels.

The most successful e-business enterprises integrate e-business and traditional business channels where cost, quality and profit can be best rationalized. This requires much more than just throwing together a set of web pages to front-end an enterprise, although integrating storefront and Web operations is clearly a key part of the model for some enterprises.

The integration of e-business and traditional business channels is the model that is judged most applicable to Information and Communications Service Providers.

Undertaking such integration is typically a substantial exercise. The use of systematic Business Process Frameworks as a basis for structuring the existing business processes (intra-enterprise integration) can have major benefits as it makes it easier to implement and deploy automated e-business channels for inter-enterprise integration.

A Conceptual Model for a Service Provider e-business

E-business involves increasingly complex networks of relationships.

Figure 2.1 depicts the sets of relationship groupings involved in a value network in the ICT industry. The value network must operate with the efficiency of a self-contained enterprise, which requires managing the value network as an end-end process rather than only from the perspective of a single enterprise. The model explicitly shows the use of the eTOM Business Process Framework by the Service Provider at its core. It is only shown here to simplify the figure and its presence is not intended to imply that its use by the Service Provider is prescribed, just that the Service Provider would probably benefit from its use. Likewise, it is not intended to preclude the use of the eTOM Business Process Framework by the other entities shown within the value network. These entities may or may not make use of the eTOM Business Process Framework.

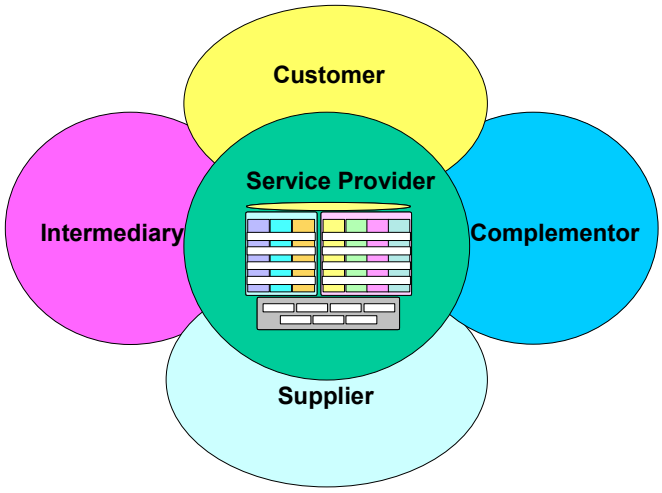


Figure 2.1 The Service Provider Conceptual Model for e-business

The roles of the entities shown in Figure 2.1 - the Service Provider Conceptual Model for e-business - are described below.

Customer

The **Customer** is responsible for ordering, using and (usually) paying for the Service Provider's products. The Customer may represent an end Customer, where the

product delivered by the value network is consumed, or a wholesale Customer that resells the product provided, usually with some added value. Depending on the Customer's activities, there may be a further refinement of this role as follows:

- The **Subscriber** role is responsible for concluding contracts for the Service Provider's products subscribed to and for paying for these products.
- The **End User** role makes use of the products.

Service Provider

The **Service Provider** presents an integrated view of their products to the Customer. It is responsible for the contractual interface with the Customer to sell products to the Customer, provide the Customer with contact and support, and bill the Customer for the products supplied. The Service Provider can deliver some or all of a product to the Customer itself, or it might subcontract out provision of parts, or even all, of the product to other service providers while maintaining the Customer-facing role of the one-stop shop. The Service Provider is responsible for acting on behalf of the value network that it represents in relationships with Intermediaries as well as with the Customer.

Complementor

The Complementary Provider extends the product provided by the Service Provider and offers additional capability that the Service Provider is not itself offering to the Customer, i.e. it complements the product being provided by the Service Provider and adds value to it, but is not essential for provision of the product itself. It could act, for instance, as a specialist Content Provider to a Service Provider that is operating a mobile phone service. The Complementary Provider is in a partnership with the Service Provider and can enhance the Service Provider's product to the Customer with its own products, thus making interactions with the Service Provider more attractive and convenient for the Customer. A business relationship between the Complementary Provider and the Customer may exist, depending on the nature of the product being provided and possibly on the business culture of the environment. Frequently, products offered by a Complementary Provider are co-branded.

Intermediary

The Intermediary supplies a service for a fee. For example, a localized selling function in a market where the Service Provider has a limited presence and/or understanding of, is a typical service provided by an intermediary. The service provided could be an information service enabling Customers to locate Service Providers most appropriate to their specific needs, or the provision of an environment in which providers can make their products known to Customers in an electronic marketplace or trading exchange (infomediary).

At a time of Internet globalization an Intermediary can play an important role as it can promote market transparency by overcoming the geographic constraints that used to limit knowledge about the products available. Functional intermediaries provide a specific function, such as selling, electronic payment or authentication.

Supplier

The supplier interacts with the Service Provider in providing hardware, software, solution and services, which are assembled by the Service Provider in order to deliver its solutions or services to the Customer. The Service Provider is bounded by its Suppliers' ability to deliver.

Note that individual enterprises can adopt multiple roles in different value networks and also multiple roles within a specific value network, e.g. one role as a retail Service Provider and another role as a wholesale Service Provider (often required by the regulator). For example a service provider may be the customer-facing service provider in one value network and a complementor or intermediary in another. In today's fast-moving marketplace, these relationships can be very short-lived compared with the more static relationships of the traditional telecommunications market.

3. Main B2B initiatives and concepts

The idea of automating inter-enterprise business processes is not a new concept. The EDI (Electronic Data Interchange) standard, which has its roots in the 1970's, represents the first generation of electronic business collaboration systems. Unfortunately it saw relatively limited adoption due to the complexity and cost of the software required to implement the standard.

Development of the Internet has brought new attempts at establishing e-business standards. One of the most successful is that of the RosettaNet consortium, formed in 1998, which provides open platform e-business standards in XML, allowing trading partners to exchange business information via the Internet. Originally the standard was designed for high-tech industry (IT and electronics), but the developed approach also started to serve as a model for other industries. The RosettaNet standards are being successfully implemented by a number of enterprises, e.g. Intel Corporation has been an early adopter of RosettaNet[2].

Another approach for standardizing e-business world was prepared under the auspices of UN/CEFACT and OASIS and was named ebXML. It provides the technical basis of B2B interfaces. ebXML inherited concepts from both EDI and RosettaNet, but so far has achieved only partial support from the industry. Annex A provides a more detailed overview of both RosettaNet and ebXML.

Web Services developed by World Wide Web Consortium (W3C) are one of the newest initiatives on e-business. They represent a request/response type of communication with no business process semantics.

There is an ongoing discussion on how ebXML and Web Services are related. Most experts claim that these technologies are complementary. The main strengths of ebXML are in inter-enterprise business process integration, while the main advantage of Web Services is in location-independent integration of request/response type message services.

The following sections present the main concepts and definitions developed by the initiatives mentioned above, which impact the approach that single enterprises using the eTOM Business Process Framework need to consider, when also implementing inter-business processes.

[2] In December 2002, Intel reported it processed about 10% of its purchasing volume (i.e. ca. 5 bln USD) with RosettaNet transactions [www.intel.com/pressroom/archive/releases/20021210comp.htm]

3.3. Shared public process

Work by RosettaNet and ebXML have developed the concept of a shared public process to describe the business process framework developed to support inter-business or multi-business processes.

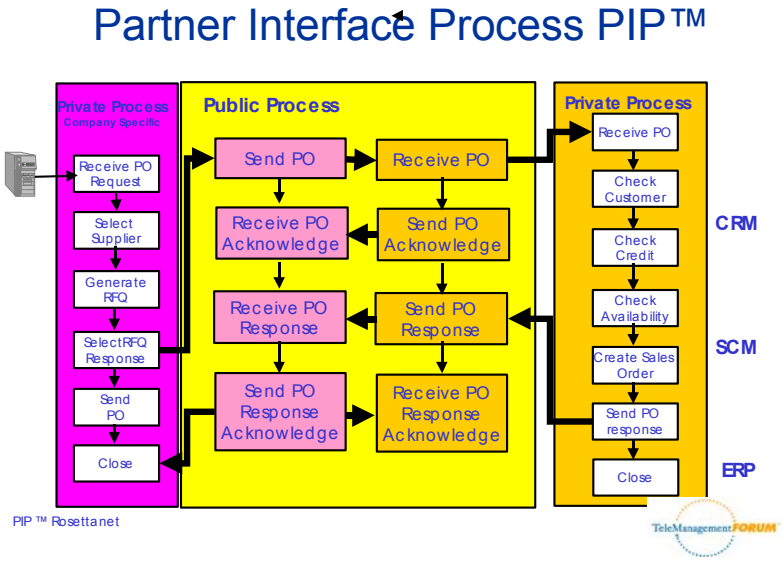


Figure 3.1 Concept of a public process

Figure 3.1 shows an example of a purchasing process. On the left side is a buyer that runs a set of private procurement processes, and on the right side is a seller that runs a set of private supply processes. In this definition, private is used in the context of processes operating within a single enterprise, and not made visible to other enterprises.

The buyer is concerned with selecting a supplier and prices, and the seller is concerned with selling and manufacturing products for supply (e.g. Supply Chain Management, Enterprise Resource Planning).

The public process comprises a set of standardized, published steps, known as Partner Interchange Processes (PIP™ RosettaNet), which both buyer and seller support. A specific collaborative agreement between a buyer and seller will specify the PIPs to be used (from amongst a large number circa 120 currently in the RosettaNet Business Operations Map) and the rules for sequencing them, sometimes known as choreography.

In this approach what is standardized are these small atomic process steps not the end-to-end process. The set of small process steps and their amalgamation to create an agreed end-end business process between a specific pair of trading parties are captured as part of a Collaboration Profile Agreement between the two parties. The concept can be extended to multiple parties.

3.4. 'Regulated' versus 'unregulated' B2B

An alternative approach to the shared process, which is sometimes referred to the 'regulated' approach, is the 'unregulated approach'. This approach is characterized by the nascent work on Web Services. The 'unregulated approach' focuses on very loose collaborations of individuals and enterprises where only weak agreements between trading parties are established. There is clearly going to be convergence in the technology of these two approaches.

3.4.1. B2B using Web pages

In the B2B world those solutions that are based on Web pages also fall in to the category of unregulated processes. The supplying party creates the Web page structure and input definitions, and the purchaser simply has to conform to that which is implemented by the supplier. Often there is no technical definition of the interface by the supplier. The problem with this technical approach is that it may be difficult for the purchasers to integrate with their automated internal processes since error conditions may not be declared; and non-functional specifications such as non-repudiation, and time to perform may also be absent; and behavior may be ambiguous, or undefined.

3.4.2. Call centers

The eTOM Business Process Framework uses examples of process interfaces to the suppliers and the customers in the form of process events such as 'the customer calls the operator to report a fault', 'the operator informs the customer that the fault has been cleared'.

These are also examples of unregulated processes since the operator's process is not shared with the customer, and the customer is not constrained to run a specific process with the operator e.g. only report the fault once.

3.5. RosettaNet Conceptual Model

RosettaNet has developed the general scoping model for B2B interfaces. It is presented in Figure 3.2.

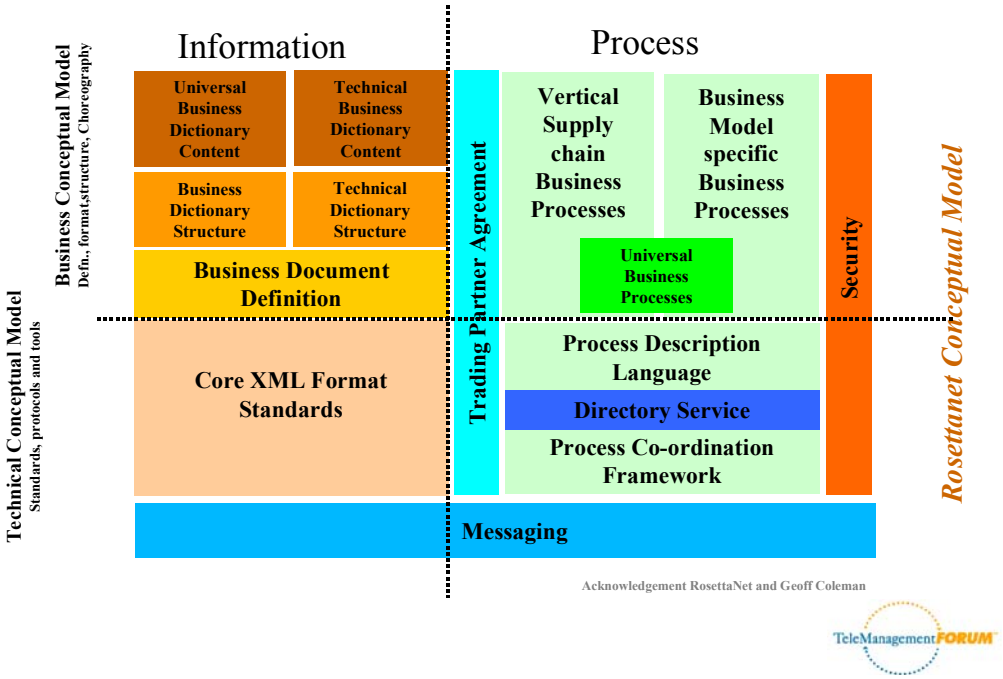


Figure 3.2 RosettaNet Conceptual Model

The RosettaNet Conceptual Model outlines the requirements for enterprises to conform to the definition of the public processes, for example those as defined by RosettaNet or ebXML. The model provides an overview of all the technical and business aspects that have to be agreed to specify an interoperable B2B interface. There are essentially four main Quadrants. The model is horizontally divided between the Technical and Business Conceptual Models, and vertically between Process and Information aspects.

The Technical Conceptual Models are largely the domain of integration activities such as NGOSS and are substantially based on work within the W3C Consortium.

From a TMF perspective the process aspects in the Business Conceptual Models are relevant to the eTOM Business Process Framework, and the Information aspects to the SID Models.

Both the Information and the Process aspects of the Business Conceptual Model are divided into what is called Horizontal or Universal industry, and Vertical industry aspects.

In the case of processes, Horizontal processes are the focus of ebXML and RosettaNet and address cross industry sector public processes such as ordering, order progression, invoicing catalogues and prices list exchange between enterprises.

The eTOM Business Process Framework has been developed as a complete process framework representing the set of processes used by Service Providers in

the ICT industry. It captures a high level view of the vertical processes required by the RosettaNet Conceptual Model as well as additional processes not yet contemplated in the RosettaNet Conceptual Model. ICT and Telecom vertical processes include Assurance – Repair Trouble Ticketing, SLA Management - and some aspects of billing such as real time hot billing, settlements, rebates, etc. It also captures high level perspectives of the horizontal processes which have traditionally been the focus of RosettaNet and ebXML. For instance the eTOM Business Process Framework was developed with the perspective that transaction occur between the Service Provider and external parties.

The challenge is to appropriately link the pre-defined eTOM Business Process Framework with the relevant aspects of the already identified RosettaNet horizontal processes and equivalent processes from other industry groups such as: ebXML/OASIS, TIPHON, ITU-T. Currently GB921C captures the likely sources of those horizontal and vertical processes that need to be linked into the eTOM Business Process Framework.

Other aspects covered by the RosettaNet Conceptual Model are reliable Messaging, Security and Trading Partner Agreements also known as Collaborative Partner Agreements (CPA).

The specific needs of Telecom vertical processes are discussed in more detail in the VC-MC Issues paper. [Ref 8]

ebXML what is it?

Introduction

The following section provides an overview of the ebXML Technical Architecture and the elements of immediate interest. A glossary of terms is at the end of the document. Much of the conceptual basis of ebXML has come from RosettaNet and OASIS.

Concept

Figure 3.3 outlines the concept behind forming e-business integrations.

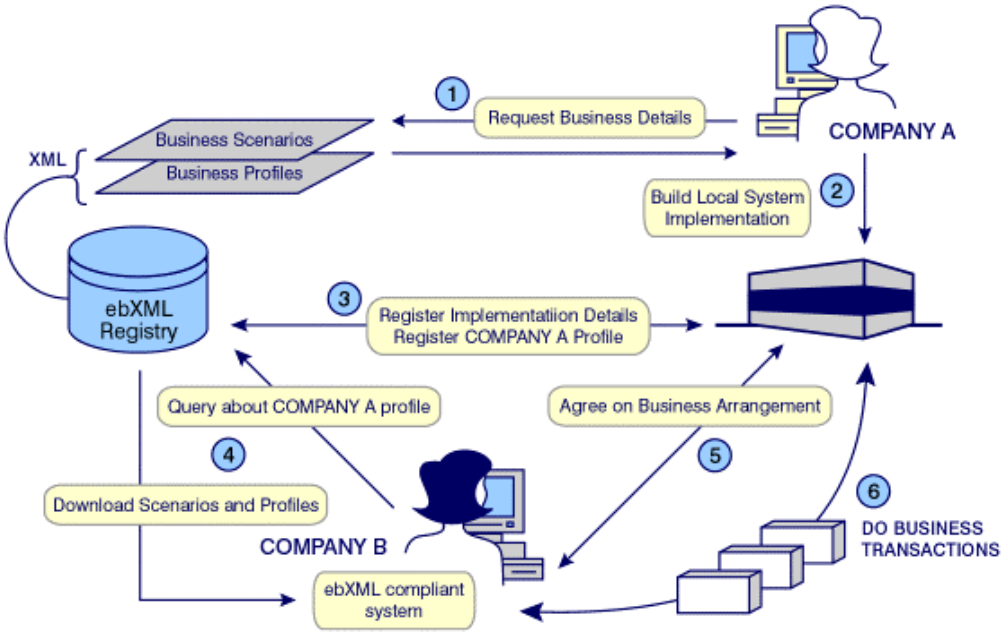


Figure 3.3 ebXML Concept

The notion is as follows:

1. Company A can request specifications of e-Business services offered by Company B and others
2. Company A builds their half of the e-Business interface and public process.
3. Company A registers their implementation
4. Company B acquires details of Company A's implementation
5. Company A and B form an agreement to trade via their respective interfaces
6. Enterprises commence exchange of business documents.

ebXML Technical Architecture

The elements of the ebXML technical architecture that facilitate this process are.

1. An ebXML Registry/ Repository based on an agreed information model and variety of services to manage data within registries.
2. A Business Process Specification Schema supporting the description of B2B public processes in a declarative fashion.
3. An information model for Collaboration Protocol Profiles and Agreements supporting the description of a trading partner's capabilities, and the role they play in B2B public processes, together with the forming of agreements between parties to participate in instances of such public processes.

4. A messaging service supporting the secure and reliable exchange of business documents between partners participating in such public processes.

ebXML Registry/Repository

The previous sections showed how organizations use the ebXML Repository. However there is an issue of how the Repository is created, and what content is contained within it.

ebXML has only partially addressed the requirements for content of the ebXML Repository:

Core Components: These are components, which appear in many different circumstances of business information and in many different areas of business. A core component is a common or "general" building block that basically can be used across several business sectors. It is therefore context free. It also represents a way to align the process development of the eTOM team, with the Information and Data modeling of the SID team.

Universal Business Library (UBL) that is organized around Business Message types such as Order, Order Response, Order Cancellation, Receipt Advice, Dispatch Advice, Invoice. These Business Transactions also record Business Information Entities (BIE) relevant to the UBL Business Transactions.

ebXML assumes that their core work will be extended to support vertical industry segments. However no specific arrangements have been put in place to achieve this goal.

In the IT and software industries RosettaNet has extended these definitions.

RosettaNet has defined a Business Operations Map categorizes that provides the taxonomy of Business Transactions.

Currently no equivalent of the RosettaNet Business Operations Map (BOM) has been created by the ICT industry.

Application Note GB921C provides an initial proposal for such an ICT B2B Business Operations Map. It is expected that this BOM will be adopted by either the TMF on behalf of the ICT industry or by means of some collaboration amongst industry organizations such as the TMF, RosettaNet, and ITU-T SG4 (Generic Telecom Data Dictionary).

Elements of Immediate Interest

The ebXML family of standards is designed to allow piecemeal implementation.

The standards of immediate appeal are:

1. ebXML Messaging Service as a means of transferring business documents (both XML and non-XML) securely over the Internet via https or SMTP.
2. The Business Process Specification Schema (BPSS) as a means of documenting Telecomm B2B public processes as a sequence of Business Transactions.
3. Core Components (CC) as a means of documenting Information related to Business Transactions and capturing the semantics of models, relations and data in a standardised and agreed way.

What does eTOM need to address?

The eTOM Business Process Framework has been extended to explicitly identify the processes required to link to an externally-oriented inter-enterprise process framework that is a sound basis for understanding e-business oriented organizational structures and which facilitates transitions from, or extensions of, existing Business channel structures towards those that embrace e-business.

In order to meet these goals, the eTOM Business Process Framework extensions at Level 3 specifically address the inter-enterprise trading B2B relationships. The approach more explicitly recognizes the notion of a public process, a concept used within the existing work of RosettaNet and the UN CEFACT ebXML. This provides a sound conceptual and technical basis for automating the inter-enterprise interfaces.

The following section describes how the eTOM Business Process Framework can be extended to support e-business based on the principle of Public Processes. Part of this requires extension of the eTOM Business Process Framework to support all the process flows described in Fig 3.3, and agreement on the content of the ebXML Repository to be used in conjunction with these extensions of the eTOM. The current candidates for the content of this repository is called the eTOM Public B2B Business Operations Map and is documented in GB921C [Ref 9]. Currently there is a mismatch between the level of detail needed for the ebXML repository and the eTOM L3 analysis. The B2B Business Operation Map provides the lowest level transaction detail at around level 5/6 of the eTOM and is documented separately in this version. Integration with the main eTOM GB921 D should be possible once the eTOM level 4 CIM and S/PIM detail has been completed.

Chapter 4 describes these extensions to the eTOM Business Process Framework and analyzes the linkages between them and other work in the industry.

4. Extending ETOM for Business to Business Interactions

In the evolving ICT industry the traditional vertically integrated Telecomm industry structure is breaking down and being replaced by an arrangement of horizontal structured trading partners that supply competitive services to one another to form a 'Value Chain'.

De-regulation, a common trend across most of the developed world is requiring operators to open up their networks and provide a number of Wholesale products to others in the ICT value chain, including their own new bushiness units in these adjacent industries.

This brings the need to maintain the same levels of process efficiency and automation between enterprises as is being developed within a single organization. This, coupled with the regulatory pressure on interconnect prices, means that there is a strong and growing business case for automating B2B interfaces between enterprises to maintain efficiency, and lower costs for end customers.

The Value Chain Market Center document on 'Value Chain Issues facing the ICT industry' TR 128 [ref 8] has carried out an impact analysis of B2B trends on the TMF technical work including the eTOM Business Process Framework.

To operate end-to-end processes across multiple trading partners it is necessary to have a process design approach to combining and linking B2B public processes with the internal processes of co-operating trading partners.

Modeling Regulated B2B Processes between instances of the eTOM

The eTOM provides a process framework to describe and structure the scope of processes relevant to ICT organizations, including processes which extend beyond the enterprise organization boundary.

In the following diagram an example is shown of a set of ICT organizations operating a value chain amongst themselves for the supply of a service to a Customer. Each relationship between each ICT organization is in the form of a customer-supplier relationship.

The customer relationship in the Value Chain is provided by the S/PIM process group of the eTOM and the supplier relationship is support by the CIM process group of the eTOM. These are also referred in the literature on B2B as 'Buy Side' and 'Sell Side'

respectively. Underpinning these relationships is a B2B Environment that provides the B2B infrastructure such as those standardized by ebXML and RosettaNet.

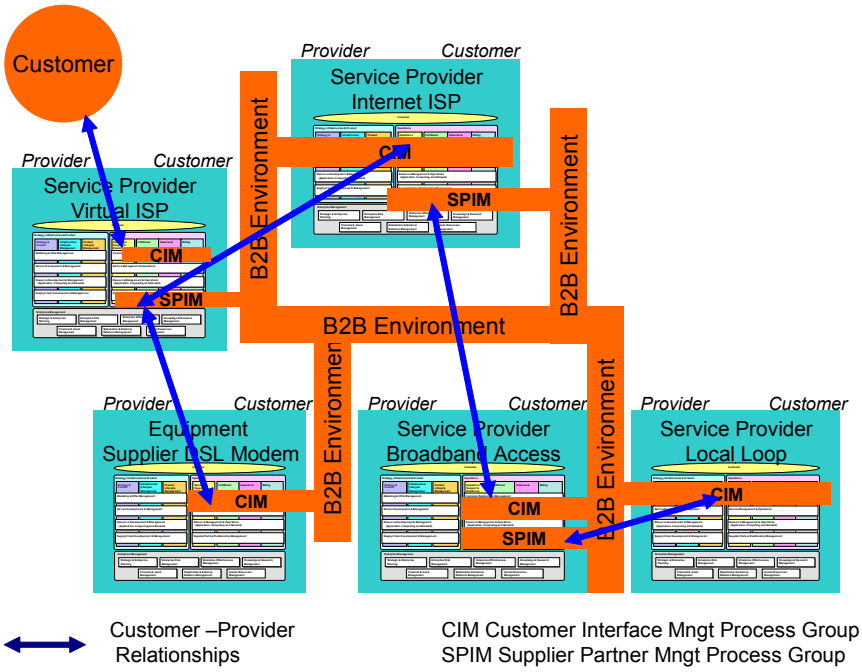


Figure 4.1 B2B Environment for modeling ICT Value Chain

For example a Broadband internet service might be provided by a combination of a virtual ISP, an actual Internet ISP with physical resources a Broadband Access provider and a metallic loop provider (Unbundled Local Loop –ULL).

Figure 4.1 more explicitly identifies the external process interactions by conceptualizing the two specific types of B2B interactions that an enterprise can engage in.. It captures in the upper limb the 'Sell' side of the B2B processes between the Service Provider and it's customers and in the lower limb the 'Buy' side of the B2B Processes between the Service Provider and it's suppliers. These interactions, depending on their specific nature, occur with either the Market & Offer Management/Customer Relationship Management horizontal process grouping in the case of customer or sell side interactions, or with the Supply Chain Development/Supplier/Partner Relationship Management horizontal process groupings in the case of supplier or buy side interactions

Normally, in regulated B2B, the definition of the detailed B2B process interactions and the B2B components are agreed by an industry process. In this case the ownership of the specific details of these B2B interactions is with the industry and not with either of two collaborating organizations. However in the case of the ICT industry, the TM Forum, through eTOM and SID developments, has gone a long way to defining the industry framework in which to define the specific content that would be used within the B2B interactions. A successful public B2B process definition for the ICT industry

thus requires strong collaboration between the public organizations and the TM Forum.

The detailed B2B process interactions follow six well defined Business Transaction Patterns (see Annex C) which require that in the context of a specific set of transactions that the customer and supplier on each end of the transaction operate in lockstep.

The B2B Environment contains all the elements described in the RosettaNet Conceptual Model and conceptually the registry/ repository aspects of ebXML. However the primary focus for this document will be on the process aspects defined in the RosettaNet Conceptual Model namely:

- Universal Business Processes
- Vertical Industry Processes

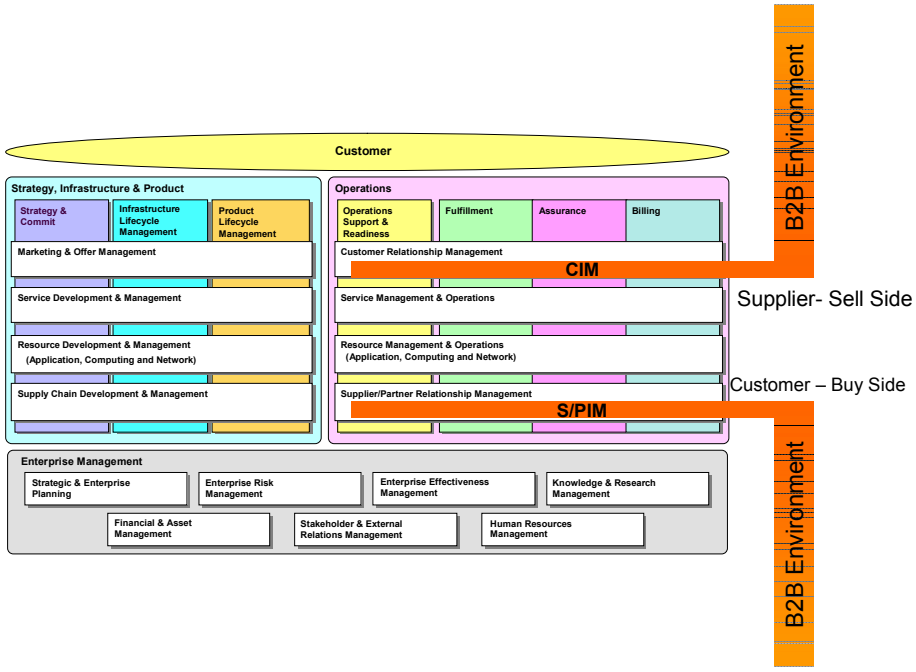


Figure 4.2 eTOM B2B Reference Model

Figure 4.2 shows the canonical model for regulated relationships in the eTOM. Each organization in the supply chain may support either the sell side or Buy side capability. In either case each is connected into the B2B Environment. However each Organization will establish relationships with other organizations – although there are examples of one organization trading between operating divisions using the same B2B mechanisms –such as when a licensed Network Operator has both Unregulated and Regulated business units where the Regulated business has to provide Equivalence of Access to all organizations.

eTOM extensions

Much of the conceptual basis for extending the eTOM Business Process Framework comes from integrating the frameworks used for B2B interactions, notably those based on the work of RosettaNet and the UN CEFACT ebXML groups, with the eTOM Business Process Framework.

B2B implies a certain structure and discipline in the way that B2B transactions are structured, defined and sequenced. Moreover, they focus solely on the processes between enterprises whereas the eTOM Business Process Framework to date has focused primarily upon the internal processes needed within a single enterprise, whilst recognizing the need to support external interactions within the single enterprise view.

Trading partners may or may not be using an internal process model based upon the e-TOM Business Process Framework, but this is not important for the development of successful end-end process interactions. Essentially the B2B public processes are synchronizing the internal processes of two different trading enterprises. A particular challenge for B2B is to maintain the integrity of the B2B public process between two badly behaved trading partner internal business processes/applications.

The eTOM Business Process Framework has been extended to explicitly recognize the process synchronization and external mediation required to allow an enterprise to participate in an external public process. Specifically both the Customer Interface Management and S/P Interface Management Level 2 process areas have been extended to include new Level 3 process elements which incorporate these new process requirements.

However, in order for the eTOM Business Process Framework to more fully support B2B transactions based on ebXML and RosettaNet Public Processes further extensions are required:.

- Further decomposition/extension of the eTOM may be required to ensure that the external interactions with the ebXML and RosettaNet public processes as indicated in shown in Fig 3.3 are fully supported; and
- Further definition and decomposition of existing eTOM process decompositions and extension of the SID will be required to identify the specific process and content detail required for the specific B2B interaction. This extension will need to be undertaken on an interaction type, i.e. ordering interaction, basis. There may be a specific tailoring required of the public process models and definitions held in the external repositories to facilitate trading within the ICT industry (given that these models and definitions were initially developed to support other industries). This tailoring of either the public definitions or of the way that the eTOM and SID are further defined and/or decomposed will need to be determined on a case by case basis.
- A potential extension is to develop an initial proposal of the content of the ebXML repository/ RosettaNet Business Operation

Map (BOM) relevant to the support of the eTOM Inter-Enterprise viewpoint. This would represent an extracted subset of the more fully developed eTOM Business Process Framework to expose those details that all parties to the B2B interaction need to be aware of, particularly those that have not adopted the eTOM Business Process Framework internally. It would also include the relevant low-level interaction/transactional detail, from public process frameworks such as RosettaNet or ebXML. In this document this is referred to as the eTOM Public B2B Business Operations Map (ePBOM).

As an example of the potential extensions required, in the ebXML there are a number of public processes supported and/or used by potential and actual Trading Partners to establish, and then use, the trading relationship. For those trading partners using the eTOM Business Process Framework, Table 4.1 indicates the parts of the eTOM Business Process Framework level 1 process groupings which would be responsible for the ebXML e-business Integration Process Steps described in Fig 3.3. Company A (Fig 3.3) is considered to be the 'Seller' and Company B the 'Buyer'. Note, however, that the actual interface for the exchange of the relevant messages would be through either the Customer Interface Management or S/P Interface Management processes.

The following table is a preliminary mapping based on V5.0 of GB 921 Addendum D

ebXML e-business Integration Process Steps (From Fig 3.3)	**eTOM Process Grouping supporting this function**
Request Business Details	For Company A: SIP: Marketing and Offer Management For Company B: SIP: Supply Chain Development and Management Note both of these retrieve content from the ebXML repository which in this context is the eTOM Public B2B Business Operations Map (ePBOM)
Build Local Implementation: Company A builds their half of the e-business interface and public process	Company A: SIP: Resource Development & Management, plus SIP: Infrastructure Lifecycle Management
Company A registers their	For Company A: Supply

implementation.	Chain Development & Management (SCD&M) Processes: Supply Chain Capability Delivery
Company B can request specifications of e-business services offered by Company A	Company B: Supply Chain Development & Management (SCD&M) Processes: Supply Chain Capability Delivery Company A: SIP: Marketing and Offer Management; Product Marketing Communication & Promotion
Company A and B form an agreement to trade via their respective interfaces	Company A: Marketing and Offer Management: Marketing Capability Delivery, and Supply Chain Development & Management: Supply Chain Capability Delivery Company B: Supply Chain Development & Management (SCD&M) Processes: Supply Chain Capability Delivery
Enterprises commence exchange of business documents.	Company A: Operations: CRM: Customer Interface Management (CIM) Company B: Operations: S/PRM: S/P Interface Management (SP IM)

Table 4.1 Mapping of ebXML Process Steps to eTOM Level 1 process groupings

The following figure of the eTOM Business Process Framework shows where B2B impacts the detailed eTOM Business Process Framework processes groupings.

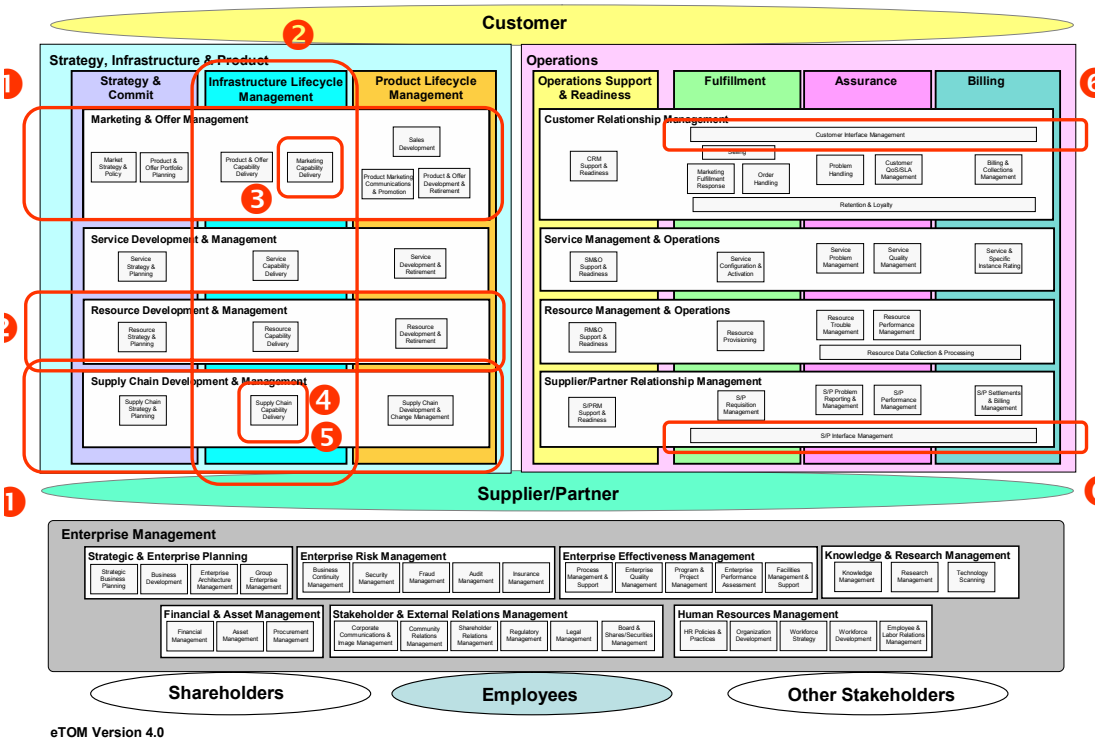


Figure 4.3 Mapping of ebXML Process Steps on eTOM Business Process Framework

The numbers that appear in Figure 4.3 refer to ebXML e-business Integration Process Steps of Table 4.1.

It can be seen that the main areas of responsibility for the ebXML Process Steps are in the SIP Area of eTOM v5.0 rather than the Operations Area. , However, all of the actual electronic exchange of information should occur through either the Customer Interface Management or S/P Interface Management processes in the Operations process area

eTOM Public B2B Business Operations Map

The ebXML RosettaNet model for Public Processes presumes the existence of a repository. Conceptually this repository is owned by an industry group. The Value Chain Market Centre 'Issues Facing players in the ICT industry' [Ref 8] has identified that the main industry libraries do not yet give adequate coverage of the B2B public processes needed for ICT.

B2B public processes have so far been based upon B2B standards being developed outside the TM Forum and are, therefore, partially under the design control of external authorities. This has mainly been driven by the lack of pre-existing industry frameworks which could be used as the basis of the B2B standards. In the ICT industry, significant progress has been made on agreeing a set of B2B frameworks. B2B standards therefore can be developed for the ICT industry using these frameworks as a starting point. The TM Forum, as the owner of these frameworks, therefore needs to be part of any public process development process.

This section proposes the development of a public eTOM B2B Business Operations Map that is the conceptual repository used for holding public B2B Business Transactions or PIPs.

The TMF in cooperation with other organizations might chose in the future to establish a role to develop and manage such a repository.

Relevance to B2B for the eTOM

The main areas relevant to the creation of an eTOM Public B2B BOM are the Process and Information areas of the RosettaNet Conceptual Model – see Figure 3.2.

In the RosettaNet Partner Interchange Process -PIPs™ - it is presumed that the technical framework is based upon the RosettaNet Implementation Framework (RNIF), and also that Business Documents and Public Processes are defined in each PIP.

ebXML is following the same conceptual ,model as RosettaNet but with some improvements.

Specifically:

- Business Process Specification Schema (BPSS) that describes how a multiparty multi-stage process can be decomposed into Business Transaction Activities that align with the RosettaNet PIP concept of an atomic process component;
- The Business Transaction Activities comply with six business transaction patterns that cover request reply and notification functions, with varying levels of non-repudiation, and reliability;
- The modeling of business documents is separated from the Business Transactions which allows existing e-commerce libraries to evolve e.g. CBL and OAGIS; and
- Recent work on Core Components and Assembly Documents are providing a flexible way of creating and extending business documents based upon fragments of specifications that are individually registered.

More information on ebXML and RosettaNet is contained in Annex A.

The eTOM Public B2B BOM would contain all the elements described in the RosettaNet Conceptual Model and conceptually the registry/ repository aspects of

ebXML. However the primary focus for this document will be on the process aspects namely:

- Universal Business Processes; and
- Vertical Industry Processes for the ICT industry.

eTOM Public B2B Business Operation Map (ePBOM)

In the main part of GB921 the concept of an external environment was introduced for establishing and operating inter organizational processes. The B2B External Environment is a specific form of inter-organizational processes that are based on the use of e-commerce methods and technologies. The RosettaNet Conceptual Model presented in section 3.3 describes all of the aspects that need to be addressed by the B2B External Environment.

The main focus for the eTOM Public B2B BOM is the Business Conceptual Model. The issues addressed in the RosettaNet Technical Conceptual Model, which focuses on technical matters such as XML specification languages, process specifications are not addressed in this document. The details of such topics are more appropriate to NGOSS.

B2B External Environment - Process components

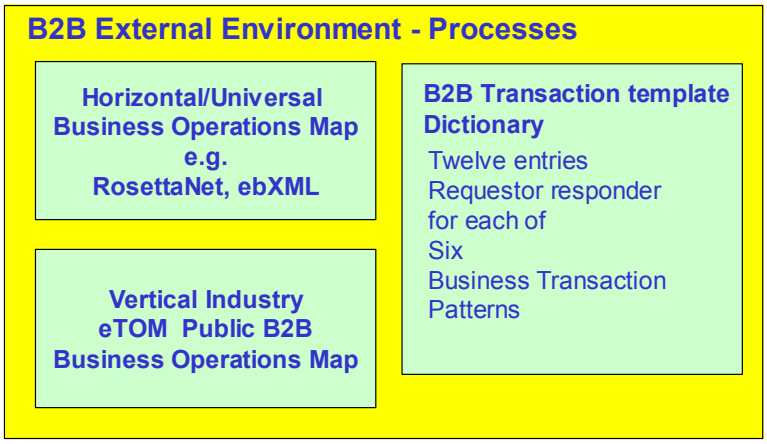


Figure 4.4 eTOM Public B2B BOM – Public Processes

Using the RosettaNet model there are three main process aspects that need to be captured and modeled in the public B2B External Environment.

- The B2B Transaction Pattern templates – RosettaNet and ebXML are both based on the definition of atomic Business Transactions.

These utilize six basic transaction patterns. As each Business Transaction Pattern has a supplier and a seller side this corresponds to 12 process templates.

- Horizontal /Universal Business Operations Map. This area has to provide a public process decomposition hierarchy for public process component / Business Transactions that are cross industry. The obvious approach in this area is to use the pre-existing RosettaNet and ebXML Business Operations Maps that cover mostly Ordering and Invoicing processes. Any detailed decomposition of the eTOM Business Process Framework in the ordering and invoicing areas should consider the use of the Rosettanet and OASIS decompositions if applicable.
- Vertical Industry Business Operations Map. This area has to provide an extract of the eTOM Business Process Framework which is required to support the .public process component / Business Transactions that are specific to the telecommunications and ICT industry: examples are Assurance Service Level Agreement Management and Billing (beyond simple invoicing). Many of the issues Identified by the VC_MC work are related to missing Vertical Industry public process components.

B2B Environment - Information Entities

Experience with Process modeling shows that it is also necessary to specify and document information entities at some level. This aligns with the RosettaNet experiences. The Information that needs to be specified includes:

- Horizontal /Universal Business Dictionaries, structure and content covering general business information, company identifiers, currency codes, country codes etc.
- Technical or Vertical Dictionary, structure and content covering ICT specific information such as telephone numbers, circuit Identifiers, locations, etc.

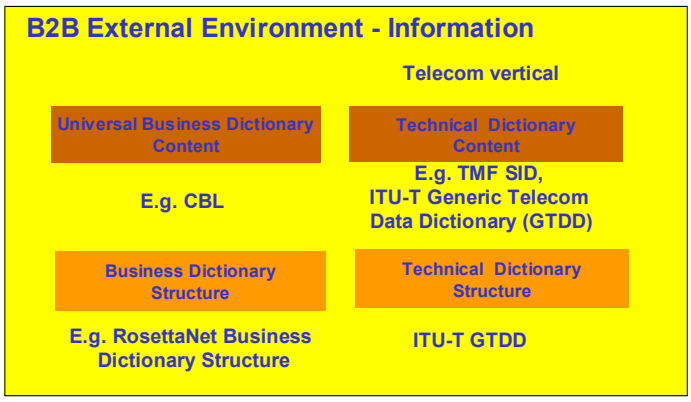


Figure 4.5 eTOM Public B2B BOM - Information

In these areas there are significant practical difficulties in making specific and concrete selections.

- For Horizontal /Universal dictionaries several commercial universal XML based dictionaries are in place, for example, the Commerce One Common Business Library (CBL) and work in the OAGIS group. For the moment ebXML has not produced a specific dictionary other than the definition of general trade terms in its parent organization UN CEFACT. It has not defined specific XML tags, which are important for interoperability.
- For Technical Dictionaries the work of RosettaNet has focused on the definitions in the fulfillment area with the well established needs of the IT and Electronics industry that also provides partial coverage of the ICT industry needs – specifically ordering and provisioning some physical equipment. What it does not cover are terms needed for ICT services such as interconnection point, locations designation and many other service related parameters.

These missing information definitions may be addressed by the ITU-T tML initiatives in Study Group 4. The ITU work on a Generic Telecom Data Dictionary GTDD is also relevant to the vertical Telecomm Dictionary structure.

The structuring and choice of the Dictionary structures is obviously dependent on the appropriate choices for Universal and Technical Dictionaries. However at this stage of the eTOM Public B2B BOM development these information aspects are secondary to the process aspects. The structuring and definitions of B2B information entities in the eTOM Public B2B BOM is not considered further at this time. It is expected that this will be addressed when the eTOM Public B2B Business Operations Map has been developed further.

The remainder of this chapter focuses solely on the process component aspects of the B2B External Environment.

RosettaNet Business Operations Map (BOM) Overview

RosettaNet has approved the structuring and organization of its process components-Partner Interchange Processes PIPs™ - using an arrangement called a Business Operation Map (BOM) which is conceptually identical to many of the eTOM Process Groupings and decompositions, except it has been produced specifically to support inter-enterprise process interactions. ebXML also uses the term BOM to classify process components.

The structure of this map is to divide the problem domain firstly into Clusters and then to divide Clusters into Segments that contain the PIPs. The purpose of the BOM is to provide a classification structure that can evolve and provide the basis for evolving the elementary process components.

{ ROSETTANET } BOM Clusters

- **Cluster 0: RosettaNet Support**
  - Provides administrative functionality.
- **Cluster 1: Partner Product and Service Review**
  - Allows information collection, maintenance and distribution for the development of trading-partner profiles and product-information subscriptions
- **Cluster 2: Product Information**
  - Enables distribution and periodic update of product and detailed design information, including product change notices and product technical specifications
- **Cluster 3: Order Management**
  - Supports full order management business area from price and delivery quoting through purchase order initiation, status reporting, and management. Order invoicing, payment and discrepancy notification also managed using this Cluster of processes.
- **Cluster 4: Inventory Management**
  - Enables inventory management, including collaboration, replenishment, price protection, reporting and allocation of constrained product
- **Cluster 5: Marketing Information Management**
  - Enables communication of marketing information, including campaign plans, lead information and design registration
- **Cluster 6: Service and Support**
  - Provides post-sales technical support, service warranty and asset management capabilities
- **Cluster 7: Manufacturing**
  - Enables the exchange of design, configuration, process, quality and other manufacturing floor information to support the "Virtual Manufacturing" environment

Figure 4.6 RosettaNet Business Operations Map - Clusters

RosettaNet defines eight clusters that cover a part of the eTOM Public B2B BOM process requirements.

Each Cluster is further subdivided into segments that enumerate the elementary process components (PIP™ and are equivalent to the ebXML Business Transaction Activities (BTA).). These Clusters correspond to eTOM Business Process Framework Level 1 processes

An example of the 3A segment of the Cluster 3 is shown below. The things to note are that the Cluster would support external B2B interactions with the Fulfillment Process Group of the eTOM Business Process Framework and also has the concept of covering the pre-order and order phases.

Cluster 3: Order Management

- Segment 3A: Quote and Order Entry

  Allows partners to exchange price and availability information, quotes, purchase orders and order status, and enables partners to send requested orders, or shopping carts, to other partners
  - PIP 3A1: Request Quote
  - PIP 3A2: Request Price and Availability
  - PIP 3A3: Request Shopping Cart Transfer
  - PIP 3A4: Request Purchase Order
  - PIP 3A5: Query Order Status
  - PIP 3A6: Distribute Order Status
  - PIP 3A7: Notify of Purchase Order Update
  - PIP 3A8: Request Purchase Order Change
  - PIP 3A9: Request Purchase Order Cancellation
  - PIP 3A10: Notify of Quote Acknowledgement
  - PIP 3A11: Notify of Authorization to Build
  - PIP 3A12: Notify of Authorization to Ship
  - PIP 3A13: Notify of Purchase Order (Information)
  - PIP 3A14: Distribute Planned Order

Figure 4.7 RosettaNet Business Operations Map – Cluster 3 Order Management

The RosettaNet BOM classifies the PIPs in a way that may or may not be convenient for users in the ICT industry. This means that if the RosettaNet public process components are adopted for the eTOM Public B2B BOM, and therefore ultimately need to be linked to the eTOM Business Process Framework, then some form of mapping between the RosettaNet public process components and the single enterprise version of the eTOM Business Process Framework is necessary.

Vertical Telecomm industry B2B Business Operations Map

At the present time there is no comprehensive ICT/ Telecom Business Operations Map. The work of the ITU- SG4 tML and GTDD activities, and national groups such as the ANSI T1 tML group and the UK Telco B2B Forum seem to be natural places for standardizing the vertical Telecomm industry B2B BOM. From the perspective of defining these public processes, the eTOM Business Process Framework can form a major contribution to this work.

eTOM Public B2B BOM-Level 0 Process Area

A major requirement is to develop a structure that allows the inclusion of public process hierarchy structures brought in from cross Industry groups such as

RosettaNet and ebXML AND to incorporate structures to support ICT/Telecomm Verticals.

A description of the RosettaNet Business Operations Map is included in Addendum C.

The proposal is to use the structure shown below to organize the eTOM Public B2B Business Operations Map (ePBOM):

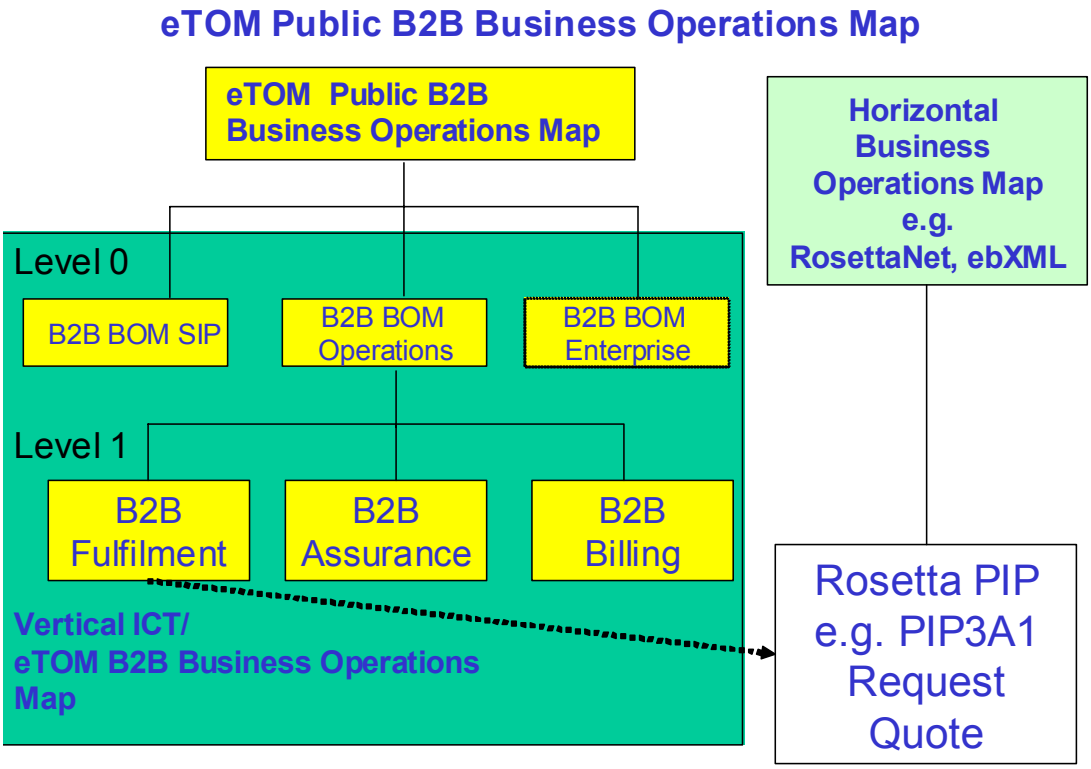


Figure 4.8 eTOM Public B2B Business Operations Map Level 0 and 1

This figure shows the eTOM Public B2B Business Operations Map (BOM) Level 0/Level 1 view. The eTOM Public B2B Business Operations Map Level 0 process is decomposed into three inter-organizational processes areas.

- Those associated with supporting the SIP Process Area;
- Those associated with supporting the Operations Process Area; and
- Those associated with supporting the Enterprise Management Process Area.

The rationale for this structure is that organizations wishing to define end to end process flows will find it easier to discover relevant B2B Business Transactions if they are organized in a way that can easily be related to eTOM Process Groupings.

Whilst the ePBOM is primarily concerned with vertical industry processes there is some overlap in the Fulfillment area with the industry horizontal BOMs such as RosettaNet. The figure shows an example of a RosettaNet PIP 3A4 being referenced by both the eTOM Public B2B BOM Fulfillment Process Grouping, and the RosettaNet net Cluster 3. Referencing these from the ePBOM makes the eBPOM a practically useful tool for organizations defining and developing automated B2B Processes.

The majority of the proposed eTOM Public B2B BOM Fulfillment Process Grouping will be aligned with the RosettaNet BOM. However concepts absent from RosettaNet such as the ANSI T1 / ITU-T Unified Ordering Model that divides ordering into pre-order, order and post order phases can be captured in the eTOM Public B2B BOM and reference the individual process components in RosettaNet Clusters.

Conceptually this simply means that the proposed eTOM Public B2B BOM (GB921C) needs to accommodate external classification schemes that are already in widespread use through the use of external references.

5. Summary

'What processes does an organization have to put in place in order to deliver automated Business to Business interfaces with its trading partners?' The answer to this question has been documented in section 4.2. This identifies the internal eTOM Process Groups where the internal processes have to be designed and developed to support public B2B processes, and automated interfaces. The concept of a public process has been described and the need for a public registry of process activities has been explained.

This document has provided the first analysis of the Process Grouping appropriate to support the creation of an extract of the eTOM Business Process Framework to be used as the basis for the eTOM Public B2B Business Operations Map. This work links into industry activities such as ebXML/OASIS, RosettaNet and other groups.

The detailed definition of the eTOM Public B2B Business Operations Map is likely to be developed in a set of specific Application Notes, pending the later full incorporation into GB921 Add D.

The level of analysis in this document together with appropriate Application Notes is sufficient to allow practical definition of end to end supply chain processes amongst trading organizations, some using the definition contained in the eTOM Public B2B Business Process Framework as a starting point for modeling; and some using proprietary or other internal process models.

The specifications in the B2B industry are evolving and this work is based on information available as of May 2003.

A specific issue that needs some care is that whilst RosettaNet has the most comprehensive set of specifications that they currently bundle specific choices of technical solutions e.g. RosettaNet Implementation Framework (RNIF) and specific document types to the process activities (PIPs).

The modeling of information for the ICT industry sector is a major challenge and this is likely to lead to an evolution from the RosettaNet mechanisms for capturing data dictionaries and different ways of structuring the business documents that are exchanged. RosettaNet itself is one of the leading partners for the evolution of these standards. The most notable is ebXML OASIS Content Assembly Mechanism (CAM) which will lead to more systematic ways of defining Business Documents that supports change management more efficiently.

Readers are strongly advised to track the most update materials from ebXML, RosettaNet, ITU-T and OASIS.

6. References

6.5.1. Referenced Organizations

Reference	Description	Brief Use Summary
RosettaNet	Consortium developing B2B solution for electronic trading in the IT and electronics industry www.RosettaNet.org	
VC-MC	Value Chain Issues facing the ICT Industry TR148 v0.5 June 2002 Member evaluation version	Describes the main issues and direction of B2B for telecom /ICT industry and does an initial impact analysis on the technical aspect of TMF work.
ebXML	Working group established under the UN CEFACT group responsible for developing XML based solutions for B2B www.ebXML.org www.ebtwg.org	

6.5.2. Citations

[1] http://b2b.ebizq.net/ebiz_integration/jenz_1.html Achieving BPM: Two Approaches, Two Sets of standards, Dieter Jenz

[2] www.RosettaNet.org

[3] www.ebxml.org and www.ebtwg.org

[4] TeleManagement Forum Enhanced Telecomm Operations Map GB921 v3

[5] Use Case p158 Object Oriented Analysis and Design Grady Booch ISBN 0-805305340-2

[6] BT/ATT/CONCERT Alliance Common Information Model Version 3.1 Helen Hepburn, Paul Muschamp

[7] TeleManagement Forum Shared Information /Data (SID) Model GB922 multi part document www.tmforum.org

[8] Value Chain Issues facing the ICT Industry TR148 v0.5 June 2002 Member evaluation version

ANNEX A: OVERVIEW OF ROSETTANET AND EBXML

A.1 Concepts

RosettaNet and ebXML both have the concept of atomic elementary process components. In both cases these atomic processes component comply with six transaction patterns.

ebXML also addresses the coordination of these atomic processes amongst multiple trading partners.

A.2 Defining public processes

RosettaNet has developed a model for defining public processes between trading partners based on defining atomic process components called Partner Interchange Processes PIP™ . End to end processes are form by sequencing these atomic process components.

ebXML (electronic Business extensible Mark-up Language) has adopted this concept and has made a number of changes to terminology but basically following the same conceptual model for forming end-to-end B2B processes.

RosettaNet PIPs are a tightly coupled package as they define:

- The message transport (RNIF);
- The business transaction patterns;
- The non functional aspects: non repudiation, time to perform;
- The XML message structures using Document Type Definitions (DTDs); and
- The business dictionaries and technical dictionaries for the IT and software industries.

ebXML captures the essential business transactions but allows more flexibility in the following areas

- Use of XML Schemas;
- Multiple libraries for Universal processes and business dictionaries; and
- Technical dictionaries for multiple industry sectors.

Current work is codifying a scheme for assembling business documents from predefined assemblies that will create a more structured and re-useable business document format than RosettaNet PIPs. This work is carried out with OAGIS under the title Content Assembly Mechanism (CAM).

A.3 The B2B Transaction Patterns

The six transaction patterns are:

Business Transaction (Commercial Transaction):
implies a contract formation process between two business partners.

Request/Response:
Used to obtain dynamic information i.e. information that the responding partner has that requires a complex, inter-dependent set of results. An example might be to get a quote.

Request/Confirm:
Used to get status information on some business activity, for example to get the status of an order that was placed earlier. It may require manual intervention to process the request and require long time than query response.

Query/Response:
Used to directly obtain (automatically) static information that the responding partner has, probably in a database. An example might be to get a catalogue.

Information Distribution:
Used to informally pass information from the requesting partner to the responding partner and therefore has no non-repudiation requirements.

Notification:
As for Information Distribution but no business response is expected, but a delivery receipt must be returned.

A.4 Binary Collaborations

In practical e-business situations B2B involves the exchange of Business Documents amongst multiple trading partners. Three issues have to be addressed:

- Decomposition of multiparty trading arrangement into a set of bilateral trading arrangements;
- Describing the coordination of the Business Transactions amongst the trading partners; and
- Describing the coordination and the sequencing of Business Transactions for a single Binary Collaboration between two trading partners.

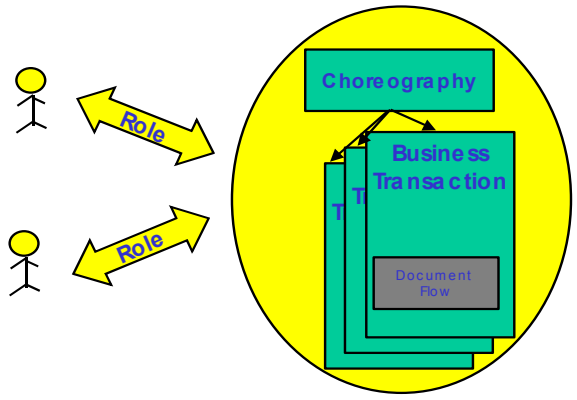


Figure A. 1 BPSS Model Business Transactions

BPSS focused on the relationship of a pair of trading roles supported by Business Transactions that are implemented by the exchange of documents and sequenced using a choreography.

The method for handling complex multiparty collaborations in ebXML is illustrated below:

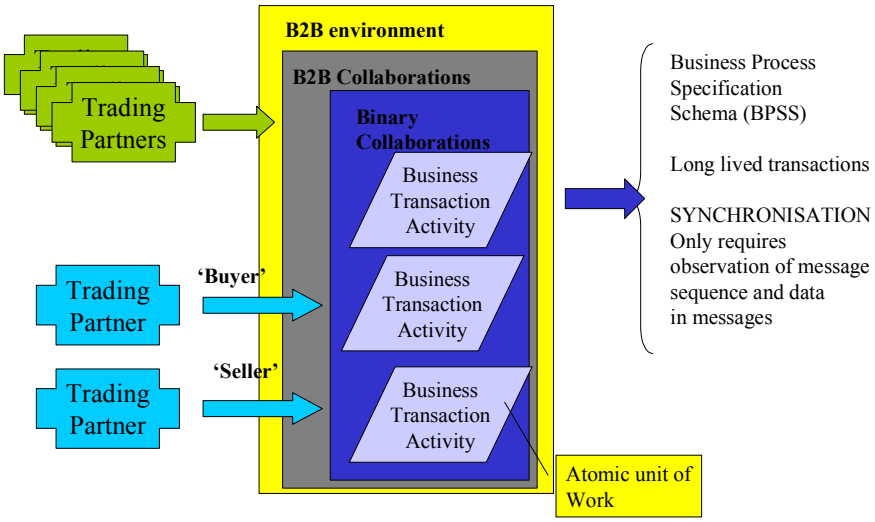


Figure A. 2 From multipart Collaborations to Business Transactions

This diagram shows that part of the B2B environment is about B2B collaborations amongst multiple Trading Partners. The BPSS specification allows these multiparty collaborations to be expressed as a series of binary collaborations between pairs of trading partners operating in a Buyer and Seller roles respectively, together with a definition of the choreography. The Binary Business Collaborations are further divided into Business Transaction Activities that are the atomic unit of work and correspond to the concept of a PIP in RosettaNet.

Note Business Transaction Activity is the formally defined name in BPSS but often the informal name Business Transaction is used in the descriptions.

A.5 General structure of a Business Transaction

There is a concept in ebXML and RosettaNet of business signals that are distinct from document flows.

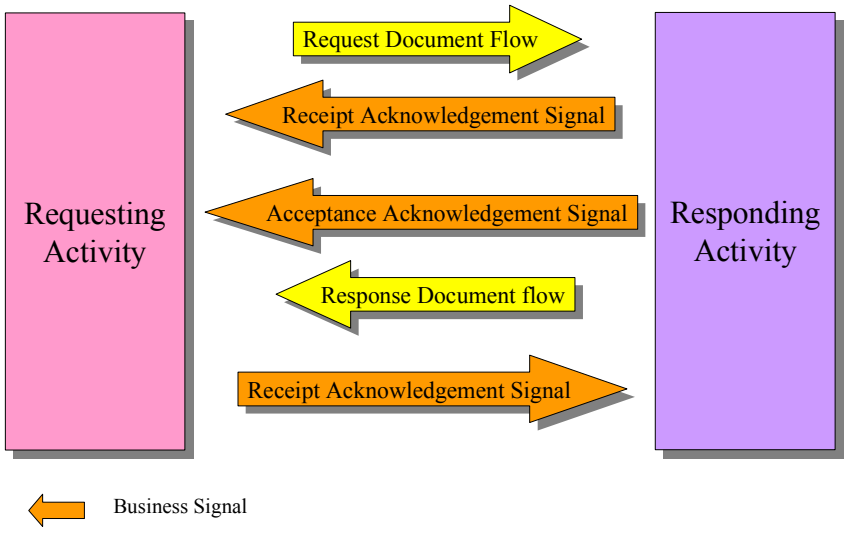


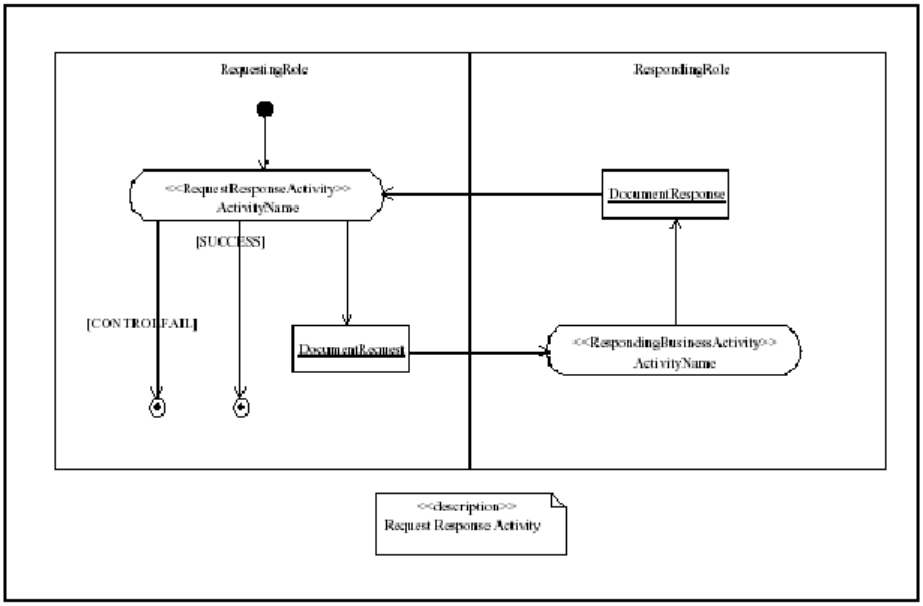
Figure A. 3 Business Documents and Business Signals

Business signals are application level documents that 'signal' the current state of the business transaction. These business signals have specific business purpose and are separate from lower protocol and transport signals.

The example above shows a simple exchange of a business document and a response such as an Order Request and an Order Confirmation document containing additional information such as order reference appointment times, etc. In addition to the Business Documents, three Business Signals are defined that are used to ensure that the state of the transaction is synchronized between requesting and responding activities in the buy and seller enterprises.

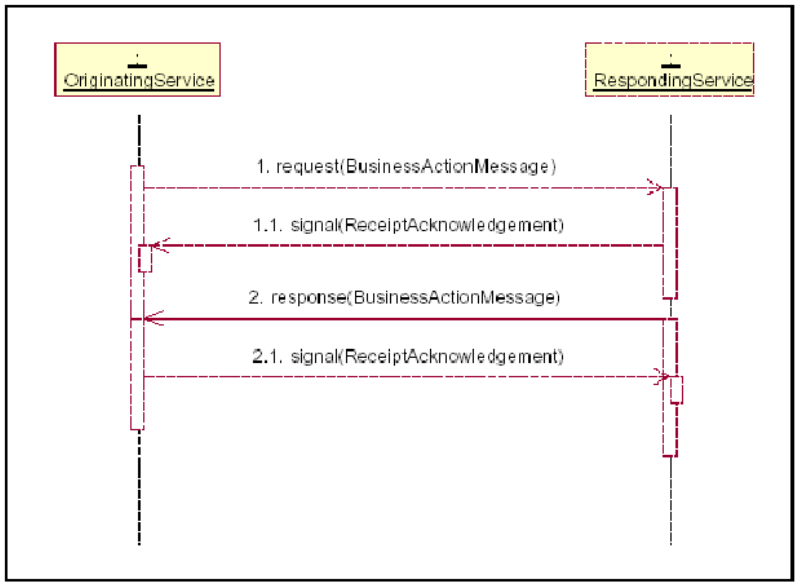
The structures of ebXML Business Signals are 'universal' and do not vary from transaction to transaction. They are defined as part of the ebXML *Business Process Specification Schema*. (www.ebxml.org ebBPSS.doc).

A.6 Example Transaction Pattern – Request Response

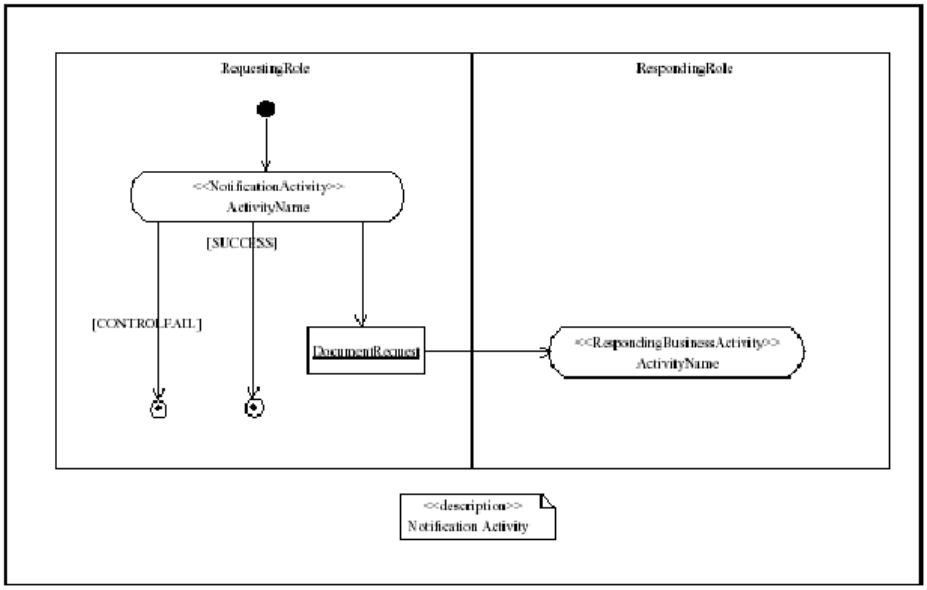


This pattern is different to the query/response pattern in that it is used to obtain dynamic information i.e. information that the responding partner has that requires a complex, interdependent set of results. An example might be to get a quote. This pattern requires some business processing by the responding partner before a result can be returned, which may include manual intervention. It has similar constraints on transaction properties to the query/response pattern, except that it optionally has non-repudiation requirements. The pattern does not imply any contractual obligations.

A.7 Message Flows



A.8 Example Transaction Pattern – Notification



This pattern is used to formally pass information from the requesting partner to the responding partner and therefore has non-repudiation requirements. No business response is expected, but a delivery receipt must be returned.

ANNEX B: B2B TERMINOLOGY USED IN THIS DOCUMENT

This section identifies the important terms, abbreviations and acronyms relevant to this document. The main GB921 document contains general terminology and acronyms.

B.1 RosettaNet and ebXML terms

The following terms are used:

ebXML

A family of B2B repository, modeling and messaging standards defined by UN/CEFACT in conjunction with OASIS.

Source: ebXML

ebXML Messaging Service

A SOAP based protocol for the reliable exchange of Business Messages containing Business Documents.

Source: ebXML

Business Processes

Activities that a business can engage in (and for which it would generally want one or more partners). A Business Process is formally recorded in XML form conforming to the Business Process Specification Schema but may also be modeled in UML.

Source: ebXML

Business Process Specification Schema

A schema defined to allow the exchange of business process information between partners in XML form. The BPSS information model is derived from the notions of the UN/CEFACT Modeling Method for modeling B2B business processes.

Source: ebXML

Collaboration - BPSS

A business process enacted between two or more business partners fulfilling particular roles. Collaborations can be binary (two partners) or multiparty (more than two partners).

Collaborations can also be nested.

The lowest level of collaboration is comprised of Business Transaction Activities (process steps involving the exchange of one or two Business Documents).

Collaboration Protocol Profile (CPP)

A profile filed with a Registry by a business wishing to engage in ebXML transactions. The CPP will specify some Business Processes of the business, as well as some Business Service Interfaces it supports.

Source: ebXML

Collaboration Protocol Agreement (CPA)

In essence, a contract between two or more enterprises that can be derived automatically from the CPPs of the respective enterprises. If a CPP says "I can do X," a CPA says "We will do X together."

Source: ebXML

Business Partner Role - BPSS

A role to be fulfilled by one of the partners in executing Business Collaboration.

Source: ebXML

Business Transaction Activity-BPSS

A process step within a Business Collaboration

Source: ebXML

Business Transaction - BPSS

A reusable exchange of business documents invoked by one or more Business Transaction Activities.

Source: ebXML

Business Document - BPSS

A document exchanged between one Role and another within a Business Transaction.

Business Messages

The actual information communicated as part of a business transaction. A message will contain multiple layers. At the outside layer, an actual communication protocol must be used (such as HTTP or SMTP). SOAP is an ebXML recommendation as an envelope for a message "payload." (Business Documents). Other layers may deal with encryption or authentication.

Source: ebXML

Registry

A central server that stores a variety of data necessary to make ebXML work. Amongst the information a Registry makes available in XML form are:

Business Process & Information Meta Models, Core Library, Collaboration Protocol Profiles, and Business Library.

Basically, when a business wants to start an ebXML relationship with another business, it queries a Registry in order to locate a suitable partner and to find information about requirements for dealing with that partner.

Source: ebXML

B.2 General e-Business Terminology

Definitions are provided here for common terms concerning Business processes and the activities occurring within them. Common terminology makes it easier for Service Providers to communicate with their Customers, Suppliers and Partners.

For the eTOM documentation to be understood and used effectively, it is essential that the wording listed here be interpreted using the meanings provided, rather than common usage or specific usage.

Complementary Provider

The Complementary Provider provides additional products and services to extend the attractiveness of an enterprise's products and services and scope of its value network. Frequently, these products and services are co-branded.

Customer

The Customer buys products and services from the Enterprise or receives free offers or services. A Customer may be a person or a business.

e-business

e-business includes the Internet presence and buy and sell transaction over digital media of e-commerce. It also includes the integration of front- and back-office processes and applications to provide support and bill for the product or service. For eTOM it is even more expansive. e-business is the integration of traditional business models and approaches with e-business opportunities.

e-commerce

e-commerce is Internet presence and business buying and selling transactions over digital media.

End User

The **End User** is the actual user of the Products or Services offered by the Enterprise. The end user consumes the product or service. See also Subscriber below.

Enterprise

Enterprise is used to refer to the overall business, corporation or firm, which is using eTOM for modeling its business processes. The enterprise is responsible for delivering products and services to the Customer. It is assumed that the enterprise is an Information or Communications Service Provider (see ICSP explanation below).

Entity

Entity, is used to mean a person, a business, technology, etc. with which a process interacts. The Customer is the most important Entity. The Enterprise Management processes interact with Government, Regulators, Competitors, Media, Shareholders, the Public, Unions and Lobby groups. The Supplier and Partner Management Processes interact with Dealers, Retailers, Partners, Brokers, Third-Party Providers, Complementary Provider, Financial Provider, Service Suppliers, and Material Suppliers.

Intermediary

Within the Value Network, the Intermediary performs a function on behalf of the Enterprise that is a part of the Enterprise's operational requirements. Intermediaries provide products and services that the enterprise either cannot provide itself or chooses not to due to cost and quality considerations. There are typically three categories of intermediaries: sales, fulfillment, and information and communication.

Offer

An offer is an aggregation or bundling of Products or Services for sale to a Customer.

Outsourcing

Outsourcing is when an enterprise contracts out one or more of its internal processes and/or functions out to an outside company. Outsourcing moves enterprise resources to an outside enterprise and keeping a retained capability to manage the relationship with the outsourced processes.

Out-tasking

Out-tasking is when an enterprise contracts with outside enterprise to provide a process, function or capability without transfer of resource. The enterprise begins using the other enterprise's capabilities directly and electronically.

Partner

A Partner has a stronger profit and risk-sharing component in their Business Agreement with the Enterprise, than a Supplier would have. A Partner generally is more visible to the Enterprise's customer than a Supplier would be. A partner might be part of an alliance, a joint service offering, etc.

Process

A Process describes a systematic, sequenced set of functional activities that deliver a specified result. In other words, a Process is a sequence of related activities or tasks required to deliver results or outputs.

Product

Product is what an entity (supplier) offers or provides to another entity (customer). Product may include service, processed material, software or hardware or any combination thereof. A product may be tangible (e.g. goods) or intangible (e.g. concepts) or a combination thereof. However, a product ALWAYS includes a service component.

Resource

Resources represent physical and non-physical components used to construct Services. They are drawn from the Application, Computing and Network domains, and include, for example, Network Elements, software, IT systems, and technology components.

Service

Services are developed by a Service Provider for sale within Products. The same service may be included in multiple products, packaged differently, with different pricing, etc.

Service Provider (SP)

See under Information and Communications Service Provider (ICSP)

Subscriber

The Subscriber is responsible for concluding contracts for the services subscribed to and for paying for these services.

Supplier

Suppliers interact with the Enterprise in providing goods and services, which are assembled by the Enterprise in order to deliver its products and services to the Customer.

Supply Chain

'Supply Chain' refers to entities and processes (external to the Enterprise) that are used to supply goods and services needed to deliver products and services to customers.

Third Party Service Provider

The **Third Party Service Provider** provides services to the Enterprise for integration or bundling as an offer from the enterprise to the Customer. Third party service providers are part of an enterprise's seamless offer. In contrast, a complementary

service provider is visible in the offer to the enterprise's customer, including having customer interaction.

User

See End User above.

Value Network

The enterprise as the hub a value network is a key concept of e-business. The value network is the collaboration of the enterprise, its suppliers, complementors and intermediaries with the customer to deliver value to the customer and provide benefit to all the players in the value network. E-business success and, therefore part of the definition of a value network, is that the value network works almost as a vertically integrated enterprise to serve the customer.

Vendor

Synonymous with Supplier above.

ANNEX C: ROSETTANET BUSINESS OPERATIONS MAP

The following paragraphs simply list the RosettaNet Clusters, Segments & PIPs. This is what is referred to as the Business Operation Map.

It is based on the published information as of May 2003.

Readers are strongly advised to check the latest information at www.RosettaNet.org as the PIP Dictionary /BOM is subject to frequent change.

Cluster 0: RosettaNet Support

Segment 0A: Administrative

PIP 0A1: Notification of Failure

Segment 0C: Testing

PIP 0C1: Asynchronous Test Notification

PIP 0C2: Asynchronous Test Request /Confirmation

PIP 0C3: Synchronous Test Notification

PIP 0C3: Synchronous Test Query/Response

Cluster 1: Partner Profile Management

Segment 1A: Partner Review

PIP 1A1: Request Account Setup

PIP 1A2: Maintain Account

Segment 1B: Product and Service Review

PIP 1B1: Manage Product Information Subscriptions

Cluster 2: Product Information

Segment 2A: Preparation for Distribution

PIP 2A1: Distribute New Product Information

PIP 2A2: Query Product Information

PIP 2A3: Query Marketing Information

PIP 2A4: Query Sales Promotion & Rebate Information

PIP 2A5: Query Technical Information

PIP 2A6: Query Product Lifecycle Information

PIP 2A7: Query Product Discontinuation Information

PIP 2A8: Distribute Product Stock Keeping Unit (SKU)

PIP 2A9: Query EC Technical Information

PIP 2A10: Distribute Design Engineering Information

PIP 2A11: Query Product Master

PIP 2A12: Distribute Product Master

Segment 2B: Product Change Notification

PIP 2B1: Change Basic Product Information

PIP 2B2: Change Marketing Information

PIP 2B3: Change Sales Promotion & Rebate Information

PIP 2B4: Change Product Technical Information

PIP 2B5: Change Product Lifecycle Information

PIP 2B6: Query Optional Product Information

PIP 2B7: Notify of Product Change

PIP 2B8: Notify of Product Change Response

PIP 2B9: Notify of Modified Product Change

PIP 2B10: Notify of Cancel Product Change

PIP 2B11: Query Product Change

Segment 2C: Product Design Information

PIP 2C1: Distribute Engineering Change Notice

PIP 2C2: Request Engineering Change

PIP 2C3: Distribute Engineering Change Response

PIP 2C4: Request Engineering Change Approval

PIP 2C5: Notify of Engineering Change Order

PIP 2C6: Notify of Engineering Change Implementation Plan

PIP 2C7: Request Bill of Material

PIP 2C8: Notify of Bill of Material

PIP 2C9: Request Approved Manufacture List

PIP 2C10: Notify of Approved Manufacture List

Segment 2D: Collaborative Design

Cluster 3: Order Management

Segment 3A: Quote and Order Entry

PIP 3A1: Request Quote

PIP 3A2: Request Price and Availability

PIP 3A3: Request Shopping Cart Transfer

PIP 3A4: Request Purchase Order

PIP 3A5: Query Order Status

PIP 3A6: Distribute Order Status

PIP 3A7: Notify of Purchase Order Update

PIP 3A8: Request Purchase Order Change

PIP 3A9: Request Purchase Order Cancellation

PIP3A10: Notify of Quote Acknowledgement

PIP3A11: Notify of Authorization to Build

PIP3A12: Notify of Authorization to Ship

PIP3A13: Notify of Purchase Order (Information)

PIP3A14: Distribute Planned Order

Segment 3B: Transportation and Distribution

PIP 3B1: Distribute Transportation Projection

PIP 3B18: Notify of Shipment Documentation

PIP 3B2: Notify of Advance Shipment

PIP 3B3: Distribute Shipment Status

PIP 3B4: Query Shipment Status

PIP 3B5: Request Shipment Change

PIP 3B6: Notify of Shipments Tendered

PIP 3B11: Notify of Shipping Order

PIP 3B12: Request Shipping Order Cancellation

PIP 3B13: Notify of Shipment Confirmation

PIP3B18: Notify of Shipping Documentation

Segment 3C: Returns and Finance

PIP 3C1: Return Product

PIP 3C2: Request Financing Approval

PIP 3C3: Notify of Invoice

PIP 3C4: Notify of Invoice Reject

PIP 3C5: Notify of Billing Statement

PIP 3C6: Notify of Remittance Advice

PIP 3C7: Notify of Self-Billing Invoice

Segment 3D: Product Configuration

PIP 3D8: Distribute Work in Process

PIP 3D9: Query Work in Process

Cluster 4: Inventory Management

Segment 4A: Collaborative Forecasting

PIP 4A1: Notify of Strategic Forecast

PIP 4A2: Notify of Embedded Release Forecast

PIP 4A3: Notify of Threshold Release Forecast

PIP 4A4: Notify of Planning Release Forecast

PIP 4A5: Notify of Forecast Reply

PIP 4A6: Notify of Forecasting Exception

Segment 4B: Inventory Allocation

PIP 4B2: Notify of Shipment Receipt

PIP 4B3: Notify of Consumption

Segment 4C: Inventory Reporting

PIP 4C1: Distribute Inventory Report

Segment 4D: Inventory Replenishment

PIP 4D1:Notify of Inventory Release

Segment 4E: Sales Reporting

Segment 4F: Price Protection

Cluster 5: Marketing Information Management

Segment 5A: Lead Opportunity Management

Segment 5B: Marketing Campaign Management

Segment 5C: Design Win Management (Electronic Components)

PIP 5C1: Distribute Product List

PIP 5C2: Request Design Registration

PIP 5C3: Create Design Win

PIP 5C4: Distribute Registration Status

PIP 5C5: Query Registration Status

Segment 5D: Ship from Stock and Debit (Electronic Components)

PIP 5D1: Request Ship from Stock and Debit Authorization

PIP 5D2: Notify of Blanket Ship from Stock and Debit Authorization

PIP 5D3: Distribute Open Ship from Stock and Debit Authorization Status

PIP 5D4: Query Ship from Stock and Debit Authorization Status

PIP 5D5: Create Ship from Stock and Debit Claim

PIP 5D6: Notify of Ship from Stock and Debit Claim Status

Cluster 6: Service and Support

Segment 6A: Provide and Administer Warranties, Service Packages, and Contract Services

Segment 6B: Provide and Administer Asset Management (Merged with 6A)

Segment 6C: Technical Support and Service Management

PIP 6C1: Query Service Entitlement

PIP 6C2: Request Warranty Claim

Cluster 7: Manufacturing

Segment 7A: Design Transfer

Segment 7B: Manage Manufacturing Work Orders and WIP

PIP 7B1: Distribute Work in Progress

PIP 7B5: Notify of Manufacturing Work Order

Segment 7C: Distribute Manufacturing Information

PIP 7C1: Notify of Manufacturing Genealogy

PIP 7C2: Query Manufacturing Genealogy

PIP 7C3: Notify of Quality goals

PIP 7C4: Notify of Manufacturing Quality

PIP 7C5: Query Manufacturing Quality

PIP 7C6: Distribute Product Quality Event Data

ANNEX D:

Acronyms

ANSI	American National Standards Institute
ASP	Application Service Provider
B2B	Business to Business
BOM	Business Operations Map
BPSS	Business Process Specification Schema
BSS	Business Support System
BTA	Business Transaction Activity
CAM	Content Assembly Mechanism
CBL	Common Business Library (also called xCBL)
COTS	Commercial Off-the-shelf
CPA	Collaboration Protocol Agreement
CPP	Collaboration Protocol Profile
CRM	Customer Relationship Management
DTD	Document Type Definition
E2E	End-to-end
ebXML	Electronic Business Extensible Markup Language
ePBOM	eTOM Public B2B Business Operations Map
EDI	Electronic Data Interchange
eTOM	enhanced Telecom Operations Map
EM	Enterprise Management
FAB	Fulfillment, Assurance and Billing
GTDD	Generic Telecom Data Dictionary
HTML	Hyper Text Markup Language
ICT	Information and Communications Technology
ILM	Infrastructure Lifecycle Management
IP	Internet Protocol
IPDR	Internet Protocol Detailed Records
ISP	Internet Service Provider
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
NGOSS	Next Generation Operations Systems and Software

OAGIS	Open Applications Group Integration Specification
OASIS	Organization for the Advancement of Structured Information Standards
OPS	Operations
ORT	Operations Readiness Testing
OSR	Operations Support & Readiness
OSS	Operations Support System
PIP	Partner Interface Process
PO	Purchase Order
PLM	Product Lifecycle Management
RFP	Request for Proposal
RM&O	Resource Management & Operations
RNIF	RosettaNet Implementation Framework
SD&M	Service Development & Management
SID	Shared Information & Data Model
SIP	Strategy, Infrastructure and Product
SM&O	Service Management & Operations
SMTP	Simple Mail Transfer Protocol
SOAP	Simple Object Access Protocol
SP	Service Provider
S/P	Supplier/Partner
S/PRM	Supplier/Partner Relationship Management
TM Forum	TeleManagement Forum (see also TMF)
tML	Telecommunications Markup Language
TMF	TeleManagement Forum (see also TM Forum)
TMN	Telecommunications Management Network
TOM	Telecom Operations Map
UBL	Universal Business Library
UML	Unified Modeling Language
UN/CEFACT	United Nations Center for Trade Facilitation and Electronic Business
VC-MC	Value Chain Market Center
W3C	World Wide Web Consortium
XML	Extensible Markup Language

To find Acronyms expansions go to http://www.acronymfinder.com

ADMINISTRATIVE APPENDIX

This Appendix provides additional background material about the TeleManagement Forum and this document. In general. sections may be included or omitted as desired, however a Document History must always be included..

About this document

This is a TM Forum Guidebook. The guidebook format is used when:

- The document lays out a 'core' part of TM Forum's approach to automating business processes. Such guidebooks would include the Telecom Operations Map and the Technology Integration Map, but not the detailed specifications that are developed in support of the approach.
- Information about TM Forum policy, or goals or programs is provided, such as the Strategic Plan or Operating Plan.
- Information about the marketplace is provided, as in the report on the size of the OSS market.

Document Life Cycle

The "Enhanced Telecom Operations Map® (eTOM) The Business Process Framework For The Information and Communications Services Industry" is being issued as a TM Forum Version Release 6.0 with a Guidebook Number of 921.

See main document (GB921 6.0) for further information.

How to comment on this document

Comments must be in written form and addressed to the contacts below for review with the project team. Please send your comments and input to:

Mike Kelly, TM Forum
eTOM Program Manager
mkelly@tmforum.org

Please be specific, since a team evaluating numerous inputs and trying to produce a single text will deal with your comments. Thus, we appreciate significant specific input. We are looking for more input than "word-smith" items, however editing and structural help are greatly appreciated where better clarity is the result.

Document History

Version History

<This section records the changes between this and the previous document version as it is edited by the team concerned. Note: this is an incremental number which does not have to match the release number>

Version	Date	Modified By	Purpose
V3.5	July 2003		Launched as an Addendum to the main eTOM GB921 v3.5 document, to improve readability
V4.0	Feb 2004		Updated to reflect member comment and further analysis
V5.0	March 2005		Minor update to replace missing diagrams (new Figures 4.1 and 4.2) and supporting text).
V6.1	Dec 2005	Mike Kelly	Extensive typographical corrections in response to CCB Change Request CR18. Main changes in Section 4 with reordering of Fig 4.1 and 4.2 and modification to Fig 4.2
7.0	Dec 2006	Mike Kelly	Final modification prior to submission for ME processing
7.1	Jan 2007	Tina O'Sullivan	Updates to enable document be posted for ME.

Release History

<This section records the changes between this and the previous Official document release>

Release Number	**Date Modified**	**Modified by:**	**Description of changes**
R7.0	January 2006	Mike Kelly	

Acknowledgments

See main document (GB921 5.0) for acknowledgements.

This eTOM – B2B Integration document, TMF GB921B Release 5.0 contains only a minor update from the previous Release 4.0 to include a useful diagram. The

document is a genuinely collaborative effort. The TeleManagement Forum would like to thank the following people for contributing their time and expertise to the production of this document.

- Dave Milham, BT
- Martin Huddleston, QinetiQ
- Krzysztof Samp, ITTI
- Greg Fidler, Practical Enterprise Architecture
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- Yigal Gur, Worldcom
- Alfred Anaya, Telcoremance
- Jose Ricardo Bueno, Fundacao CPqD
- Members of the Value Chain Market Centre

Documentation and work from standards bodies and other fora have also contributed to the evolution of the eTOM – B2B Integration document. This access was via public information or TM Forum member knowledge. This list of standards bodies and forums is not exhaustive and does not imply review and concurrence by these enterprises or their representatives. It is important however to acknowledge the following work and their influence on the TeleManagement Forum work:

- RosettaNet www.RosettaNet.org
- ebXML – OASIS www.ebxml.org, www.oasis-open.org

Particular thanks go to Dave Milham of BT who handled editing of this document, and integrated comments and suggestions into the final form shown here. This task requires insight and an ability to balance and combine suggested changes into a result that can find consensus amongst those involved, and the efforts involved are much appreciated.

About TeleManagement Forum

TeleManagement Forum is an international consortium of communications service providers and their suppliers. Its mission is to help service providers and network operators automate their business processes in a cost- and time-effective way. Specifically, the work of the TM Forum includes:

- Establishing operational guidance on the shape of business processes.
- Agreeing on information that needs to flow from one process activity to another.
- Identifying a realistic systems environment to support the interconnection of operational support systems.
- Enabling the development of a market and real products for integrating and automating telecom operations processes.

The members of TM Forum include service providers, network operators and suppliers of equipment and software to the communications industry. With that combination of buyers and suppliers of operational support systems, TM Forum is able to achieve results in a pragmatic way that leads to product offerings (from member companies) as well as paper specifications.