Business Process Analysis Worksheets & Guidelines

Procedures for developing business processes in ebXML

Document Version: 0.8e

Status: WORK IN PROGRESS

Date: 17 March 2001

1 Status of this Document

This document specifies an ebXML WORK IN PROGRESS – NOT FOR IMPLEMENTATION for the electronic business community.

Distribution of this document is unlimited.

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

This version:

http://www.ebxml.org/working/project_teams/jdt/ts/BpWorksheets-WIP-0.8e.zip

Latest version:

http://www.ebxml.org/working/project_teams/jdt/ts/BpWorksheets-WIP-0.8e.zip

Previous version:

http://www.ebxml.org/working/project_teams/jdt/ts/BpWorksheets-WIP-0.8d.zip

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4 Introduction

4.1 Summary

The primary goal of the ebXML effort is to facilitate the integration of e-businesses throughout the world with each other. Towards this end much of the work in ebXML has focused on the notion of a public process: the business process(es) by which external entities interact with an e-business. The specification and integration to such public processes has long been recognized as a significant cost to such businesses. In order to reduce this cost ebXML is recommending the use of Business Libraries. The principle goals of these libraries are to:

a) Promote reuse of common business processes and objects

b) Provide a place where companies and standards bodies could place the specifications of their public processes where appropriate trading partners could access them.

In order to realize these goals, a *lingua franca* needed to be leveraged so that all users of this repository could understanding what each other where specifying. The ebXML community has decided upon the semantic framework specified by the UN/CEFACT Modeling Methodology and it's Metamodel as this lingua franca.

The UMM "is targeted primarily at personnel knowledgeable in modeling methodology who facilitate business process analysis sessions and provide modeling support." It also serves as a checklist for standardized models when a previously specified business process is contributed to UN/CEFACT for inclusion and incorporation as a standard business process model." [UMM]

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

This document contains several worksheets that guide analysts towards UMM compliant specifications of their common business processes. We have tried to provide tools for users regardless of whether we're working on behalf of a standards body or an individual company. Furthermore, we provide a variety of scenarios guiding how one might go about filling out these worksheets (e.g. top-down vs. bottom up)

Different degrees of rigor are required within these worksheets. As we approach the lower level, certain elements and organization of the specification are required to meet the requirements of the ebXML technical framework. At higher levels there is a good deal of latitude about the way concepts are grouped. In many cases, things such as assumptions and constraints will be specified in natural language rather then in a formal one.

4.2 Audience

We do not expect the users of these worksheets to be experts in business modeling, however it is expected that they are subject matter experts in their respective areas of practice. They should have detailed knowledge of the inter-enterprise business processes they use to communicate with their trading partners.

This document could also be used by industry experts to help express their sectors business processes in a form that is amenable to the goals of the ebXML registry and repository.

Of course, software vendors that are supplying tools (modeling and otherwise) in support of the ebXML framework will find useful information within.

4.3 Related Documents

[TAS] *ebXML Technical Architecture Specification*. Version 1.0. 4 January 2001. ebXML Technical Architecture Project Team.

[UMM] *UN/CEFACT Modeling Methodology*. CEFACT/TMWG/N090R8E. October 2000. UN/CEFACT Technical Modeling Working Group.

[MM] ebXML Business Process Collaboration Metamodel.

[SCOR] *Supply Chain Operations Reference model*, The Supply Chain Council (http://www.supply-chain.org/)

[CCBP] ebXML Catalog of Business Processes. Version TBD. Date March 17, 2001. ebXML Business Process Project Team

[BPAO] ebXML Business Process and Business Document Analysis Overview. Version TBD. Date March 17, 2001. ebXML Business Process Project Team

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

[REG1] *ebXML Registry Information Model*. Version 0.56. Working Draft. 2/28/2001. ebXML Registry Project Team.

[REG2] *ebXML Registry Services*. Version 0.85. Working Draft. 2/28/2001. ebXML Registry Project Team.

[REA] Guido Geerts and William.E. McCarthy "An Accounting Object Infrastructure For Knowledge-Based Enterprise Models,"
IEEE Intelligent Systems & Their Applications (July-August 1999), pp. 89-94

[PVC] Michael E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance*, 1998, Harvard Business School Press

4.4 Document Conventions

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

Heretofore, when the term *Metamodel* is used, it refers to the UMM e-Business Process Metamodel as defined in [UMM].

5 Design Objectives

5.1 Goals/Objectives/Requirements/Problem Description

ebXML business processes are defined by the information specified in the ebXML UMM e-Business Process Metamodel (hereafter referred to as the “Metamodel”). The Metamodel specifies all the information that needs to be captured during the analysis of an electronic commerce based business process within the ebXML framework. ebXML recommends the use of the UN/CEFACT Modeling Methodology (UMM) in conjunction with the Metamodel. The UMM provides the prescriptive process (methodology) to use when analyzing and defining a business process.

The ebXML Business Process Worksheets are a set of business process design aids, to be used with the UMM as a reference, to sufficiently reflect all necessary parts of a business process towards the Metamodel; and thus be able to activate an ebXML business process relationship. It is the Worksheet based approach that provides an easier way of applying the UMM and the UMM Metamodel.

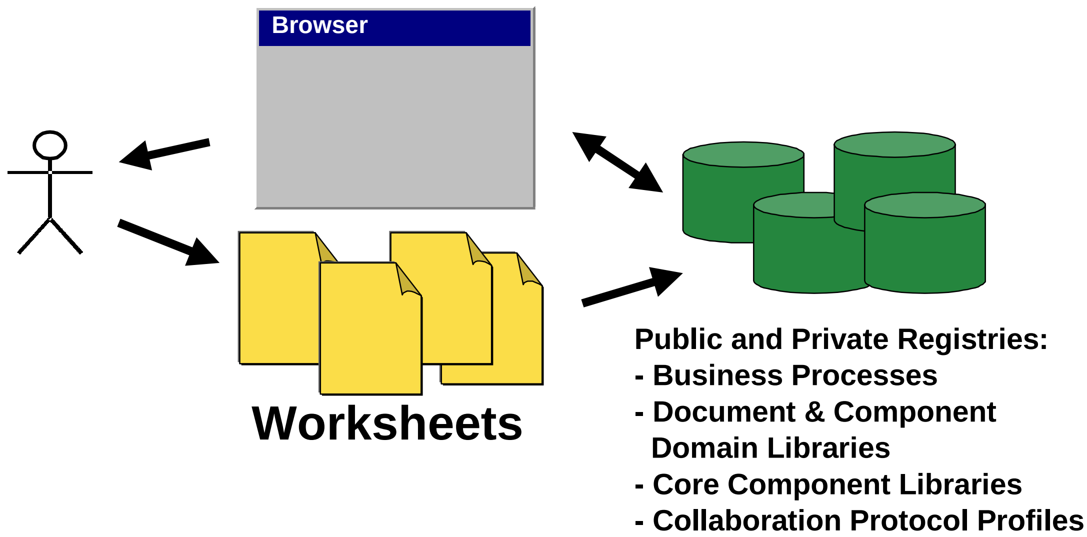
The intent of the worksheets (or a business process editor) is to capture all the bits of information that are required to completely describe a business process so that it can be registered, classified, discovered, reused and completely drive the software.

To develop company business processes for an ebXML compliant electronic trading relationship, use the UMM as a reference guideline plus the ebXML Business Process Worksheet to create the necessary business process models.

1. A business need or opportunity is identified and defined before using these procedures.

2. A Focus Project Team, usually representing a multifunctional set of experts from IT, business process ownership and business process experts needed to work out the business process using the ebXML Business Process Worksheet.

3. Using the ebXML Business Process Worksheets, the Focus Project Team will be able to develop an ebXML Business Process Specification that can be reviewed and verified by the business. In addition, all necessary information to populate the ebXML Metamodel will be made available to enable an ebXML trading relationship.



197 Figure 5-1, Worksheets Architectural Context

5.2 The Analogy

The following analogy is useful in understanding the role of the Worksheets and other documentation and tools to the ebXML Business Process Collaboration Metamodel and the UN/CEFACT Modeling Methodology.

Item	**United States Internal Revenue Service (IRS) Tax System**
ebXML Business Process Collaboration Metamodel *UN/CEFACT Modeling Methodology*.	Entire tax code
Worksheets and Templates	IRS Forms
Methodology Guidelines	IRS Instruction Booklets
Business Process Editor Tool Suite Repository of Business Process Specifications, Core Components, etc.	Something like TurboTax and other software packages for preparing personal or business tax forms where these packages would have on-line access/search of all your tax and tax related records and the Tax code.

In order to actually specify a business process all we really need is the Worksheets and Templates[4]. However, in order to ensure that we fill in the forms properly we will need to have a set of instructions that augment the templates and provide some of the rationale behind the templates.

5.3 Caveats and Assumptions

The worksheets in this document are targeted towards the UMM as specified in the Revision 8E document. Revision 9 has come out while this document was under development but there was not enough time before the delivery date of this document to align it with the changes present in Rev 9.

This document is *non-normative*; the documents identified above should be considered the authority on the definitions and specifications of the terminology used herein. This document is intended to be an application of those principals and technologies.

[4] A template is a document of file having a preset format that is used as a starting point for developing human-readable versions of the buinsess process specifications so that the format does not have to be recreated each time it is used.

6 Worksheet Based Analysis Overview

As stated above, the purpose of this document is to provide worksheets that guide the user through the construction of a UMM compliant specification of their business processes. The following diagram shows mapping from the worksheets to the high level components of the UMM. Note, the document definition worksheet is currently not included in the set of worksheets, please see the Core Components tools for this.

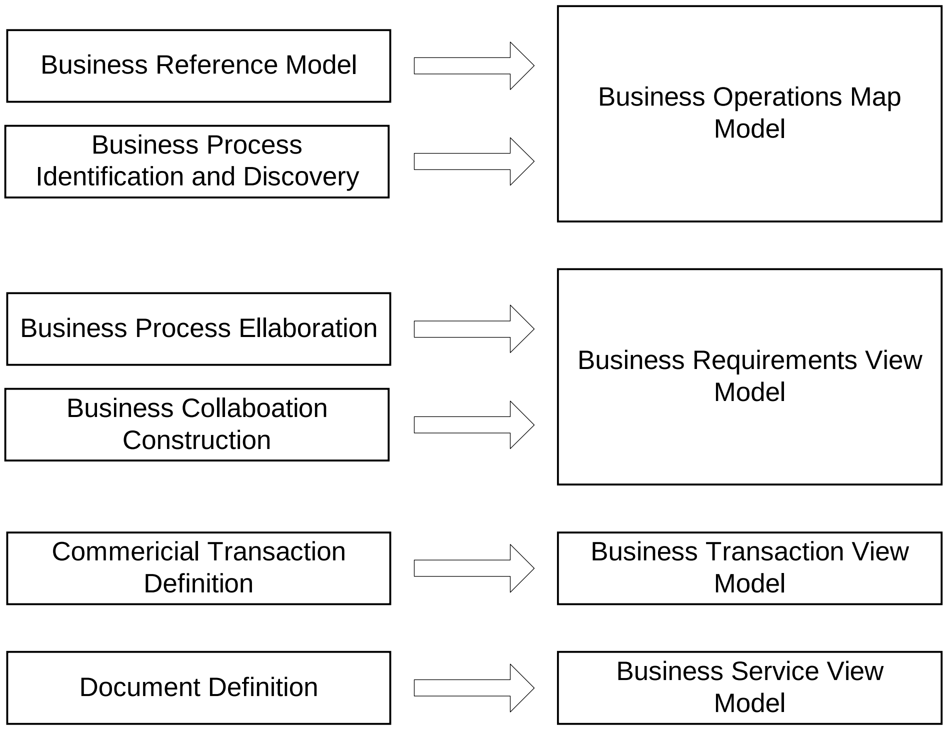


Figure 6-1 Overview of mapping from Worksheets to Metamodel

The expectation is that after the worksheets have been completed, there will be sufficient information to mechanically produce a Metamodel based specification of the modeled business process(es). The worksheets given above are:

Business Reference Model – Use this to define the “frame of reference” of the rest of the worksheets. This provides definitions of terms and, perhaps, canonical business processes (e.g. [SCOR][5])

Business Process Identification and Discovery – Use this to do an inventory of the business processes. This is really just a set of high-level use cases merely to identify the existence of processes and the stakeholders without going into detail.

Business Process Elaboration – These worksheets are used to flesh out the business processes. This identifies the actual actors as well as pre and post conditions for the business process.

[5] Defines plan, source, make and deliver business areas in their Supply Chain Operations Reference (SCOR) model

Business Collaboration Definition – In these worksheets we define the economic events that take place to fulfill the business process. This is where one defines the system boundaries and the protocols that flow between them.

Commercial Transaction Definition – These worksheets are more technically oriented than the others (which have a decidedly more "modeling" orientation). At this stage one defines the actual activities and authorized parties within the organization that initiate these transactions.

Business Information Definition – In these worksheets one defines the contents of the information field, widths, data types, descriptions, requirement traceability and, perhaps, the additional *context*[6] necessary to construct the document from the Core Components subsystem.

6.1 Basic Guidelines for filling out Worksheets

6.1.1 Focus on public Business Processes

While these worksheets could be used to model any kind of business process, the focus of the ebXML effort is to make trading partner integration easier, cheaper, and more robust. Therefore the expectation is that the primary focus will be on *public* faces of your business processes.

6.1.2 The REA Ontology

The UMM and ebXML groups are recommending the use of the Resource-Economic Event-Agent Ontology for the formalization of business collaborations. The worksheets in the main body of this document are intended to be more generic in nature however please refer to [BPAO] for further information on this topic[7] and associated worksheets.

6.1.3 Use the worksheets in the order that makes the most sense for you

For the purposes of this document we proceed from the top-level step (Business Reference Model) down to the lowest-level step (Commercial Transaction). It is important to note, however, that these worksheets can be filled out in whatever order makes the most sense from the user's perspective. For example, a person who is trying to retrofit an existing document based standard (e.g. EDIFACT) might want to start by filling in the Commercial Transaction Definition worksheets (perhaps only specifying trivial definitions for the higher level worksheets). A person looking to formalize the definitions for an entire industry may very well start from the Business Reference Model worksheet.

6.1.4 The worksheets can be used for projects of various scopes

Although the Metamodel has definite requirements on *what* objects need to be present to comprise a complete specification, it says little about the scope of what those specifications represent. For example, if you are only trying to model a specific interaction with one of your trading partners, you do not need to include a complete *Business Reference Model* for your entire industry, just include the parts that are directly relevant for the interaction you are modeling. Similarly, if you are just doing a small set of interactions for your company, you might choose to have the *Business Area* or *Process Area* just be your own company.

[6] Please see [RCRCCBP].
[7] Worksheets will be made available in a future version of this document.

6.1.5 Think how will people use what you construct

As you fill in these worksheets please keep in mind how the generated UMM specification will be used by a user of the repository. The two principal uses envisioned are:

- To determine if a given collaboration is appropriate for reuse (or at least is a close enough match for subsequent gap analysis)

- As an *on-line implementation guide*. A potential trading partner (or a 3rd party on their behalf) could examine the public processes/collaborations you provide and construct an integration plan.

This means trying to use industry wide terms (or at least Business Reference Model terminology) to decrease the ambiguity or misunderstanding between you and the eventual consumers of these specifications.

6.1.6 Re-use is one of the primary goals of ebXML

As stated above, the hope is that users will develop models that are reusable by others. Towards that end, it is intended that the Worksheets be used in conjunction with a browser that lets the user search business process libraries for items that have already been defined. The items (e.g. business processes, business collaborations, document schemas, etc.) can be referenced (re-used as is) or copied to the worksheets and changed as needed. Overtime, business process catalogs will become populated with a sufficiently large number of business processes. When this happens, the analysis processes will often be a simple matter of validating pre-defined business processes against requirements.

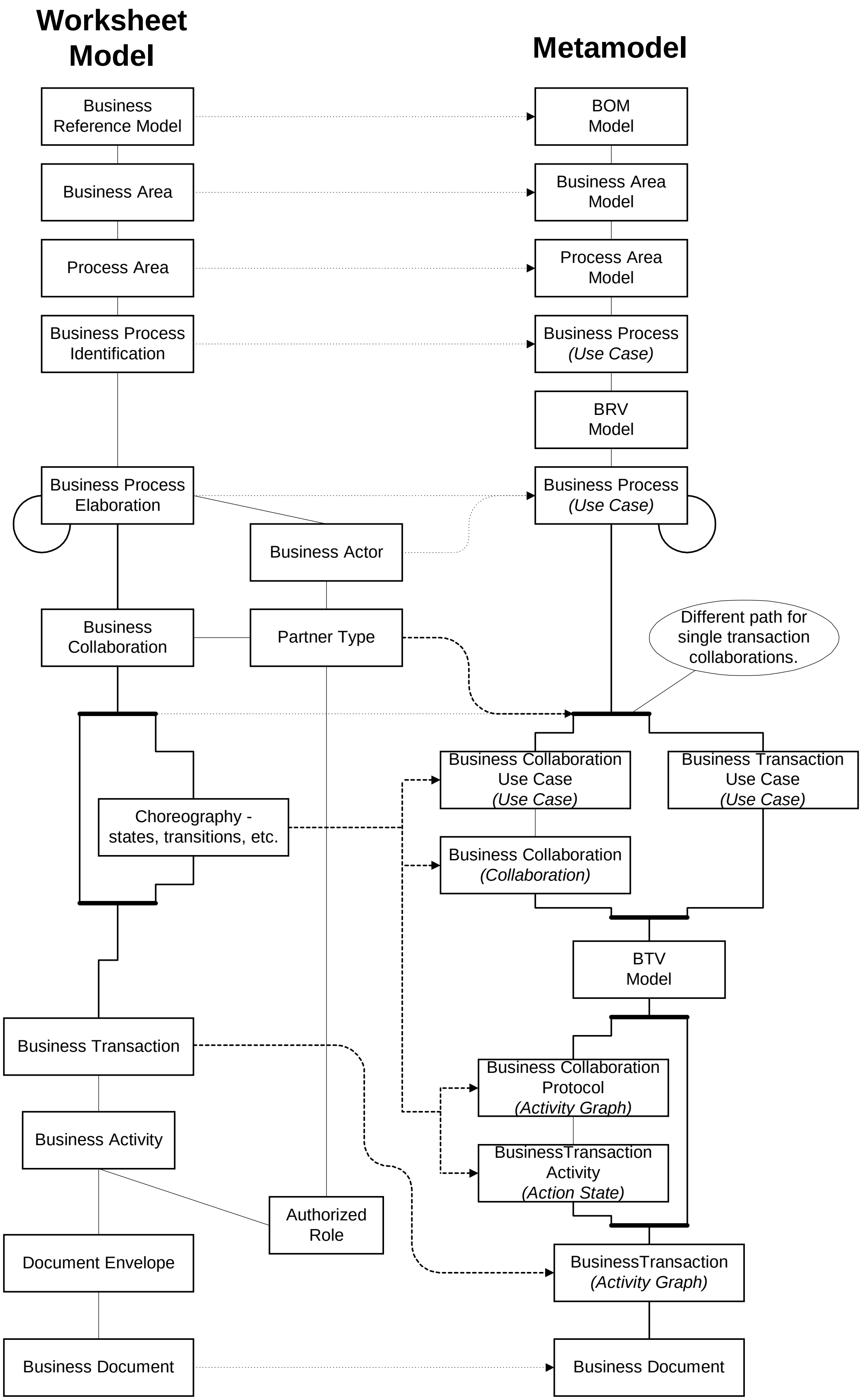
6.1.7 Note on optional fields in the worksheets

Some of the worksheets contain entries that are labeled as optional for ebXML. These are attributes that appear in the UMM but are not required as part of the ebXML Specification Schema. These are typically business objective/justification topics. While these are obviously very important aspects of any modeling endeavor, ebXML is oriented towards *exposing* an organization's public processes to their trading partners. Advertising that organizations justifications for such interfaces could potentially publicize strategic information that said organization would prefer to keep private.[9]

6.2 Worksheets to Metamodel Mapping

The following diagram sketches out a more detailed mapping from the Worksheets Model to the Metamodel defined by the UMM. The leftmost column is the selection of the main elements that that the Worksheets need to specify or edit. The rightmost column are the Metamodel elements that those worksheets map to, also showing intervening elements that the Worksheets need to construct and manage in order to be able to save and retrieve the business process model correctly (in terms of the Metamodel). The rightmost column also shows the base element for each element. The middle column is the other elements that are part of the Worksheets. They are the same as the Metamodel elements of the same name.

[9] There has been discussion on private vs. public repositories where some or all aspects of the model are stored in a restricted access repository.


Worksheet Model
Metamodel
Business Reference Model
BOM Model
Business Area
Business Area Model
Process Area
Process Area Model
Business Process Identification
Business Process (Use Case)
BRV Model
Business Process Elaboration
Business Process (Use Case)
Business Actor
Business Collaboration
Partner Type
Different path for single transaction collaborations.
Business Collaboration Use Case (Use Case)
Business Transaction Use Case (Use Case)
Choreography - states, transitions, etc.
Business Collaboration (Collaboration)
BTV Model
Business Transaction
Business Collaboration Protocol (Activity Graph)
Business Activity
BusinessTransaction Activity (Action State)
Authorized Role
Document Envelope
BusinessTransaction (Activity Graph)
Business Document
Business Document

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7 Business Process Identification and Discovery

7.1 Goals

The first set of worksheets helps the user begin formalize the domain they are trying to model processes in. The first stage in the methodology is to identify the "top level" entities and organizing concepts in the domain.

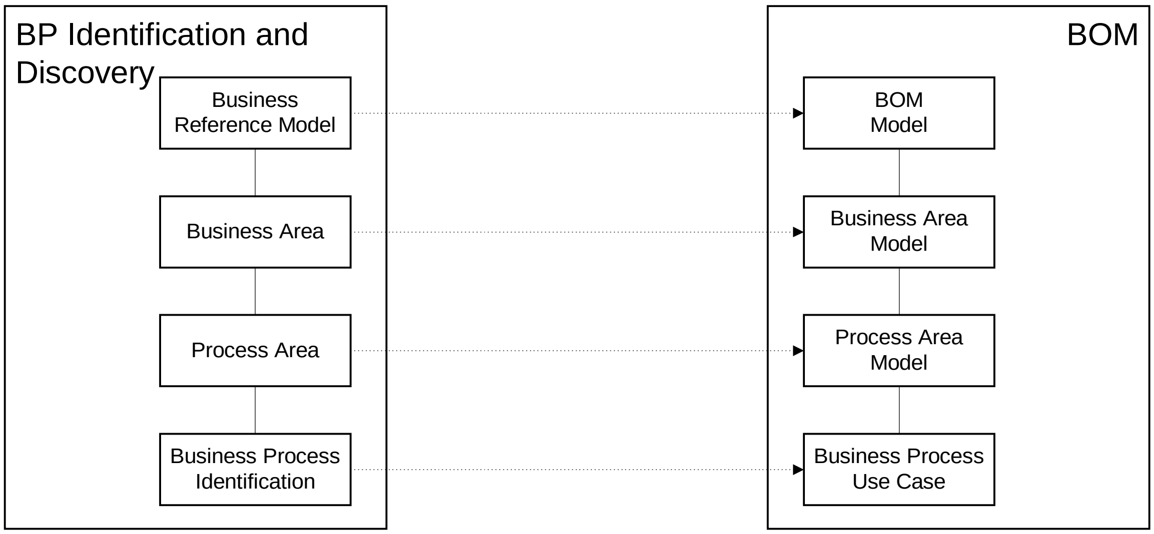


Figure 7-1 Business Process Identification and Discovery Worksheet to Metamodel Mapping

At this stage we define terminology and identify the players as well as which business processes those players interact with. To quote the UMM, at this stage in the model the goal is to:

- To understand the structure and dynamics of the business domain,
- To ensure that all users, standards developers and software providers have a common understanding of the business domain,
- To understand the daily business in the business domain independent of any technical solution,
- To create categories to help partition the business domain that enables an iteration plan to complete the model,
- To structure the model in the form of a Business Operations Map (BOM),
- To capture the justification for the project,
- To identify the stakeholders concerned with the modeled domain, some who will be independent of the processes within the domain.

The modeling artifacts that correspond to the UMM are:

- Business Area [Package]
- Process Area [Package]
- Process(es) [Use Cases]

7.2 Guidelines

7.2.1 How does one decide how big to make the various groupings at this level?

Referring back to the primary guidelines, think about what you are trying to communicate. If you are more focused on identifying the public processes, then think about grouping them by partner type or, perhaps by the area of your business these partners interact with. If you are trying to formalize an entire business sector, determine the *archetypes* that are prevalent in that sector and group them by business function area. These are just rules of thumb and this is still largely an "art". Keep in mind your potential audience and think what would make the most useful organization for them.

The activity diagrams in this workflow will likely discover more refined business process use cases. The Business Operations Map (BOM) Metamodel allows a business process to be represented by more refined business processes. NOTE: At the point where the business process can not be broken down into more child business processes, the parent business process can be called a business collaboration use case as specified in the Requirements workflow.

7.2.2 What is the boundary of the business area?

According to the [UMM] the following guidelines are to be used in defining a business area:

- Stakeholders that are within the scope of the business domain and outside the scope of the business domain but affect or are affected by inputs/outputs to/from processes within the business domain. A stakeholder is defined as someone or something that is materially affected by the outcome of the system but may or may not be an actor. For example one who funds the business modeling project is a stakeholder. Actors are stakeholders that are involved in the business process and are thus part of the business model.

- Information passing into or out of the business domain. Where possible, the domain boundaries should be chosen so that a business transaction is logically initiated and concluded within them.

- Key business entity classes. (i.e., things that are accessed, inspected, manipulated, processed, exchanged, and so on, in the business process)

7.3 Worksheets[10]

7.3.1 Business Reference Model

Often times it is useful to define a "frame of reference" for the business processes being identified. This frame of reference might define basic terms accepted by the given industry segment. For

[10] Note that the examples given in the following worksheets more or less come from the hypothetical business process described in section 8.4 of [CCBP].

example the SCOR model defines a frame of reference for supply chain. VICS defines a frame of reference for trading partners in the retail industry. It also might be a more horizontal view such as the Porter Value Chain.

Form: Describe Business Reference Model	
Business Reference Model Name	[Provide a name for the reference model. You can use an existing reference model such as the Supply Chain Council or the Porter's Value Chain or create your own name.] DOTCOM DROP SHIP RETAIL MODEL
Industry Segment	[Provide the name of the industry segment that this business applies to. Search the business process library for a list of possible industry segments. If the industry segment does not exist, then provide an appropriate name/label for the industry segment.] Retail.
Domain Scope	[Provide a high level statement that encapsulates the scope of all the business areas.] Online catalog, distribution center, delivery, billing.
Business Areas	[List the business areas within the scope. A business area is a collection of process areas. A process area is a collection of business processes. You may wish to refer to the ebXML Catalog of Business Processes that provides a list of normative categories that may be used as business areas.] Order Management, AR.
Optional for ebXML	
Business Justification	[Provide the business justification for the collection of business processes] Define more efficient on-line retailer/vendor interaction.

7.3.2 Business Area

As mentioned in the guidelines section, there are no hard and fast rules for how to divide up the model into different business areas. One suggestion is to group business processes according to the primary business function. You might consider using the Porter Value Chain classification scheme (see Appendix B).

Form: Describe Business Area	
Business Area Name	[Provide a name for the business area. This should be listed in the Business Areas section of at least one Business Reference Model.] Direct to Customer Retail
Description	[A brief summary of this functional area.]
Scope	[Provide a high level statement that encapsulates the scope of all the business areas. The scope of the business area must be within the scope of the encompassing business reference model. Typically the scope of the business area will be more constrained or limited than the scope of the business reference model.] Online catalog, order placement, distribution center, delivery, billing.
Boundary of the Business Area	[Describe the boundary of the business area. This defines the entities that interact in this business area; actors, organizations, possibly systems] Customer, Retailer, DSVendor, Carrier, Credit Authority.
References	[Any external supporting documentation.] VICS, SCOR
Constraints	[Identify any constraints on the process areas (and, thus, business processes) within this business area.] 1. Completely automated system. 2. Web browser limitations. 3. Domestic orders only
Stakeholders	[Identify the practitioners that care about the definition of this business area. At this level, this is likely to be some participants in an industry group (perhaps a standards body or an enterprise). These are the people who will define the BRV.] Customer, Retailer, DSVendor, Carrier, Credit Authority.
Process Areas	[List the process areas within the scope. A process area is a collection of business processes. You may wish to refer to the ebXML Catalog of Business Processes that provides a list of normative process groups that may be used as process areas.] Customer Commitment, Order fulfillment, Billing, Inventory Management.
Optional for ebXML	
Objective	[Describe the objective of this business area.] To deliver a product to a customer in a timely efficient manner.
Business Opportunity	[Describe the business opportunity addressed by this business area.]

7.3.3 Process Area

Typically a business reference model would define a canonical set of process areas (see the Porter or SCOR reference models for examples). A process area consists of a sequence of processes that are combined to form the “value chain” of the given business area.

Form: Describe Process Area	
Process Area Name	[Provide a name for the process area. This should be listed in the Process Areas section of at least one Business Area.] Order Fulfillment
Objective	[Describe the objective of this process area.] To deliver the goods ordered to the customer.
Scope	[Provide a high level statement that encapsulates the scope of all the business areas. The scope of the business area must be within the scope of the encompassing business reference model. Typically the scope of the process area will be more constrained or limited than the scope of the corresponding business area.] To fulfill customer’s order using the third party supplier for a drop ship delivery.
References	[External supporting documentation.]
Boundary of the Process Area	[Describe the boundary of the process area. The communicating services.] Retailer and third party vendor. [Issue: How is this different than Scope?]
Constraints	[Identify any constraints on the business processes within this process area.] Inventory availability. On time delivery. System constrain.
Stakeholders	[Identify the practitioners involved in this process area. *Question: is this a subset of those listed in the Business Area?*.] Retailer, Third party vendor
Business Processes	[List the business processes within the scope of this process area. You may wish to refer to the ebXML Catalog of Business Processes that provides a normative list of business processes.] Manage Purchase Order.
Optional for ebXML	
Business Opportunity	[Describe the business opportunity addressed by this process area.]

7.3.4 Identify Business Processes

For each business process in the process area fill in the following worksheet. A suggested rule of thumb for the appropriate granularity for a business process is that it is the smallest exchange of signals between stakeholders that has an identifiable economic value (cref. [REA]).*Note that this is not always appropriate since “negotiation” could be a valid business process but it doesn’t really result in an economic consequence.*

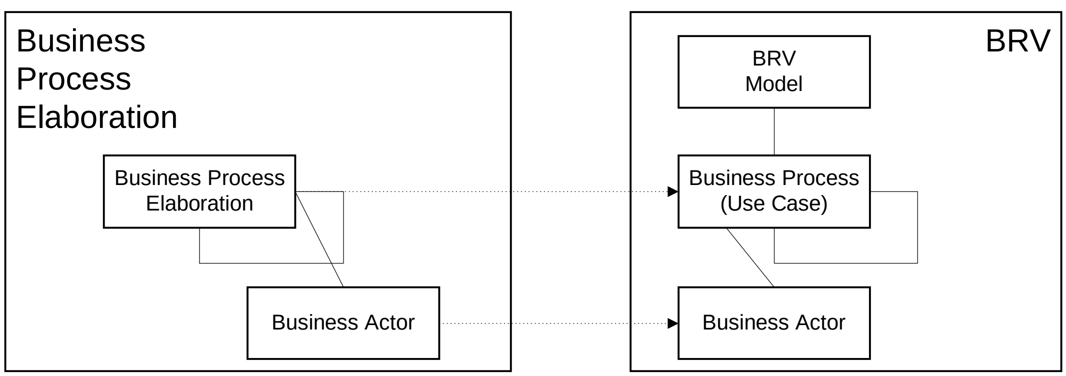
Be sure to validate the information in the process area against the encompassing business area. For example, validate that the scope of the process area is within the scope of its business area.

Form: Identify Business Process	
Business Process Name	[Provide a name for the business process. You may wish to refer to the ebXML Catalog of Business Processes [CCBP] that provides a suggested set of commonly used business processes.] <u>Manage Purchase Order</u>
Process Area	[A process area is a group of business processes. Complete a Process Area form.] <u>Order Fulfillment</u>
Business Area	[A business area group together related process areas. Create a Business Area form.] <u>Direct to Customer Retail</u>

8 Business Process Elaboration

8.1 Goals

At this stage we begin to move from requirements analysis to design analysis. Consider the following diagram:



A business process is a use case that is used to gather requirements about business processes. Inputs to the business process must be specified in the preconditions and outputs from the business process must be specified in the post-conditions.

8.2 Worksheet

One of these is filled out for each business process. Keep in mind that a business process could be nested. You should use whatever organization makes sense for your purposes (though you might want to think in terms of reuse when considering possible decompositions).

Form: Business Process Use Case	
Business Process Name	[Provide a name for the business process. This should be a name identified on the form "Identify Business Process" and on a "Describe Process Area" form. If you are starting with this form, you may wish to refer to the ebXML Catalog of Business Processes that provides a normative list of business processes.] Manage Purchase Order.
Identifier	[This is a unique identifier that follows the Business Process Identifier Naming Scheme. This can be provided when the business process description is submitted to a business process library. See Appendix A for a more detailed discussion.] bpid:ean.1234567890128:ManagePurchaseOrder$1.0
Actors	[List the actors involved in the use case.] Retailer, Vendor
Performance Goals	[A specification of the metrics relevant to the use case and a definition of their goals. Non-functional requirements may be a source of performance goals. For each performance goal, provide a name of the performance goal and a brief description of the performance goal.]
Preconditions	[Preconditions are constraints that must be satisfied starting the use case.] 1. Valid Sales Order 2. Valid Vendor Relation
Begins When	[Describe the initial event from the actor that starts a use case.] Sales Order Validation (expressed as events)
Definition	[A set of simple sentences that state the actions performed as part of the use case. Include references to use cases at extension points.] A valid Purchase Order placed by retailer with the vendor and a PO Ack is received from the vendor.
Ends When	[Describe the condition or event that causes normal completion of the use case.] PO Acknowledged returned to retailer.
Exceptions	[List all exception conditions that will cause the use case to terminate before its normal completion.] 1. PO Rejected (Failure state of a process) 2. Late PO acknowledged
Postconditions	[Post-conditions are constraints that must be satisfied ending the use case.] 1. Valid PO 2. Allocated Product
Traceability	[These are the requirements covered (as shown in Annex 4, Use Case Specification Template, in the UMM).] "PRD-FOO-6.5.4" (meaning Product Requirements Document for FOO project/solution, requirement 6.5.4).

Business Collaboration and Economic Events

8.3 Goals

These worksheets develop the Business Requirements View (BRV) of a process model.

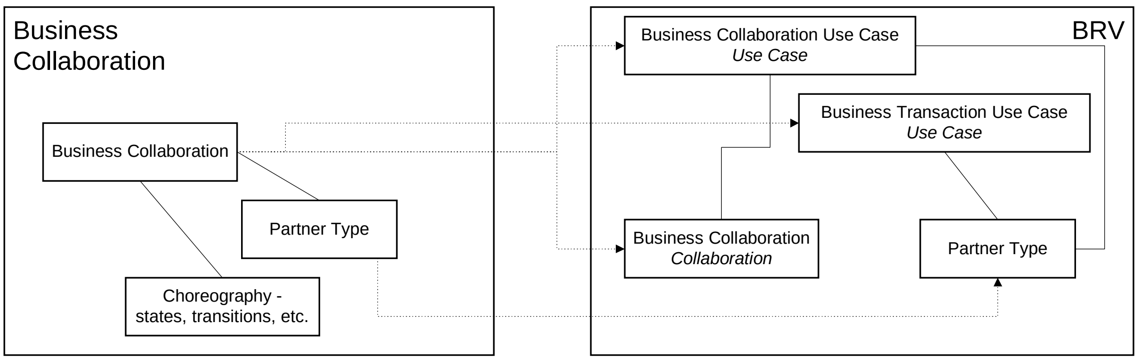


Figure 0-1 Mapping from Business Collaboration to BRV

The following items are specified:

- The business collaboration protocols that tie economic events together
- The system boundaries between which the protocols flow
- The input and output triggers of these collaborations
- The roles and constraints associated with the collaboration

The purpose of the Partner Collaboration and Economic Agreements Worksheets is:

From the [UMM, 3.1]:

… to capture the detailed user requirements, specified by the stakeholders, for the business-to-business project. … This workflow develops the Business Requirements View (BRV) of a process model that specifies the use case scenarios, input and output triggers, constraints and system boundaries for business transactions (BTs), business collaboration protocols (BCPs) and their interrelationships.

The modeling artifacts to be identified are:

- Business Transactions [Use Case]
- Business Collaboration [Use Case]
- Business Collaboration Use Case [Use Case Realization, Activity Diagram]

- Economic Modeling Elements [Business Entities]

8.4 Worksheets

Detail the information in the table below for each business collaboration. Note that it may make sense to use UML diagrams to convey some of this information.

Form: Business Collaboration	
Partner Types	[This is a list of entities that participate in the collaboration. These participants exchange the events that form the collaboration.]
Authorized Roles	[These are the roles that a partner must be authorized to play to issue specific transitions in the collaboration (by sending certain signals).]
Legal steps/requirements	[If any step in the collaboration has any legal standing, it should be captured here.]
Economic consequences[11]	[If any step in the collaboration has and economic consequence, it should be captured here.]
Initial/terminal events	[List the events that initiate this collaboration and how it terminates.]
Scope	[Specify the set of business actions this collaboration encapsulates.]
Boundary	[Specify the systems and users that communicate with each other over he course of this collaboration.]
Constraints	[Spell out any special constraints that are relevant to this collaboration (e.g. business scenario, pre-conditions.)]

[11] Worksheets the address REA to greater detail and help uses through the process of developing REA oriented collaborations will be developed in the future.

9 Business Transactions and Authorized Roles

9.1 Goals

The goal of this worksheet is to identify the individual transactions that implement the workflow of a Business Collaboration. A transaction is made up of several *activities* and each activity has an *authorized role* that the signaler must have in order to initiate that activity.

The modeling artifacts generated as a result of this worksheet is the BusinessTransaction Activity Diagram. Fill out one worksheet for each transaction in the collaborations

9.2 Guidelines

The UMM has defined several transaction patterns. It may be useful for you to identify your transactions with one of those (if for no other reason to make it clear to others the basic interaction pattern you intend to follow)

9.3 Worksheets

Form: Business Transaction	
Pattern	[If you have chosen to follow one of the canonical transaction patterns in the UMM[12] (or elsewhere) denote it here.]
Agents and Services	[This is a list of agents and services that initiate activities.]
Business Activities and Associated Authorized Roles	[List each activity (along with it's initiator) and the role required to perform that activity]
Constraints	[Any constraints should be listed here.]

10 Business Information Description

10.1 Goals

The goal of this set of worksheets is to identify the information requirements for the business documents specified in the business transactions.

10.2 Worksheets

The first step in specifying business documents in a business process and information model, is to attempt to reuse business information objects in a Business Library. If an existing business document cannot be found then, domain components from Domain Libraries and core components from the Core Library can be used. Until the Business Library is built up, or imported from a creditable source, core components are likely to be referred to frequently, to first add to the

[12] See chapter 4 in [UMM].

repertoire of business information objects in the Business Library, and second, to create business documents.

The steps for completing these worksheets are as follows:

1. See what attributes are available in business information objects in the available Business Libraries that can be used in a business document.

2. If business information objects with appropriate attributes as required for business documents are not available, new business information objects must be created.

3. Look for re-usable information components in the business library and the Core Library as candidates for business information object attributes. Take context into account, as specified in the business process and information models. Extend existing business information objects, domain components, and core components as required.

4. Add the new attributes to existing business information objects, or introduce new business information objects through a registration process that manages changes to the Business Library.

5. Use the new attributes, now in the Business Library, as needed in creating the business documents.

10.2.1 Document Content Description

Describe each element or group of elements in the document. Logically related elements can be placed in separate forms (For example, a document may have logically three parts, a header, body, and summary. The body may have further logical partitioning.). Possible values for Occurs include: 1 (one instance), 0..1 (zero on one instance), 0..* (zero or more instances), 1..* (one or more instances), or n..m (n to m instances where n is less than m). Possible values for Data Type include primitive data types such as integer, string, date-type. If you happen to know the name of a reusable component from an domain library or the Catalog of Core Components, then you MAY reference it. The Semantic Description SHALL be stated in business terms and SHALL be unambiguous.

Form: Content Description					
Form Id:	[A name for the form. For example, “Invoice” or “Order Header”]				
Element/Component Name	**Occurs**	**Data Type**	**Field Width**	**Semantic Description**	**Notes**
[Provide a name for the element/component. For example, “Order Summary” or “Issued Date.”]					

10.2.2 Content Mapping

These forms SHOULD be completed. This information is very important as it shows that the documents have a basis in existing standards. Furthermore, the information will be used to create document transformations. Standards to map to include EDIFACT, X12, xCBL, RosettaNet, and other standards such as OBI. Use XPATH and XSLT notation for referencing XML elements and describing the mappings. If a new document schema is created to fulfil the content requirements specified in the Document Content Description forms, then a set of Content Mapping forms should be completed for that schema (the component names in the forms are simply requirements for information)

For each Content Description form, complete a Document Content Mapping form for each standard to be cross-referenced.

<table>
<tr><th colspan="3">Form: Content Mapping</th></tr>
<tr><td>Form Id:</td><td colspan="2">[A name of the corresponding Content Description the form. For example, “Invoice” or “Order Header”]</td></tr>
<tr><td>Standard</td><td colspan="2">[Name of the standard. For example, UN/EDIFACT]</td></tr>
<tr><td>Version</td><td colspan="2">[Standard version number. For example, D.01A]</td></tr>
<tr><td>Element/Component Name</td><td>Mapping/Transformation</td><td>Note</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

12 Appendix A Business Process Identifiers

Objects of the entire ebXML business arrangement embodied by the UMM can be identified by a Business Identifier Naming Scheme, directly related to the layers of the UMM. Specifically the Business Operations Map (BOM) with a Business Process Identifier naming Scheme (BPINS), the Business Requirements View with a Business Collaboration Identifier Scheme (BCINS) and the Business Transaction View with a Business Transaction Identifier Scheme (BTINS).

A BPINS naming scheme format is defined by :

bpid:<agency>:<agency-id>:<business-process-name>$<major-version-number>.<minor-version-number>

A BCINS naming scheme format is defined by :

bcid:<agency>:<agency-id>:<business-collaboration-name>$<major-version-number>.<minor-version-number>

A BTINS naming scheme format is defined by :

btid:<agency>:<agency-id>:<business-transaction-name>$<major-version-number>.<minor-version-number>

Where

- *bpid* is the fixed string “bpid” indicating the entire identifier is a business process identifier.
- *bcid* is the fixed string “bcid” indicating that the entire identifier is a business collaboration identifier.
- *btid* is the fixed string “btid” indicating that the entire identifier is a business transaction identifier.
- *agency* identifier or name of the agency that owns the agency-ids **and must be a globally unique identifier**. For example, DUNS and EAN.
- *agency-id* identifer of the organization that owns the business process **and must be a globally unique identifier**. *No other entity SHALL use the agency identification of another entity.*
- Major and minor version numbers are each integers and need to respect any specific Registry Authority conventions defined.

The business-process-name, business-collaboration-name, business-transaction-name should be descriptive names. It is recommended that the descriptive name be in camel-case. The names must not contain spaces, periods, colons, or dollar signs. The organization or agency-id that owns the business transaction SHALL be responsible for guaranteeing that the identifier is unique..

Valid examples of business processes using the identifier naming scheme include :

btid:ean.1234567890128:DistributeOrderStatus$1.0
bpid:icann:my.com:NewBusinessProcess$2.0

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With respect to the ebXML Registry Information Model specification[13] the definition is as follows:

BPINS	Registry Information Model
bpid	ExtrinsicObject.objectType
bcid	ExtrinsicObject.objectType
btid	ExtrinsicObject.objectType
agency	Organization.name
agencyid	Organization.uuid
business-process-name	ExtrinsicObject.name
business-collaboration-name	ExtrinsicObject.name
business-transaction-name	ExtrinsicObject.name
major-version-number	ExtrinsicObject.majorVersion
minor-version-number	ExtrinsicObject.minorVersion

An ExtrinsicObject is a special type of ManagedObject (one that goes through a defined life cycle); the extrinsic object is not required for the core operation of a registry. An Organization is defined as an IntrinsicObject; it is core to the function of a registry.

[13] Cref [REG1] and [REG2].

Appendix B The Porter Value Chain

The following table shows the categories of the Porter Value Chain and how they map to REA concepts. This is included as an aid to help users formalize their classification of the elements of a business process specification.

Normative Category	Normative Sub-Category	Resource inflows & outflow	Major types of events	Economic Agents & Roles
Procurement	Bid Submission Contract Negotiation Purchase Order Preparation Receiving	Money Raw materials Facilities Services Technology	Payments Purchase Purchase Orders Price Quotes Contract Negotiation	Buyer Seller Vendor Cashier
Human Resources	Hiring Training Payroll Management Personnel Deployment	Money Purchased training materials Purchased benefit packages	Cash Payments Acquisition of labor Training	Employee Student Beneficiary
Transportation	Loading Shipping Packaging	Raw Materials Delivered Raw Materials Manufactured Goods Delivered Manufact. Goods	Shipment Warehousin g Tasks Material Handling Trucking	Buyer Vendor Logistics Worker Trucker
Manufacturing	Product Development Product Design Assembly Quality control	Facilities & Technology Labor Raw Materials Finished Goods	Manufacturi ng Operation Raw Material Issue Manufacturi	Factory Worker Supervisor QC Inspector

			ng Job	
Marketing & Sales	Advertising Use & Campaigning Marketing Management Sales Calling Customer Credit Managemnt	Labor Advertising Service Delivered Goods Product Services Cash	Cash Payment Customer Invoice Sale Order Price Quotes Contract Negotiation	Customer Salesperson Cashier
Customer Service	After Sales Service Warranty Construction	Labor Purchased Services Product Warranties and Services	Service Call Product Repair Service Contract	Customer Service Agent Customer
Financing	Loan Management Stock Subscriptions and Sales Dividend Policy	Cash Bonds Stocks Derivative Instruments	Interest Payments Stock Subscription s Dividend Declarations Cash Receipts	Stockholder s BondHolder s Investment Brokers Financial Managers
Administration	Accounting Financial Reporting Executive Management	Employee Labor	Employee Service Manageme nt Projects	Managers Clerks

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13 Disclaimer

The views and specification expressed in this document are those of the authors and are not necessarily those of their employers. The authors and their employers specifically disclaim responsibility for any problems arising from correct or incorrect implementation or use of this design.

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