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4 Analysis

4.1 Workflow

4.1.1 Purpose

The purpose of the Analysis workflow is to translate the requirements identified in Business Requirements workflow into a specification that enables software developers and message designers to design and implement electronic business solutions.

Analysis goals are:

- To build a set of business objects from the Requirements workflow,
- To transform the requirements into a precise, object oriented specification,
- To provide a foundation for the design of electronic information exchange,
- To provide system integrators interfaces to hook into their existing information systems,
- To explicitly specify the dynamics of the business system.

4.1.2 Analysis Methodology

Activity diagrams at the collaboration and business transaction levels are created to represent the business process requirements at the collaboration and business transaction levels. As needed, sequence diagrams are created to illustrate the dynamics of information exchange, primarily for verification with business experts. Conceptual class diagrams capture the information bundles associated with the information exchanges. The Analysis Workflow reflects the business knowledge contained in a Lexicon, utilizing common business processes and common information entities.

4.1.3 Analysis workflow Use Case

The Analysis Workflow use case diagram is shown in Figure 20. The Analyze the Requirements use case that transforms the business requirements, as elicited from the business domain expert, into a modelling representation involves the business process

analyst and technical modeller. Activity diagrams are developed for the business collaboration as well as for each utilized business transaction modelling pattern. In addition, business information entities contained in the Lexicon are used to build a conceptual class diagram, or free structured data diagram. The Analysis Workflow is the first workflow that does not directly involve the business domain expert.

The primary activity is to specialize the business transaction modelling patterns for each business transaction in the business-to-business project and to create the conceptual class diagram from business knowledge contained in the Lexicon.

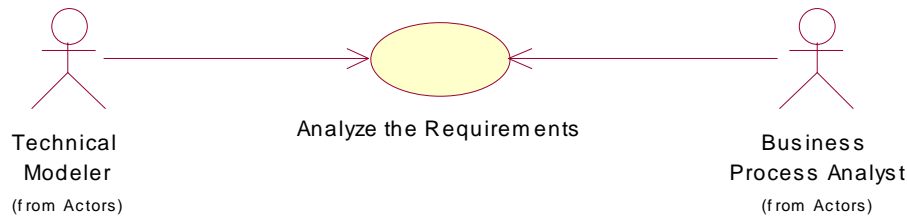


Figure 20. Analysis Workflow Use Case Diagram

4.1.4 UMM Framework: Analysis Workflow

Figure 21 highlights the methodology steps and the artifacts created in the Analysis Workflow.

Workflow	Methodology	Pattern	Model Artifacts [UML]
Analysis	<ul style="list-style-type: none"> • Process Analysis • Activity Modelling • Conceptual Class Modeling 	<ul style="list-style-type: none"> • Business Transaction Modelling Patterns 	BTV <ul style="list-style-type: none"> • Business Collaboration Protocol [Activity Diagram] • Business Transactions [Activity Diagram] • Business Documents (conceptual) [Class Diagram]

Figure 21. Extract from the UMM Framework

4.1.5 Process Analysis

A business collaboration activity diagram is prepared for each business collaboration use case to illustrate the dynamic interactions of the use case activities. It shows the sequence of the activities within the use case. Activities that can be performed simultaneously are discovered. Figure 4-1 provides an example of a business collaboration activity diagram for the “Order from Catalog” use case.

Note that this formal specification of an activity diagram references UN/CEFACT business transaction modelling patterns for each activity, i.e.,

1. Business Transaction
2. Request / Confirm
3. Query / Response

4. Request / Response
5. Notification
6. Information Distribution

These business transaction modelling patterns are described in Section 4.4.

4.1.6 Activity Modelling

Each business transaction modelling pattern identified in the business collaboration activity diagram is labeled for the specific activity, e.g., Obtain Buyer ID application of Business Transaction Pattern. Figure 4-2 illustrates the Obtain Buyer ID activity diagram.

4.1.7 Conceptual Class Modelling

Business information entities contained in the Lexicon are used to discover candidates for classes and attributes in the conceptual class diagram. Figure 4-3 illustrates a conceptual class diagram for Obtain Buyer ID. A business information entity captures information about a real world (business) concept, and relationships between that concept and other business concepts. An information entity can be either an individual piece of business information, or a natural “go-together” family of business information pieces. An information entity may contain another information entity in combination with one or more information entities.

If, in the process of creating the conceptual class diagram, required business information entities are not as yet contained in the Lexicon, they become candidates for being added to the Lexicon. Methodologies developed for admitting Lexicon additions, such as extension rules, context analysis and naming conventions will be followed in extending the Lexicon.

4.1.8 Review/validate deliverables

The purpose of this step is to verify if the analysis and deliverables are consistent and meet the functional requirements of the system. Furthermore, verify whether the traceability identifiers have been applied for all deliverables (see Annex 2).

Check-points for each analysis class

- Are the classes reasonable?
- Does the name of each class clearly reflect the role it plays?
- Does the class represent a single well-defined abstraction? If not, consider splitting it.
- Does a class define any attributes and responsibilities that are not functionally coupled to the other attributes or responsibilities defined by that class?
- Do the classes offer the behaviour the use case realisation and other classes require?

4.2 Artifacts

4.3 Guidelines

4.4 Example