
**Financial services — UNiversal Financial
Industry message scheme —**

**Part 3:
ISO 20022 modelling guidelines**

*Services financiers — Schéma universel de messages pour l'industrie
financière —*

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Partie 3: Lignes directrices pour la modélisation ISO 20022
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 20022-3 was prepared by Technical Committee ISO/TC 68 to complement ISO 20022-1, Overall methodology and format specifications for inputs to and outputs from the ISO 20022 Repository, with detailed modelling guidelines to be used to construct ISO 20022 compliant business transactions and message sets. This Technical Specification should be reviewed and considered for publication as an International Standard once further experience has been gained in using these guidelines and the use of the underlying technology has further stabilized.

ISO 20022 consists of the following parts, under the general title *Financial services — UNiversal Financial Industry message scheme*:

- *Part 1: Overall methodology and format specifications for inputs to and outputs from the ISO 20022 Repository*
- *Part 2: Roles and responsibilities of the registration bodies*
- *Part 3: ISO 20022 modelling guidelines* [Technical Specification]
- *Part 4: ISO 20022 XML design rules* [Technical Specification]
- *Part 5: ISO 20022 reverse engineering* [Technical Specification]

Introduction

The methodology described in this document focus on the development of standardized Business Transactions and Message Sets. The objective of a standardized Business Transaction is to define a commonly agreed solution for communication problems existing among different organizations within the context of a given Business Process.

For a given communication problem in a given business context, several solutions can be developed. The purpose of this document is to explain the different steps a modeller should follow to ensure that ISO 20022 Business Components / Elements, Message Components / Elements, Business Transactions and Messages are defined in a consistent way.

The ISO 20022 methodology is composed of a set of activities. These activities are grouped into the following phases:

- business analysis
 - requirements analysis
 - logical analysis
 - logical design (message design)
 - technical design
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For each of these activities, this document describes:

- the artefacts needed to start this activity (required input)
- the artefacts that should be the result of this activity (expected output)
- an example – where useful
- any modelling and other guidelines that should be followed or taken into account

It is not the intent of this document to describe what will be the allowed artefacts and/or documents to be submitted to the Registration Authority. This information is described in the ISO 20022 submission templates and their related guidelines.

Examples are provided only to illustrate the modelling methodology and should not be regarded as definitive for the Business Areas described.

For the purpose of ISO/TS 20022-3, the terms and definitions given in ISO 20022-1 apply.

1 Business analysis

A small example of Business Analysis can be found in Annex A (Business analysis: funds industry Business Processes).

1.1 Introduction

1.1.1 Purpose

The purpose of business analysis is to achieve a better understanding of the Business Area and Business Processes for which ISO 20022 compliant Business Transactions and Message Sets will be developed:

- Describing the Business Processes, including the Business Roles and their need for Business Information, helps in the identification of the communication problems that exist among the organizations that take part in these processes. Those communications problems are the main drivers for the next phase (requirements analysis).
- Identifying Business Information manipulated in a Business Area is also important because the Messages - that will be designed in later phases - will contain data elements that are related to this Business Information. An explicit link between Business Elements/Components and Message Elements/Components will be helpful for interoperability, for later maintenance and for change management: if something changes in a Business Area, it will be possible to identify the impact on previously defined Messages.

1.1.2 Key topics

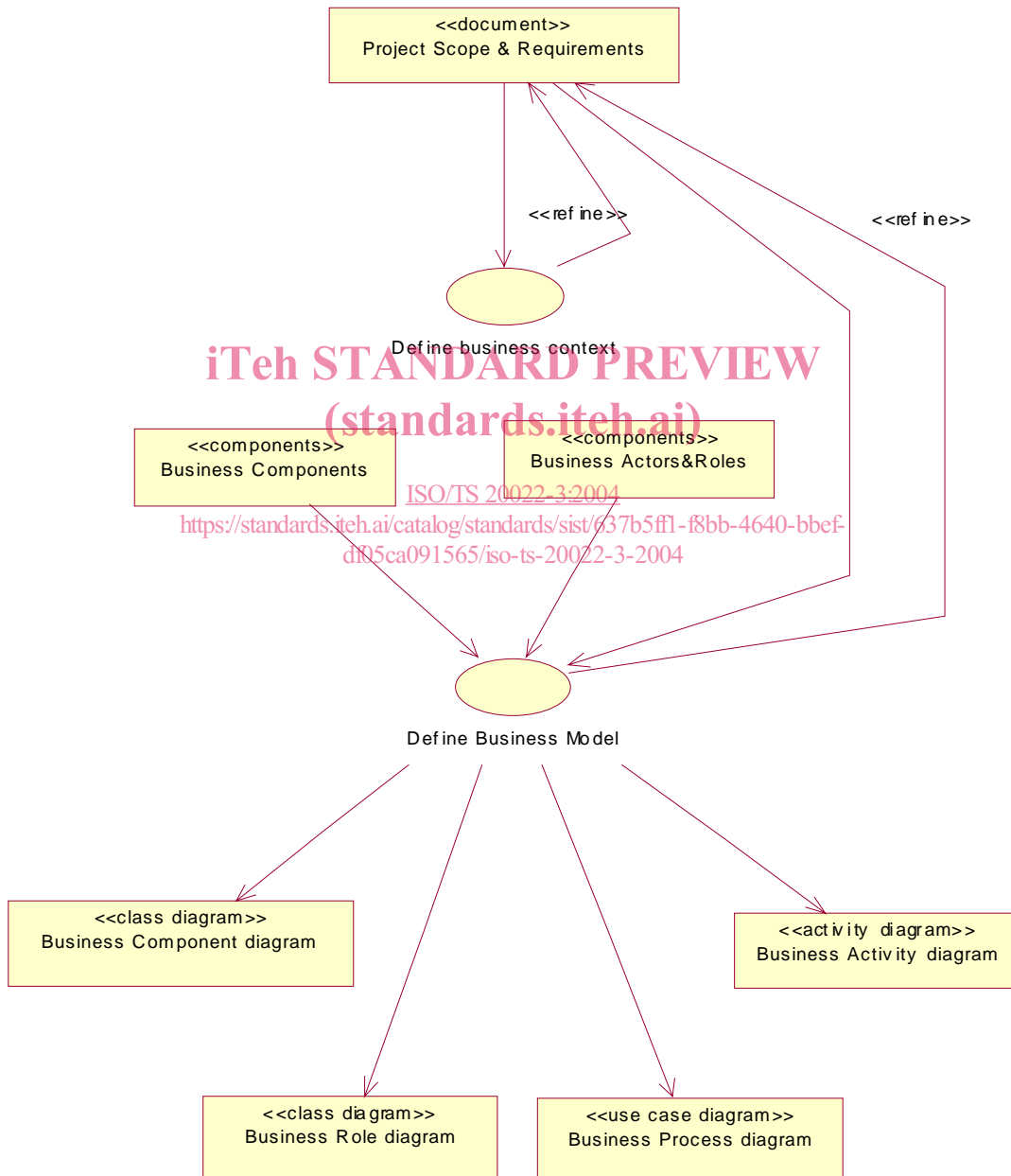
- To identify the business context of the communication problem to be solved.
- To understand the daily business in the Business Area and Business Processes with no special focus on the Business Transactions and Message Sets to be developed.
- To capture the Business Information manipulated within the Business Processes.
- To ensure that all users, such as business experts and standards developers have a common understanding of the Business Area and the Business Processes.

1.1.3 Deliverables

- Textual description of the Business Area (objectives, scope and boundaries)
- Models describing the Business Processes and the Business Information and Business Roles involved in these Business Processes. All model elements are enriched with textual descriptions, including a glossary of business terms.

1.2 Process overview

The below picture shows the different activities (shown as ovals) this process has to follow and what the required inputs and outputs (shown as squares). These activities are further detailed in the following paragraph.



1.3 Activities

1.3.1 Define business context

This activity consists of defining and refining:

- Business goal: global objectives and purposes for the considered Business Area.
- Scope: which Business Processes are in or out of scope, which financial instruments are in or out of scope, which Business Actors and Business Roles need to be considered, etc.
- Boundaries: key Business Components and Elements that are handled and/or used within the business context. They can be classified into input information (i.e. information that influences the Business Processes but that is not controlled within the scope of the business context) and output information (i.e. information that is controlled within the scope of the business context and impacts other Business Processes).
- Assumptions related to the Business Area.
- Business requirements (expected functionality) and constraints (e.g. market infrastructures to be part of the solution, performance requirements (T+1), interoperability requirements, Market Practices to be considered)
- Business terms will either be accompanied by a short and clear description to remove possible ambiguities or - preferably - must refer to an existing glossary of business terms.

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1.3.2 Define Business Model

To define the Business Model, following steps are necessary:

1. **Business Process diagram:** produce a diagram of all Business Processes, starting from the list of Business Processes that have been identified in the project scope. The diagram should show the organization of the Business Processes, starting from a top-level node (representing the overall business goal). Refinements can be made using AND-decompositions, OR-decompositions, "include" associations and "extend" associations.
2. **Business Activity diagram:** complement the Business Process diagram with one or more activity diagrams for each Business Process. These activity diagrams will provide a better and more detailed understanding of the various activities and Business Roles in the Business Processes and on the interaction between the activities and Business Roles. The activity diagrams should ideally describe the normal flows and the exception flows within each Business Process.

The type of activity diagrams that is recommended is called "Swim Lanes". Indeed, for each Business Role, there is a "swim lane" indicating the activities performed by that Business Role and, optionally, major states that can be reached by that Business Role.

3. Describe for each Business Process and each activity within a Business Process:
 - the definition (i.e. a description of the activity)
 - the trigger (i.e. an event that causes the start of the activity)
 - the pre-conditions (i.e. conditions that must be fulfilled in order to start the activity)
 - the post-conditions (i.e. conditions that must be fulfilled when the activity is completed)
 - the arguments (i.e. information that is required, created or changed for the execution of the activity)
 - the roles (i.e. functions of Business Actors when they are involved in the activity).

4. **Business Role diagram:** produce a diagram of all Business Roles that are relevant for the defined project scope (these roles have been defined during the previous steps). Go through all existing roles in the ISO 20022 Data Dictionary (DD) and copy the required ones in the Business Role diagram. Complete the diagram with those Business Roles that have been identified and that don't exist yet in the DD. If Business Roles are identified that exist "more or less" in the DD (i.e. there is a significant match but also some important differences) they should be created as new roles and an association should be added in the diagram to the related existing Business Role in the DD. All these additional Business Roles will have to be submitted to the Registration Authority.

5. **Business Component diagram:** Produce a diagram of all Business Components¹ derived from the "arguments" in step three. It can contain inheritance, association and aggregation relations. Go through all existing Business Components in the DD and copy the required ones in the Business Component diagram. Complete the diagram with those Business Components that have been identified and that don't exist yet in the DD. If Business Components are identified that exist "more or less" in the DD (i.e. there is a significant match but also some important differences) or new Business Elements need to be added, create them as new Business Components and add an association in the diagram to the related existing Business Component in the DD. All these additional Business Components will have to be submitted to the Registration Authority.

6. Check the consistency of the Business Model by verifying following points:
 - Are all Business Components and Business Roles that are used in the Business Process descriptions and in the activity diagrams included in the Business Role diagram and in the Business Component diagram?
 - Are all Business Components and Business Roles that have been defined in the diagrams referred to in at least one Business Process or activity (except possibly the ones that have been copied from the DD as basis for a project-specific "specialization")?
 - Is the Business Process diagram consistent with the information in the project scope?

¹ Business Components are defined as classes in the Business Model. A Business Component is the exhaustive definition of a business notion. Note that Business Components will never be used directly in message models because they are generic and don't take into account specific needs of the message context.

- Is the Business Component diagram consistent with the information in the project boundaries?
- Is the lifecycle (create - update - delete) of the used Business Components correctly covered² by the Business Process and activity descriptions?

1.4 Guidelines

- Apply a "bird's eye view". At the business analysis level, we want to concentrate on the business and avoid discussing the solution or even the communication problem. This means that we assume there is no communication problem and each of the Business Roles has a perfect knowledge of and access to all information manipulated in any of the Business Processes. Remember always that a "good" Business Process must add tangible business value.
- Focus mainly on Business Processes that provide a lot of added value, by eliciting Business Components or Business Roles. Don't get into details, like "cancel", "modify" or "create", etc. at this stage and don't bother about error handling either. For example, the description of an "Interbank Transfer" Business Process will elicit concepts like "Account", "Credit", etc. The description of the "Cancel Interbank Transfer" will have no specific added value and shouldn't be considered at this stage. These details will be elaborated during the logical analysis, when Business Transactions and Message Sets are defined.
- Concentrate on functional roles, rather than on real-life actors. It's for instance important at this stage to identify the role "Buyer", but it's not yet important to identify whether the buyer is an individual, a corporate or a financial institution.
- Depending on the useful level of detail, one may decide to decompose a Business Process into more detailed Business Processes.
- Normally, roles should only be associated to the most detailed Business Processes and to the activities (i.e. the lowest level).
- Make sure to provide all required information (e.g. a proposed name and a definition) for new Business Components and Business Roles.
- Be careful in the Business Component diagram to use aggregation ONLY to represent real business containment (e.g. a party is NOT contained in an account and there should therefore be no aggregation relation between account and party). Real business containment means that in real life the contained element can never exist without the container (e.g. an account balance cannot exist without an account).
- The Business Component diagram can contain information regarding multiplicity and must indicate the type (represented by a Data Type or a Business Component) of each Business Element.

² This doesn't mean that all Business Components must necessarily be created, updated and deleted in the described Business Processes, but that one is sure that it has been covered or that one knows why it doesn't have to be covered

2 Requirements analysis

A small example of requirements analysis can be found in Annex A (Requirements analysis: fund communication requirements).

2.1 Introduction

2.1.1 Purpose

The purpose of the requirements analysis is to define the communication requirements caused by the physical separation of the Business Actors that will execute the various Business Roles in the Business Processes.

The requirements analysis will identify and specify all communication requirements that exist within the agreed scope of Business Processes and activities. It will identify who needs what kind of information, from whom, at what moment. As such, the requirements analysis will provide the specifications for the solution (i.e. the Business Transactions and Message Sets) that will be developed, without going into the actual definition of messages and message flows.

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2.1.2 Key topics

- Analysis of the results of the business analysis in order to discover the communication requirements that arise.
- Precise definition of the expected properties of the Business Transactions and Message Sets to be developed (functionality and interaction with the Business Roles).

2.1.3 Main activities

- Identification of the goals of the Business Transactions and Message Sets to be developed (exchange of information and possibly enhanced performance of specific Business Processes or activities).
- Specification of functional (= behavioural) requirements of the Business Transactions and Message Sets to be developed.
- Specification of constraints (= imposed restrictions) of the Business Transactions and Message Sets to be developed.

2.1.4 Deliverables

- Textual descriptions refining the scope and boundaries of the final solution
- Textual descriptions refining and completing the constraints.
- Requirements use cases describing the expected functionality of the Business Transactions and Message Sets to be developed. The description of the use case must include the definition, arguments, triggers, pre- and post-conditions.
- Business Component diagram describing the information used by each of the Business Roles (possibly complemented with textual descriptions of some business related Rules).

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2.2 Process overview

The below picture shows the different activities (shown as ovals) this process has to follow and what the required inputs and outputs (shown as squares) are. These activities are further detailed in the following paragraph.

