TECHNICAL SPECIFICATION

ISO/TS 20022-5

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Financial services — UNIversal Financial Industry message scheme —

Part 5: ISO 20022 reverse engineering

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

Partie 5: Ingénierie inverse 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order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn.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again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.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 20022-5 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 the reverse engineering guidelines explaining how to extract relevant information from existing industry message sets in order to prepare the submission to the ISO 20022 Registration Authority of equivalent 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.

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]

1 Introduction

The ISO 20022 Repository will contain all ISO 20022 compliant Business Transactions and Message Sets, as outlined in ISO 20022-1. The approach that must be followed to add ISO 20022 compliant Business Transactions and Message Sets to the Repository can be classified as follows:

a) **Case 1:**
No ISO 20022 compliant Business Transactions and Message Sets exist
No Industry Message Set exists
- Example: Collective Investment Vehicles
- Approach: full development of ISO 20022 compliant Business Transactions and Message Sets using the ISO/TS 20022-3 Modelling guidelines.

b) **Case 2:**
No ISO 20022 compliant Business Transactions and Message Sets exist
One or more Industry Message Sets exist
- Example: Securities Pre-Trade (FIX Message Set exists)
- Approach: conversion of the Industry Message Set(s) into ISO 20022 compliant Business Transactions and Message Sets, using ISO/TS 20022-5 Reverse engineering guidelines.

c) **Case 3:**
ISO 20022 compliant Business Transactions and Message Sets exist
One or more existing Industry Message Sets exist as well
- Example: Securities Post-Trade (FIX, Omgeo Message Sets exist)
- Approach: comparison of the existing Industry Message Set(s) with the ISO 20022 compliant Business Transactions and Message Sets and extension of the ISO 20022 compliant Business Transactions and Message Sets as necessary, using ISO/TS 20022-5 Reverse engineering guidelines.

This document describes the activities of “ISO 20022 reverse engineering” from the point of view of the user who wants to verify that the business functionality, covered by his own Industry Message Set, is covered by ISO 20022 compliant Business Transactions and Message Sets.[1] The document is not an attempt to define a “methodology” for reverse engineering.

It describes the following set of required activities:

- Extract relevant information from existing Industry Message Sets and compare it to the related information in the ISO 20022 Repository

[1] The document is based on preliminary reverse engineering experiences in the framework of “electronic Business Oriented Methodology” (eBOM) and of “SWIFTStandards Modelling methodology”. It has been enriched on the basis of the work conducted in domain groups of the ISO/TC68/SC4/WG10 reverse engineering project team and on the results of the ISO/TC68/SC4/WG10 Proof of Concept.

- Use the results of this comparison for the development of ISO 20022 compliant Business Transactions and Message Sets
- Submit the resulting update requests to the Registration Authority[2]
- Prepare the migration to the ISO 20022 compliant Business Transactions and Message Sets.

The main objectives of the “ISO 20022 reverse engineering” are as follows:

- Capture the industry knowledge covered by existing Industry Message Sets
- Build upon former standardization efforts in the industry when building ISO 20022 compliant Business Transactions and Message Sets
- Ensure that the resulting ISO 20022 compliant Business Transactions and Message Sets fully cover the business scope of existing Industry Message Sets
- Maximise interoperability between existing Industry Message Sets and ISO 20022 compliant Business Transactions and Message Sets
- Support the migration from existing Industry Message Sets to ISO 20022 compliant Business Transactions and Message Sets.

The document is structured as follows:

- Chapter 2 contains some specific terms that are used in this document.
- Chapter 3 describes the major activities that will be conducted during reverse engineering and also describes at a high level the resulting deliverables.

- Chapter 4 gives a detailed workflow, explaining all activities, inputs and outputs.
- Appendix A contains a detailed description of the Convergence Documentation.

2 Terms and definitions

This document uses the terms and definitions as explained in ISO 20022-1: Overall methodology and format specifications for inputs to and outputs from the ISO 20022 Repository.

Additionally, particular attention should be given to following terms and definitions that are used in this document:

Industry Message
A Message that offers a particular Message Functionality (possibly multi-functional) and whose Message Definition is part of an Industry Message Set.

ISO 20022 Message
A Message that offers a particular Message Functionality and whose Message Definition is registered in the Business Process Catalogue of the new ISO 20022 Repository.

[2] Note that it is not the intention of reverse engineering to systematically create ISO 20022 compliant versions of all existing Industry Message Sets. Update requests shall always be based on a valid business justification.

Message Item
An element or field used at a particular place in a Message. This exact place is typically described by the Message Path.

Message Path
The exact position in a particular Message Definition. This position is uniquely identified by the full hierarchy (i.e. "path") from the message level (i.e. the highest level) down to the element level (i.e. the lowest level).

All these terms are capitalised when used throughout this document.

3 Activities and deliverables

There are four main activities in the "ISO 20022 reverse engineering":

- Gap analysis
- Development of ISO 20022 compliant Business Transactions and Message Sets
- ISO 20022 registration
- Preparation of migration.

The major objectives and deliverables related to these activities are described in this chapter.

3.1 Gap analysis

Objectives:

- Determine the Business Area of the Industry Message Set and identify the corresponding Business Area, Business Processes, activities and supporting Business Transactions in the ISO 20022 Business Process Catalogue.
- Compare Business Roles in ISO 20022 Business Processes and Business Transactions to the parties that use the Industry Messages or that are identified in the Industry Messages.
- Verify whether existing ISO 20022 Messages offer the complete Message Functionality that is offered by the Industry Messages.
- Evaluate whether the business content of the relevant ISO 20022 Messages cover the business content of the individual Industry Messages.
- Compare the meaning and the data typing of the used Message Components and/or Business Components to the individual Industry Message Items.

Deliverables:

- Documentation of the coverage, the differences and the gaps between the Industry Message Set and the ISO 20022 compliant Business Transactions and Message Sets.

This documentation concerns following repository items:

- Business Areas
- Business Processes
- Business Transactions and Message Sets
- Message Definitions (including Message Rules)
- Business Roles
- Business Components (including Business Elements and Rules)
- Message Components (including Message Elements and Rules)
- Data Types

- The documentation of the Industry Message Set for those repository items that were missing (i.e. the gaps) or for which a difference was identified.

3.2 Development of ISO 20022 compliant Business Transactions and Message Sets

Objectives:

- Complete the gap analysis with all additional information that is required to define or complete ISO 20022 compliant Business Transactions and Message Sets.
- Define the required updates and additions to the existing ISO 20022 compliant Business Transactions and Message Sets.

This step shall only focus on the identified gaps and differences and shall verify whether there's a valid business justification to include these gaps and differences in the ISO 20022 repository. It shall also take into account that the goal of reverse engineering is not to question (except with respect to the business justification), modify or complement the business functionality that is currently supported in the Industry Message Set.

Deliverables:

- Detailed documentation describing how the existing ISO 20022 compliant Business Transactions and Message Sets must be updated to incorporate the identified gaps and differences.

3.3 ISO 20022 Registration

Objectives:

- Prepare the information for the ISO 20022 Registration Authority to request the update of the ISO 20022 repository with all required additions and modifications.

Deliverables:

- Requests to the ISO 20022 Registration Authority to add or modify Dictionary Items and/or Catalogue Items.

3.4 Preparation of migration

Objectives:

- Define and document the relationship between the Industry Message Set and ISO 20022 compliant Business Transactions and Message Sets. The required amount of information will depend on the chosen migration path:
  - in case of a “big bang” migration, it will be sufficient to only document the relationship in a way that supports the convergence towards ISO 20022
  - in case of an accepted period of coexistence there will be a need to have “bi-directional” documentation that not only supports the convergence towards ISO 20022, but also a backwards mapping to the Industry Message Sets.
- Define a plan for the migration to the ISO 20022 compliant Business Transactions and Message Sets.

Deliverables:

- Convergence Documentation
- Coexistence Documentation (optional)
- Migration plan

4 Workflow

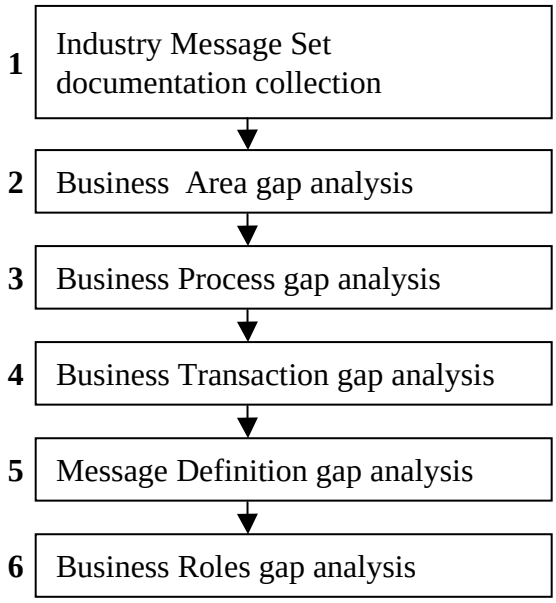
This chapter contains a detailed workflow description of the four main activities in the “ISO 20022 reverse engineering”.

4.1 Gap analysis

Preliminary remarks:

- The gap analysis requires a lot of expertise and documentation about the Industry Message Set. In case this documentation is not readily available, there will be a need to perform a thorough analysis of the Industry Message Set and its use (see first step below).
- The gap analysis also requires a lot of documentation about the ISO 20022 compliant Business Transactions and Message Sets. The repository outputs will include this documentation.
- Gap analysis is crucial for all subsequent steps:
- Identifying the differences and gaps will define the scope of the subsequent development of ISO 20022 compliant Business Transactions and Message Sets and ISO 20022 registration.
- Identifying the overlaps will provide the required information for the Convergence Documentation and the related migration.

The main steps in gap analysis are shown on the following diagram:



These steps, which are described in more detail in the subsequent paragraphs, will be executed in an iterative and incremental way. In the “reverse engineering case 2” (i.e. no existing ISO 20022 compliant Business Transactions and Message Sets) only the collection of the Industry Message Set documentation needs to be done.

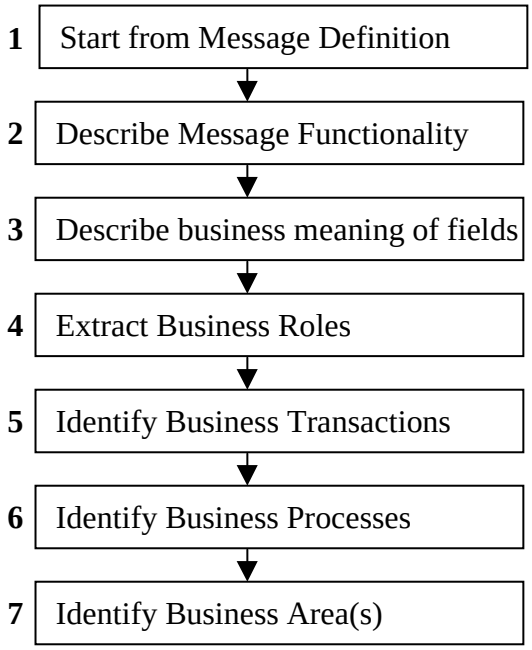
4.1.1 Industry Message Set documentation collection

If the Industry Message Set is well documented (i.e. a full description including the Business Area, the Business Processes and the Business Transactions), this step is limited to the explicit identification of the documentation set.

In many cases however, the Industry Message Set documentation will focus only on the Message Definitions and will mainly document the functionality and content of all Industry Messages. In some cases, even this documentation may be very limited (e.g. restricted to a description of the physical structure). In these cases, it is mandatory to complete the Industry Message Set documentation prior to the reverse engineering.

Activities:

The recommended approach to complete the Industry Message Set documentation is depicted in the following diagram and further explained in the text.



1. Start from the description of the Industry Message Definition.
2. Describe, for each Industry Message, the Message Functionality (i.e. the purpose(s) for which the Industry Message may be used). Note that Industry Messages may be multi-functional and that each function should be described.
3. Describe for each Industry Message Item the business meaning. Note that the meaning of the Item may depend on the specific Message Functionality, in case the Industry Message is multi-functional. In this case, all meanings must be described.[3]
4. Extract from each Industry Message the Business Roles[4], by identifying the functional roles of the sender and the receiver of the Industry Message and by identifying the functional roles of all other parties that appear in the Industry Message content.
5. Analyse the use of the Industry Messages in order to identify the “Business Transactions” (i.e. the different message flows that occur in the industry) in which the

[3] One of the big challenges of this step is to identify the real business meaning of the fields.

Note that one Industry Message field may contain multiple Business Elements and/or may contain partial Business Elements (in which case it may have to be combined with other Industry Message fields to obtain meaningful Business Elements).

Note that a multi-functional Industry Message will also contain fields to specify the used functionality. These fields won’t have a corresponding Message Element in the ISO 20022 Message. For these fields, document the Message Functionality they represent.

Note that an Industry Message may contain “technical” fields, which have no business meaning. In some cases these fields may have a corresponding technical Message Element in the ISO 20022 Message Definition but they will never have a corresponding Business Element.

[4] The distinction between “Business Actors” and “Business Roles” is that the latter indicate functional roles (e.g. buyer, seller, etc.) whereas the first indicate real business parties (e.g. bank, corporate, broker/dealer, etc.). One Business Actor can play various Business Roles in a business process (e.g. a bank can be a buyer, a seller, an account servicer, etc.) and various Business Actors can often play the same Business Role (a bank, a corporate or an individual person can act as buyer).