International Standard

ISO 20022-5

Second edition
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Financial services — Universal financial industry message scheme —

Part 5: Conceptual interoperability and reverse engineering

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

Partie 5: Interopérabilité conceptuelle et ingénierie inverse

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 68, *Financial services*, Subcommittee SC 9, *Information exchange for financial services*.

This second edition cancels and replaces the first edition (ISO 20022-5:2013), which has been technically revised.

The main changes are as follows:

— Activities and workflows for enhancing interoperability at the conceptual level have been added.

— Reverse engineering workflow has been amended based on previous experience.

A list of all parts in the ISO 20022 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ISO 20022 series defines a scalable, methodical process to ensure consistent descriptions of messages throughout the financial services industry.

The purpose of the ISO 20022 series is to describe precisely and completely the externally observable aspects of financial services messaging in a way that can be verified independently against operational messaging.

The trigger for the creation of the ISO 20022 series was the rapid growth in the scale and sophistication of messaging within financial services during the 1990s using the ISO 15022 series. The financial services industry (hereafter referred to as "the industry") created the first version of the ISO 20022 series as the successor to the ISO 15022 series in response to that trigger. Since the ISO 15022 series, the industry has broadened the scope from securities to the entire industry for the ISO 20022 series.

The ISO 20022 series is based on open technology standards, which historically have evolved more rapidly than the industry itself. Consequently, the ISO 20022 series adopted a model-driven approach where the model of the industry's messaging can evolve separately from the evolution of the messaging technology standards. The period during which the ISO 20022 series has emerged followed the widespread adoption of the internet for business. The eXtensible Mark-up Language (XML) emerged as the de facto standard for document representation on the internet and it became the first syntax for the ISO 20022 series.

The modelling process is further refined into three levels which, in addition to the messaging technology standard, is why the ISO 20022 series is based on four levels: the scope level, the conceptual level, the logical level and the physical level. This four-level approach is based on the first four levels of the Zachman Framework[2]. The remaining two levels of the Zachman Framework are equivalent to the implementations and the operational levels, respectively.

In ISO 20022-1, the first, second and third levels are described in Unified Modelling Language (UML) because it is widely supported and supports multiple levels of abstraction. The models created in accordance with ISO 20022-1 are technology independent in that they do not require any particular physical expression or implementation. Such models aim to describe all parts of the message exchange. The models form the definition of the protocol between participants exchanging messages. ISO 20022-1 defines a method that describes a process by which these models can be created and maintained by the modellers.

The model artefacts are stored in an ISO 20022 Repository (hereafter referred to as "the Repository"). The Repository and physical level artefacts are exposed in a publicly accessible location, such as a website, serviced by a Registration Authority. The name and contact information of the Registration Authority for the ISO 20022 series can be found at www.iso.org/maintenance_agencies.

The Repository is organized into two areas:

— a DataDictionary containing the industry model elements likely to have further or repeated use;

— a BusinessProcessCatalogue that contains models describing specific message definitions and business processes and physical syntax implementations.

The ISO 20022 series is organized into the following parts.

— ISO 20022-1 describes the metamodel of all the models and the Repository according to ISO/IEC 19502:2005 (MOF).

— ISO 20022-2 covers the UML profile, a grounding of general UML into a specific subset defined for the ISO 20022 series (to be used when UML is selected to define the models).

— ISO 20022-3 describes a modelling method to produce models for the ISO 20022 series.

— ISO 20022-4 covers XML schema generation rules to transform a logical level model into a physical level description in the syntaxes.

— This document covers business concept model interoperability, and logical model alignment and reverse engineering.

— ISO 20022-6 covers message transport characteristics that define the quality of service required by the business process definitions so that they can operate successfully.

— ISO 20022-7 describes the process of managing the registration of models and physical syntax implementations.

— ISO 20022-8 gives ASN.1 syntax generation rules to transform a logical level model into a physical level description in ASN.1.

— ISO 20022-9 describes generic guidelines, which are used to define schema generation rules for any specific syntax.

Financial services — Universal financial industry message scheme —

Part 5: Conceptual interoperability and reverse engineering

1 Scope

This document defines a scalable, methodical process to ensure business concept model interoperability and logical model alignment and reverse engineering.

This document provides guidance on conceptual interoperability and reverse engineering to explain how to extract relevant information from existing IndustryMessageSet, proprietary MessageSet or business model in order to prepare the submission to the ISO 20022 Registration Authority of equivalent, ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets.

This document describes the activities of ISO 20022 conceptual interoperability and reverse engineering from the point of view of the user who wants to verify that the business functionality, covered by their own IndustryMessageSet, proprietary MessageSets or business model, is covered by ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 20022-1, *Financial services — Universal financial industry message scheme — Part 1: Metamodel*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20022-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
IndustryMessage
message that offers a particular MessageDefinition functionality (possibly multi-functional) and whose MessageDefinition is part of an IndustryMessageSet

3.2
message item
element or field used at a particular place in a MessageDefinition

Note 1 to entry: This exact place is typically described by the MessagePath.

3.3
MessagePath
exact position in a particular MessageDefinition

Note 1 to entry: 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).

3.4
convergence
planned replacement of IndustryMessageSet (or proprietary MessageSet) with ISO 20022 MessageSet

3.5
coexistence
compatible, contemporaneous use of IndustryMessageSet (or proprietary MessageSet) with ISO 20022 MessageSet for similar or related business purposes

3.6
interoperability
ability of ISO 20022 conformant MessageSets and IndustryMessageSets to cooperate and collaborate, with the aim of sharing and making use of data

4 Background

This document was prepared to complement ISO 20022-1. The ISO 20022 Repository contains all ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets, as outlined in ISO 20022-1. The approach to be followed for adding ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets to the Repository can be classified according to the following scenarios:

a) Case 1:

   1) No ISO 20022 conformant BusinessTransactions and MessageSets exist.

   2) No IndustryMessageSet exists.

      EXAMPLE 1 Collective investment vehicles.

   3) Approach: full development of ISO 20022 conformant BusinessTransactions and MessageSets using ISO 20022-3.

b) Case 2:

   1) No ISO 20022 conformant BusinessTransactions and MessageSets exist.

   2) One or more IndustryMessageSets, proprietary MessageSets or business models exist.

      EXAMPLE 2 Securities Pre-Trade (FIX IndustryMessageSet exists).

   3) Approach option 1 (reverse engineering): conversion of the IndustryMessageSet(s) or proprietary MessageSet(s) into ISO 20022 conformant BusinessTransactions and MessageSets, using this document.

   4) Approach option 2 (enhance interoperability at the conceptual level): modelling of the IndustryMessageSet(s) into ISO 20022 conformant BusinessComponents (including BusinessElements and Constraints), using this document.

c) Case 3:

   1) ISO 20022 conformant BusinessTransactions and MessageSets exist.

   2) One or more existing IndustryMessageSets, proprietary MessageSets or business models exist as well.

EXAMPLE 3 Securities Post-Trade (FIX and Omgeo IndustryMessageSets exist).

3) Approach option 1 (reverse engineering): comparison of the existing IndustryMessageSet(s) with the ISO 20022 conformant BusinessTransactions and MessageSets and extension of the ISO 20022 conformant BusinessTransactions and MessageSets, using this document.

4) Approach option 2 (enhance interoperability at the conceptual level): comparison of the existing IndustryMessageSet(s) with the ISO 20022 conformant BusinessTransactions and MessageSets, and enhancement or extension of the ISO 20022 conformant BusinessComponents (including BusinessElements and Constraints), using this document.

This document describes the activities of ISO 20022 conceptual interoperability and reverse engineering from the point of view of the user who wants to verify that the business functionality, covered by their own IndustryMessageSet, proprietary MessageSets or business model, is covered by ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets. The intention of this document is not to attempt to define a "methodology" for reverse engineering.

This document describes the following set of activities:

— extract relevant information from existing IndustryMessageSets, proprietary MessageSets or business model and compare it to the related information in the ISO 20022 Repository;

— use the results of this comparison for the development of ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets as necessary;

— submit the resulting update requests to the Registration Authority;

— prepare the migration to the ISO 20022 conformant BusinessTransactions and MessageSets for community of users who desires a migration.

The main objectives of this document are to:

— capture the industry knowledge covered by existing IndustryMessageSets and business models;

— build upon former standardization efforts in the industry when building ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets;

— ensure that the resulting ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets cover fully the business scope of existing IndustryMessageSets;

— facilitate interoperability between existing IndustryMessageSets or proprietary MessageSets or business models and ISO 20022 conformant BusinessTransactions, BusinessComponents (including BusinessElements and Constraints) and MessageSets when applicable;

— support the migration from existing IndustryMessageSets to ISO 20022 conformant BusinessTransactions and MessageSets if needed by users of IndustryMessageSets.

NOTE Whilst API Resources are not explicitly stipulated in this document, the same thought process for conceptual interoperability and reverse engineering is expected to apply for API Resources, once they become available for Registration.

5 Activities and deliverables

5.1 General

This clause is subdivided as follows:

— 5.2 describes the major objectives and deliverables related to activities of reverse engineering at the logical and physical level.

— 5.3 describes the major objectives and deliverables related to activities of enhancing interoperability at the conceptual level.

5.2 Reverse engineering

5.2.1 General

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

— gap analysis;

— development of ISO 20022 conformant BusinessTransactions and MessageSets;

— ISO 20022 registration;

— preparation of migration.

5.2.2 Gap analysis

The objectives of the gap analysis are to:

— determine the BusinessArea of the IndustryMessageSet and identify the corresponding BusinessArea, BusinessProcesses, activities and supporting BusinessTransactions in the ISO 20022 BusinessProcess Catalogue;

— compare BusinessRoles in ISO 20022 BusinessProcesses and BusinessTransactions to the parties that use the IndustryMessages, or that are identified in the IndustryMessages;

— verify whether existing MessageInstances offer the complete MessageDefinition functionality that is offered by the IndustryMessages;

— evaluate whether the business content of the relevant MessageInstances cover the business content of the individual IndustryMessages;

— compare the meaning and the data typing of the used MessageComponentTypes and BusinessComponents to the individual IndustryMessage items.

If there are any gaps, the deliverables of the gap analysis are as follows:

— Documentation concerning the coverage, the differences and the gaps between the IndustryMessageSet and the ISO 20022 conformant BusinessTransactions and MessageSets. This documentation concerns the following repository items:

  — BusinessAreas;

  — BusinessProcesses;

  — BusinessTransactions and MessageSets;

  — MessageDefinitions (including MessageDefinition Constraints);

  — BusinessRoles;

  — BusinessComponents (including BusinessElements and Constraints);

  — MessageComponentTypes (including MessageElements and Constraints);

  — DataTypes.

— The documentation of the IndustryMessageSet for those repository items that were missing (i.e. the gaps) or for which a difference was identified.