INTERNATIONAL STANDARD

ISO 20022-1

First edition
2004-12-15

Financial services — UNIversal Financial Industry message scheme —

Part 1: Overall methodology and format specifications for inputs to and outputs from the ISO 20022 Repository

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

Partie 1: Méthodologie globale et spécifications pour le format de soumission et de publication du Référentiel ISO 20022

Reference number
ISO 20022-1:2004(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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.

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 20022-1 was prepared by Technical Committee ISO/TC 68, *Financial services*.

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

In the mid-1990s, it was felt strongly that the International Standard for communication between securities industry participants required an urgent review aiming at (1) reducing the time taken to deliver new standardized Message Sets to the market place and (2) improving “straight through processing” capabilities.

ISO 15022 set the principles necessary to provide the different communities of users with the tools to design Message Definitions to support their specific information flows. These tools consisted of

— a set of syntax and message design rules;

— a Data Field Dictionary uniquely identifying Business Elements to be communicated and their technical representation;

— a Catalogue of Messages built by the industry with the above-mentioned fields and rules.

To address the evolving needs of the industry as they emerge, the Data Field Dictionary and the Catalogue of Messages had been kept outside ISO 15022 though maintained according to it. They were made available by a Registration Authority, which updated them as necessary upon the request of industry participants.

The early 2000s saw the widespread growth of IP (Internet Protocol) networking and the emergence of XML (eXtensible Mark-up Language) as the *de facto* open technical standard for electronic communications. It was felt that ISO 15022 needed to be extended to offer the whole financial industry a common platform for the development of messages in a standardized XML syntax. At the same time, to shield the platform from further syntax changes, it was felt necessary to better split messaging into its business dimension, on one hand, and its technical representation, on the other hand. Therefore, while capitalizing on the original ISO 15022 tool set, ISO 20022 proposes

— to use a modelling methodology (e.g. based on formal notation such as UML – Unified Modelling Language) to capture, analyse and describe in a syntax-independent way the Business Areas, Business Processes, Business Transactions, Business Actors, Business Roles, Business Information and associated Message Flow Diagrams and Message Definitions which allow the industry to exchange the information required to achieve its business objectives;

— to define the design rules to be used to convert Message Definitions described in a modelling notation into a standardized syntax representation. At the moment of the publication of ISO 20022 the preferred syntax for all electronic documents (including the subset of electronic STP-messages) is XML [as defined by the World Wide Web Consortium (W3C)]. On request of the financial industry, the design rules can later be extended to cover other future open syntaxes.

Under this approach, which is in line with the messaging developments undertaken by other industries, the complete models and the derived syntax output are stored in a central Repository (the ISO 20022 Repository), serviced by the Registration Authority. The ISO 20022 Repository offers industry participants access to the following.

— A financial Business Process Catalogue, containing

  — the description of the financial Business Model;

  — the description of financial Business Transactions, including Message Definitions;

  — the Message Schemes represented in an agreed syntax (such as ISO 20022 XML).

— A financial Data Dictionary, containing

  — Business Concepts, Data Types and Message Concepts used in Business Areas, Business Processes, Business Transactions and Message Sets.

It is expected that this flexible framework will allow communities of users to build Business Transactions and Message Sets according to an internationally agreed approach and to migrate to the use of a common syntax (such as ISO 20022 XML). If the existing set of Business Transactions and Message Definitions stored in the ISO 20022 Repository does not address their requirements, the communities of users can agree on the use of other Business Transactions and Message Definitions and design them from the items registered in the Data Dictionary. They can submit these Business Transactions and Message Definitions to the Registration Authority. The Registration Authority, with the support of Standards Management Groups, will validate the requests and update the ISO 20022 Repository as necessary and generate the corresponding ISO 20022 syntax output using the agreed ISO 20022 Syntax Design Rules for XML or for other future open syntaxes.

Agreement of common financial Business Models and Message Definitions, which address the business requirements of the communities of users and include a common syntax solution (such as ISO 20022 XML), facilitates end-to-end straight through processing. Furthermore, the agreed Business Models and Message Definitions serve as a reference to migrate to an agreed ISO 20022 syntax (such as ISO 20022 XML). Indeed, communities using another syntax may link the content of their Industry Message Sets to items already existing in the ISO 20022 Repository. The relation between these items could be provided to the communities of users as “Convergence Documentation”. It is expected that this new, dual split of business standard and technical standard will facilitate the convergence and the development of any required conversion mechanisms.

ISO 20022 contains

— the overall description of the modelling approach (Part 1);

— the overall description of the ISO 20022 Repository contents (Part 1);

— a high-level description of the input to be accepted by the Registration Authority to feed/modify the Repository’s Data Dictionary and Business Process Catalogue (Part 1);

— a high-level description of the Repository output to be made publicly available by the Registration Authority (Part 1);

— the responsibilities, service levels and procedures for the Registration Bodies, including the role of Standards Management Groups and the supervision by a Registration Management Group and ISO (Part 2);

— the detailed modelling guidelines to be used to construct ISO 20022 compliant Business Transactions and Message Sets (Part 3);

— the syntax design rules applied by the ISO 20022 Registration Authority to translate an ISO 20022 compliant Message Definition into an ISO 20022 syntax solution. The actual document shall specify a particular syntax such as “XML Design Rules” for the production of ISO 20022 XML Message Schemes and ISO 20022 XML Message instances (Part 4).

NOTE The Syntax Message Schemes published by the Registration Authority for the Message Definitions registered into the ISO 20022 Business Process Catalogue constitutes the reference against which Syntax Message Schemes generated by proprietary implementations of the ISO 20022 syntax design rules can be compared in order to validate the compliance of those implementations with the design rules.

— 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 (Part 5).

The ISO 20022 Registration Authority keeps a set of Submission Templates to the Data Dictionary and Business Process Catalogue available outside of ISO 20022. These templates are to be used when submitting requests to the Registration Authority for inclusion into the ISO 20022 Repository.

NOTE Even though ISO 20022 deals with the standardization of the communication between financial industry players, it should be clear that it does not deal directly with any of the seven layers of the ISO Open Systems Interconnect model (OSI model). In fact, one could state that ISO 20022 starts where the OSI-model ends, i.e. ISO 20022 standardizes the content of the "file" (i.e. the message content) that is transported in the OSI Application Layer. The standardization of the message content deals itself with two separate layers: the "syntax layer", i.e. the standardization of the physical representation of the information that is transported, which deals with aspects related to the use of XML, Enhanced 7775, EDIFACT or other syntaxes; and the "semantic layer", i.e. the standardization of the meaning of the information that is transported. Although these layers were already covered in ISO 15022, ISO 20022 makes the standardization of these layers more formal and makes the separation between both layers more explicit and complete. The introduction of this formal approach improves (1) the interoperability and convergence across existing Industry Message Sets, (2) the re-usability across business domains and market practices and (3) the stability of the standardized Business Transactions and Message Sets. Another important factor in ISO 20022 is the introduction of open syntaxes, such as XML, which removes the necessity to describe the technical specification of a particular syntax (such as Enhanced 7775 in ISO 15022).

Financial services — UNIversal Financial Industry message scheme —

Part 1: Overall methodology and format specifications for inputs to and outputs from the ISO 20022 Repository

1 Scope

This part of ISO 20022 consists of

— the overall description of the modelling approach;

— the overall description of the ISO 20022 Repository contents;

— a high-level description of the input to be accepted by the Registration Authority to feed/modify the Repository's Data Dictionary and Business Process Catalogue;

— a high-level description of the Repository output to be made publicly available by the Registration Authority.

ISO 20022 compliant Business Transactions and Message Sets can be used for electronic data interchange amongst any industry participants (financial and others), independently of any specific communication network. Network dependent rules, like message acknowledgement and message protection are outside the scope of ISO 20022.

2 Normative references

The following referenced documents are indispensable for the application 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 15022-1:1999, *Securities — Scheme for messages (Data Field Dictionary) — Part 1: Data field and message design rules and guidelines*

ISO 15022-2:1999, *Securities — Scheme for messages (Data Field Dictionary) — Part 2: Maintenance of the Data Field Dictionary and Catalogue of Messages*

ISO 20022-2, *Financial services — UNIversal Financial Industry message scheme — Part 2: Roles and responsibilities of the registration bodies*

ISO 20022-5, *Financial services — UNIversal Financial Industry message scheme — Part 5: ISO 20022 Reverse engineering*

UML (Unified Modelling Language), Version 1.4 — Object Management Group

XML (Extensible Markup Language) 1.0 (Second Edition) W3C Recommendation 6 October 2000 — World Wide Web Consortium

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. All these terms are capitalized when used throughout the document.

NOTE These terms and definitions do not necessarily fully reflect the UML specific terminology.

3.1
Business Actor
physical business user playing one or more Business Roles in a particular Business Process or Business Transaction

EXAMPLE Bank, corporate.

NOTE 1 A Business Actor may be a person, organisation or infrastructure.

NOTE 2 Business Actors are a category of Business Concepts. They are stored in the Data Dictionary.

See Figure 1.

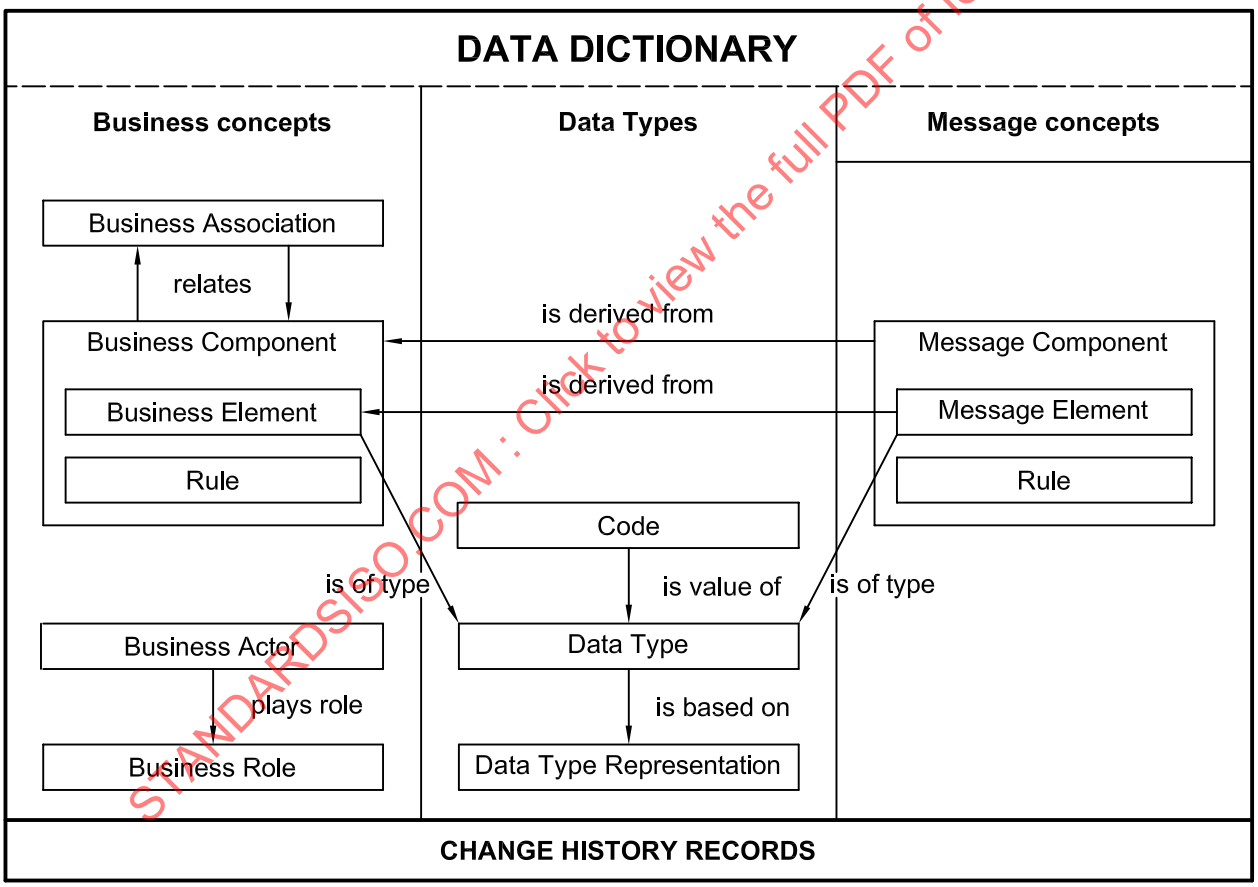

Figure 1 — ISO 20022 Data Dictionary

3.2
Business Area
set of strongly related business activities, that provide a self-standing business value to a set of Business Actors

EXAMPLE Securities pre-trade, payment initiation.

NOTE 1 A Business Area may contain other Business Areas (i.e. hierarchical structure). At the lowest level it will contain a set of Business Processes.

NOTE 2 Business Areas are stored in the Business Process Catalogue.

See Figures 2 and 3.

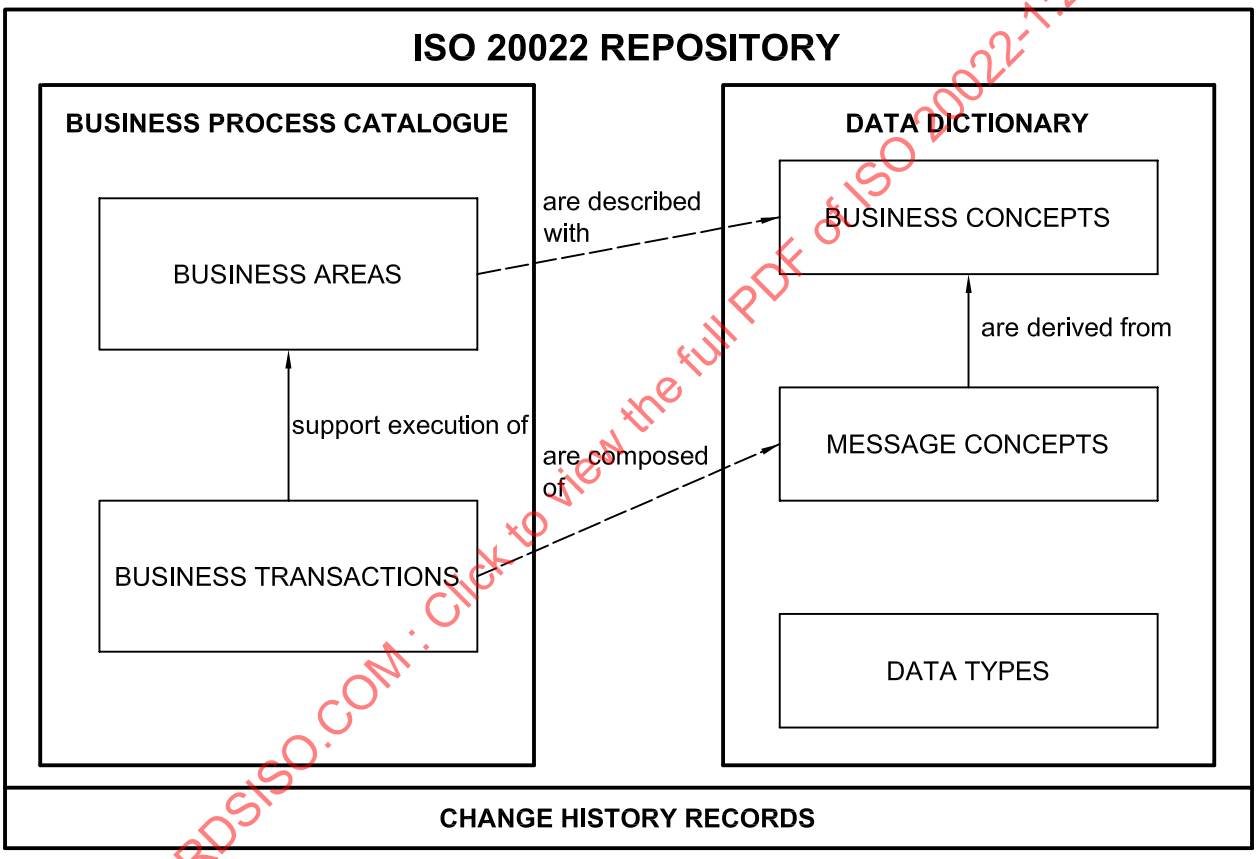

Figure 2 — ISO 20022 Repository Structure

3.3
Business Association
relation between two Business Components

EXAMPLE A party services an account.

NOTE 1 Business Associations are a category of Business Concepts. They are stored in the Data Dictionary where they are linked to their two related Business Components. Their meaning can only be described unambiguously in combination with these two Business Components.

NOTE 2 There can be several Business Associations between two particular Business Components.

See Figure 1.

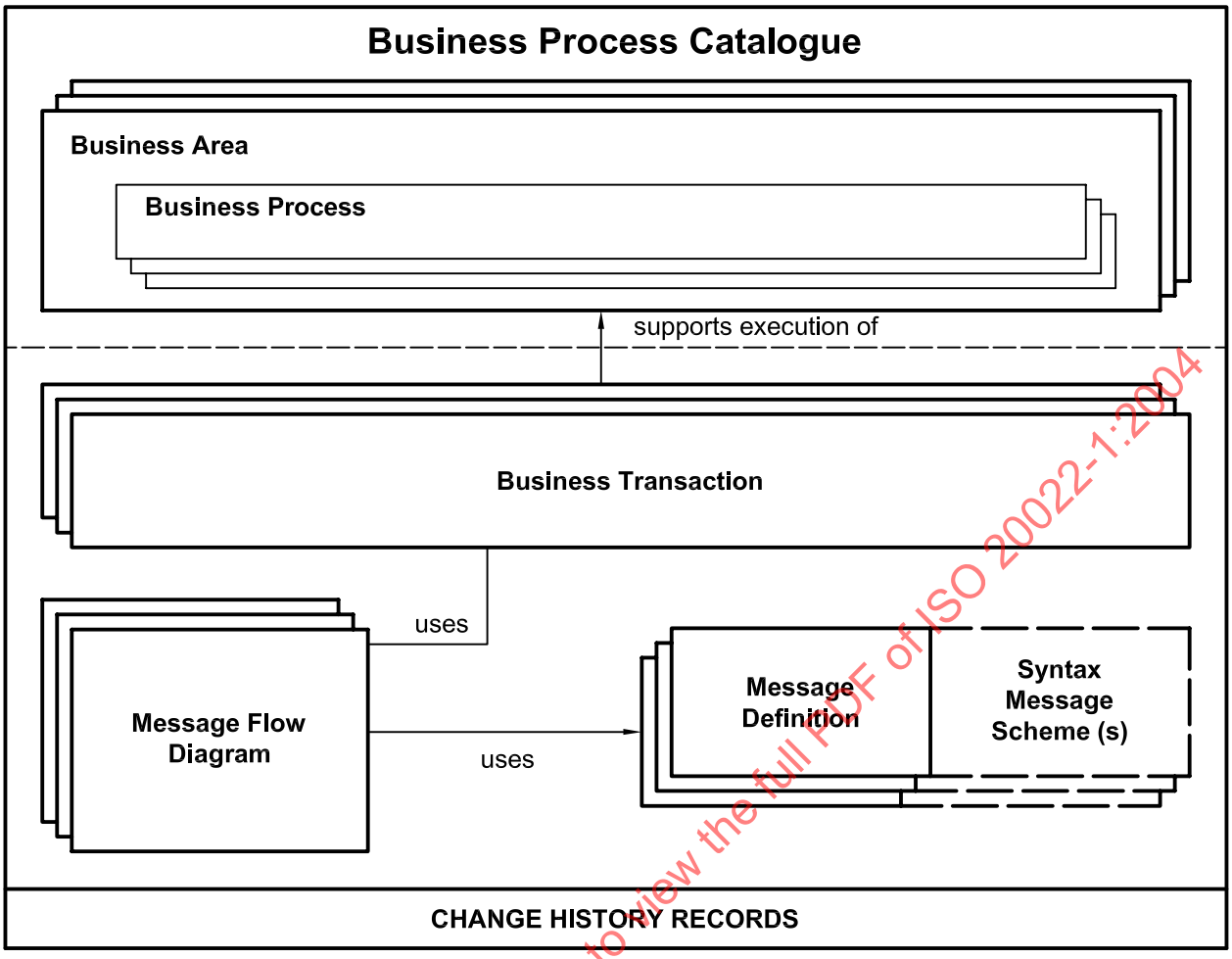

Figure 3 — Business Process Catalogue meta model

3.4
Business Component
representation of a (part of a) key business notion, characterized by specific Business Elements

EXAMPLE Account, trade, party.

NOTE 1 Business Components are a category of Business Concepts. They are stored in the Data Dictionary.

NOTE 2 A Business Component may have one or more Business Associations with other Business Components.

See Figure 1.

3.5
Business Concept
Dictionary Item with a business meaning

EXAMPLE Business Actor, Business Role, Business Component, Business Element, Business Association.

See Figures 1 and 2.

3.6
Business Element
business characteristic of a Business Component

EXAMPLE Account status, deal price, trade date and time.

NOTE Business Elements are a category of Business Concepts. They are stored in the Data Dictionary where they are linked to their owning Business Component. Their meaning can only be described unambiguously in combination with this Business Component.

See Figure 1.

3.7
Business Information
generic name covering Business Components, Business Elements and Business Associations

3.8
Business Information Diagram
diagram that shows a set of Business Components, Business Elements and Business Associations

3.9
Business Model
abstract description of a (part of a) Business Area showing the main Business Processes and Business Concepts relevant to this (part of a) Business Area

3.10
Business Process
main business activity within a Business Area that yields an observable result to one or more industry participants and that allows the industry to achieve its business objectives

EXAMPLE Securities ordering, trade matching.

NOTE 1 A Business Process may contain other Business Processes such as in a hierarchical structure.

NOTE 2 Business Processes are stored in the Business Process Catalogue.

See Figure 3.

3.11
Business Process Diagram
diagram that shows a set of Business Processes, Business Actors and Business Roles in a particular Business Area

3.12
Business Process Catalogue
part of the ISO 20022 Repository that contains all Business Process and Business Transaction related items

NOTE It contains related items from the Business Area down to the Message Definitions and their physical implementation.

See Figures 2 and 3.

3.13
Business Role
functional role played by a Business Actor in a particular Business Process or Business Transaction

EXAMPLE Account owner, buyer.

NOTE Business Roles are a category of Business Concepts and are stored in the Data Dictionary.

See Figure 1.

3.14
Business Transaction
particular solution that meets the communication requirements and the interaction requirements of a particular Business Process and/or Business Area

NOTE It is typically based on the use of Messages.

See Figures 2 and 3.

3.15
Catalogue Item
item that is uniquely identified in the Business Process Catalogue

3.16
Code
one possible value in a finite enumeration of all possible values of a Data Type of Data Type Representation "code" assigned to a Business or Message Element

EXAMPLE "INDI" is a possible value for the Data Type "Rate Status Code" and represents an indicative rate.

NOTE Codes are stored in the Data Dictionary where they are linked to their owning Data Type. Their meaning can only be described unambiguously in combination with this Data Type.

See Figure 1.

3.17
Convergence Documentation
documentation set showing relations between ISO 20022 Message Definitions, Message Components, Message Elements, Business Components, Business Associations and/or Business Elements and items defined in other Industry Message Sets

NOTE The Industry Message Sets include the ISO 15022 Message Set.

3.18
Data Dictionary
part of the ISO 20022 Repository that contains all items that can be re-used during business process modelling and message definition activities

NOTE The Data Dictionary therefore contains Business Concepts, Message Concepts and Data Types.

See Figures 1 and 2.

3.19
Dictionary Item
item that is stored in the Data Dictionary

3.20
Data Type
item that unambiguously specifies the set of valid values of a Business Element or Message Element

EXAMPLE ISO 9362 - Bank Identifier Code (BIC).

NOTE 1 The set of valid values may be defined via a format specification (e.g. text pattern) or via an exhaustive enumeration of all possible values (e.g. a list of Codes or a reference to a standardized coding scheme). Data Types are stored in the Data Dictionary.

NOTE 2 This definition is semantically equivalent to the definition of "datatype of data element values" in 3.26 of ISO 11179-1:1999 (*"A set of distinct values for representing the data element value"*). The definition has only been adapted to the particular terminology of ISO 20022.

See Figures 1 and 2.

3.21
Data Type Representation
category of Data Types, characterized by a set of technical information required for implementation and processing

EXAMPLE Code, Text, Amount, Identifier.

NOTE 1 The full list of valid Data Type Representations is registered in the Data Dictionary.

NOTE 2 This definition is semantically equivalent to the definition of "representation" in 3.60 of ISO 11179:1999 ("*The combination of a value domain, datatype, and, if necessary, a unit of measure or a character set*").

See Figure 1.

3.22
Diagram
graphical representation of information, complementing a textual description

NOTE It can be used during the development of ISO 20022 compliant Business Transactions and Message Sets to clarify the meaning of specific information in the ISO 20022 Repository.

3.23
Industry Message Set
set of messages that is defined and used by a part of the (financial) industry

EXAMPLE The set of FIX v4.3 messages.

3.24
ISO 15022 Message Set
Industry Message Set constructed according to the rules defined in ISO 15022-1 and ISO 15022-2 and that is stored in the ISO 15022-1 Catalogue of Messages

3.25
ISO 20022 Repository
repository composed of the Data Dictionary and of the Business Process Catalogue

NOTE The ISO 20022 Repository is NOT identical to the ISO 15022-1 Data Field Dictionary and Catalogue of Messages. As explained in Clause 8, all information that is contained in the ISO 15022-1 and ISO 15022-2 Data Field Dictionary and Catalogue of Messages will be transferred to the ISO 20022 Repository.

See Figure 2.

3.26
Market Practice
set of rules that are derived from specific (usually regional) business or regulatory agreements and common practices

NOTE A Message Definition covering a specific Message Functionality may differ slightly as a function of the Market Practice: there may be some variation in the structure and/or the set of rules related to the Message Definition.

3.27
Message
set of structured information exchanged between Business Actors or Business Roles, in the scope of a Business Transaction

EXAMPLE Notice Of Execution, Order To Buy, Credit Transfer.

3.28
Message Component
re-usable Dictionary Item that is a building block for assembling Message Definitions

EXAMPLE Trade Details (which contains a number of the properties of the related Business Component "Trade").

NOTE 1 It is normally linked to a Business Component and characterized by specific Message Elements.

NOTE 2 Message Components are a category of Message Concepts. They are stored in the Data Dictionary.

See Figure 1.

3.29
Message Concept
Dictionary Item used for Message Definitions

NOTE It includes Message Component, Message Element or Rule (when defined in the scope of a Message Component).

See Figures 1 and 2.

3.30
Message Definition
formal description of the structure of a Message

NOTE The Message Definition is built as a tree structure of Message Components. A Message Definition is uniquely identified in the Business Process Catalogue.

See Figure 3.

3.31
Message Definition Diagram
graphical representation of the structure of a Message

3.32
Message Element
characteristic of a Message Component, having a unique meaning within the scope of that Message Component

EXAMPLE Trade Date and Time (as part of the Message Component "Trade Details").

NOTE Message Elements are a category of Message Concepts. They are stored in the Data Dictionary where they are owned by a particular Message Component. Their meaning can only be described unambiguously in combination with that Message Component.

See Figure 1.

3.33
Message Flow Diagram
diagram that depicts an ordered sequence of Messages that may be exchanged between Business Actors or Business Roles

NOTE A Message Flow Diagram is uniquely identified in the Business Process Catalogue.

See Figure 3.

3.34
Message Functionality
purpose for which a Message described by a Message Definition can be used

NOTE 1 Messages in existing Industry Message Sets (including the ISO 15022-1 and ISO 15022-2 Message Set) are often multi-functional, meaning that they can be used for multiple purposes. The ISO 20022 modelling guidelines contain guidelines to avoid such multi-functionality.

NOTE 2 Example of multi-functionality: the ISO 15022-1:1999 Message "MT 502" can be used as an order to buy securities, as an order to sell securities, to cancel a previously placed order, to change a previously placed order.

3.35
Message Rule
specific constraint that is specified at the level of a Message Definition

NOTE Message Rules are stored in the Business Process Catalogue where they are linked to their owning Message Definition. Their meaning can only be described unambiguously in combination with that Message Definition.

3.36
Message Set
set of Message Definitions

3.37
Model
simplified but formal description of reality, created to better describe and understand a particular view on reality

3.38
Rule
constraint defined in the scope of a particular Business or Message Component and describing specific conditions applicable to that component and/or its associated components

EXAMPLE Within an order message, the requested delivery date shall be a future date.

NOTE Rules are a category of Business Concepts and a category of Message Concepts. They are stored in the Data Dictionary where they are linked to their owning Business Component or Message Component. Their meaning can only be described unambiguously in combination with that Business Component or Message Component.

See Figure 1.

3.39
Syntax Message Scheme
syntax processable notation used to define the structure of a Message in a particular syntax

NOTE 1 In case of XML, the scheme may, for instance, be an XML DTD or an XML Schema and may then be used as a validation tool for Messages.

NOTE 2 Syntax Message Schemes are stored in the Business Process Catalogue.

See Figure 3.

4 Methodology for the development of ISO 20022 compliant Business Transactions and Message Sets

4.1 Overview

The methodology comprises five activities.

- The Business Analysis focuses on getting a thorough understanding of the business objectives of the considered Business Area.
- The Requirements Analysis focuses on discovering the communication and interaction requirements related to the Business Processes that are part of the considered Business Area.
- The Logical Analysis and Logical Design specify the Business Transaction and Message Set that meet the identified communication and interaction requirements.
- The Business Transaction and Message Set are defined independently of any physical implementation and include Message Flow Diagrams and Message Definitions.
- The Technical Design delivers the physical implementation of Message Definitions and Message Rules in an appropriate syntax such as ISO 20022 XML.

These five activities are applied in an iterative and incremental way for the development of ISO 20022 compliant Business Transactions and Message Sets.

4.2 Business Analysis

The purpose of the Business Analysis is to acquire an understanding of the Business Area for which an ISO 20022 compliant Business Transaction and Message Set is to be developed. Describing the Business Processes and their need for Business Information helps in the identification of the communication problems that exist among the business users (modelled as Business Actors and Business Roles) that take part in these processes. Those communication problems will be the main drivers for the Requirements Analysis. Identifying the Business Information that is manipulated in a Business Area is also important for the later Message Design, because the Message Definitions will contain data elements that are related to this Business Information.

The key objectives of the Business Analysis phase are:

- to identify and define the Business Area;
- to understand the daily business in the Business Area;
- to define the structure and dynamics of the Business Processes within the Business Area;
- to capture the Business Concepts handled within the Business Processes;
- to ensure that users, business experts and messages developers have a common understanding of the Business Area.

The main activities involved in the Business Analysis are:

- the definition of the Business Area in terms of its objectives, scope and boundaries;
- the discovery and analysis of the Business Processes;

— the discovery and analysis of all Business Concepts that are relevant to the Business Area; this may lead to the re-use or modification of existing Business Components and to the creation of new Business Components and Business Elements;

— the verification of the consistency of the resulting Business Model.

4.3 Requirements Analysis

The purpose of the Requirements Analysis is to identify the requirements related to the communication problems for which an ISO 20022 compliant Business Transaction and Message Set is to be developed. The Requirements Analysis activity uses a "black box" perspective [1)] in order to avoid prematurely tackling architectural issues regarding the implementation (these issues are tackled in further activities).

The key objectives of the Requirements Analysis are:

— to identify the communication problems that need to be solved;

— to refine the scope of the Business Transaction and Message Set that will be developed;

— to define precisely the expected properties of the Business Transaction and Message Set that will be developed (functionality, interaction with Business Actors and Business Roles).

The main activities of the Requirements Analysis phase are:

— the identification of the goals of the Business Transaction and Message Set that will be developed;

— the specification of requirements.

4.4 Logical Analysis

The purpose of the Logical Analysis is to specify the details of the Business Transaction and Message Set that will be developed. This means that the focus is moving from the "black box" perspective to a "white box" perspective [2)]. The Business Transaction and Message Set are still characterized from a pure business perspective. The focus still remains on the semantics (i.e. the underlying business meaning) and not yet on the syntax (i.e. how to physically represent a Message and a set of validation rules). All decisions are driven by the requirements.

The key objectives of the Logical Analysis are:

— to determine the possible Message Flows;

— to determine the business content of the required Messages;

— to determine which rules apply to the various Message Flows and Messages.

The main activities of the Logical Analysis phase are:

— the refinement of the requirements into concrete Business Transactions and identification of Messages, Message Flows and rules related to these Message Flows;

1) A "black box" perspective means that one does not try to define Message Flows and Message Definitions. The focus is only on defining "who needs what" in order to execute the Business Processes. There is no attempt yet to define how to get the information at the right moment to the right business user.

2) A "white box" perspective means that one looks into all the details of the Business Transaction and Message Set. The focus is now on defining the Message Flows and Message Definitions that are needed to get the required information at the right time to the right business user.

— the identification of the required business contents of the Messages and the rules that govern the Message Flows and the Messages; this will provide a first draft of the Message Definition.

4.5 Logical Design

The purpose of the Logical Design is to refine the result of the Logical Analysis in order to make it formal (i.e. precise and unambiguous) and in order to identify items to be re-used (e.g. Message Components and Message Elements). Logical Design refines both the static part (i.e. the precise structure of the Messages) and the dynamic part (i.e. the precise description of the full interaction between all involved Business Roles) of the Business Transaction and Message Set. The static part is also called “Message Design”.

The key objectives of the Logical Design are:

— to identify the re-usable Message Components and Message Elements that will be used to create the required Message Definitions;

— to define new re-usable Message Components that shall be created;

— to design the structure of the Message Definition;

— to identify all aspects of the interaction between all involved Business Roles.

The main activities of the Message Design phase are:

— the identification of the required message information;

— the identification of the re-usable Message Components derived from the appropriate Business Components in order to build the Message Definition; this may lead to the creation of new Message Components within the Data Dictionary;

— the formalization of the Message Definition;

— the formal description of the interaction between all involved Business Roles.

4.6 Technical Design

The purpose of the Technical Design is to produce a physical implementation of the Message Definitions. Specific design rules are used to build the physical representation of the Message Definitions from the deliverables of the Message Design [3)].

The key deliverable of the Technical Design is:

— a set of ISO 20022 Syntax Message Schemes in a particular syntax, such as ISO 20022 XML. These Syntax Message Schemes are the result of applying the ISO 20022 Syntax Design Rules on the Message Definitions designed during the Logical Design.

4.7 Reverse Engineering

The purpose of Reverse Engineering is to make sure that the ISO 20022 Repository covers the business functionality of an existing Industry Message Set.

3) Note that this approach makes the Message Set (as defined in the Logical Analysis and Design phases) independent of the final physical representation. This will ease a potential future evolution of the syntax to a more advanced technology.

The key objectives of Reverse Engineering are:

— to extend the ISO 20022 Repository to cover the full functionality of an existing Industry Message Set;

— to facilitate the convergence of the Industry Message Set towards the use of the equivalent ISO 20022 compliant Business Transaction and Message Set.

The main activities of reverse Engineering are:

— the identification of differences and gaps between the Industry Message Set and the content of the ISO 20022 Repository;

— the definition of required updates to the ISO 20022 Repository to cover the identified differences and gaps;

— the submission of these updates to the ISO 20022 Registration Authority;

— the documentation of the equivalence between the Industry Message Set and the information stored in the ISO 20022 Repository (in order to ease the convergence towards the ISO 20022 compliant Business Transaction and Message Set).

5 Repository contents

5.1 ISO 20022 Repository structure

Figure 2 shows a high level view of the structure of the ISO 20022 Repository. As indicated, the ISO 20022 Repository consists of two major parts: the Business Process Catalogue and the Data Dictionary.

The Data Dictionary contains Business Concepts, Message Concepts and Data Types. All these items are re-usable and are called Dictionary Items. The Data Dictionary as a whole is under release control.

The Business Process Catalogue is organized in Business Areas. The communication requirements and the interaction requirements in the various Business Areas are supported by Business Transactions. All items that are stored in the Business Process Catalogue are called Catalogue Items. Within the Business Process Catalogue the Business Transactions are under release control. A Business Process Catalogue release is always based on one single Data Dictionary release.

Figure 2 also shows the main relationships between Dictionary Items and Catalogue Items:

— within the Data Dictionary: Message Concepts are derived from Business Concepts.

— within the Business Process Catalogue: Business Transactions support Business Areas.

— between the Business Process Catalogue and the Data Dictionary: Business Areas are described using Business Concepts and Business Transactions mainly composed of Message Concepts.

All Dictionary Items and Catalogue Items are uniquely identified, registered and managed within the Repository. Those items are the result of the approach outlined in Section 4. The ISO 20022 Repository contains change history records, which contain the “change log” of those items, reflecting the life cycle of the items. Change history records are maintained and controlled by the Registration Authority.

The following change history record information is associated with every item:

— *Change Type:* identifies purpose of this change history record, in terms of item creation, amendment or deletion.

— *Request By:* identifies the institution or community of users that submitted the item's change request to the Registration Authority. The requestor's contact information will be stored in this information field: organisation, company, contact person, address, telephone number, e-mail address, etc.

— *Replaces:* indicates, when applicable, the item that has been replaced by this item.

— *Change description:* provides the business justification and motivation to change the item.

— *Change Date:* date at which the change to the item has been registered.

5.2 Data Dictionary

5.2.1 Overview

As shown in Figure 1, a Data Dictionary Release contains Dictionary Items, namely Business Concepts, Data Types and Message Concepts. Each Dictionary Item is described by some descriptive information and has a change history record containing information about its life cycle.

Figure 1 also shows the main relationships between Dictionary Items:

— a Business Component contains Business Elements and Rules;

— a Business Association defines a relationship between two Business Components;

— a Business Actor can play multiple Business Roles and a Business Role can be played by multiple Business Actors;

— a Message Component contains Message Elements and Rules;

— a Code is a possible value of a particular category of Data Type;

— a Data Type defines the set of valid values of Business Elements and of Message Elements;

— a Data Type is based on a Data Type Representation;

— a Message Component is derived from a Business Component;

— a Message Element is derived from a Business Element.

5.2.2 List of Dictionary Items

5.2.2.1 Business Concepts

The Data Dictionary contains the following types of Business Concept, which reflect the nature of the Dictionary Items that are defined and used during the Business Analysis and Requirements Analysis activities. They form the basic items with which the Business Model of a Business Area is built:

— Business Components;

— Business Elements;

— Business Associations;

— Rules (defined in the scope of a Business Component);

— Business Actors;

— Business Roles.

5.2.2.2 Data Types

The objective of a Data Type is to specify unambiguously the set of valid values that a Business Element or a Message Element can have.

The Data Types are categorized in a limited number of Data Type Representations, such as amount, identifier, quantity, code, date, time and text. The full list of Data Type Representations is registered in the ISO 20022 Data Dictionary.

Each Data Type Representation defines the following information:

- The primitive type that will be used for all Data Types that are based on this Data Type Representation, e.g.:
  - Data Types that are based on Data Type Representation “text” will use “string” as primitive type.
  - Data Types that are based on Data Type Representation “amount” will use “real” as primitive type.
- The additional information that shall be specified to distinguish Data Types that are based on the same Data Type Representation. This additional information will limit the set of possible values that can be used for a particular Data Type. This can be done in two ways:
  1) Defining explicitly the list of possible values, by exhaustive enumeration or by referencing a list. For the Data Type Representation “code”, the Registration Authority will either use an existing list of Codes or the Registration Authority will define a new list of Codes within the ISO 20022 Repository. In the latter case all Codes will be of 1 up to 4 alphanumeric characters.
  2) Specifying a format specification (e.g. by defining the length of a string).
- Some examples:
  - Data Types that are based on Data Type Representation “Identifier” can specify the list that contains the possible values of this identifier (e.g. the Data Type “ISIN” contains its possible values in the “ISIN directory”).
  - Data Types that are based on Data Type Representation “text” can specify the maximum length that is allowed (e.g. the Data Type “Max35Text” – which is used, amongst others, for the street name – has a maximum of 35 characters).

The list of possible values for Data Types that have the Data Type Representation “Code” will be included in the Data Dictionary if the list of Codes is maintained by the ISO 20022 Registration Authority.

5.2.2.3 Message Concepts

The Data Dictionary contains the following types of Message Concept, which reflect the nature of the Dictionary Items that are defined and used during the Logical Analysis and Logical Design activities. They form the basic items of Message Definitions.

- Message Components are the re-usable Dictionary Items with which the Message Definitions shall be built. A Message Component is normally derived from one single Business Component. It can be considered as a “view” on that Business Component that will be used in Message Definitions.

  Several Message Components can be derived from the same Business Component. These Message Components will be different because of their specific subset of Message Elements or because of specific constraints such as specific Rules or multiplicity constraints.

  In exceptional cases, a Message Component can be based on a set of related Business Components or can even be defined for message specific reasons without being derived from any Business Component at all.

— Rules (defined in the scope of a Message Component).

— Message Elements: they are usually derived from the Business Elements of the Business Component corresponding to the Message Component. There may be situations where Message Elements in one Message Component come from multiple related Business Components. The Message Elements will then be linked to the relevant Business Element in the correct Business Component.

  In exceptional cases the Message Element may be defined for message specific reasons without being derived from any Business Element at all.

  The set of possible values of a Message Element is either defined by a Data Type or by another Message Component.

5.2.3 Dictionary Item Registration Status

Each Dictionary Item is assigned a "Registration Status". The Registration Status may take the following values:

— `PROVISIONALLY REGISTERED`: the Dictionary Item is pending final approval by one or several Standards Management Groups (see ISO 20022-2). This enables the Registration Authority to inform a community of users of Dictionary Items that will potentially become "`REGISTERED`" in the near future (according to the time frames defined in ISO 20022-2).

— `REGISTERED`: the ISO 20022 compliant Dictionary Item is approved and can be used.

— `OBSOLETE [<REMOVAL-DATE>]`: the Dictionary Item is no longer considered as ISO 20022 compliant and may no longer be used for registering updates to the ISO 20022 Repository. The Dictionary Item will however be kept in the Data Dictionary as long as it is used in other Dictionary or Catalogue Items. The optional `<REMOVAL-DATE>` enables the Registration Authority to inform a community of users that the Dictionary Item will be physically removed from the Data Dictionary at the date specified as `<REMOVAL-DATE>`.

5.2.4 Dictionary Items Description Information

The semantics of each Dictionary Item is defined by the following information [4)].

— *Name:* official name of the Dictionary Item (uniqueness is defined in Clause 3). It may include versioning information.

— *Definition:* precise description of the meaning of the Dictionary Item.

— *Removal date*: the date at which a Dictionary Item having an "`OBSOLETE`" Registration status is removed from the Repository.

— *Synonyms*: alternative names known for a Dictionary Item in a specific identified context. This includes acronyms.

— *Examples*: examples of the use of the Dictionary Item in its business context.

4) This list of information is not exhaustive but is provided in the scope of the information that may be required for the submission requests to the Registration Authority.

— *Multiplicity*: indicates whether the Dictionary Item is mandatory, optional and/or repetitive. This information is only applicable to Business Elements in Business Components, to Message Elements in Message Components, to Message Components in Message Definitions, and to Business Associations between Business Components.

5.2.5 Data Dictionary life cycle

On a regular basis, the Registration Authority makes publicly available the current release of the Data Dictionary. This published Data Dictionary contains all Dictionary Items, i.e. with status `PROVISIONALLY REGISTERED`, `REGISTERED` or `OBSOLETE [<REMOVAL-DATE>]`[5]. This allows the Registration Authority to inform communities of users of Dictionary Items that will either become registered, or will be removed from the Dictionary in the near future.

At any time, only the latest release of the Data Dictionary is available as the official point of reference. It replaces any previously released Data Dictionary and contains at least all Dictionary Items that are referenced in the current issue of the Business Process Catalogue.

The Registration Authority will also publish archive Releases of the Data Dictionary. An archive Release contains only Dictionary Items with status `REGISTERED` or `OBSOLETE [<REMOVAL-DATE>]`[6]. This allows a user community to find information about Dictionary Items that are no longer officially supported.

Change history records (see 5.1) are published at the same time as the Data Dictionary. The change history records reflect the evolution of the Dictionary Items.

5.3 Business Process Catalogue

5.3.1 Overview

As shown in Figure 3 the Business Process Catalogue contains Business Areas. A Business Area can be described in more details using Business Processes. The communication requirements and the interaction requirements in the various Business Areas and Business Processes are supported by Business Transactions, which include a detailed description of the possible message flows in Message Flow Diagrams. A Message Flow Diagram contains one or more Messages. Each Message is described in a Message Definition, which is also converted into an ISO 20022 Syntax Message Scheme.

Every Message Definition is thus associated with the following context information when it is used to support the communication requirements of a business activity:

— a specific Message Flow Diagram, itself being used in support of a Business Transaction;

— a specific Business Area, potentially detailed in a specific Business Process.

All this information is required to understand the precise function, role and application of a Message Definition in the considered Business Process and/or Business Area.

5.3.2 List of Catalogue Items

The following items may be contained in the Catalogue:

— Business Area;

— Business Process;

---

5) "`<REMOVAL-DATE>`" is greater than the release publication date.

6) "`<REMOVAL-DATE>`" is greater than the archive date.