The common standards platform for the financial industry

Second Edition

ISO 20022

FOR DUMMIES®

A Wiley Brand

ISO

ISO is the International Organization for Standardization. It has a membership of 164 national standards bodies (NSBs) from countries large and small, industrialized, developing and in transition, in all regions of the world. ISO's portfolio of more than 19,600 standards provides business, government and society with practical tools for all three dimensions of sustainable development: economic, environmental and societal.

ISO International Standards make a positive contribution to the world we live in. They facilitate trade, spread knowledge, disseminate innovative advances in technology, and share good management and conformity assessment practice.

ISO supports this brochure, which has been prepared by SWIFT, as a useful source of information for current and potential users of ISO 20022.

ISO/TC 68, Financial services

ISO 20022 was developed and is maintained by ISO/TC 68, the ISO technical committee responsible for standardization in the field of banking, securities and other financial services. Its current portfolio consists of 51 standards or related documents and its membership comprises the NSBs of 31 countries, plus the following stakeholder organizations: ANNA, ECB, EPC, MasterCard, SWIFT, UN/CEFACT, VISA.

International Organization for Standardization, ISO:

www.iso.org

ISO 20022

FOR

DUMMIES®

A Wiley Brand

2nd Edition

ISO 20022

FOR DUMMIES®

A Wiley Brand

2nd Edition

by The SWIFT Standards Team

FOR DUMMIES®

A Wiley Brand

ISO 20022 For Dummies, 2nd Edition
Published by
John Wiley & Sons, Ltd
The Atrium
Southern Gate
Chichester
West Sussex
PO19 8SQ
England

For details on how to create a custom For Dummies book for your business or organisation, contact CorporateDevelopment@wiley.com. For information about licensing the For Dummies brand for products or services, contact BrandedRights&Licenses@Wiley.com.

Visit our Home Page on www.customdummies.com

Copyright © 2013 by John Wiley & Sons Ltd, Chichester, West Sussex, England

All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except under the terms of the Copyright, Designs and Patents Act 1988 or under the terms of a licence issued by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London, W1T 4LP, UK, without the permission in writing of the Publisher. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, England, or emailed to permreq@wiley.com, or faxed to (44) 1243 770620.

Trademarks: Wiley, the Wiley logo, For Dummies, the Dummies Man logo, A Reference for the Rest of Us!, The Dummies Way, Dummies Daily, The Fun and Easy Way, Dummies.com and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates in the United States and other countries, and may not be used without written permission. All other trademarks are the property of their respective owners. John Wiley & Sons, Inc., is not associated with any product or vendor mentioned in this book.

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: THE PUBLISHER, THE AUTHOR, AND ANYONE ELSE INVOLVED IN PREPARING THIS WORK MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZATION OR WEBSITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUBLISHER ENDORSES THE INFORMATION THE ORGANIZATION OR WEBSITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTERNET WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

ISBN: 978-1-118-81444-4

Printed and bound in Great Britain by Page Bros, Norwich

Foreword

To all interested readers:

The Financial Services industry has a unique opportunity. Despite all of the intricacies of our business processes and transaction types, our industry has the opportunity to identify and promote interoperable business processes that contain risk, reduce cost and deliver effective products and solutions.

How can we achieve this? Through leveraging the process that is the ISO 20022 standard – a standard that our industry has developed, adopted and continues to improve.

We can define and hold the basic foundations of our businesses in a common Repository and Data Dictionary and derive the financial messaging that we use from these tools. We can leverage current technical advances and adapt to future technical change. This foresight and flexibility is built into the ISO 20022 standard.

As standards professionals, and more importantly, as business managers, we need to raise the awareness and provide industry participants with the knowledge that they need to improve, grow and sustain their businesses in the long-term.

Thank you to SWIFT both as a constant and dedicated member of the ISO process and for this valuable book, which simply, can contribute to the achievement of a smooth, managed transition and adoption of the ISO 20022 standard.

Karla McKenna

Chair

ISO TC68, Financial Services

Table of Contents

Introduction 1

Foolish Assumptions 1
How to Use This Book 1
Icons Used in This Book 3
Where to Go from Here 3

Chapter 1: What Is ISO 20022? 5

What Are Financial Messaging Standards? 5
ISO 20022 Basics 11
What Makes ISO 20022 So Great? 17

Chapter 2: ISO 20022 in Practice 21

Available Today: Payments, Funds, Securities and Trade 21
How Standards Co-Exist 24
Making Coexistence Work 27
ISO 20022 Implementation 32
Implementation Considerations 35

Chapter 3: The ISO 20022 Organisation 37

Business Justification Approval 37
Development of Candidate ISO 20022 Messages 38
Approval of Candidate ISO 20022 Messages 39
Publication of ISO 20022 Messages 39
The Technical Support Group (TSG) 40

Chapter 4: ISO 20022 and SWIFT 41

SWIFT's Role in the ISO 20022 Standard 41
Tools and Services for Standards Developers 42

Chapter 5: Ten Great Things about ISO 20022 45

Chapter 6: Almost Ten Things to Tell Your CIO about ISO 20022 46

Chapter 7: Ten (or more) Useful Links for Standards Implementers 47

Appendix: Glossary 48

Introduction

While many people in the financial services industry have heard about ISO 20022, few truly understand what it is about and what is so great about it. We at SWIFT are convinced that ISO 20022 can bring profound benefits to the financial services industry, as it realises end-to-end processing across domains and geographies that currently use vastly different standards and information formats. This book removes the mystery from ISO 20022, helps you understand why it matters, and lets you see how you can benefit from it.

Foolish Assumptions

This book makes some foolish assumptions about you, the people who read it:

- You are interested in information processing in the financial services industry.
- You know something about how the financial industry works.
- You have heard about ISO 20022 and you want to know more: what it aims to do; who uses it and why; how to use it yourself.
- You want to contribute to the ISO 20022 effort.

While some knowledge of the industry and the use of information processing might be helpful when reading this book, we explain all the concepts and terms when we first introduce them. In addition, we have added a glossary of terms and acronyms in the appendix.

How to Use This Book

This book comprises seven chapters and a Glossary. If you don't have time to read the whole book, we suggest you flip to

Chapters 5 and 6 and read the summaries: Ten Great Things about ISO 20022 and Almost Ten Things to Tell Your CIO about ISO 20022.

- **Chapter 1: What Is ISO 20022?:** This part introduces the key concepts of financial messaging, explains where ISO 20022 fits in, and outlines what makes it different from other standards.
- **Chapter 2: ISO 20022 in Practice:** This part focuses on the use of ISO 20022 – where it is currently being used, and for what; it also contains some helpful advice on implementation.
- **Chapter 3: The ISO 20022 Organisation:** Here we explain the ISO organisation, and describe the various committees and working groups that together define, maintain and promote the standard.
- **Chapter 4: ISO 20022 and SWIFT:** SWIFT is a major contributor to ISO 20022 on many fronts. This part describes SWIFT's long relationship with the standard, and the services that SWIFT can offer to help implementers and contributors.
- **Chapter 5: Ten Great Things About ISO 20022:** Finally, we give you ten good reasons why ISO 20022 is good for you and good for your business.
- **Chapter 6: Almost Ten Things to Tell Your CIO about ISO 20022:** A summary of the key points in the book.
- **Chapter 7: Ten (or more) Useful Links for Standards Implementers:** Find websites to further your understanding.

Although most of the terms and acronyms you need are explained as we go, we have also collected these into a glossary, which you will find in the back of the book.

Dip in and out of the book as you wish. You can go to any chapter that looks interesting, or read it from front to back.

Icons Used in This Book

The Dummies man indicates examples to illustrate a point and inspire you.

The target signifies particularly useful advice.

The knotted string highlights important information to bear in mind.

Where to Go from Here

Check out the section headings in this book and start reading whichever ones interest you the most. This book is written with sequential logic, but if you'd prefer to skip ahead to the information you need rather than read it from cover to cover, feel free to do so.

Chapter 1

What Is ISO 20022?

In This Chapter

- Introducing financial messaging standards
- ISO 20022 and how it is different

In essence, ISO 20022 is a recipe for making financial messaging standards. But before we go much further, we should say what financial messaging standards are, so that's what this Part starts off by doing. We come to ISO 20022 itself later in the Part.

What Are Financial Messaging Standards?

To conduct their business, financial institutions exchange massive amounts of information with their customers and among themselves. Such exchanges only work if the sender and receiver of a message have a common understanding of how to interpret this information. This is especially true if either party wishes to rely entirely on computers to process information.

Grasping the basics: Syntax and semantics

To be able to eliminate the need for human intervention to interpret the data, the financial industry has created message definitions – that is, agreements on how to organise the data

they want to exchange in structured formats (*syntax*) and meaning (*semantics*). Based on such message definitions, they will exchange messages, as illustrated by the following extract of a simple payment instruction.

Suppose ExampleBank in Utrecht, the Netherlands (Bank Identifier Code (BIC) EXABNL2U) has been requested by its corporate customer ACME NV, Amstel 344, Amsterdam to transfer 12,500 US Dollars on 29 October 2009 from its account 8754219990. Instead of addressing the above instruction to its US Dollar correspondent in unstructured text, ExampleBank sends a structured message based on a standard message definition:

```
<CdtTrfTxInf>
      <IntrBkSttlmAmt Ccy='USD'>12500</IntrBkSttlmAmt>
      <IntrBkSttlmDt>2009-10-29</IntrBkSttlmDt>
      <Dbtr>
            <Nm>ACME NV.</Nm>
            <PstlAdr>
                  <StrtNm>Amstel</StrtNm>
                  <BldgNb>344</BldgNb>
                  <TwnNm>Amsterdam</TwnNm>
                  <Ctry>NL</Ctry>
            </PstlAdr>
      </Dbtr>
      <DbtrAcct>
            <Id>
                  <Othr>
                        <Id>8754219990</Id>
                  </Othr>
            </Id>
      </DbtrAcct>
      <DbtrAgt>
            <FinInstnId>
                  <BIC>EXABNL2U</BIC>
            </FinInstnId>
      </DbtrAgt>
</CdtTrfTxInf>
```

The above example is an excerpt from an ISO 20022 Customer Credit Transfer In the XML syntax.

Messaging standards provide clear definitions of the information and data formats (field lengths, codes, character sets) that can be exchanged between parties. The above message, for example, contains the line

<IntrBkSttlmAmt Ccy='USD'>12500</IntrBkSttlmAmt>

to indicate the currency and amount of the transaction. The underlying standard for a Customer Credit Transfer message tells you that this field is mandatory, that it starts with the tag "IntrBkSttlmAmt", that the information in the field must consist of three letters (the ISO currency code) and up to 18 digits for the actual amount.

ISO 20022 is just one example of a standard used in the financial industry. The following section gives some context by describing financial messaging, the standards it uses and some of the problems posed by the multitude of such standards.

So many standards, so little time

'The great thing about standards is that there are so many to choose from'. It's an old joke, but very relevant in the financial industry. Many different standards exist covering different geographies and business areas. Many individual institutions even use their own proprietary standards internally and/or with their customers.

This excerpt is taken from a SWIFT Single Customer Credit Transfer message (MT 103) that does more or less the same as the ISO 20022 Customer Credit Transfer shown earlier. You will note that most information is the same, but the tags and the order of the fields are different:

:32A:091029USD12500,

:50K:/8754219990

ACME NV.

AMSTEL 344

AMSTERDAM

NETHERLANDS

:52A: EXABNL2U

Here is another example of the same information, this time using the Fedwire proprietary standard:

{1520}20091029xxxxxxxxyyyyyy {2000}000001250000

{5000}D8754219990ACME NV.*AMSTEL 344*AMSTERDAM*
NETHERLANDS* {5100}BEXABNL2U*

All of the above examples provide the same information, each using a different standard.

Processes and value chains in financial services often cover different geographical and business areas. The proliferation of different messaging standards in the financial industry creates problems in automating these end-to-end chains. Two significant barriers exist to a common understanding of information shared by the people and computers involved in such processes: the use of different syntaxes (structure) and the use of different semantics (meaning).

The syntax barrier

The *syntax* is the format in which the information in a message is structured. Unless the reader understands a specific syntax, it will not be possible to understand the message content. There is a lot of confusion about the difference between a standard and a syntax. The *standard* describes the agreement on what information is expressed, while the syntax is the format, or the 'language' used to express that information. It is difficult for two people to have a conversation unless they both use and understand the same language. The same is true for syntax. Globalisation and the ever increasing need for end-to-end processing increases the problem.

In ISO 20022, the most widely used syntax is eXtensible Mark-up Language (XML). The use of short tag names (like <PstlAdr> to represent a postal address) is also part of the syntax.

Some widely used existing standards

- **ISO 15022** is currently the predominant securities standard in cross-border settlement, reconciliation and corporate action processing. It was introduced around 1998 to replace ISO 7775, which was much less structured and often omitted crucial settlement information. The adoption of ISO 15022, mandated in 2003, has led to a dramatic increase in Straight Through Processing (STP) rates. In settlement messages, for example, it is common to come across STP rates of more than 95 per cent. One of the standard's advantages is its data dictionary based approach, which enables reuse and standardization of data across all messages. About half of the 20 million messages that are exchanged on the SWIFT network every day are ISO 15022.
- **ISO 8583** is used for almost all credit and debit card transactions, including ATMs. Several hundred million ISO 8583 messages are exchanged daily between issuing and acquiring banks.
- **FIX** is the predominant standard of the securities front office. Millions of indications of interest, trade instructions, executions etc., are sent each day using the FIX protocol.
- **FpML** stands for Financial products Markup Language. It uses the XML syntax and was specifically developed to describe the often complicated contracts that form the base of financial derivative products. It is widely used between broker-dealers and other securities industry players to exchange information on Swaps, CDOs, etc.
- **SWIFT proprietary**, also known as MT messages, are the standard for messaging in correspondent banking, foreign exchange and documentary credits. Over 10,000 financial institutions around the world use this standard to exchange millions of messages per day over the SWIFT network.
- **Proprietary domestic standards** are also widely used. DTCC is an example of a market infrastructure using proprietary standards. Each day some 40 million messages are exchanged with DTCC to clear and settle US domestic securities trades.
- **XBRL** is a flexible XML based standard for exchanging business information, which specializes in providing easy automation for information found in unstructured documents.

XML is one of the most popular syntaxes to encode documents (or messages) electronically on the Internet. XML allows communities to define their own identifiers (or *tags*) and format (or *data type*) for each component of a message. With XML, data is marked up by using opening and closing tags that indicate the meaning and structure of the information that is communicated. For example, <Dt>2009-09-29</Dt> is an XML representation of 29 September 2009. The combination of opening and closing tags with the data is called an *element*.

The MT103 Single Customer Credit Transfer extract illustrated in this part uses a SWIFT proprietary syntax. It too uses tags, called *field tags*, to introduce data. These are alphanumeric characters between colons. This is followed by the actual field content. In the example, :52A: is the field tag (Ordering Institution) and EXABNL2U is the field content.

The semantic barrier

Once the syntax is out of the way, another barrier appears: the semantic barrier. Specialists in different domains or countries have developed their own jargon or vocabularies. Different words might refer to the same concept, or worse, the same word could have different meanings.

For example, what some players in the payments industry call an Ordering Customer, others refer to a Payer or Payor, while still others talk about a Payment Originator or Initiator. The context also plays a role here: the Payment Originator/Initiator is a Debtor/Payor in a credit transfer, while that Payment Originator/Initiator is a Creditor/Payee in a direct debit.

These different names create difficulties when you are looking at end-to-end integration. You need (expensive) expert knowledge to understand what the specialists mean and how to reconcile the information.

In order to understand the information exchanged in a particular business domain, you need to be familiar with the details of the specific syntaxes and the underlying semantics. This requires a significant investment in time and technology.

ISO 20022 Basics

The previous section sketched two barriers to a common understanding of information shared between people and computers involved in these processes: the use of different syntaxes and the use of different semantics or interpretation of terms. ISO 20022 was designed to help overcome these barriers. Let's see what makes ISO 20022 special.

ISO 20022 is the agreed methodology used by the financial industry to create consistent message standards across all the business processes of the industry.

The ISO 20022 method is based on the concept of separate layers. We distinguish three layers: the top layer provides the key business processes and concepts; the middle layer provides logical messages or message models; and the bottom layer deals with syntax.

Business processes and concepts

One of the key characteristics of the ISO 20022 methodology is that there is a distinct separation between the business and the way it is represented in a message, that is, the syntax. The ISO 20022 methodology starts with the creation of the business model. Put simply, this is the definition of the activity or business process, the business roles and actors involved in that activity and the business information needed in order for the activity to take place.

The business information is organised into business components containing business elements. For example, when looking at the processes involved in a credit transfer, key notions such as debtor (the party that pays), creditor (the money receiver), debtor agent (the bank of the debtor), creditor agent (the bank of the creditor), and payment were identified. Each of these components has further details. Figure 1-1 shows a simplified business information model, represented in Unified Modeling Language (UML).

Central is the payment itself, which is associated with the debtor agent and creditor agent, which are both financial institutions. The payment is also associated with a debtor and creditor, which are both parties (i.e. persons or organisations, financial or other), which in turn have elements such as a name and address. Additionally, these parties may be owners of an account. Behind these elements lie further details. A payment, for example, contains elements such as currency and amount, a requested execution date and settlement date, and remittance information.

Logical messages independent of syntax

Using these business concepts, ISO 20022 then defines logical messages, or message models, which are the middle layer.

A logical message is a description of all the information that is needed to perform a specific business activity, independent of syntax. It is composed of message components organised in a hierarchical structure. A message component contains one or more message elements and is derived from a business component by using one, some or all of its elements. The logical message structure for the excerpt of the Customer Credit Transfer message can be seen in Figure 1-2.

The message component CreditTransferTransactionInformation contains 4 elements. Some of these, for example, Debtor and DebtorAgent, require further definition and are message components themselves. Shown here is a simplified representation that does not show, for example, whether elements are mandatory or optional, as is normally done at this level.

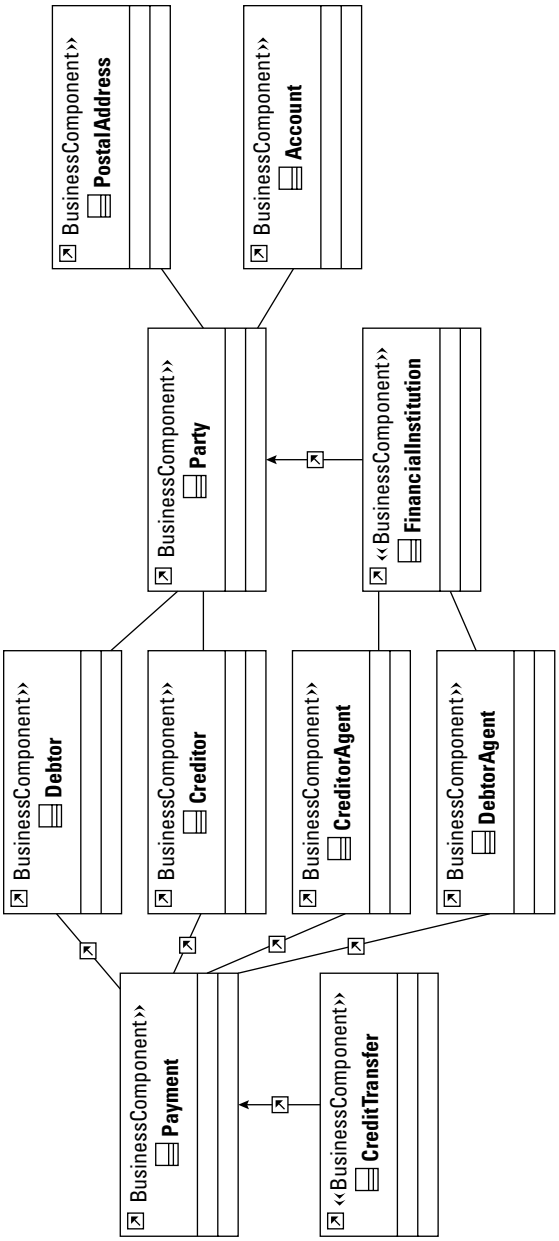


Figure 1-1: A simplified business information model for a payment transaction.

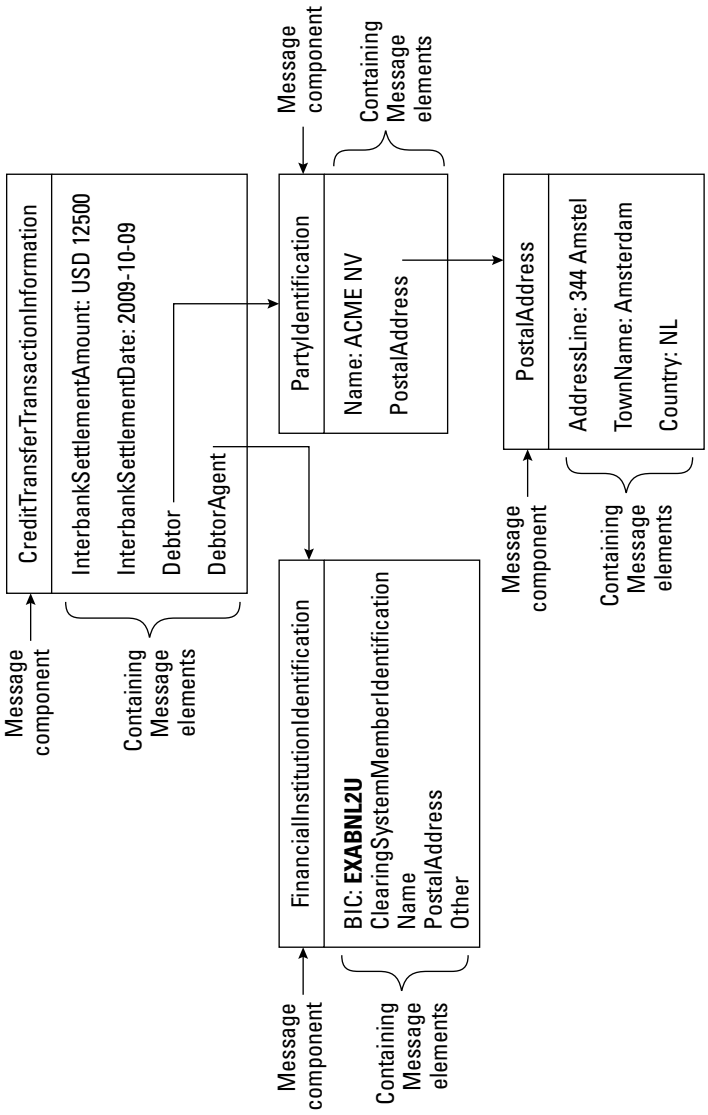


Figure 1-2: Part of the logical message structure for a credit transfer.

A key feature of ISO 20022 is the ability to reuse business and message components across all messages. Whether the message is a credit transfer or a credit card payment, a securities or foreign exchange transaction, the component 'PostalAddress' can be used to express a party or financial institution's address where appropriate. Individual elements such as 'InterbankSettlementAmount' and 'InterbankSettlementDate' can also be reused.

The syntax

As stated earlier, the ISO 20022 methodology is based on the concept of separate layers. The business model and the logical messages are two of those layers. The third layer, the syntax, is the physical representation of the logical message. ISO 20022 uses XML and ASN.1 as primary syntaxes and has specified how to convert a message model to XML or ASN.1. However, in a particular business domain, a message model could be expressed in a syntax different from XML or ASN.1, for example, the SWIFT proprietary syntax or the FIX syntax, if agreed.

It's all in the repository

All of the content described so far is stored in a common repository.

A dictionary forms part of this repository. The ISO 20022 dictionary, much like the Oxford Dictionary, lists the name of a component, its structure (with references to subcomponents that may be described elsewhere in the dictionary) and, most importantly, what it means and how it should be used or interpreted. Just like with words in the English language, the meaning often depends on the context. For instance, the specific meaning can depend on whether the context is a national or international payment or a securities transaction on a stock exchange. The entry for DebtorAgent tells you that it is the 'Financial institution servicing an account for the debtor'. It also tells you, that when referring to a Debtor Agent, you should use the structure called FinancialInstitutionIdentification7, which defines the data required to identify a financial institution – its name and address, Business Identifier Code (BIC) and so on. If you look up this message component in the dictionary you will find the entry shown in Figure 1-3.

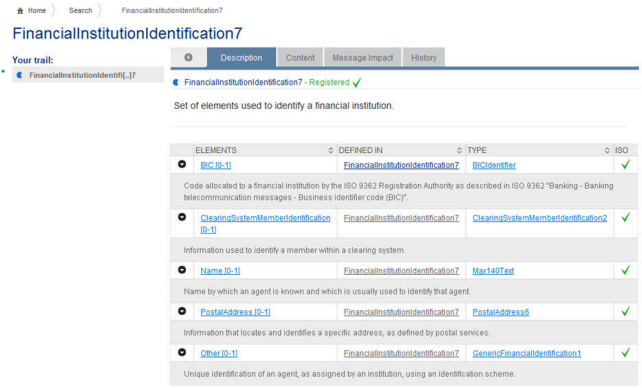


Figure 1-3: The ISO 20022 web query tool showing details of a message component.

ISO 20022 standardises such components across all messages used in the financial industry. So whenever a message is received that mentions 'debtor agent' it is clear what is meant and what to expect in terms of descriptive data about the debtor agent.

The crucial notion here is reusability. For example, the data structure FinancialInstitutionIdentification (with all its sub-structures) is used to describe all financial institutions in all ISO 20022 messages. Similarly, the message component DebtorAgent is used across all financial messages whenever a financial institution plays that role in a transaction.

Currently, the ISO 20022 repository holds around 700 business components and more than 300 message definitions.

What Makes ISO 20022 So Great?

ISO 20022 offers two things:

- A method to develop well structured financial messages, as described in the previous section.
- A way to unify the many existing standards.

A message definition in any existing standard can be looked at logically as a description of what data is exchanged in the message, its structure and what it means. Such a 'logical' message definition can be mapped to the business definitions of ISO 20022. This is critical in making standards interoperable: it enables the use of multiple standards and multiple syntaxes to support the same business process, as information from these can be mapped unambiguously to the business process itself. So the advantages of ISO 20022 over other standards fall into two categories; those concerned with using the standard itself, and those concerned with interoperability with other standards.

Using ISO 20022

The advantages of using ISO 20022 fall into three main categories: linking messages to business processes, reusing components, and the use of the XML or ASN.1 syntax.

Linking messages to business processes

Each part of an ISO 20022 message is linked to business components (in the model) that are meaningful and easily recognisable to users and can be linked to the data in back-office applications.

Reusing components that are well documented and structured

Since the components and elements are reused across messages, institutions need to map them only once to their internal data structures. It is therefore much easier to introduce new messages: most of the components will already be known and mapped to back-office applications. Maintenance is also a lot easier, since most of the changes can be made at the component level.

Appreciating the benefits of XML syntax

While the key feature of ISO 20022 is the use of common business models, when the XML syntax is used, it also brings significant benefits. The message format description is contained in an XML schema. This file is machine readable, so implementation of new messages, or changes to existing messages, requires less manual effort. It also enables easy manipulation of messages by most modern software, including mapping the information to other formats and standards.

About XML and XML schemas

The eXtensible Markup Language (XML) is a simple text-based format for representing structured information. XML uses tags set between angled brackets to identify items of information. Each data item is enclosed by a pair of opening and closing tags. The combination of opening and closing tags and the data they contain is called an *element*. Elements can contain other elements, to group related information together, for example:

```
<address>
        <number>1</number>
        <street>Short Lane</street>
        <city>London</city>
</address>
```

One advantage of XML is that it is (reasonably) easy for people to read and understand. However this readability comes at a cost; XML is sometimes criticised for being more verbose than other syntaxes and therefore less efficient to transmit and to store. Compression tools can overcome this problem, lessening its impact on user communities where a more efficient syntax is needed, for example, in (pre-) trade messages for securities exchanges, where microseconds count.

An *XML schema* sets out the permitted structure for an XML document (or message). It defines, amongst other things, which elements are allowed in a document, the order in which they should appear, which are mandatory and which are optional. XML schemas can be used by a computer to check whether a message conforms to its definition or not. The ISO 20022 methodology describes how to generate an XML schema from a logical message definition, for messages that will use the XML syntax. XML schemas are provided to define formally the structure of all ISO 20022 XML messages.

XML is an *international open standard*, which means that it enjoys widespread support across industry boundaries and gets extensive support from vendors. Being an international standard also means that a wide variety of XML editing, document management, validation, and other off-the-shelf tools is available. These tools allow the automatic injection of message definitions and lower the cost for their validation and their integration into back-office systems.

Appreciating the benefits of ASN.1

ASN.1 is an open international standard for the description and encoding of data. It is used in many standards in different application areas, such as wireless communications, where it is important to minimize both encoding/decoding latency and bandwidth utilization.

A description of a set of messages in ASN.1 language is called an *ASN.1 schema*. ASN.1 schemas are machine-readable and are independent of hardware platform, operating system, programming language, and local representation. Software development tools are available that read an ASN.1 schema, check its syntax, and generate source code and other artifacts supporting the development of applications that need to exchange messages. In addition, ASN.1 schemas are usually terse and readable.

About ASN.1 Encodings

A unique characteristic of ASN.1 is the clean separation between the schema and the rules that specify how an instance of a message is encoded on the wire (encoding rules). This separation allows a user to focus on the message definitions without being distracted by the details of the encodings.

Several standard sets of encoding rules have been introduced over the years to address specific requirements for the encoding of ASN.1 messages. The most significant ones are the *Packed Encoding Rules* (PER), the *Basic Encoding Rules* (BER), the *Distinguished Encoding Rules* (DER), the *Octet Encoding Rules* (OER), and the *XML Encoding Rules* (XER). The encodings produced by PER are the most compact. Those produced by BER and DER are more extensible and more robust in the face of unexpected changes to the schema. Those produced by OER are the most efficient in terms of CPU utilization. Those produced by XER consist of XML messages which usually conform to an XML schema (this would be the case for any ISO 20022 logical message from which both an ASN.1 schema and XML schema were generated). ASN.1 tools typically include encoder/decoders for various sets of encoding rules.

ISO 20022 recommends the use of PER for the encoding and decoding of ISO 20022 messages due to its great compactness and good encoding/decoding speed.

ISO 20022 and other standards

ISO 20022 covers the entire financial industry, enabling a common understanding and interpretation of information across such diverse areas as foreign exchange trading and credit card payments. One big advantage is that this facilitates mapping between standards. For example, the MT103 Single Customer Credit Transfer field *52a Ordering Institution* and the *ISO 20022 DebtorAgent* element are structured differently, but still describe essentially the same business concept: the financial institution that services the account of the ordering customer (or debtor). Therefore, both of them can be mapped to the same ISO 20022 business component. This is a powerful concept, because it lays the foundation for different standards to be able to work with each other (known as *interoperability*). We will get into the details of interoperability in the following parts. The main point here is that such mapping makes life a lot easier for all the parts involved in providing such interoperability: applications, translation services, and so on. Such interoperability enables automated transfer and straight-through processing across entire processing chains.

Chapter 2

ISO 20022 in Practice

In This Chapter

- Who uses ISO 20022 today?
- Standards coexistence
- ISO 20022 implementation

To date, use of ISO 20022 is not as widespread as many people had hoped. Having said that, momentum is clearly building as several large financial infrastructures and user groups have committed to using ISO 20022. Just as importantly, many existing standards are being mapped to ISO 20022. An "ISO 20022 Adoption mApp" which reflects the adoption of ISO 20022 around the world is available from the ISO 20022 website (`www.iso20022.org`) and the Standards Forum site (`http://www.swift.com/standards`).

Available Today: Payments, Funds, Securities and Trade

ISO 20022 organises financial message definitions in business areas – well recognised functional domains in the industry. These business areas are uniquely identified by four-character codes called business area codes. Some examples include:

- ***pacs*:** Payments Clearing and Settlement
- ***pain*:** Payments Initiation
- ***camt*:** Cash Management
- ***setr*:** Securities Trade
- ***sese*:** Securities Settlement

- ***acmt***: Account Management
- ***tsmt***: Trade Services Management

Messages are also available for supporting functions related to payments, such as exceptions and investigations, and bank account management, as well as direct debit mandate management. The coverage is continuously expanding, driven by industry requirements.

Payments

ISO 20022 messages are available for the complete end-to-end payments chain: customer to bank (payment), bank to bank (payment clearing and settlement) and reporting (cash management). A big driver for adoption of ISO 20022 in the payments arena is the *Single Euro Payments Area* (SEPA), which is currently replacing domestic retail credit transfers and direct debits with standardised European payments that use ISO 20022 messages. *Real Time Gross Settlement Systems* (RTGS) and low value payments systems around the world have also shown interest in adopting ISO 20022, while others are focusing on building alignment with the standard.

Investment funds

ISO 20022 messages are used for investment fund orders, transfers, reconciliation, price reporting, and fund cash forecast reports. Messages are also available for hedge funds and *fund processing passport* (FPP) information. The main driver in this business area is the desire to eliminate fax or e-mail communication and manual processes, and to facilitate straight-through processing (STP).

Securities clearing and settlement and corporate actions

Recent years have seen the creation of new global and regional *market infrastructures* (MI) to facilitate the clearing and settlement of securities and other instruments. In addition, many existing national MIs are facing significant investments as they prepare to enable cross-border access and cater for the needs of foreign participants. Both existing and new MIs will have to

decide which messaging standard/syntax to use in the communication with their participants.

A growing number of them, most notably, T2S (TARGET2-Securities), the Eurosystem's new securities settlement service, the US Depository Trust and Clearing Corporation (DTCC) and JASDEC, the Japanese Central Securities Depository, have chosen ISO 20022. DTCC started using ISO 20022 corporate actions messages in 2011. T2S has announced that it will use ISO 20022 from the outset, and JASDEC will switch to ISO 20022 to replace its domestic standards. Whenever necessary, new ISO 20022 messages have been developed to address the specific business functions covered by these MIs. Other MIs, such as Clearstream, Euroclear and other European securities clearing and settlement systems, expect to adopt these as well.

Many players affected by these market infrastructure projects are planning to implement the ISO 20022 messages before the scheduled live dates of the MIs, to ensure that they are ready.

Another important factor in the adoption of ISO 20022 in the securities industry is the *Giovannini Protocol*. This protocol aims to harmonise the clearing and settlement of securities in Europe by eliminating several barriers to efficient cross-border processing. One of these barriers (Barrier 1) is the different standards and communication protocols used for accessing Central Securities Depositories (CSD). The industry specified that CSDs had to support the use of ISO messages for the clearing and settlement of European cross-border securities transactions by 2011. Those flows that are common across MIs are covered by both ISO 15022 and ISO 20022 in an interoperable way.

The same is true for the asset servicing business, where the industry is looking to automate the generation of corporate action information. The basic functionality will be covered by both standards. Additional functionality, for example, proxy voting, has only been developed in ISO 20022.

Trade

In the trade area, there are currently 75 ISO 20022 messages among which 50 are used by financial institutions to communicate with the Trade Services Utility (TSU). The TSU is a

collaborative centralised matching utility designed to help banks meet the supply chain challenge, to provide enhanced financing services for open account settlement.

How Standards Co-Exist

Will the whole world speak English one day, replacing people's native language? Who knows? For the time being existing standards/syntaxes like FIX, FpML, SWIFT proprietary and many domestic standards are in widespread use and generally do a good job at achieving straight through processing.

Legacy systems and migration costs

While standards, like languages, evolve over time, real migrations are rare. Check out some examples of standards (and migrations from older, so-called *legacy* standards, to new ones) in the wider world:

- **Left hand versus right hand drive:** About half of the world drives on the left side of the road and the other half drives on the right side. Clearly, it would be more efficient if we all drove on the same side of the road: no need to make cars in two versions, bigger markets for used cars, no adaptation for continental Europeans who choose to live in the UK, or for retired London investment bankers starting wine farms in France or Italy. Still, there are only two documented cases of migration: Sweden changing to right hand side in 1966 and Samoa to left-hand side driving in 2009.
- **Measurement systems:** The Anglo-Saxon world measures in gallons, miles, feet and inches, compared to litres and metres for the rest of the world. Being different comes at a price: at least one aeroplane accident and a crashed Mars Lander can be attributed to confusion about measurement systems. Still, most attempts at migration have been frustrating. Just witness the Canadian struggle with kilometres (most road signs still display distances in miles) and the British 'metric martyrs' (grocers insisting on weighing vegetables by the pound). And the issue is

broader, as anyone trying to print an American letter or 'legal' sized document on A4 paper can attest.

- **Railway gauges:** The initial free-for-all has given way to a clear global standard (the 4 ft 8 ½ in Stephenson standard). There have been migrations, notably the American South after the Civil War and many of the early railways in Britain like Brunel's Great Western Railway. Plenty of other gauges are still in use: Russia, Iberia and parts of Australia, for example still use much wider gauges.
- **Alphabets and characters:** Large parts of the world use non-Latin character sets to write: Russia, Japan, China and the Arab world to name just a few. Again there have been migrations, notably the migration of Turkey to the Latin character set by Ataturk, but the use of non-Latin characters appears well-entrenched. ICANN (Internet Corporation for Assigned Names and Numbers) has just enabled the use of Arab and Chinese character domain names.

There are plenty more examples: voltage and electricity plugs, ring binders, TV (PAL versus NTSC), Mobile phones (GSM, CDMA), keyboards (QWERTY versus AZERTY), and so on. While you can make a clear case for a single global standard for all of these cases, differences persist and migrations are rare. Not surprisingly, as migration costs are often substantial due to hardware replacement, retraining, conversion of existing data, etc.

Financial messaging standards are subject to the same dynamics. Financial institutions have invested enormous resources in building systems that use existing standards. It is possible to replace one standard with another, as the migration of the securities industry from ISO 7775 to ISO 15022 has shown. But while adopting the ISO 20022 standard gives substantial benefits, in many cases these are not sufficient to outweigh the migration cost. In these cases mapping to, or even compliance or alignment with, ISO 20022 might be the preferred route.

Why not force migration to ISO 20022?

Why doesn't the French or German government force their population to abandon their native language and only speak

English? Because apart from the fact that their voters would throw them out of office in a blink, it would cost too much and cause far too much hassle to be worth doing, that's why. Already today the financial community is a dominant user of ISO financial services standards. But for the majority of its members the cost of migrating their legacy applications to ISO 20022 outweighs the costs of having several standards coexisting.

It worked for ISO 7775 to ISO 15022, didn't it?

Indeed it did. In 2004, the securities industry completed a migration from the legacy ISO 7775 standard to ISO 15022 – a technically and functionally superior messaging standard. That migration brought enormous benefits to the community, as important processing information was made mandatory in messages. That in turn allowed the securities clearing and settlement industry to increase straight through processing rates from 60 and 70 percent to currently more than 95 per cent, which translates into billions in operating cost reductions. Although securities players had to change their back-office systems and change communication interfaces, the benefits more than outweighed the substantial migration cost.

The migration to an updated standard has already taken place for some parts of the securities industry. ISO 15022 messages for corporate actions and securities settlement and reconciliation are already well-structured and based on a data dictionary. For players with large legacy systems in these spaces, the benefits of migration from ISO 15022 to ISO 20022 may not outweigh the cost. Obviously, it's a different story for areas like investment funds and asset servicing (proxy voting for example), where ISO 20022 messages offer significant benefits over current practice, which largely revolves around fax, phone and file transfer.

Wouldn't these securities players find it easier to have everything in ISO 20022? Yes, but the reality is that they have to deal with multiple formats anyway, most of which are domestic. Even a forced migration at an industry level would not eliminate these domestic formats.

What about MT 103s and the ISO 20022 messages?

For European retail payments the first migration to ISO 20022 is a fact. Financial institutions in Europe have adopted ISO

20022 messages, complemented with implementation guidelines, to meet the specific Single Euro Payments Area (SEPA) community requirements. ISO 20022 is now the common standard for SEPA compliant payments and has replaced a multitude of domestic standards.

Will ISO 20022 messages ever replace the MT 103? Not in the near term. The MT 103 and other related messages, such as the MT 202 General Financial Institution Transfer and MT 950 Statement Message, are deeply embedded in the legacy systems of financial institutions, making a rapid migration very costly. More than this, an MT 103 or MT 202 are often the result of an underlying transaction and until these underlying transactions are communicated using ISO 20022, migration of the payment messages is perceived as premature.

As adoption progresses further, some players may find it easier to use ISO 20022 for all of their interbank payments. Furthermore, banks that have gone through an implementation in the interbank area are also starting to look at implementation in the payments initiation and reporting space. These banks will be able to use message translation products and services to map their ISO 20022 messages to MT 103s in order to communicate with their correspondent banks that are not (yet) using ISO 20022.

Making Coexistence Work

So, if outright migration from legacy standards to ISO 20022 is out of the question, what's the alternative? As long as the world does not speak a single language, multiple languages will coexist. The same holds true for the financial industry as long as it uses multiple message standards. And as is the case with languages, this is not a problem as long as you communicate with people in your own community. But as communities interconnect, there is a need for mechanisms to understand and communicate with each other, translation being one of them.

From coexistence to interoperability

To continue with our language analogy, does everyone use translators to communicate with foreigners? Of course not; most people have some knowledge of other languages and sometimes one of the participants in the conversation will

revert to an 'internal' translation and switch to the language of the conversation partner. Often, both participants settle on a *lingua franca* (English, Swahili, Hindi) whereby both parties translate internally to and from this third language. Life is also made easier by the fact that most service providers (telecommunications, banks, governments) allow customers to work with them in the language of their choice.

Financial institutions are no different. Many use their own internal formats to store information and exchange it between applications. They then map this information to whatever format is needed for the outside world. Even when these outside formats change, they often continue to use the old version internally and map it to the new format before sending it out. It's true that the securities industry migrated from ISO 7775 to ISO 15022 in 2004, but many securities players still use ISO 7775 internally and with some of their customers. Similarly, in 2003, SWIFT replaced its workhorse MT 100 Customer Transfer with a new format, the MT 103 Single Customer Credit Transfer, but several institutions still use the MT 100 internally. Typically these institutions find it cheaper to map/transform the information to and from the new format, than to change their legacy applications. For centuries, people dreamt of a common language (for example, Esperanto) to breach the communication gap. However, this dream never materialised. Standardisers shared a similar dream over 10 years ago and are now facing the same issue: multiple standards will not go away any time soon. As a consequence, coexistence is not a short term situation and the challenge becomes one of interoperability between different standards.

Interoperability products and services

Interoperability refers to the seamless execution of a business process by various counterparties with different levels of automation and time-to-market requirements or capacity. There are many aspects to interoperability, but the ability to map different messaging standards is an important element.

Rapid developments in software technology make mapping increasingly feasible and cheap. Given a set of rules, interoperability tools (such as middleware components) can easily transform information from one message standard/syntax to another. Let's take an example of the simple credit transfer message mentioned in Chapter 1.

Figure 2-1 illustrates the debtor and debtor agent details as shown in the form of a SWIFT MT 103 and an ISO 20022 pacs.008 message. Arrows represent the mapping of data from one message to the other.

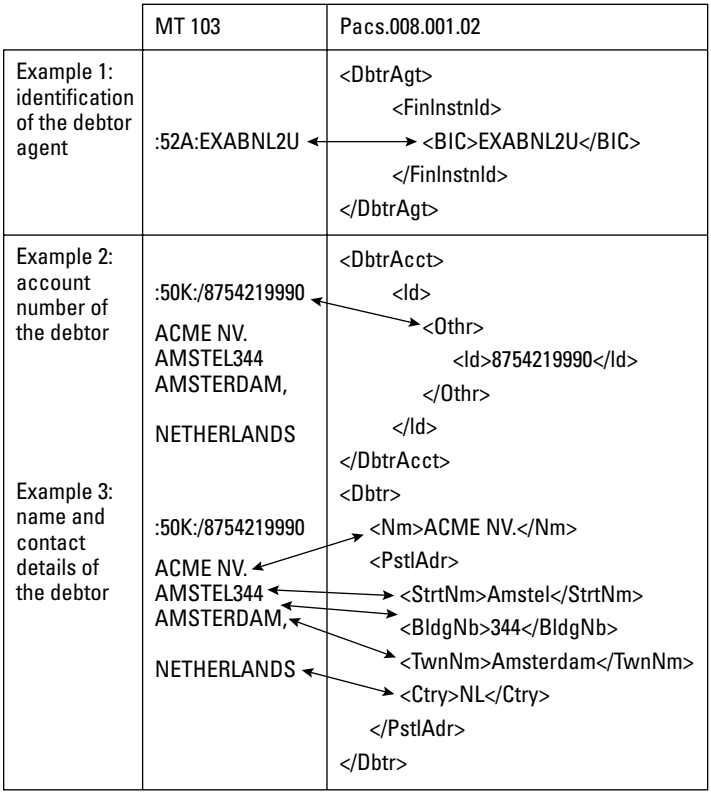


Figure 2-1: Mapping an MT103 to an ISO 20022 Credit Transfer.

Middleware is software that can adapt the outputs of one system to the inputs of another, so that they can communicate. What middleware needs is a set of mapping rules that tells it to take the information from one field in the MT message and move it to the correct corresponding element in the ISO 20022 message. In the first example, the information in field ':52A:' is moved to the BIC element in the component called 'DebtorAgent'. The mapping is straightforward as this field in MT has only one equivalent element in the ISO 20022 message.

In the second example, the information on the first line of field ':50K:' is moved to the account identification element in the component called 'DebtorAccount'.

The third example is more complex; part of the information in the MT field :50K: has to be split into the ISO Name and PostalAddress elements in the component called 'Debtor'. Sometimes information may not fit in the field or the element in the destination message, in which case the overflow needs to be inserted elsewhere, or dropped . The good news is that such mapping and translations are increasingly available between commonly used standards, and interoperability tools (such as integration components) allow users to configure their middleware to execute such mappings. The increasing use and availability of electronic dictionaries makes this even easier.

ISO 20022, the foundation of interoperability

We have claimed that ISO 20022 is the unification tool across standards and syntaxes and we have explained how ISO 20022 can interoperate with other standards. We can now go on to explain how ISO 20022 can further facilitate interoperability by acting as an *interoperability hub*.

In foreign exchange, deals involving less common currencies are generally carried out over a hub (in this case, a trading portal), usually in US dollars (USD) or in Euros (EUR). For example, the Thai Baht is first converted into USD, after which the USD can be traded for Bolivian Pesos. Similarly, translation and mapping rules are generally only available between the most common standards. This is where ISO 20022 increasingly plays the role of interoperability hub; work is underway to map the information in many standards into ISO 20022.

Take a look at the example of the *International Payments Framework* (IPF) in which two infrastructures on different continents use different syntaxes and where ISO 20022 enables translation. USD transfers for Europe initiated in the US Automated Clearing House (ACH), using the NACHA proprietary format will first be mapped into ISO 20022 as a

common format before the message is sent to the European participants which will map the incoming ISO 20022 message into an outgoing ISO 20022 transfer message. An example of this mapping system can be seen in Figure 2-2.

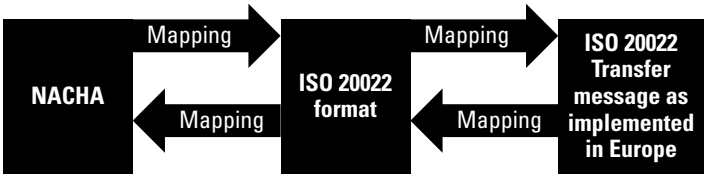


Figure 2-2: Mapping from a US NACHA payment to a European ISO 20022 message.

Interoperability with FPL and FpML

Securities pre-trade business requires messages to be sent, received and processed as quickly as possible. Because FIX is very widely used in this area, the organization that designed the FIX standard, FIX Protocol Ltd (FPL), has ensured that its own syntax is very compact and efficient. But FPL also aims to ensure that information structures, components and elements are part of ISO 20022. Working in collaboration with other members of the ISO 20022 community, FPL does this in two ways:

- FPL submits its own components for ISO 20022 when these components cover information/functionality that is not already in the dictionary.
- Where the functionality is already covered by ISO 20022, SWIFT and FPL collaborate towards interoperability by designing transformation rules between the FIX syntax and the XML syntax, using ISO 20022 as the common business model.

Similar work is underway with FpML (the industry-standard protocol for complex financial products).

Alignment with XBRL

eXtensible Business Reporting Language (XBRL), is a technology that has been around for many years in the financial reporting arena. XBRL is used to 'tag' business information so that it can be meaningfully integrated into business applications and understood by analysts, investors and other financial intermediaries. Its recent international success can be partly attributed to its adoption by the US Securities and Exchange Commission as a mandatory format for filing specific financial reports through their automated reporting system. Several other jurisdictions around the globe are adopting similar mandates for financial and business reporting. Increased regulatory scrutiny and the need for additional transparency in financial reporting have also contributed much to the 'perfect storm' that created the catalyst for XBRL US and ISO 20022 to work together with DTCC (The US Depository Trust & Clearing Corporation).

In June 2009, SWIFT and DTCC embarked on an initiative with XBRL US to build a corporate actions taxonomy that will be fully aligned with the ISO 20022 dictionary for corporate actions elements. In this way, corporate issuers of securities can tag their corporate actions documents and create XML data that can be easily used in ISO 20022 corporate action messages for financial intermediaries downstream in the corporate actions lifecycle process.

Issuers (or their agents) can 'tag' documents using an XBRL tagging tool and the resulting XBRL instance document can then be automatically transformed into an ISO 20022 corporate actions message for consumption by financial and other intermediaries involved downstream.

This was the first collaboration of its kind across standardisation domains – XBRL in the accounting and business reporting domain, and ISO 20022 (SWIFT and DTCC) in the transaction processing domain.

ISO 20022 Implementation

As ISO 20022 adoption increases in the market place, it will impact different types of players in a variety of ways. The following sections cover some of the main cases.

Small player in a single business area with mature standards

If you are a small player in a single business area, then generally you should be able to continue to use the communications infrastructure you use today. Most large counterparties and service providers are equipped to continue to support existing formats, for example, by using the interoperability tools described in the earlier chapters.

Focused player in a business where ISO 20022 standards are heavily used

Focused players in areas such as European retail payments or the funds industry need ISO 20022 to operate. If this is you, you have to implement ISO 20022 capabilities, so you have to install communications and interface software that is ISO 20022 aware. Players with legacy systems that use existing standards (domestic, proprietary or other) may decide not to migrate these systems to ISO 20022, but instead rely on mapping at the middleware level.

Players facing new investments, however, may decide to enable their applications for ISO 20022 from the start. Examples could be transfer agents in Asia that are making investments to replace the current fax and phone communications, and new market infrastructures in securities.

A side-benefit of the ISO 20022 approach for new players is that they can use all of the existing data definitions from published ISO 20022 content as the basis for defining their internal data structures. This is possible thanks to the separation between the semantic layer and the message layer and the consistent usage of the dictionary.

Implementers should of course maintain appropriate decoupling of the internal versus external structures through proper architectural layers, but using internal structures close to the standard significantly simplifies integration tasks since a lot of the mappings would become very straightforward.

Global financial institution that's active in many businesses

So you have to deal with the Tower of Babel on a daily basis: many different formats across geographies and businesses and large legacy systems that are very expensive to change. In all likelihood your institution already uses enterprise scale middleware - sometimes known as Enterprise Application Integration (EAI) software - to connect applications and communications interfaces, mapping and transforming information as needed. In a highly simplified form your overall architecture could look similar to Figure 2-3.

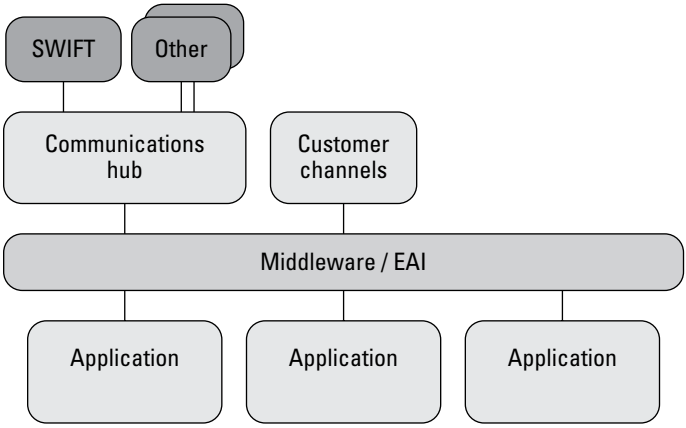


Figure 2-3: Enterprise Application Integration software (middleware) connects applications to each other and to external networks such as SWIFT.

This approach insulates your channels and back-office applications from changes in the standard by isolating ISO 20022-specific definitions and processing in the EAI software. It also allows you to re-use common functionality, such as network connectivity, across multiple implementations. Typical EAI software includes features for mapping data from proprietary internal formats or other standards to and from ISO 20022, enriching messages with data from other systems and orchestrating message flows. EAI also features a range of adaptors that connect to standard data exchange or storage mechanisms – databases, message queues, mail servers, etc. – and standard software applications, such as Enterprise Resource Planning (ERP) systems.

Implementation Considerations

There are many questions to consider when implementing the ISO 20022 standard:

- **Which business processes does ISO 20022 support?**
- **What are the touch-points in my organisation and my application landscape?**
- **How will I get message data into – and out of – my applications?**
- **What data do I need to fulfil the minimum requirements of the messages I will generate? (This may not just be the mandatory fields; depending on the context in which the message is to be used and the service to be offered, other data may also be required.)**
- **Where can I find the data: is it in my back-office system already? If not, can I find it elsewhere, and use my EAI's enrichment capability to add it to a message?**
- **What business event should trigger the production of outgoing messages?**
- **What processing steps are required? For example, do I need to batch and un-batch messages?**
- **Is manual authorisation of messages required?**
- **What should I do with invalid or rejected messages?**
- **If my solution requires a conversational message processing style (request-response), what do I need to do to accept the request and create the response?**
- **What is the messaging style? Depending on the type of solution, messages may be exchanged with partners interactively, on a store-and-forward basis, or in batch files.**

By considering these questions it should be possible to map out the ISO 20022 implementation for a solution and determine the impact on existing systems and processes. In some cases – for example when replacing a legacy format with ISO 20022 – much of the 'plumbing' will already exist and the principal effort will be in adapting to the new message formats and connectivity requirements. In other cases, for example,

implementing a new solution for a new market, the impact on the existing landscape may be more dramatic. The good news is that, using an EAI-based approach, much of the logic built for one solution can be re-used in another, so the effort of implementing new solutions decreases dramatically over time; it is possible to have an overall strategic picture of ISO 20022 adoption, towards which you migrate piecemeal, responding to business drivers – but with each implementation smoothing the way for those that follow.

Cost of implementation

How much will it cost? A difficult question because no two institutions are alike. However, the fact that ISO 20022 mostly uses XML syntax does help, mainly because the popularity of XML has driven commoditisation in the XML tools market, and first-class integration tools are available from many vendors and open-source projects; but also because XML skills are increasingly easy to find. The balance of implementation cost has therefore tilted away from technology concerns towards business analysis. From a business analysis point of view, the consistency across message definitions enforced by the dictionary (and the separation of the semantic layer) significantly simplifies the exercise, especially as people build up ISO 20022-specific skills. With the critical mass that ISO 20022 has in the industry, the likelihood of reusing content you have seen before is indeed very high.

Building for the future

ISO 20022 messages are designed to support current and future business needs all around the world. To this end, specifications include international characters in narrative fields, long identifiers and references, very large monetary amounts and very precise interest and exchange rates. If you are a technical architect or a designer of back-office systems you should take into account both the semantics of ISO 20022, which provide an internationally agreed common vocabulary for financial industry concepts, and the physical forms in which these concepts are represented. In this way, you can guarantee that systems will be aligned with ISO 20022 for messaging purposes, but also with the industry's collective wisdom regarding the best ways to represent financial data for present and future needs.

Chapter 3

The ISO 20022 Organisation

In This Chapter

- ISO 20022 governance
- The role of the Registration Authority
- Technical working group

Any organisation can develop ISO 20022 messages. You don't need to be affiliated with ISO, but you are obliged to comply with the rules set out in the ISO 20022 standard. The standard describes the method to develop the messages as well as the process to get them approved and published as part of the official portfolio of ISO 20022 messages. Twenty organisations have already embarked on developing ISO 20022 messages.

A series of bodies have been created by ISO to monitor the use of the standard and to help organisations develop successful and compliant messages. All of these bodies report to ISO 'Technical Committee 68' (TC68), the ISO committee responsible for all financial industry standards.

Business Justification Approval

If you want to develop ISO 20022 messages, you first have to introduce a *business justification* describing the scope and purpose of the messages and their benefits for the future users. The business justification is reviewed and approved by the ISO 20022 Registration Management Group (RMG). The RMG is the highest ISO 20022 body governing the overall process. It's made of senior industry experts nominated by countries or international organisations.

The RMG will analyse your business justification and assess the need for the message development: check that the messages do not overlap with existing ISO 20022 messages and verify their attractiveness for the international financial community. Specifically, it judges whether the application meets key criteria. These include:

- Is there a clear business need for these messages?
- Does the scope address the requirements of the targeted users?

Development of Candidate ISO 20022 Messages

Approval of your business justification gives you the green light to start developing the messages. Before you start, you will need to be in contact with the ISO 20022 Registration Authority (RA).

The RA is the guardian of the ISO 20022 repository, which includes all existing ISO 20022 messages and the dictionary of ISO 20022 components. SWIFT acts as the RA under a contractual agreement with ISO.

The RA will provide the input and guidelines required to develop the syntax independent logical message models. For this, you will reuse existing ISO 20022 message components or ask the RA to create new components, if necessary.

You will need a *modelling tool* to design the message models. SWIFT can provide you with a lite version of the Standards Editors tool, which was developed by SWIFT to use for its own development of ISO 20022 message models and, in its role of ISO 20022 RA, to verify the compliance of ISO 20022 message models submitted by others.

Where possible, the RA will assist submitting organisations during development of the message models, to ensure that they are adhering to rules, and to answer questions. When the message models are ready (these are called *candidate*

ISO 20022 messages), the RA validates their compliance and generates evaluation documentation, which includes the full description of your messages and the derived ISO 20022 XML or ASN.1 schemas.

Approval of Candidate ISO 20022 Messages

The RA distributes the evaluation documentation to the appropriate ISO 20022 Standards Evaluation Groups (SEGs) for validation. The SEGs are groups of industry experts nominated by ISO members, representing the (future) users of ISO 20022 messages. There are currently five SEGs, each covering a specific business domain: payments, securities, foreign exchange, trade services and cards.

Over 200 experts from 23 countries and 10 international organisations affiliated with ISO currently participate in the SEGs. Their role is to ensure that your candidate messages truly address the requirements of the community of users they represent.

You will be required to participate in the evaluation of your candidate messages. The SEG may require that you make some changes to ensure future adoption of your messages by the international community.

Publication of ISO 20022 Messages

Upon approval by the SEG, your messages become *ISO 20022 compliant messages*.

The RA will officially register your messages and any new components in the ISO 20022 repository and publish them on `www.iso20022.org`. The messages and their schemas are made available free of charge to the entire community, but you remain the owner of the messages, and you will be contacted in case users request a modification to the messages.

The Technical Support Group (TSG)

There is one more ISO 20022 group that might be of interest to you.

The Technical Support Group advises submitting organisations, the RMG, the RA, and the SEGs on the most appropriate and consistent interpretation of the ISO 20022 standard.

Chapter 4

ISO 20022 and SWIFT

In This Chapter

- SWIFT's role in the ISO 20022 standard
- Tools and services for submitters
- Tools and services for implementers

ISO 20022 grew out of a previous standard in the securities messaging space, ISO 15022. SWIFT was one of the key contributors to ISO 15022 and maintained this leading role in the development of ISO 20022. This chapter outlines SWIFT's role in the development of ISO 20022, and the services SWIFT offers to standard setters and to users of the standard.

SWIFT's Role in the ISO 20022 Standard

SWIFT's commitment to ISO 20022 is broad and deep. In 2000 SWIFT drafted the original ISO 20022 specification as part of the ISO working group that developed the standard.

In June 2004, SWIFT was appointed Registration Authority (RA) for the standard – a role that SWIFT continues to fulfil. The RA is responsible for maintaining and publishing the central repository of ISO 20022 content and ensuring its integrity. The first formal edition of the standard was approved and published by ISO in December of the same year. In its role of RA, SWIFT developed and continues to support and update ISO 20022 web resources, including `www.iso20022.org` and the web query tool shown in Chapter 1.

The RMG – the body responsible for the overall management of the standard and the registration process was formed in January 2005. SWIFT sends delegations representing both the RA and SWIFT to RMG meetings.

In June 2005 the first two ISO 20022 Standards Evaluation Groups (SEG) were formed, for the business domains of Payments and Securities. In 2006, two more SEGs were formed, for Trade and Foreign Exchange business, followed in 2008 by a new SEG for Cards. The role of the SEGs is to review submitted message definitions in terms of their business content. SWIFT is represented on all 5 SEGs.

In addition to the expertise SWIFT contributes to ensure the validity of the business content of the standard, SWIFT is also active on the technical front. SWIFT participated actively to the definition of the second edition of ISO 20022 which was published by ISO in May 2013.

SWIFT also develops and maintains the Standards Editors, a customised modelling tool that is used within SWIFT to create standards content in the ISO 20022 repository and generate documentation and XML schemas. SWIFT provides a 'lite' version of the same tool, the Editor, for the use of other submitting organisations.

SWIFT is the major submitter of content to the standard. Over 85 per cent of the message definitions currently included in the ISO 20022 catalogue were developed by SWIFT, sometimes on behalf of other submitting organisations. SWIFT also actively promotes ISO 20022 in its commercial offerings, in the media and at industry events.

Tools and Services for Standards Developers

The ISO 20022 standard makes rigorous demands on the quality of submitted content. The RA is responsible for ensuring that content meets these demands before it is officially registered.

SWIFT offers a number of tools and services for developers of ISO 20022 content, to help submitting organisations develop and submit content which conforms to the standard.

SWIFTNet

SWIFTNet is SWIFT's secure IP network, which connects over 10,000 financial institutions and corporations around the world.

SWIFT offers a variety of services over SWIFTNet for users of ISO 20022 messages, including interactive messaging (which includes message validation) and file transfer. For more information about SWIFT's network services, visit `www.swift.com`.

Implementation tools and services

Many tools exist to support coexistence and interoperability. Some of these tools are provided directly by SWIFT, but many others are available from SWIFT partners with SWIFT providing key elements and input.

Translation and mapping rules

For several key areas such as funds and credit transfers, SWIFT has developed translation rules between SWIFT's existing and widely-used MT messages and ISO 20022 messages. These were developed with key members of the SWIFT community and are made available to members and partners. For some business areas, SWIFT has also developed 'compatibility' versions of ISO 20022 messages, which are guaranteed to be fully translatable from and to the equivalent SWIFT messages, smoothing the path of coexistence.

Machine readable standards definitions

The ISO 20022 message models and dictionary that are the source for ISO 20022 content can be downloaded from `www.iso20022.org` as well as the message schemas and documentation. In addition, SWIFT can provide a number of useful representations of the ISO 20022 content, which can be used to accelerate development of things like input screens and user documentation.

Middleware and interface products

SWIFT enables its own interface products to support ISO 20022, as do many other vendors of connectivity and middleware products.

Implementation consultancy

SWIFT provides a variety of consulting offerings for ISO 20022 implementation.

Standards management tools

MyStandards is a web-based platform provided by SWIFT to facilitate the management and implementation of ISO 20022 (and FIN MT) standards and related market practice information. Everyone can browse the ISO 20022 standards in MyStandards on `www.swift.com/mystandards`.

Training

SWIFT provides a comprehensive range of classroom courses and self-study modules covering all aspects of ISO 20022 development and implementation.

References

For more details of SWIFT's products and services for ISO 20022, visit `www.swift.com/standards`.

Chapter 5

Ten Great Things About ISO 20022

Hopefully this book has told you everything you need to know about ISO 20022. Here are the top ten reasons why ISO 20022 is right for your business:

- The ISO 20022 Dictionary helps the financial community align and do business by providing concise definitions for common business concepts.
- The ISO 20022 process is open to anyone in the industry who wants to participate.
- ISO 20022 mostly uses XML and ASN.1 – technical syntaxes which enjoy great support from software platforms and tools. But the standard is designed to allow the use of other syntaxes as new requirements emerge.
- ISO 20022 schemas provide a high level of business validation, reducing the risk of sending or receiving incorrect data.
- ISO 20022 messages are free for anyone to implement on any network.
- The ISO 20022 maintenance process allows users to shape the development of the messages on which they rely.
- The leaders of ISO 20022 work actively with other standards bodies to promote interoperability.
- ISO 20022 definitions can be used as the basis for your own internal communication needs.
- ISO 20022 definitions are created collaboratively by industry experts from around the world, to ensure their completeness and accuracy.
- The ISO 20022 web query tool allows anyone to explore the ISO 20022 dictionary; no special software is required.

Chapter 6

Almost Ten Things to Tell Your CIO about ISO 20022

Now you know all about ISO 20022 and why it's right for your business, tell people about it! Here are nearly ten things about ISO 20022 to be sure to tell your CIO about:

- ISO 20022 is a methodology for defining financial messages – a standard for standards, so to speak.
- Currently, 325 messages have been defined, and there are many more on the way.
- It's not just about messages – ISO 20022 provides a common language for machines and people to exchange information about financial business. This common language is set out in a formal dictionary.
- ISO 20022 is a business standard; its principal focus is on the content of the dictionary, rather than the technicalities of how data is exchanged.
- You can use the dictionary to help translate between messages that use different syntaxes, and to solve other kinds of problems where a shared understanding of the business is important, such as internal system integration.
- Although ISO 20022 messages are mostly exchanged in XML, ISO 20022 doesn't depend on a specific message syntax, so if a different syntax is required to satisfy a business or technical requirement, or a new syntax emerges, ISO 20022 can accommodate it. The second edition of ISO 20022 includes design rules to produce both XML and ASN.1 schemas.
- ISO 20022 adoption is gathering pace in major markets around the world.
- ISO 20022 is an open standard that anyone can use, and to which anyone can contribute.

Chapter 7

Ten (or more) Useful Links for Standards Implementers

Feel like you've learnt a lot about ISO 20022 but want to know more? Here is a list of useful URLs for ISO and other standards bodies.

- ISO 20022 `www.iso20022.org`
- SWIFT `www.swift.com`
- ISO 15022 `www.iso15022.org`
- FIX Protocol Limited `www.fixprotocol.org`
- Financial products Markup Language (FpML) `www.fpml.org`
- eXtensible Business Reporting Language (XBRL) `www.xbrl.org`
- Unified Modeling Language (UML) `www.uml.org`
- ASN.1 for ISO 20022 `www.oss.com/iso20022.html`
- Extensible Markup Language (XML) `www.w3.org/XML`
- International Securities Association for Institutional Trade Communication (ISITC) `www.isitc.org`
- My Standards `www.swift.com/mystandards`
- Securities Market Practice Group `www.smpg.info`
- Payments Market Practice Group `www.pmpg.info`

Appendix

Glossary

ACH: Automated Clearing House that is used to clear retail payments between banks in a country or region.

ASN.1: Abstract Syntax Notation One - data specification and encoding technology jointly standardized by ISO, IEC (International Electrotechnical Commission), and ITU (International Telecommunication Union), and widely used across several industries, such as cellular telephony, signaling, network management, Directory, Public Key Infrastructure, videoconferencing, aeronautics, Intelligent Transportation. One of the two official ISO 20022 syntaxes with XML.

Business components and elements: Business concepts used and processed to perform the various financial activities, such as 'Account', 'Trade', and 'Party'. Business components are usually characterised by a series of 'business elements'. For example, a 'Trade' will be characterised by business elements such as Trade Date, Trade Time, Trade Price and Trade Place.

Business justification: Document prepared by an organisation wishing to develop and register ISO 20022 messages. The document describes the messages to be developed, the purpose, and benefits for the industry. It is submitted for the approval of the ISO 20022 Registration Management Group (RMG).

Coexistence: The situation of multiple standards existing at the same time in the same business space. Within SWIFT, this refers to the coexistence between the MT and MX standards. This also refers to the set of measures being taken to make the situation easier to handle by the community (publication of mapping rules, translation services…).

Components: *See* Business components and message components

Corporate action: An event initiated by a public company that affects the securities issued by the company. Also refers to the sub-domain of the financial services industry related to the management of such events.

CSD: A Central Securities Depository (CSD) -an organisation holding securities to enable book entry transfer of securities. The physical securities may be immobilised by the depository, or securities may be dematerialised (so that they exist only as electronic records).

Dictionary: Part of the ISO 20022 Repository that contains all items that can be re-used during business modelling and message definition activities.

EAI: Enterprise Application Integration - middleware to connect applications and communication interfaces. Typical EAI software includes features for mapping data between various formats, enriching messages with data from other systems and orchestrating message flows.

FIN: The messaging service offered by SWIFT for the secure and reliable exchange of MT messages in store-and-forward mode. By extension, the syntax used to format these MTs.

FIX: Financial Information eXchange - a communication protocol designed by the FIX Protocol Limited (FPL) for transmission of messages in specific areas of the securities processing lifecycle, for example the pre-trade and trade spaces.

FpML: Financial products Mark-up Language a primarily XML based communication protocol dedicated to OTC derivative contracts processing lifecycle. FpML is owned by the International Swaps and Derivatives Association (ISDA).

Giovannini Protocol: In its 2003 report, the Giovannini Group, as advisor to the European Commission, published a report identifying 15 barriers to efficient EU cross-border clearing and settlement. The Giovannini Group under the chairmanship of Dr. Alberto Giovannini, CEO of UNIFORTUNE SGR SpA, stated that SWIFT, through the Securities Market Practice Group (SMPG), should define a solution to eliminate Barrier 1, which cites national differences in information technology and interfaces used by clearing and settlement providers.

Interoperability: Capability to easily exchange business information while using different message standards. ISO 20022 promotes global use of syntax-neutral business and message components as a common denominator to achieve interoperability between standards using different syntaxes.

ISO: The International Organization for Standardization – an international standard-setting body, composed of representatives from more than 160 national standards organisations that promulgates worldwide standards in a variety of domains aiming at facilitating cross-border exchanges of goods, services and techniques.

ISO 15022: An ISO standard that describes the syntax to be used for developing securities messages used mainly to support back office related transaction flows. It replaced the previous securities messaging standard ISO 7775.

ISO 20022 RA: Registration Authority - offers the services described in an ISO standard on behalf of and under a contractual agreement with the International Organization for Standardization.

ISO 20022 Repository: Repository maintained by the ISO 20022 RA which contains the financial business models, message definitions and components defined in compliance with the ISO 20022 standard.

ISO 20022 RMG: Registration Management Group - in charge of the overall management of the ISO 20022 development and registration process in accordance with the ISO 20022 standard.

ISO 20022 SEG: Standards Evaluation Groups -in charge of validating candidate ISO 20022 messages within the scope of the business justification and ensuring that they address the needs of their (future) international community of users.

Message: A set of structured information exchanged between two parties involved in a financial transaction.

Message component and element: A re-usable data structure used for assembling message definitions. The data defined in a message component is 'traced' back to the business components and business elements. In simple terms, business components define the business meaning, message components create data structures for messaging.

MI: Market Infrastructure - a system that provides services to the financial industry for trading, clearing and settlement, matching of financial transactions, and depository functions.

Middleware: Software that enables data to be exchanged among different systems with standard communication components and tools for formatting, mapping, and processing.

MT: The traditional ':tag:value' Message Types for use on the FIN service offered by SWIFT.

MX: An XML message exchanged over SWIFTNet, whether or not ISO 20022 compliant.

MyStandards: A web-based platform provided by SWIFT to manage and implement standards and related market practices.

RTGS: Real Time Gross Settlement System.

Semantics: The study of meaning, usually in language. The word is often used in ordinary language to denote a problem of understanding that comes down to word selection or connotation.

SEPA: Single Euro Payment Area.

Standards Editors: Standards work station - developed by SWIFT to support the development of ISO 20022 compliant models and messages and the ISO 20022 RA services.

Standards Editor: 'Lite' version of the Standards Editors, developed by SWIFT and offered to submitting organisations.

SWIFT: Society for Worldwide Interbank Financial Telecommunication. See `www.swift.com`.

Syntax: Physical format of a message used to identify and represent the conveyed pieces of information.

T2S: TARGET2 Securities – an initiative of the Eurosystem. It is an IT platform that aims to make settlements across national borders simpler and more cost-efficient.

TARGET2: The Eurosystem-owned European Real Time Gross Settlement (RTGS) system. TARGET2 is one of the largest high-value payment systems in the world.

Taxonomy: The classification in a hierarchical system, typically organised by supertype-subtype relationships, also called generalization-specialization relationships, or less formally, parent-child relationships.

TC 68: ISO Technical Committee 68 in charge of all ISO standards to support financial services.

Translation rules: Set of rules to be used to map the pieces of information included in a message expressed in one syntax to the equivalent message expressed in another syntax.

UML: The Unified Modeling Language, the visual modelling language used in ISO 20022 to represent the industry business model.

XBRL: eXtensible Business Reporting Language – an open data standard for financial reporting.

XML: eXtensible Mark-up Language – popular syntax to encode documents (or messages) electronically on the Internet. XML allows communities to define their own identifiers (or tags) and format (or data type) for each component of a message. One of the two official ISO 20022 syntaxes with ASN.1.

Acknowledgements

The authors would like to thank all the members of the SWIFT Standards team that contributed to the content of this book, particularly Charifa Elotmani, who did a great job of collating and interpreting review comments from around the community. We would also like to thank the following SWIFT people that contributed their time and expertise: Gottfried Leibbrandt, Martine DeWeirdt, Rosie Halfhead and Kim Bratanata.

We would also like to extend our thanks to those members of the SWIFT and ISO communities that took the time to review an early draft of the book and offer their comments: Andreas Schneider (BHF), John Masterson (BoNY-Mellon), Rune Olofsson (Nordea), Mike Tagai (JPM-Chase), Javier Santamaria (Santander), Loretta Briano (SanPaulo) and Peter Potgieser (RBS). Finally, we would like to thank Nicolas Fleury and his colleagues at ISO for the Introduction, and Karla McKenna (Citi) for providing the Foreword.

Publisher's Acknowledgements

We're proud of this book; please send us your comments at `http://dummies.custhelp.com`. For other comments, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at (001) 317-572-3993, or fax 317-572-4002.

Some of the people who helped bring this book to market include the following:

Acquisitions, Editorial, and Vertical Websites

Corporate & Custom Publishing: Scott Smith

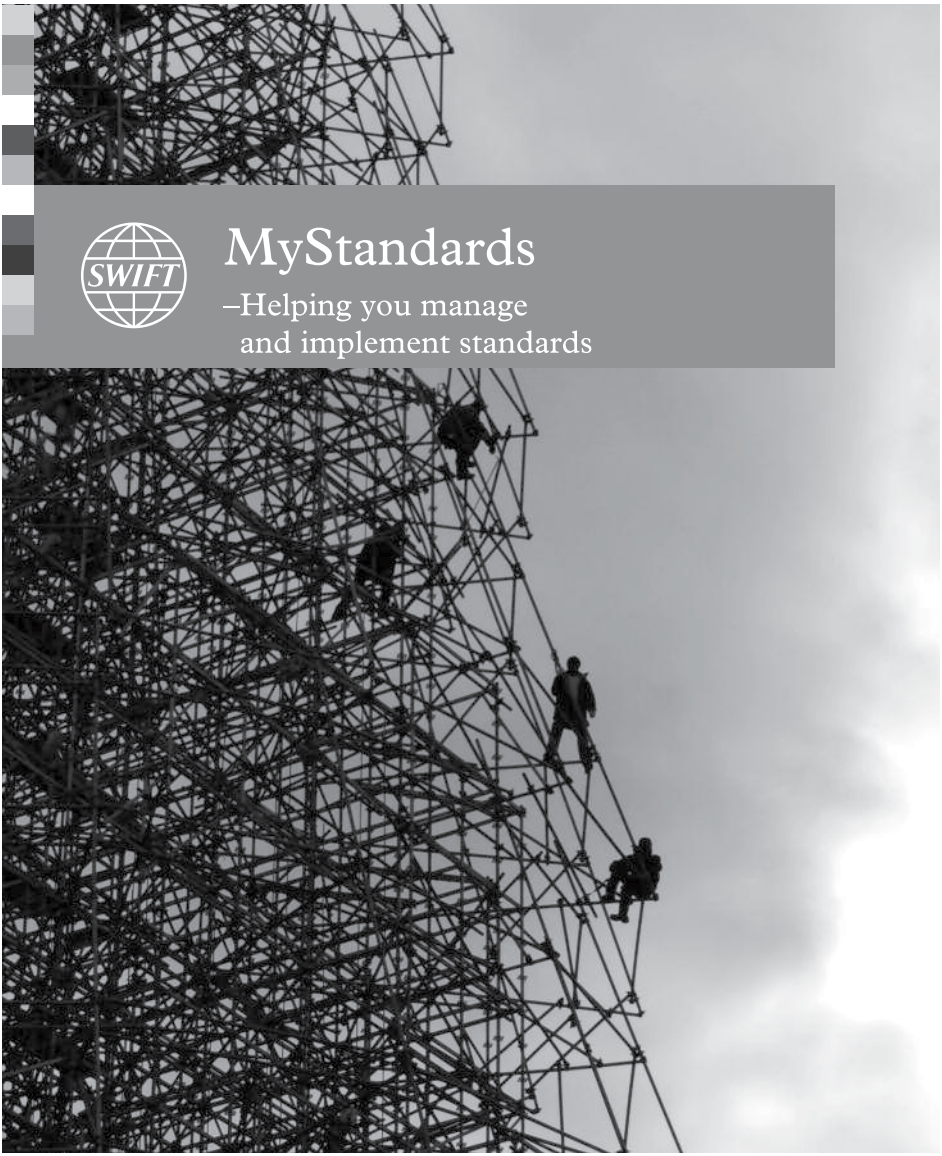
Project Editor: Jo Jones

Development Editor: Simon Bell

Production Manager: Daniel Mersey

Composition Services

Project Coordinator: Kristie Rees



MyStandards

–Helping you manage and implement standards

A coherent set of tools and resources for standards users

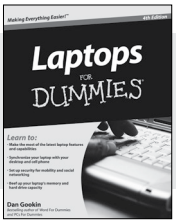
- Centralise all your standards information
- Improve your release management
- Automate documentation and accelerate your implementation
- Streamline your usage guidelines management

More information? www.swift.com/MyStandards

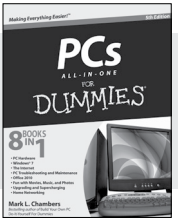
FOR DUMMIES®

Helping you expand your horizons and achieve your potential

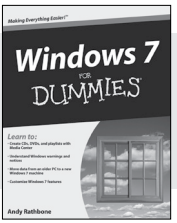
COMPUTER BASICS



978-0-470-57829-2

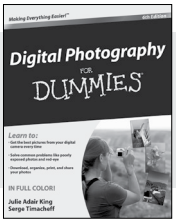


978-0-470-61454-9

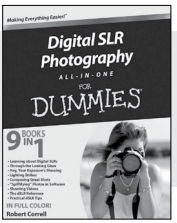


978-0-470-49743-2

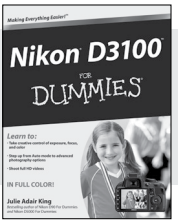
DIGITAL PHOTOGRAPHY



978-0-470-25074-7

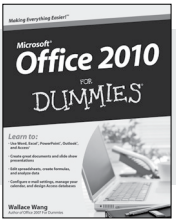


978-0-470-76878-5

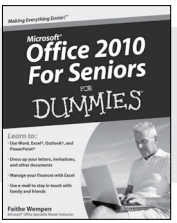


978-1-118-00472-2

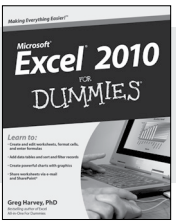
MICROSOFT OFFICE 2010



978-0-470-48998-7



978-0-470-58302-9



978-0-470-48953-6

Access 2010 For Dummies
978-0-470-49747-0

Android Application Development For Dummies
978-0-470-77018-4

AutoCAD 2011 For Dummies
978-0-470-59539-8

C++ For Dummies, 6th Edition
978-0-470-31726-6

Computers For Seniors For Dummies, 2nd Edition
978-0-470-53483-0

Dreamweaver CS5 For Dummies
978-0-470-61076-3

iPad For Dummies 2nd Edition
978-1-118-02444-7

Macs For Dummies, 11th Edition
978-0-470-87868-2

Mac OS X Snow Leopard For Dummies
978-0-470-43543-4

Photoshop CS5 For Dummies
978-0-470-61078-7

Photoshop Elements 9 For Dummies
978-0-470-87872-9

Search Engine Optimization For Dummies, 4th Edition
978-0-470-88104-0

The Internet For Dummies, 12th Edition
978-0-470-56095-2

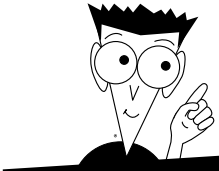
Visual Studio 2010 All-In-One For Dummies
978-0-470-53943-9

Web Analytics For Dummies
978-0-470-09824-0

Word 2010 For Dummies
978-0-470-48772-3

WordPress For Dummies, 4th Edition
978-1-118-07342-1

Available wherever books are sold. For more information or to order direct go to www.wiley.com or call +44 (0) 1243 843291

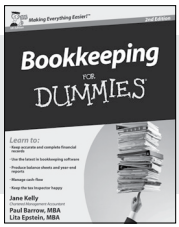


FOR DUMMIES®

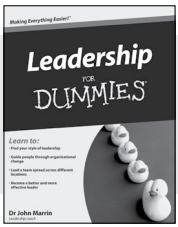
Making Everything Easier!™

UK editions

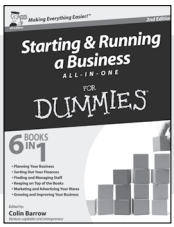
BUSINESS



978-0-470-97626-5



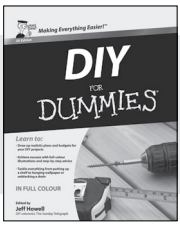
978-0-470-97211-3



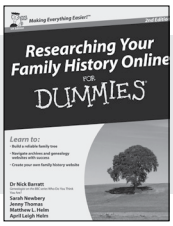
978-1-119-97527-4

REFERENCE

978-0-470-68637-9

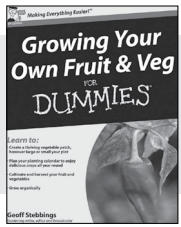


978-0-470-97450-6



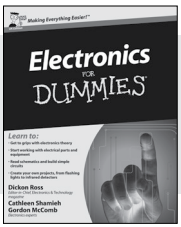
978-0-470-74535-9

HOBBIES



978-0-470-69960-7

978-0-470-68641-6



978-0-470-68178-7

Asperger's Syndrome For Dummies
978-0-470-66087-4

Basic Maths For Dummies
978-1-119-97452-9

Boosting Self-Esteem For Dummies
978-0-470-74193-1

British Sign Language For Dummies
978-0-470-69477-0

Cricket For Dummies
978-0-470-03454-5

Diabetes For Dummies, 3rd Edition
978-0-470-97711-8

English Grammar For Dummies
978-0-470-05752-0

Flirting For Dummies
978-0-470-74259-4

IBS For Dummies
978-0-470-51737-6

Improving Your Relationship For Dummies
978-0-470-68472-6

Keeping Chickens For Dummies
978-1-119-99417-6

Lean Six Sigma For Dummies
978-0-470-75626-3

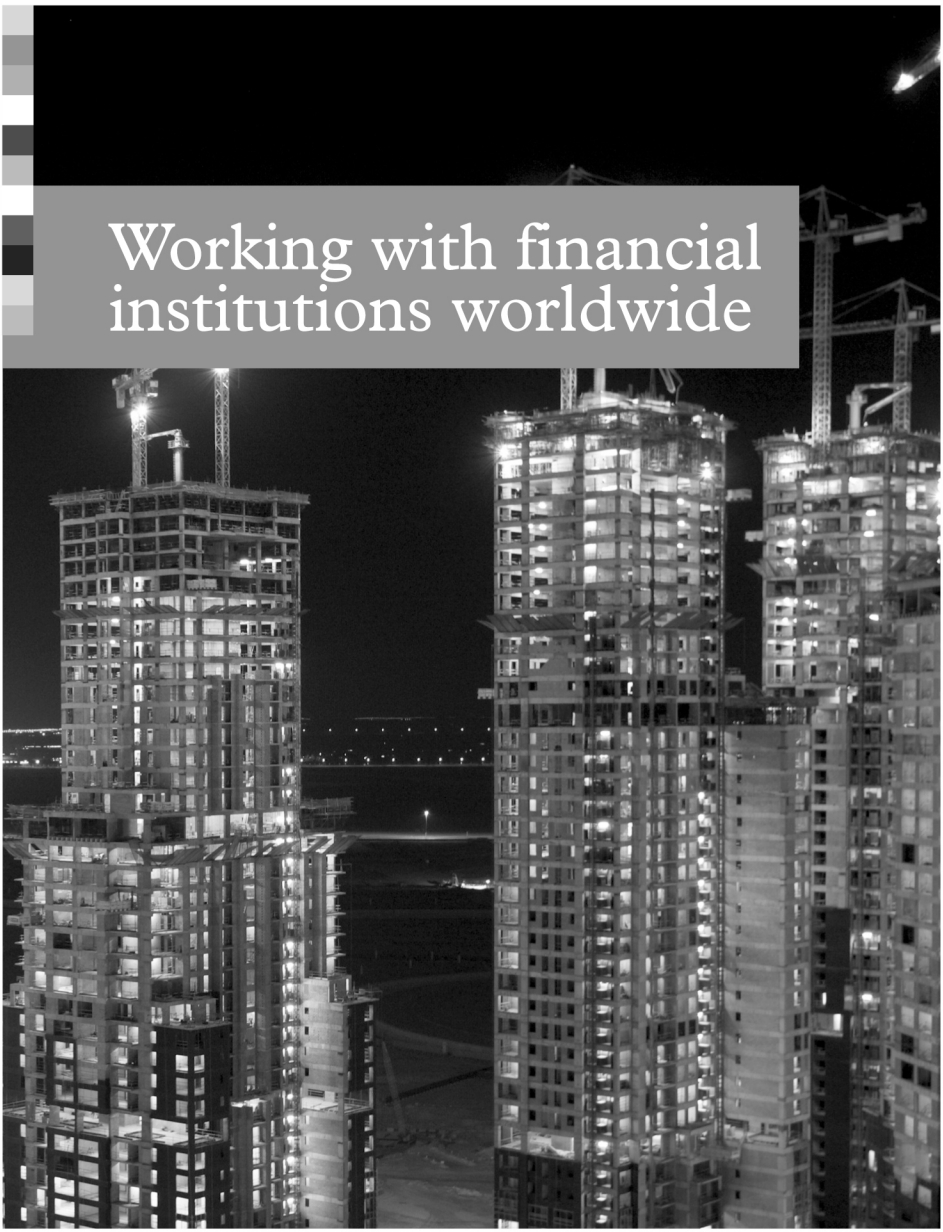
Management For Dummies, 2nd Edition
978-0-470-97769-9

Neuro-linguistic Programming For Dummies, 2nd Edition
978-0-470-66543-5

Nutrition For Dummies, 2nd Edition
978-0-470-97276-2

Available wherever books are sold. For more information or to order direct go to www.wiley.com or call +44 (0) 1243 843291

32812 (p1)



SWIFT

The means to standardise and automate

The way to lower costs, reduce risk and eliminate operational inefficiencies

The reason why the world's top 1,000 institutions rely on us for their secure global financial messaging

ISO 20022 provides a common platform for developing financial message standards

ISO 20022 brings profound benefits to the financial services industry, as it realizes end-to-end processing across domains and geographies that currently use vastly different standards and information formats. In this book, you will learn the key ideas behind ISO 20022, and what makes it different from other financial message standards. You will also discover how to:

- ***Understand how ISO 20022 can help you* — use ISO 20022 to define your business information and communicate it internally and externally**
- ***Benefit from ISO 20022* — learn how to put ISO 20022 at work in your organization and benefit from its advanced features**
- ***Contribute to ISO 20022* — help unify message standards in the financial services industry**

Open the book and find:

- **What's a financial message standard**
- **How message standards can be independent of the syntax**
- **Why ISO 20022 is more attractive than other message standards**
- **Why and when you should adopt ISO 20022**
- **How to sell it to your management**
- **What's the relationship between SWIFT and ISO 20022**
- **How you can develop new ISO 20022 messages**

Go to Dummies.com®
for videos, step-by-step examples, how-to articles, or to shop!

The SWIFT Standards Team: SWIFT's commitment to ISO 20022 is broad and deep. SWIFT is the official ISO 20022 Registration Authority and provides a series of tools and services for ISO 20022 standards developers and implementers.

FOR DUMMIES®
A Wiley Brand

ISBN: 978-1-118-81444-4
Not for resale