WhitePaper

INTRODUCTION TO ISO 20022 FOR U.S. FINANCIAL INSTITUTIONS

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NACHA
The Electronic Payments Association®

Q insights

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NACHA Meeting the Needs of the Present…

"With **ISO 20022 ACH Integration**, NACHA is providing industry tools and solutions that allow ACH users to *translate* and *integrate* the ISO 20022 Payment Message standard for both electronic payments *initiation* and payments remittance without making changes to the current NACHA formats and with the support of the *NACHA Operating Rules.*"

…While Preparing for the Future

"NACHA will continue to monitor, explore and engage with market participants with respect to **ISO 20022 ACH Conversion**—i.e., the current NACHA file formats are converted to ISO 20022 Payment Messages for all ACH payment types to all endpoints with the support of the *NACHA Operating Rules*, as revised to accommodate the different ISO formats or messages.

There are potential 'triggers' or events that will influence decisions around when, if or how to convert the current NACHA format to an ISO 20022 format. These are:

- Significant gaps or opportunities are not met by ISO 20022 ACH Integration impacting users;

- The ACH Operators complete significant system and operation modernization efforts that would create a catalyst for NACHA format conversion;

- Adjacent systems that facilitate straight-through processing (STP) are updated to ease acceptance and utilization of ISO formats for all parties including accounting, banking and reporting systems for payments, and remittance included in the ACH flow;

- The benefits of ISO 20022 NACHA format conversion justify the potential industry cost; and

- Regulatory/mandatory requirements."

George Throckmorton
Managing Director of Network Development, NACHA

Table of Contents

Introduction

In an era of apps and real-time interconnectivity, the payments needs of the U.S. have been transformed. Today's legacy standards have less flexibility than other newer standards to effectively adapt to the new digital economy and the growing demands of the information age.

Standards, often established to meet local requirements, vary widely across the globe. As the development of earlier standards were constrained by the technology available at the time like Standard 18 in the U.K. and CPA005 for low-value payments in Canada, so too were the standards established to support the U.S. ACH Network. The NACHA formats, which define the specifications for U.S. ACH Network payments, were created in 1974 and have a 94-character record length and a remittance addenda capability of up to 80 characters. These restrictions are a reflection of the IT infrastructure of the day. More precisely, the 94 characters came from the binary coded ASCII (American Standard Code for Information Interchange) files, while the 80-character constraint of the remittance data a result of the legacy world of mainframe computers that used 80-column punch cards. Yet, unlike the limitations faced around the globe, the U.S. ACH system can carry significant data and still remains one of the most robust payments infrastructures in the world.

The NACHA standard and processes have worked well for decades and will continue to serve its purpose for years to come. However, with the evolution of Internet technology, along with the emerging needs for greater efficiencies and opportunities of international trade, an open common global standard, such as the ISO 20022 standard that is gathering pace in major markets around the world, may offer more.

The global payments marketplace is buzzing with activity ranging from exploration and investigation to actual implementation of ISO 20022. The emerging status of ISO 20022 as a perceived international payments standard, coupled with early adopter actions in major global markets, are driving a frenzied dialogue among financial institutions, businesses and related providers. In this setting, there is a lot of confusion about what ISO 20022 is, and particularly for the NACHA audience, what ISO 20022 means for potentially replacing current NACHA formats with ISO 20022 messages in the ACH Network.

The purpose of this white paper is to provide clarity and dispel some of the myths surrounding ISO 20022 for payments, to illustrate the benefits and challenges of converting current NACHA formats to ISO 20022 messages for U.S. Network transactions, and to offer best practice guidance for interim steps to integrate the current NACHA formats with the ISO 20022 message standard.

Setting the Backdrop — ISO 20022 Landscape

Today, there is a slow, but certain global convergence toward ISO 20022. We are observing different adoption scenarios worldwide by payments market infrastructures. The first is the complete replacement of domestic payments systems with definitive timelines for when ISO 20022 projects will supersede existing proprietary or legacy standards. Another approach is parallel existence between ISO 20022 and the incumbent standard. In geographies where there is no catalyst for payments market infrastructure modernization to ISO 20022, large global financial institutions are emerging with solutions to support ISO 20022 message standards in corporate-to-bank communications. It is amidst this expanding base of ISO 20022 users that the question of replacing NACHA formats with ISO 20022 messages in the U.S. is being discussed.

The European Union's[1] Single Euro Payments Area (SEPA)[2] implementation based on ISO 20022 propelled the standard to the global forefront. The introduction of the euro in 1999 was to achieve a vision of a common financial marketplace. SEPA, completed in 2014, was a further step to integrate the economic markets from many domestic legacy ACH systems to a Pan-European ACH based on the ISO 20022 standard.

While SEPA is the most mature market and has been the epicenter of ISO 20022 migration, countries in other parts have committed to modernizing their legacy payments infrastructures to ISO 20022, most visibly Canada and Australia. In Asia, newly developed payment market systems use ISO 20022, such as in Singapore and China, or have been enhanced to incorporate ISO 20022, such as in Japan. In the U.S., the Federal Reserve Banks and The Clearing House, the Operators of the U.S. payments infrastructures, have declared an intention to implement ISO 20022 for U.S. wires in the next three to five years. But what of the plans for the U.S. ACH Network?

Today NACHA Supports ISO 20022 Integration with the ACH Network for Corporate-to-Bank Payment Messages

NACHA is trying to prepare the U.S. ACH Network for present and future needs. George Throckmorton, Managing Director of Network Development for NACHA, explains, "There are two distinctions we're trying to make. One is to define what is ISO 20022 ACH integration? Today, NACHA is providing industry tools and solutions that allow ACH users to leverage the ISO 20022 payment message standard for electronic payments and remittance without making changes to the current NACHA formats. In other words, ACH users can *translate* and *integrate* the ISO 20022 payment message standard for both electronic payments initiation and payments-related addenda with the support of the existing *NACHA Operating Rules*."

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[1] The European Union (EU) is comprised of the 28 member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

[2] The Single Euro Payments Area (SEPA) is a payment-integration initiative driven by the European Union to simplify euro-dominated bank transfers denominated in euro. As of August 2015, SEPA consists of 34 countries: the 28 EU member states, the four members of the EFTA (Iceland, Liechtenstein, Norway and Switzerland), and Monaco and San Marino.

NACHA is Reviewing Opportunities to Convert NACHA Formats to ISO 20022 Messages for Bank-to-Bank Communications

George Throckmorton continues, "The second is more future looking — In other words, what is ISO 20022 ACH *conversion*? That would be when the current NACHA file formats are replaced by ISO 20022 payment messages for all ACH payment types to all endpoints and supported by the *NACHA Operating Rules*, as revised to accommodate the different ISO formats or messages. We don't know when or if that will happen. Converting NACHA formats to ISO 20022 would require specific triggers. But if we don't have a significant gap; if we don't have a significant opportunity; if we don't have the systems transformation that we envision could happen one day at the ACH Operator level; and if we don't have a business case, which our U.S. Stakeholder study identified that we do not, then why would we move?"

Until now the U.S. payments systems have not warranted a need for conversion to ISO 20022, but there may be strategic reasons to consider. More recently the U.S. wire systems began to collect data to determine an optimal timeline and approach for a conversion project. Figure 1 is a diffusion of ISO 20022 in the worldwide market, plotting the adoption stages of select countries that have migrated one or more of their legacy payments systems against time.[3]

The U.S. may be considered behind the rest of the world in supporting conversion of legacy payments market infrastructures to ISO 20022. Yet while it may appear that the U.S. is a laggard in the time continuum, it can also be argued that the vast financial services market actually falls into two ends of the spectrum of the ISO 20022 adoption curve.

FIGURE 1: DIFFUSION OF INNOVATION – ISO 20022 ADOPTION CURVE

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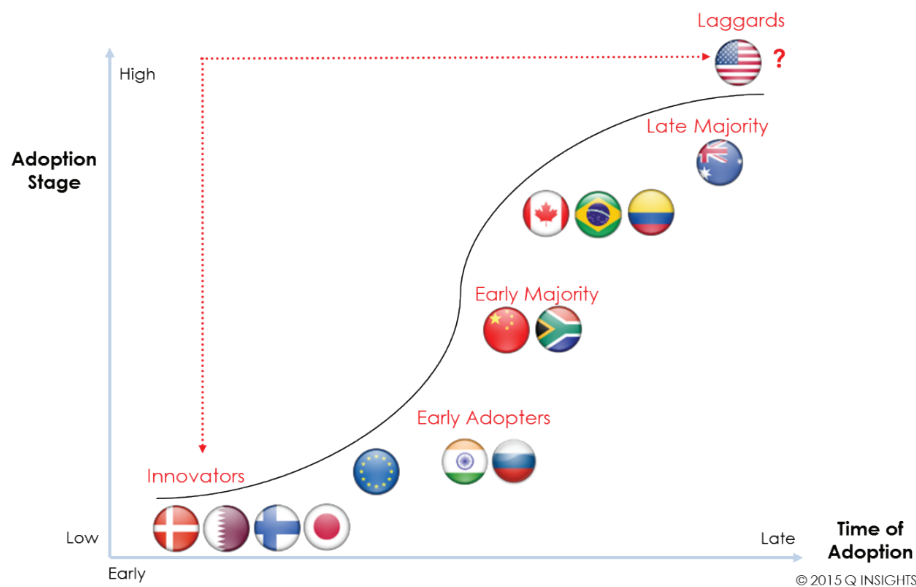
[3] The adoption curve is a sequence of phases with pioneers, who use a new technology, called *innovators*; followed by the *early adopters*; then the *early* and *late majority*; and, finally, the last group to adopt a technology are the *laggards*. The *theory of the innovation adoption curve* was formalized by Everett Rogers in his 1962 book, *Diffusion of Innovations*. The development of the ISO 20022 adoption curve is based on research and data points collected by Q Insights.

There are the leaders that have been involved with ISO 20022 since its inception; the largest U.S. global financial institutions, participants of the ISO 20022 Payments Standards Evaluation Group (SEG) and instrumental in the development of the standards; they were also early movers to implement ISO 20022 for corporate-to-bank communications. Other large U.S. banks driven by corporate customer demand have been fast followers in integration and moved swiftly to offer support of the standard.

Corporate Adoption of ISO 20022 Corporate-to-Bank Messages

While the number of corporate clients that have implemented ISO 20022 in the U.S. is not staggering, more and more businesses are increasingly starting to ask their banking partners to support ISO 20022 messaging. This phenomenon is moving downstream from the larger companies to the midmarket customer segment.

Although the driving force in moving to ISO 20022 is particularly prevalent for those active in the SEPA region, companies doing business in EMEA (Europe, Middle East and Africa) and Latin America are also a contributing factor as banks see growth in these geographies. Importantly, multinationals seek to move away from the many proprietary bank formats to one format to streamline and reduce the number of standards that they have to support.

Bank Support for Corporate-to-Bank ISO 20022 Message Integration

Corporate demand has not been the only catalyst, however; the opportunity to gain a competitive advantage inspired some of the larger financial institutions to invest in ISO 20022 early on to support ISO 20022 corporate-to-bank payments messaging.

While the larger banks are meeting the needs of these organizations, at the other end of the U.S. financial market spectrum are the thousands of smaller retail banks and credit unions that are unfamiliar with ISO 20022. This segment does not have the clientele or other major drivers to migrate. Equally, demand may not ever translate down to the smaller business banking customer and the lower segment whose primary need is focused on such issues as payroll. It is unlikely that the smaller financial institutions will move to ISO 20022 until a time when they modernize their back-end systems, when ISO 20022 will likely be a common built-in feature or part of outsourced vendor solutions, thereby allowing them to leapfrog any of the current intermediate steps.

From Integration to Conversion

The wide array of resource levels and technological capabilities of the financial institutions in the U.S. also make it likely that many years will pass before the U.S. will have the sufficient number of banks with an appetite for change needed to achieve the critical mass for migration of the ACH payments infrastructure to ISO 20022. An immediate step is the gradual migration in the corporate-to-bank space as observed with a small number of large financial institutions. A longer term view is a possible migration of the entire ACH Network to ISO 20022, which would be based on key industry triggers.

It is against this backdrop of a vast and unique landscape of financial service players in the U.S. that we discuss what ISO 20022 is, introduce essential concepts and dispel some of the myths surrounding the standard. We also bring to light the benefits and advantages realized by those financial institutions that have integrated ISO 20022 as

part of a suite of supported message standards and highlight the risks, challenges and concerns that it may pose for banks and processors in practice. The discussion then explores the future implications for U.S. stakeholders and offers helpful strategies for those considering integration as an intermediate step with a focus on the U.S. ACH Network.

Demystifying ISO 20022

This section addresses the myths and confusion about ISO 20022.

Myth 1: ISO 20022 is an XML Format

ISO 20022 messages are mostly exchanged in XML (or Extensible Markup Language). Inevitably, this has led people to equate ISO 20022 with XML. However, ISO 20022 is syntax (known as format) independent. The ISO 20022 model is built to be flexible and evolve to accommodate alternative model-compliant syntax, whether a new technology emerges in the future to benefit from the latest innovations or if an existing syntax, such as ASN.1, is required to satisfy a current business or technical requirement. ISO 20022 and XML will be addressed in more detail in the sections that follow.

Myth 2: ISO 20022 is a SEPA Standard

The rollout of SEPA in 2008 of mass euro payment transactions for payments clearing and settlement, corporate and bank communications, among other ISO 20022 uses represents one of the initiatives that pioneered broad-scale ISO 20022 conversion. The SEPA data formats are a valid *subset* of the global ISO 20022 standard, or key data elements that are necessary for making SEPA payments, and do not comprise all of the data elements of ISO 20022 messages. Despite ISO 20022 being closely linked to SEPA data formats, the use of ISO 20022 is not limited to Europe. There are more than 70 projects worldwide at the country level. Table 1 illustrates projects at a regional level, which are multinational in focus. The African and Asian markets are also very active in this domain as seen in the Table.

TABLE 1: REGIONAL ISO 20022 PROJECTS

Region	Projects
Africa	49
Asia	46
Europe	250
Middle East	7
North America	15
South America	9

Source: ISO20022.Org / SWIFT

Myth 3: ISO 20022 is a SWIFT Standard

While SWIFT (Society for Worldwide Interbank Financial Telecommunication) has been closely involved in ISO 20022 from its creation, the official body for the standard is the International Organization for Standardization (ISO),[4] the world's largest developer of voluntary international standards.

SWIFT plays two key roles in ISO 20022. First, SWIFT is a Registration Authority (RA) and a major content contributor to the ISO 20022 portfolio. The RA is responsible for maintaining and publishing the central repository of ISO 20022 content and ensuring its integrity. Second, SWIFT is a facilitator of the Common Global Initiative-Market Practice (CGI-MP).[5] The CGI-MP was established by major global banks, corporations, ERP (enterprise resource planning) vendors, and SWIFT in 2009 with a common interest in collaborating, promoting and adopting an internationally agreed upon approach to ISO 20022 financial messages.

The CGI-MP is helping to educate the industry, address concerns with varying interpretations, and vet the ISO 20022 XML schema in new implementations. More information on the CGI-MP activities is offered later in this paper.

However, the governance of ISO 20022 sets of messages are supported by independent leading actors of expert representatives from all sectors including large financial institutions, market infrastructures, and standards bodies such as the American National Standards Institute (ANSI) and IFX (Interactive Financial eXchange) Forum as part of Payments SEG and the Registration Management Group (RMG). Together, they play an integral part in defining the standard (see Figure 2). The RMG is the highest ISO 20022 body responsible for the overall management of the standard and the registration process. The Payments SEG's role is to review submitted message definitions to address the requirements of the community of users.

FIGURE 2: REGISTRATION & DEVELOPMENT
PROCESS OF NEW SETS OF MESSAGES

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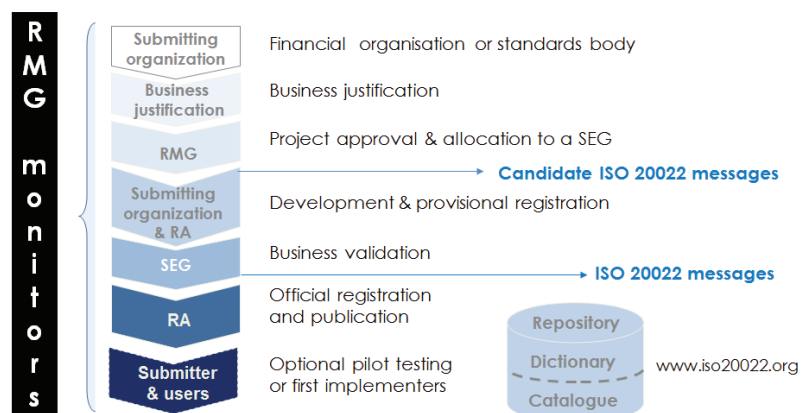
[4] For more information on the International Organization for Standardization, visit the website at http://www.iso.org.

[5] For more information on CGI-MP, visit the website at http://corporates.swift.com/en/cgi-mission-and-scope.

Myth 4: ISO 20022 is a Standard for Only Cross-Border Payments

The ISO 20022 message can be used in both domestic and cross-border scenarios. Indeed, ISO 20022 is supporting efficiencies in domestic commerce today in corporate-to-bank payments initiation communications (but this still requires integration with local payment instruments).

Over the years, diverse message standards have been implemented in the U.S. to meet specific payments needs, which has led to a proliferation of multiple formats. As such, the businesses, payments processors and financial institutions that create, send and receive payments need to maintain multiple suppliers, software, processes and business systems to support their payments operations.

Consider the burden banks face in supporting a myriad of standards for corporate customers inherited through mergers and acquisitions. There are multiple formats produced from ERP systems and TMS (treasury management system) software, and depending on the number of subsidiaries, there may be different versions of SAP idoc files, Oracle, MS Dynamics, and/or others. Likewise, if corporate treasuries have relationships with dozens of banks, they most likely manage multiple proprietary standards, each with its own structure and rules.

It is cumbersome for banks to offer and manage a variety of standards requested by corporations that then require translation across multiple technology platforms for domestic and international clearing systems such as Fedwire, CHIPS, U.S. ACH and so on.

At the same time, payments travelling across today's U.S. national clearing and settlement systems do not "speak the same language." There is one message standard for ACH, another for Fedwire, and a third for CHIPS wire formats. While realizing one standard for ACH, wires and other payment types may not happen in the U.S. anytime soon, banks and corporate treasuries alike would favor minimizing and streamlining the standards that need to be maintained.

ISO 20022 is intended to be a single message standard for all financial communications, irrespective of the counterparty (financial institutions, market infrastructures, corporate customers, and the like), the business domain (payments, securities, treasury, trade services, etc.), or the network (public or proprietary, domestic or international).

Myth 5: ISO 20022 is Just a Payments Standard

While payments initiatives are leading the way in ISO 20022 adoption, around the world ISO 20022 migrations are underway more broadly across five financial service domains: payments, securities, trade services, cards and foreign exchange (FX). See Table 2.

The next big push following payments is in the securities industry with the implementation of ISO 20022 as the communication protocol for securities processing messaging. One looming deadline is full replacement of legacy formats with ISO 20022-based standards for pan-European securities settlements engine Target-2 Securities (T2S) to communicate with European securities depositories and global custodian banks in 2015. In other regions, there is a gradual migration toward full implementation of ISO 20022. This is the approach taken by market participants

in Japan, i.e., the Japan Securities Depository (JASDEC) and the country's central securities depositories (CSD), to move their existing message standards to ISO 20022 formats by December 2018. In the U.S. market, the Depository Trust & Clearing Corporation (DTCC), the post-trade market infrastructure for the global financial services industry, is embracing ISO 20022 messages for the entire corporate actions lifecycle.

TABLE 2: ISO 20022 INITIATIVES BY FINANCIAL SERVICES DOMAIN

Business Domain	Live	Rollout/ Testing	Planned	Under Discusssion	Projects
Payments	26	3	7	3	39
Securities	13	1	15	1	30
Trade Services	2	0	1	0	3
FX	0	1	0	0	1
Cards	1	0	0	0	1
Total	42	5	23	4	74

Source: ISO20022.Org / SWIFT

Myth 6: ISO 20022 Implementation Means Global Interoperability

Implementation of ISO 20022 in corporate-to-bank and bank-to-bank communications does not necessarily translate to global interoperability. Different markets may use different versions of the ISO 20022 messages or have local country or bank proprietary requirements.

To facilitate the standardized use of ISO 20022 in corporate-to-bank communications for domestic and global payments, the CGI-MP was developed. The CGI-MP maintains implementation guidelines to harmonize how banks integrate ISO 20022 messages with legacy domestic payment instruments, as well as documentation for executing international payments.

The CGI-MP defines guidance from recommended message versions (e.g., pain.001 version 3 message) to the population of data fields. The notion is that the core ISO 20022 XML template will fulfill 80 to 90 percent of in-country format requirements with some tweaking to be able to use the XML payments format more universally. This means minimal adjustments are needed to implement ISO 20022 to achieve interoperability not only across bank relationships, but across borders. Recognizing the value of this group, the membership of banks, corporations, vendors, standards bodies, and market infrastructures continue to grow.

Myth 7: ISO 20022 Equates to Real-Time Payments

Real-time payments (aka Faster Payments, Immediate Payments, and Instant Payments) initiatives are receiving the attention of regulators and the banking industry across the

globe. Such developments as UK's Faster Payments Service, Australia's New Payments Platform (NPP), Singapore's FAST, Poland's KIR Elixir EXPRESS, Sweden's BiR and Swish and Denmark's RealTime24x7 are characterized by instant messaging, irrevocability and certainty in payments. Another element that is becoming a common feature in more recent real-time payments initiatives is the commitment to use ISO 20022 standards. Indeed, Mats Wallén, Business Developer at Bankgirot, the Swedish Automated Clearing House explains, "When designing BiR and Swish, one strategic goal was to use the ISO 20022 standard as much as possible when available or develop missing message types using ISO 20022 building blocks."

Yet a misconception by some is that ISO 20022 has an impact on the speed of the payment. ISO 20022 as a standard is independent of the implementation architecture that will define speed of processing and settlement. Nor are all immediate payments market infrastructures built on ISO 20022. The UK's Faster Payments Service is an example of a near real-time payments system that uses a version of the ISO 8583 card and ATM-based standard.

Recognizing that adoption of ISO 20022 for real-time payments is growing substantially, the trade association, Payments UK brought together more than 40 representative organizations from around the globe to begin discussions and efforts to harmonize ISO 20022 real-time payments market practices for global interoperability under ISO governance. James Whittle, Director of Industry Policy offers the perspective of the Payments UK "Common open standards are vital to the continued success of the UK world class payments infrastructure and ISO 20022 is the obvious choice for its openness and wide adoption by banks, suppliers and corporate end-users."

A Technical Overview

To appreciate the benefits and challenges of ISO 20022 in the U.S., it requires a conceptual, as well as technical, understanding of the standard. What follow are the mechanics particularly as they relate to current day ACH file formats.

The New Language of Payments
ISO 20022 was established in 2004. The origins of ISO 20022 come from the securities messaging standard ISO 15022 developed in the 1990s. In 2004, the scope was broadened to include all financial services to form what would become ISO 20022 – Universal financial industry message scheme (also known as ISO 20022/UNIFI, now abbreviated to ISO 20022).

Today financial institutions exchange vast amounts of data and information among themselves and their corporate customers to move payments domestically and across international borders. To do so, the sender and receiver of the message need to have a common understanding of how to interpret that information. ISO 20022 solves the communication confusion with a common global dictionary in a language that everyone can understand, so information can be processed and exchanged worldwide clearly and consistently.

In brief, ISO 20022 is a standard for standards—a "recipe" or a standard approach to building message standards across financial services. ISO 20022 defines two key elements of communication: semantics and syntax.

A common barrier to communication is semantics or the meaning of information. Different countries or geographies can have their own vocabulary or jargon. Different words may refer to the same concept or the same word could refer to different things. From country to country and payment type to payment type, use of terminology may be similar, but sometimes its definition is slightly different. As an example, unique to the U.S. is the reference to Originators and Receivers in ACH. Other countries, such as Canada, refer to Payees and Payors, and elsewhere Remitters and Remittees, Debtors and Creditors and Senders and Receivers. In many ways, these are talking about and conceptually are trying to act in the same way. Table 3 is illustrative of the varied nomenclature around the world.

TABLE 3: GLOBAL PAYMENTS LEXICON

ISO 20022	Synonyms	ISO Description
Debtor	• Originator (in a credit transfer) or Receiver (in a debit transfer) • Ordering Party • Buyer • Payor • Remitter	Party that owes an amount of money; the party that pays
Debtor agent	• ODFI (in a credit transfer) or RDFI (in a debit transfer) • Payor Bank • Remitter Bank	Party is the bank of the payor
Forwarding agent	• Intermediary Bank • Correspondent Bank	Financial institution that receives the instruction from the initiating party and forwards it to the next agent in the payment chain for execution
Creditor	• Receiver (in a credit transfer) or Originator (in a debit transfer) • Seller • Beneficiary • Payee • Remittee	Party to which an amount of money is due; the recipient of the payment
Creditor agent	• RDFI (in a credit transfer) or ODFI (in a debit transfer) • Beneficiary bank • Payee bank • Seller's bank • Remitee's bank	Party is the bank of the beneficiary

In other cases, the terminology is entirely different. For example, what is referred to as U.S. bank transit routing numbers are "sort codes" in the U.K. and may have other names elsewhere.

Likewise, context plays a role. The payment Originator is a Debtor/Payor in a credit transfer, while the payment Originator/Initiator is a Creditor/Payee in a direct debit. These different names create difficulties when looking at end-to-end integration, which requires a specialist to understand and reconcile the information. ISO 20022 provides an internationally agreed upon frame of reference for financial industry concepts.

In parallel, the syntax is also an essential component of communication. It is the physical format in which the information in a message is structured. Included in the syntax are the fields or elements in a message, the order in which they appear, their structure in terms of length, possible values, allowable characters to whether information is mandatory or optional, and the number of occurrences permitted. As an example, the syntax helps eliminate ambiguity and allows automation of structured information in differences in format such as day-month-year in a message from the U.S. (NACHA file format: YYMMDD e.g., 150214) to that in the UK (BACS file format: DD-MMM-YYYY e.g., 01-Jan-2006). Unless the reader understands a specific syntax, it will not be possible to interpret the message content. As previously mentioned, the primary syntax of ISO 20022 is XML.

Notably, while the majority of implementations use XML as their syntax, in theory ISO 20022 can be used with a wide range of formats that are aligned with the standard. ISO 20022 decouples the syntax (or data description) from the semantics (or data format). Thus, if a better approach came along in the future, the underlying semantics would remain constant. In this way, ISO 20022 is designed to support current technical advances and adapt to future business needs.

Extending Possibilities with XML

XML is the defacto technical syntax for the ISO 20022 standard. XML was designed to be used on the Internet. With the advent of online and mobile channels, today banks are digitizing their internal infrastructures and XML is becoming the technology of choice for internal financial messaging and communication.

The use of short opening and closing tags is part of the syntax. The end tag is the same as the start tag but precedes with "/". For example, <ReqdExctnDt>2015-02-19</ReqdExctnDt> is an XML representation of a requested execution date (in NACHA parlance, an Effective Entry Date) of February 19, 2015. The beginning and ending tags along with the data is called an element.

The excerpt from an ACH CCD file illustrated in Figure 3 does more or less the same as the ISO 20022 Customer Credit Transfer message shown in Figure 4. The information is the same between the two, but in contrast to the NACHA flat file format, ISO 20022 is organized in a hierarchical structure with tags identifying the fields.

FIGURE 3: EXCERPT FROM A PHYSICAL LAYOUT OF A NACHA FORMAT –
COMPANY / BATCH HEADER RECORD "5"

```
           1         2         3         4         5         6         7         8         9
  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123 4
                                         Example Data

  5200ABCD IMPORTS CR             1234567891CCDSUPPLIRPMT      150219000198765432 0000014
```

FIGURE 4: ISO 20022 EXCERPT – CUSTOMER CREDIT TRANSFER TRANSACTION LEVEL


```
<PmtInf>
    <PmtInfId>011011</PmtInfId>
    <PmtMtd>TRF</PmtMtd>
    <PmtTpInf>
        <SvcLvl>
            <Cd>NURG</Cd>
        </SvcLvl>
        <LclInstrm>
            <Cd>CCD</Cd>
        </LclInstrm>
        <CtgyPurp>
            <Prtry>SUPPLIRPMT</Prtry>
        </CtgyPurp>
    </PmtTpInf>
    <ReqdExctnDt>2015-02-19</ReqdExctnDt>
<Dbtr>
<Nm>ABCD IMPORTS CR</Nm>
    <Id>
        <OrgId>
            <Othr>
                <Id>1234567891</Id>
            </Othr>
        </OrgId>
    </Id>
</Dbtr>
<DbtrAgt>
    <FinInstnId>
        <ClrSysMmbId>
            <ClrSysId>
                <Cd>USABA</Cd>
            </ClrSysId>
            <MmbId>987654321</MmbId>
        </ClrSysMmbId>
        <Nm>USA BANK</Nm>
    </FinInstnId>
    </DbtrAgt>
</PmtInf>
```

Non-Urgent / ACH payment

NACHA SEC Code

Company Entry Description

Effective Entry Date

Company Name

Company Identification

Originating DFI Identification

Another advantage of XML is the richer expansive data that is native to the syntax. XML-based ISO 20022 can carry international characters such as Japanese and Chinese characters, long identifiers and references, extremely large monetary amounts and very precise interest and exchange rates, which most domestic formats are not able to do.

The XML language is also increasingly being used for development of web-based applications. Payments data in the form of XML files can be integrated into web and mobile-based applications that are not as easily possible with today's ACH flat file.

Of XML and XML Schema

XML "schemas" describe the permitted structure of an XML document (or message). The schema has an "XSD" file extension and not an "XML" extension; though the schema itself is in fact an XML file. XML schemas define, among other things, which elements are allowed in the document, the order in which they should appear, which are mandatory and which are optional, as well as information on data formats (field lengths, codes, character sets). A software tool can validate the XML file against the specified XSD schema to check whether a message conforms to its definition and can reduce the risk of sending or receiving incorrect data. More information on validation is offered later in the document.

### How Does it Work? — The Business Model

Fundamental to ISO 20022 is the business model. In simplest terms, the ISO 20022 business model is an industry standard dictionary. More precisely, the business model defines the activities or business processes, the business roles and actors involved in those activities, and the business information needed for those activities to occur.

The ISO 20022 data dictionary helps the financial community align the common business concepts. These are organized into business components containing business elements. Central to this concept are the roles of the players. For example, in looking at the business processes involved in a credit transfer, parties to the transaction may include:

- *Ultimate debtor* – the party that originally ordered goods or services and to whom the seller sent the invoice

- *Debtor* – the party that pays; could be the payer itself, an agent or the parent company shared service center

- *Creditor* – the recipient of payment and whose account is credited with the payment

- *Ultimate creditor* – the ultimate beneficiary of the payment (e.g. when payment is made to an account of a financing company, but the ultimate beneficiary is the customer of the financing company)

- *Debtor agent* – the bank of the debtor

- *Creditor agent* – the bank of the creditor

The transaction flow and parties in a credit transfer are illustrated in Figure 5.

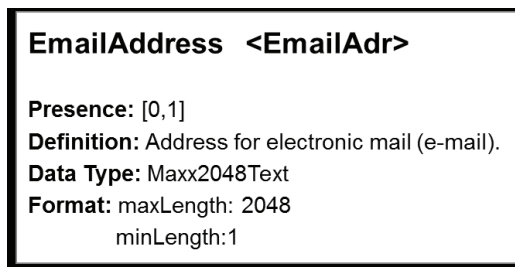FIGURE 5: ISO 20022 PARTIES OF A CREDIT TRANSACTION
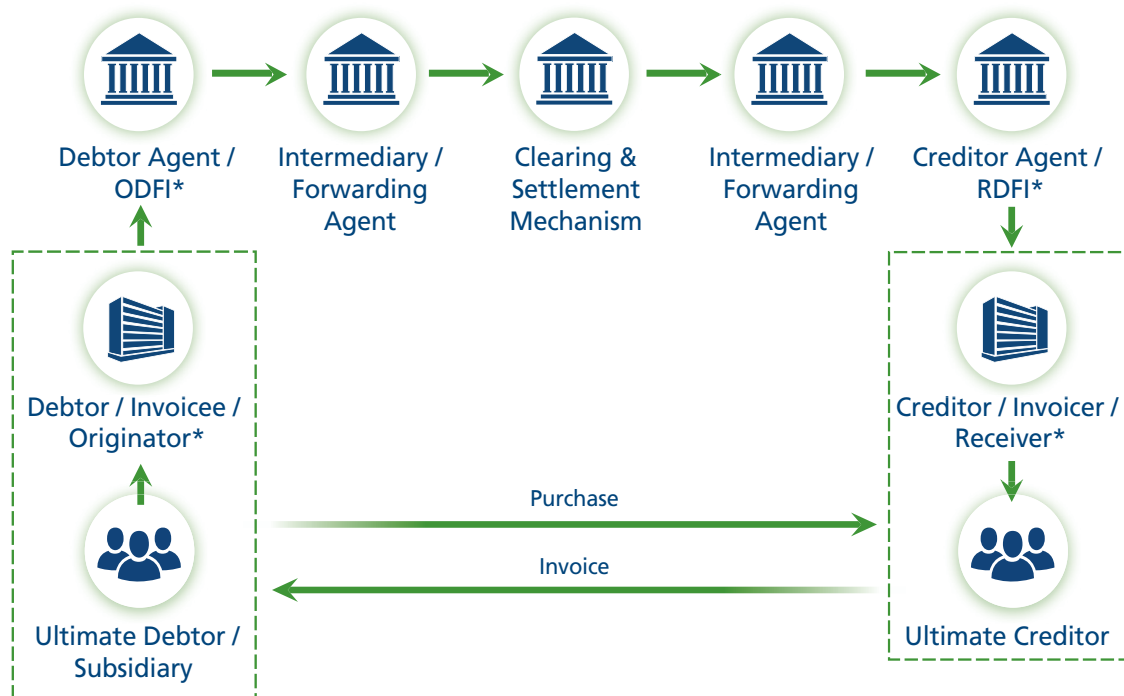
NOTE: RDFI / ODFI and Originator/Receiver are reversed when a debit transfer (pain.008) is originated. The dotted lines indicate the Debtor may initiate payment instructions on behalf of an Ultimate Debtor, or conversely accept payments on behalf of an Ultimate Creditor.

Behind these key business elements lie further details. A payment, for example, contains elements such as currency, amount, requested execution date, settlement date and remittance information. The importance of the business model is that it standardizes on semantics (and not on message formats or syntax).

The business model also provides the relationships between terms. For example, the ISO 20022 business model defines the term "account," but also offers the different types of accounts (e.g., cash, securities and the like), that an account has an account owner and account servicer, that the account servicer is a financial institution and so on. The business model further defines the format or data type of individual data items, whether these are dates, amounts, texts, codes or larger structures, such as name and address (see Figure 6). This is to ensure consistency of data reported and to avoid any misinterpretation of the data. All of the content on ISO 20022 including definitions is stored in a common repository.

FIGURE 6: TYPES OF DETAILS IN A DATA ELEMENT

EmailAddress   <EmailAdr>

Presence: [0,1]
Definition: Address for electronic mail (e-mail).
Data Type: Maxx2048Text
**Format:** maxLength: 2048
        minLength:1

What's in a Message?

The ISO 20022 XML message is a description of all the information that is needed to perform a specific business activity. The full ISO 20022 XML message catalogue is available online on the ISO 20022 website[6]. The naming convention for the ISO 20022 messages are based on a format as depicted in the Figure 7.

The first part defines the business area, in this case, payments initiation. Other examples of business areas include: cash management (camt), payments clearing and settlement (pacs), and trade services (tsrv). The business area is followed by three digits that define the message type, such as a credit transfer (001) or a direct debit (008). The following three digits specify the variant of the XML format that is used. In the harmonized ISO 20022 EPC approach, the variant is 001 and generally used for SEPA. However, local flavors may exist; for example, 002 for Germany. Finally, the last two digits indicate the version of the format. For instance, the sets of formats defined are updated when the need arises and thus as a new version is released. Therefore, even though the latest version available today for the pain.001 message is version 6, the leading global implementation is version 3; many use version 2 as well. Similarly, for collections (direct debit) the current ISO version for pain.008 is version 5, though version 2 is the most widely used.

FIGURE 7: ISO 0P20022 FILE NAMING CONVENTION
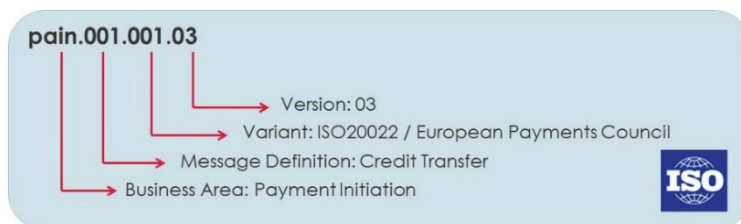
ISO Messages and Version Handling

The lessons from the SEPA region—which allowed for exceptions and modifications to the standard for in-country rules that led to local flavors of ISO 20022—should also be applied to new ISO 20022 implementations. SEPA did not deliver on the original vision of a harmonized Europe as many had hoped. As such, the CGI-MP was formed to provide a standardized approach for SEPA and other ISO 20022-based payments.

The CGI-MP is underpinned by a formal governance model supported by working groups that have a mandate to deliver and maintain implementation guidelines to provide guidance and achieve a harmonized implementation. Membership of the CGI-MP continues to grow with over 140 participating organizations at the time of this writing.

U.S. financial institutions are following the prevailing practice in the SEPA region as driven by the mandate from the European Payments Council (EPC)[7]. At the same

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[6] http://www.iso20022.org.

[7] In February 2012, the European Union (EU) co-legislators, i.e. the European Parliament and the Council of the EU representing EU governments, adopted the "Regulation (EU) no 260/2012 establishing technical and business requirements for credit transfers and direct debits in euro and amending Regulation (EC) No 924/2009" (the "SEPA Regulation"). More information on the regulation and the European Payments Council can be found at: http://www.europeanpaymentscouncil.eu/index.cfm/sepa-direct-debit/iso-20022-message-standards/.

time the CGI-MP also advises using the 2009 ISO 20022 specifications (or release of the messages) due to the growing adoption by financial industry stakeholders, which include corporate clients and software application developers. These include the messages and versions outlined in Table 4.

TABLE 4: TYPES OF MESSAGES IN THE 2009 ISO 20022 SPECIFICATIONS

Message	Version	Description
pain	001.001.03	Customer Credit Transfer Initiation
pain	002.001.03	Payment Status Report
pain	008.001.02	Customer Direct Debit Initiation
pacs	002.001.03	Inter-bank Credit Transfer Reject
pacs	003.001.02	Inter-bank Collection (direct debit)
pacs	004.001.02	Inter-bank Return Credit Transfer
pacs	007.001.02	Customer to Bank Reversal Instruction for a Collection
pacs	008.001.02	Inter-bank Credit Transfer
camt	029.001.03	Inter-bank Negative Answer to a Recall of a Credit Transfer
camt	056.001.01	Inter-bank Positive Answer to a Recall of a Credit Transfer
camt	052.001.02	Bank to Customer Account Report (intraday or prior day)
camt	053.001.02	Bank to Customer Statement (end of day or current day)

Among the areas the CGI-MP addresses is agreement on the core payments message and which fields (XML tags) should be used to support any "local" in-country information. For example, in the SEPA region the bank account of a recipient's bank requires an <IBAN> as opposed to clarifying the clearing system identification code of "USABA" and providing a transit routing number within the <MemberIdentification> tag in the U.S. Other considerations of message alignment the CGI-MP continues to shape are the associated payment status reports (file and payment acknowledgement) and to ameliorate issues in differences among bank back-office systems.

Each bank's interpretation of the XML schema logic, from a corporate perspective, represents a bank-specific logic within their ERP system or TWS (treasury workstation). Thus, these discussions led to the development of a bank-agnostic common error code list, thereby removing one of the complexities associated with a multi-banking corporate.

A notable difference between ISO 20022 and U.S. ACH is in the message process flow. A native NACHA file format may be originated by a corporate customer and transmitted to its bank, passed through to the U.S. ACH Operators, to the bank of the receiver, to

finally reach the receiver. In practice, corporates may originate an ACH file in other than a NACHA format. As such, banks may receive payment instructions in a variety of file formats. These, in turn, are translated into the appropriate formats like a NACHA file format, Fedwire, or CHIPS by their bank and passed along the chain. The bank status reports may then follow in BAI, BAI2, SWIFT MT or other proprietary formats.

In contrast, the electronic information exchange for ISO 20022 standards move through the chain as a consistent format for all the different file communications, including payment instruction, payments clearing and settlement, and additional invoice information, to the acknowledgement and cash management reports that are reconciled with an ERP or TWS.

The ISO 20022 flow of messages is illustrated in Figure 8.

FIGURE 8: ISO 20022 XML FLOW OF MESSAGES
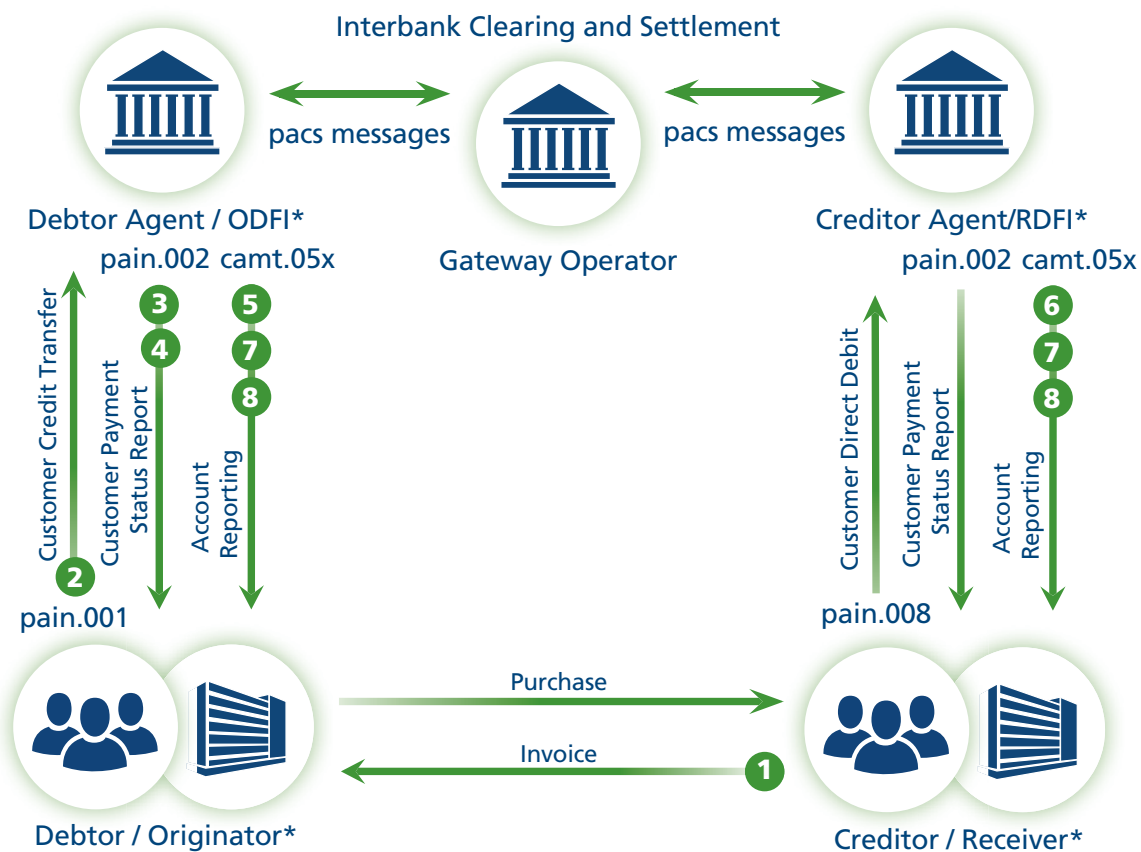
*NOTE: RDFI / ODFI and Originator / Receiver are reversed when pain.008 is originated

1. The Debtor (Originator) receives an invoice for a purchase.

2. The Debtor creates the payment instruction, which is a Credit Transfer Initiation (pain.001) file that is sent to the Financial Institution, the Debtor Agent (or ODFI).

3. The Debtor Agent validates the message and sends a Payment Status Report (pain.002) notifying the Debtor if the file is accepted or rejected.

4. The information included in every single payment is validated against each payment system and the Debtor Agent sends a Payment Status Report (pain.002) reporting rejected payments to the Debtor, if any.

5. Once a file is transmitted via the clearing house to the Creditor Agent (or RDFI), the Debtor Agent will send a Debit Notification report (camt.054) to the Debtor reporting executed payments.

6. The Creditor Agent sends a Credit Notification report (camt.054) to the Creditor reporting incoming payments.

7. Debtor Agent and/or Creditor Agent send an Interim Account Report (camt.052) to the Debtor and/or Creditor.

8. Debtor Agent and/or Creditor Agent send an Account Statement (camt.053) to the Debtor and/or Creditor.

Another salient difference with the ISO 20022 transaction process is that a message instruction can only contain either Credit Transfer or Direct Debit information. A file cannot include a combination of both Credit Transfer and Direct Debit transactions as with today's ACH mixed-batch files. As such, two separate files, pain.001 and pain.008, need to be sent for the credit and debit transactions.

Yet a key feature and advantage of ISO 20022 is the ability to reuse business and message components across all financial messages, whether payments, securities, foreign exchange and so on. One example is the component <PostalAddress> used to express a party or a financial institution's address (see Figure 9). This same block of information is used in all the different messages (payments, securities, etc.).

FIGURE 9: XML DETAILS OF POSTAL ADDRESS COMPONENT

```
<Nm>Sherlock Holmes Company</Nm>
<PstlAdr>
    <AdrTp>BIZZ</AdrTp>
    <Dept>Curious Department</Dept>
    <SubDept>A</SubDept>
    <StrtNm>Baker Street</StrtNm>
    <BldgNb>221b</BldgNb>
    <PstCd>NW1 6XE</PstCd>
    <TwnNm>London</TwnNm>
    <CtrySubDivsn>WC2E 9RZ</CtrySubDivsn>
    <Ctry>United Kingdom</Ctry>
</PstlAdr>
```

The Promise of ISO 20022

There is immense potential associated with ISO 20022. Roy DeCicco, Managing Director at J.P. Morgan Chase and Chairman of the Accredited Standards Committee (ASC) X9 Board, comments, "ISO 20022 are newer formats. They are data rich. They solve some immediate issues the entire industry has around structuring fields, around screening, around remittance information, and the ability to build priority payments. They also offer other benefits and advantages like new industry initiatives and new solutions that will be developed on the ISO 20022 standard."

Some of the early movers of ISO 20022 have realized tangible benefits. (See Figure 10.)

FIGURE 10: BENEFITS OF ISO 20022

Improved Regulatory Reporting, Compliance & Auditing	Expanded Cross-Border Trade	Value of Big Data
Lower Costs & Efficiency Gains	Integrated Payables – Simplifying Processes	Future Proof Technology
Automated Exceptions and Investigations	Resource Availability, Training & Planning	Revenue Opportunities & Value Added Products and Services

Improved Regulatory Reporting, Compliance and Auditing

The financial industry is confronted by unprecedented scrutiny. All banks and financial institutions in the U.S. must address Know Your Customer (KYC), Anti-Money Laundering (AML) and sanctions compliance requirements that include the Bank Secrecy Act (BSA), the USA PATRIOT Act, and the Office of Foreign Assets Control (OFAC) regulations. With these regulations, there is an ever-increasing need for more information. The compliance requirements have now become even more onerous with global governments expecting banks to provide more detail on payments like Know Your Customer's Customer (KYCC) that include date of birth and passport number. Extracting these forms of identification can be a manual process today when data is not well structured.

As one financial services executive explains, "Take the traditional standard used for cross-border payments with SWIFT MTs. The name and address is found in a block of information; this complicates the screening of information." These transactions may fall to manual repair and mean time consuming investigation.

He continues, "ISO 20022 supplies more granular information—you know the precise data and exact location. There is no doubt whether you're screening a name, or you're screening a country or you're looking at a street name." A move to a more structured format, where details such as reporting of account numbers, names, addresses and other identifying information of payers are coded, allows for an optimized screening process and enhanced STP.

While historically financial institutions were under no obligation to provide complete information on all parties in a payment, it is anticipated that in the future, global regulators may prevent banks from processing transactions when all party information cannot be validated for international payments. The existing NACHA ACH format does support identification of all parties for international payment instructions; however, the format structure of ISO 20022 can improve the automation of scanning and compliance processes as well as address the current practice of payment instructions originating in a myriad of formats each with its own set of challenges. The rigor and precision of key financial industry concepts within the ISO 20022 dictionary and messages make it ideal for regulatory reporting, compliance and auditing.

A crucial aspect of the regulatory requirements are the parties that have to be scanned against a list of high-risk individuals and businesses including OFAC's Specially Designated National's (SDN) list, Politically Exposed Persons (PEP), covering the U.S. and many other countries, along with embargoed nations (i.e., FATF blacklist or non-cooperative countries). ISO 20022 messages offer discrete data on the relationships between parties, including actual and on-behalf of a customer (e.g., <UltimateDebtor> and <UltimateCreditor>), intermediate and receiving roles, as well as geographies of the participants. One Vice President at a large global bank comments, "The elements in the party information in ISO 20022 provide a full section for regulatory reporting that is especially useful for financial institutions doing business globally with more stringent bank information requirements." These finer details enable compliance professionals to distinguish real hits from false positives.

The richer data and party structure also facilitate the task of extracting and sharing information with regulatory and compliance authorities more easily compared to traditional payments data and process models. ISO 20022 provides a solid foundation for standardized global reporting. It is critical that entities interpret and report data in the same way. Consistency in data from different organizations permits meaningful comparison, aggregation and examination of the data by the supervisory community.

Expanded Cross-Border Trade
ISO 20022 eases interoperability with other regions. ISO 20022 is a way for stakeholders in different markets to talk the same language. The ability to communicate in a common language eliminates the risk of confusion, and thereby removes a lot of the friction, waste and cost associated with international payments. While only one factor, communication in standards is a key element in cross-border operations.

As ISO 20022 streamlines the processes, whether doing domestic payments or international transactions, it also lowers the barriers to entry to increase the reach of firms and banks to more locations than otherwise previously possible. While ISO 20022 is often associated with the highly visible multinational corporations, the medium

26

sized businesses have also embraced the standards to an extent. It has allowed this demographic to look beyond their domestic borders and expand their business to other markets, an indirect benefit observed in countries that implemented ISO 20022 as part of SEPA. Greater trade can now happen more easily in areas such as the Far East, Middle East and South America.

International interoperability is one of the drivers for Canada to introduce ISO 20022. ISO 20022 strengthens Canada's abilities as a trading nation and its trading relationship with the U.S. is significant. "The United States is Canada's largest trading partner and that means cross-border payments are vital to both of our economies. The Canadian Payments Association (CPA), which promotes efficiency and safety in payments, is advancing the use of ISO 20022 as the standard for payments that streamlines the process of sending and receiving payments globally," explains Jeff Moran, Vice President, Payments and Industry Relations for the CPA.

As the digital revolution in payments continues to blur the lines between domestic and international payments, the CPA is working with its U.S. counterparts on the adoption of ISO 20022 to provide the foundation for safer and faster payments."

Value of Big Data

Today's data exist in a variety of forms and formats dispersed and/or replicated across business lines both inside and outside the walls of a financial institution. One value proposition of ISO 20022 is its structured data and business model, and the valuable insights and foresight that can be gleaned from it.

Indeed, this concept has an even more advanced application in Finland. Considered one of the pioneering countries in electronic payments and processing, Finland is constructing a nationwide repository of financial data leveraging ISO 20022 as the building block.

Taking the concept of structuring the data between disparate parties for future innovations, Harri Rantanen, Manager, Formats & Standards, Transaction Services Product Management at SEB and Finnish banking community elected representative to the ISO 20022 Registration Management Group explains, "In Finland, we're building a data repository of information from different stakeholders – end-customers, system vendors, authorities, corporations, financial institutions, customs, and even tax authorities are involved. We're now trying to establish data models based on the ISO 20022 business model—not necessarily the actual messages—but the business model. This model will be open for all data repository providers to develop solutions and applications to connect via different end-user devices with a secure access. In collecting information that is related to your business and your transaction, you will be able to reconcile different things in your own systems or an asset for a Third Party Service Provider that is providing your bookkeeping services, A/P or A/R services, e-invoicing services (matching to the financing of the invoices), and finally when you pay taxes on value-added taxes, and withholding taxes, so that everything can be automated." This "huge source of information" can be harnessed into different areas Rantanen observes "to offer bigger possibilities" in better solutions and services based on customer behavior to improvements in internal processes from the consolidated information.

Developing a nationwide database would be an ambitious initiative that may be too challenging for the vast U.S. market, but it has potential practical applications within a financial institution. Bank data along with valuable information is dispersed and/or replicated across corporate payments, retail payments, high-value payments and other lines of business. Moving away from the siloed multiple databases to a common ISO 20022 database and repository offers a single, central and holistic view of all data fields for enhanced analytics, revenue generation, risk management and lower costs. A common database also ensures that integration and ongoing maintenance are rapid and efficient.

Future-Proof Technology

Banks are seeing a great deal of potential with ISO 20022. Robert Rosdorff, Group Product Manager of BBVA Compass explains, "Our clients needed a versatile, global-centric XML version that we could rely upon to emerge as a strategic standard in the payments systems. That's how we arrived on the idea of embracing ISO 20022. We are very pleased that we are on the same page as NACHA and the Fed."

A growing trend in the industry is to future-proof internal bank infrastructure streamlining the different connections and different formats with the use of ISO 20022. The lowest level of the data dictionary has traditionally been comprised of all different formats. The rich ISO 20022 data model is ideal as an integration layer between front and back-end systems. As data comes into the organization in multiple formats, banks "normalize" or translate the incoming data into an internal representation referred to as the "canonical model." Sophisticated banks are architecting their internal and external processes around ISO 20022; they are mapping proprietary vendor file layouts and message formats and other industry standard syntaxes into ISO 20022 to form the basis of a bank's internal canonical model.

Frank Van Driessche, Senior Business Manager, Market Infrastructures of SWIFT, notes, "Drawing from the past, if you had 10 different standards, you had to convert between each individual pair of them ending with a nice spider web of multiple combinations. What we are seeing today, is that more and more organizations as a first step on the road to ISO 20022 link their proprietary standards to ISO 20022 as common reference in the middle, taking ISO 20022 as a means to harmonize at the lowest business data level. By linking their standards to that common model, they are aligning on what things mean from the business point of view."

Lower Costs and Efficiency Gains

An added appeal of ISO 20022 is the improved STP—i.e., the automation of a transaction without human intervention. Because the entire chain uses a uniform format for payments—from origination to acknowledgement—to satisfy operational and data requirements, processing time is shortened and the likelihood of errors is minimized. In turn, all parties in the chain benefit.

While U.S. domestic ACH formats generally function seamlessly, other legacy domestic formats as well as international formats often require financial institutions to send the file for manual mapping or repair. As an example, International ACH Transactions (IATs) are often originated in other formats such as SWIFT MT, EDI 820, or proprietary messages that leverage existing fields not intended to carry or accommodate the

required information. When transactions do not get completed successfully or there is a need for human intervention, it costs money. With the ISO 20022 XML format, each piece of data has a dedicated discrete data element to facilitate scanning and processing. The parsing of data fields provides a practical advantage particularly concerning enhanced risks and government compliance as previously noted.

Also, today different infrastructures are maintained at financial institutions to manage domestic and international payments to meet disparate technical and business requirements. Multiple schemes also mean various platforms or payments engines exist to process these proprietary formats. Consider the payments model in the U.S. where banks process Fedwire and CHIPS for high-value payments and ACH formats for low-value clearing. International payments are transmitted mostly via SWIFT. Each has its own unique format and back-end infrastructure.

When the financial messages are sent across borders, they need to be converted into other formats for the specific network or geography it is intended to reach. There are costs in the translation of the messages; costs in the transfer of the messages as they pass through intermediary banks; and associated costs with information that gets truncated during conversions leading to additional information having to be sent via other channels. The migration to one global standard can eliminate or reduce many of these infrastructure, translation and other processing costs. An advantage of ISO 20022 XML is the transparent nature of the ISO 20022 XML format. Because end-users can more easily interpret the messages, tracing and solving errors or inconsistencies for investigations becomes a more efficient process. Combined with the larger support of banks' back-end systems of XML technology can reduce the maintenance costs of these formats.

Integrated Payables – Simplifying Processes

The evolution of the ISO 20022 standard reflects the global nature of the financial services industry, bringing together the needs of diverse legacy formats. The one standard can accommodate different payment types such as low-value and high-value payments, as well as checks, and can work domestically or across borders. A key benefit of the standard one senior Product Manager at a financial institution observes, "ISO 20022 is agnostic to the channel that the payment will be delivered."

FIGURE 11: DOMESTIC FORMATS VERSUS ISO 20022
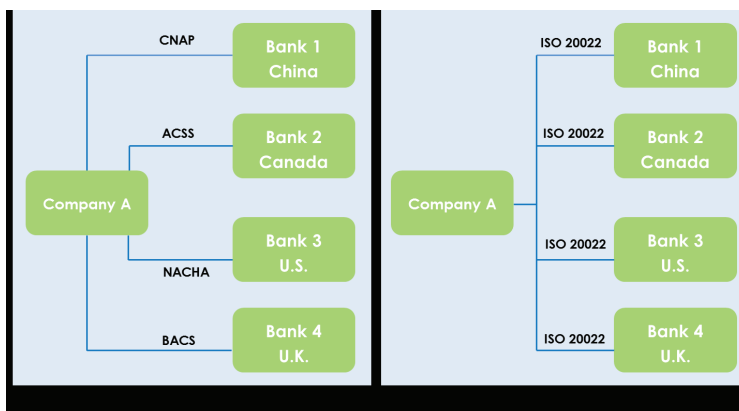
Today, banks face a myriad of document formats from SAP idocs to other proprietary message formats used by corporate clients. Lisa Hays, Product Manager at BNY Mellon Treasury Services, comments, "From a capabilities and standardization perspective, ISO 20022 has helped us tremendously in that we no longer have to figure out how to accommodate one-off formats. Before ISO 20022, there was no standardization for the formats used by global clients versus domestic clients—EDIFACT has been in use in the UK and the 820 is in use in the U.S. ISO 20022 makes sense because it accommodates both domestic and international payments."

Recognizing the benefits that can be reaped from ISO 20022, the standard is being integrated as part of payments software solutions beyond the larger ERP systems to achieve a cohesive approach in multi-bank communications. Seth Blacher, Senior Vice President, Global Product Management Manager at Wells Fargo, notes, "We are looking to integrate directly with ERP providers on behalf of mutual customers of Wells Fargo and the ERP systems from a payables perspective. This concept developed organically. Our customers expressed interest in having their bank partner directly with their ERP providers to enable an optimal integration experience and the ERP providers expressed interest in generating a file to Wells Fargo's ISO 20022 specification. Everyone's interests were aligned. ISO enabled ERP providers to use the same file output format on behalf of mutual customers across banks. To me, that seems like a big benefit there. We've had some success and limited adoption, but we expect to see that grow over time."

Automated Exceptions and Investigations

An area that may have been ahead of the industry when it was first developed is exceptions and investigations (E&I) in corporate-to-bank and bank-to-bank ISO 20022 communications. According to one report, 2 to 5 percent of all payments daily result in an inquiry and multiplied processing costs.[8] The widespread use of free-format messages combined with a lack of industry rules contributes to one of the most labor-intensive activities within a financial institution.

The development of the E&I ISO 20022 messages were in support of automating processes to achieve higher STP rates. The set of camt messages designed by SWIFT to optimize the treatment of exceptions and investigations include payment-related activities such as: request to cancel payment, modify payment, unable to apply payment or claim non-receipt, as well as the resolution of investigation, notification of case assignment, status reports, reject messages and the like.

Despite the significant potential, given the financial services landscape at the time and lack of budgets at financial institutions, this area did not take off. However, more recently there is growing interest especially from U.S. banks in trying to roll out these messages to address many of the manual processes in their daily payments operations.

Resource Availability, Training and Planning

A key issue financial institutions face is the ability to support bank processes and applications looking into the future. As newer generations enter the professional market, familiarity with legacy file formats such as ACH or ANSI ASC X12 EDI are

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[8] Payments Standards – Exceptions and Investigations" *UNIFI (ISO 20022)* Message Definition Report. 25 August 200.6.

steadily declining. "You can find someone a lot more easily with knowledge of XML than you can with knowledge of a NACHA file format. That's something we have to keep in mind," said one Senior Product Manager at a global financial institution. A common syntax used across software platforms and tools, XML knowledge is more readily available today and growing.

Another attractive feature of ISO 20022 XML is that the syntax is more human readable and reasonably easier to understand and manage. The descriptive tags in an XML file help to clarify and interpret data. Traditional file formats such as an ACH flat file or an EDI format require understanding of the specific Record, Field names or Data segments and their position; it is not obvious what the information is and where that information resides within the string of text. Lisa Hays, Product Manager of Treasury Services at BNY Mellon, explains, "In a CTX transaction with EDI 820, you need a translator to be able to create the format and interpret. EDI is very technical. You need to know EDI terminology. Take for example the use of BPR02, by looking at a guide, you know that '02' represents the dollar amount. With ISO 20022 XML, recourse to a guide is not required—you know the information based on the tags that precede it. ISO 20022 does not require software to create accommodations for or decipher non-standardized formats."

Revenue Opportunities and Value-Added Products and Services

Increasingly, financial institutions are observing ISO 20022 as a requirement in requests for proposals (RFPs). Cheryl Jacobs, Global Product Manager at Wells Fargo, notes, "It is still a relatively small number of customers from the whole universe, but for certain segments—our global customers, large corporate and even some of our high-end technology clients—it is starting to make its way into the standard questionnaire for RFPs. Customers are hearing about it at conferences. They are hearing their friends and colleagues talking about it. So they are asking us what we can support."

History has shown that standards take time to become established. In fact, the ISO 20022 standard was developed nearly 10 years ago and is still in the early stages of adoption. This period of adoption may, in addition to the possible revenue from the acquisition of potential new clients, serve as an opportunity to leverage the ISO 20022 standard as a vehicle to help deliver innovative products and services for more opportunities and revenue. These include testing and validation services; enhanced remittance information, reporting, and analysis; electronic invoicing or e-invoicing and supply chain finance; electronic bank account management (eBAM); and other products and services.

- *Testing and Validation Services*
  It will be many years before ISO 20022 becomes a common standard and there is uniform application of ISO 20022 for payments in the U.S. As such, banks are recognizing that corporate customers can make common errors ignoring the limits and other restrictions in the use of ISO 20022 XML for in-country specifications that may override the ISO schema. A common deviation is where the beneficiary name (creditor) can be up to 140 characters in ISO 20022 XML schema, but in the case of say a NACHA file format, the creditor field would have an in-country maximum number of 22 characters (or 70 characters for a SEPA payment). If the information in

the XML payments format is longer than the required number of characters, the receiving bank may truncate or in other scenarios reject the sent payment leading to additional fees.

The originating banks can offer testing and validation tools and services to ensure the country clearing system and specified schema are adhered to. A validation tool will check the XML file layout against the specified XSD file or "XML schema," which describe the structure of a XML document. Syntax validation can verify that the field length does not exceed the allowable characters or that dates are formatted correctly, and highlight errors.

A second validation check is around semantic rules. Semantics rules validation concern the meaning of the data and the relation of one piece of information to another. For instance, in comparing a Creation Date of a transaction to the Settlement Date, the semantic rule would confirm that the latter did not come before the former. The business validations can maximize STP.

- *Enhanced Remittance Information, Reporting and Analysis*
  One benefit frequently cited with ISO 20022 is in the extended remittance information. Many ACH systems around the world have very strict limitations on what remittance can be shared. Often these may be unstructured data up to 20 characters or 15 characters of reference information, and nothing more. These limitations also hinder greater adoption of electronic payments. Meanwhile, the move to ISO 20022 XML promises more data and better structured information to promote efficiencies in electronic payments and reconciliation. As an example, in Canada the CPA's intent in the conversion to ISO 20022 is to enable remittance information in AFT (an ACH equivalent) to be repeated up to 100,000 times, which today is constrained by the existing format and legacy infrastructure.[9]

  Unlike ACH networks around the globe, the U.S. ACH Network can accommodate the transfer of a maximum of 9,999 addenda records each carrying 80 characters of payments-related data (to pay multiple invoices) – along with the transfer of payments. One of the problems lies in the *NACHA Operating Rules* that require remittance information in ACH addenda records to be formatted according to ANSI ASC X12 specifications, which has limited its use to primarily large businesses. Existing ANSI ASC X12 EDI formats are challenged in providing better reporting and reconciliation recognized by industry participants. At the same time, XML-based ISO 20022 offers an opportunity to achieve STP of payments and remittance data for a larger base of businesses. For this reason, NACHA began support of enhanced ISO 20022 remittance messages in August 2014 as an optional program.

  To advance efficiencies and electronic business-to-business payments in the market, Rob Unger, Senior Director of NACHA, notes, "Today, NACHA offers a Remittance XML-ACH Opt-in Program that expands ACH remittance capabilities and supports the use of structured ISO 20022 remt messages within the existing ACH transactions. In the future, NACHA has plans to transition the XML-ACH Remittance Program from opt in to mandatory. NACHA will seek community input on making it mandatory to

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[9] Canadian Payments Association. "Creating New Opportunities in Canadian Payments." August 2015. https://www.cdnpay.ca/imis15/pdf/pdfs_news/ISO_20022_Consultation_August2015.pdf

receive as part of the *NACHA Operating Rules*—providing ubiquity and better STP opportunity."

With more granular and improved quality of structured data, the corporate-to-bank reconciliation process can be optimized. Instead of a megabyte of bulk information, ISO 20022 offers very detailed information on invoice, dates and other pieces of identifiable information for reconciliation. When the remittance information field in ISO 20022 messages is consistent for the customer instruction (pain.001), in the interbank clearing message (pacs.008), and in account statement (camt.053), this greatly simplifies the complexity of managing reconciliations for payment transactions. It has been reported that when Microsoft moved to ISO 20022 in the reporting space for statement messages, the company managed to increase automated reconciliation of outstanding invoices with incoming payments by 80 percent. Automation and efficiency are only possible with standardized, structured detailed remittance information.

- *e-invoicing and Supply Chain Finance*
  Some banks are recognizing the potential of offering e-invoicing – the digital exchange of the invoice document between a supplier and a buyer. The true value of e-invoicing can be realized when the invoice data is structured in a standardized format, such as ISO 20022, to make a seamless end-to-end transaction beyond just a "payment" transaction, and linked to existing services for corporate clients.

  For corporate buyers, e-invoicing enables the full automation of supplier payment processes from the disbursement of invoices to the release of finance. Meanwhile, suppliers benefit from access to supply chain finance. Supply chain finance, also known as supplier finance or reverse factoring, is a set of solutions that link the various parties in a transaction—the buyer, seller and financing institution (i.e., offering financing) to optimize cash flow by allowing businesses to lengthen their payment terms to their suppliers while providing the option for their large and SME (small-to-medium enterprise) suppliers to get paid early. This can only be possible with the use of a technology platform that automates transactions and tracks the invoice approval and settlement process from initiation to completion. When an e-invoice is presented, as opposed to 20-30 days when a paper invoice is received, access to early finance (i.e., short-term credit to optimize working capital for both the buyer and the seller) is possible. The reduction in the paper involved and lowering of processing costs is an added appeal of the e-invoice.

  Historically, one of the core issues with e-invoicing has been the existence of multiple fragmented networks and no one standard to enable widespread use. Capitalizing on the ISO 20022 vocabulary for e-invoicing makes it possible for broader adoption and reduces the inefficiencies that exist today. Combined with the EU directive to implement e-invoicing in member states by 2018, adoption may have additional international spillover to the U.S. when a foreign country is trading with domestic-based companies that use e-invoicing.

- *eBAM*

  One of the areas the U.S. has been a frontrunner in ISO 20022 innovation is through the expanded concept of harmonized formats from payments to other areas of customer-to-bank communications, more specifically, in eBAM. Electronic banking is one of the most paper-based, cumbersome processes—the on-boarding of clients and dealing with account management functions such as opening accounts, closing accounts and changing the parameters of accounts. Faxes and emails are the norm. EBAM aims to address and transform today's paper intensive and time-consuming bank account management process into an electronic automated one.

  The development of eBAM messages by SWIFT is designed to standardize account management (acmt) messages that companies can use to instruct their banks to open accounts, add authorized signers and other account management functions. The practical proof of concept and production has only happened in the U.S. with pilot projects between SWIFT, a number of corporations, system providers and banks. Some financial institutions such as Bank of America that participated in the pilot now have an automated process from implementing the standards. Other financial institutions like Wells Fargo launched a pilot with its U.S.-based accounts recently. Europe is expected to follow suit based on these use cases. While this area remains in a nascent stage for now, significant future growth is expected.

- *Other Products and Services*

  Financial institutions are finding unique ways to apply ISO 20022 as the backbone of solutions to foster innovation. One such example is a money transmitter service offered by one financial institution.

  A banking professional at a global financial institution offers, "We have a hybrid pacs.008 implementation for a bank-to-bank instruction for one of our remittance or money transfer products. It goes directly to foreign banks. It does not go through a network. It is basically acting like an MT103, paying one of your account holders on behalf of money that is coming from an account holder at our bank. As we on-board new foreign banks for this particular service, rather than passing instructions through SWIFT as legacy SWIFT messages, we are pushing this implementation of the pacs.008. It is done in a web service request response protocol."

  The banker continues, "We wanted a low-cost, secure point-to-point solution—that is, not going through another third-party network—for instructing foreign banks to make relatively small dollar payments out. Cost was a factor as well as us being able to dictate the message format rather than each foreign bank we on-board requesting unique proprietary formats."

Roadblocks on the Path to ISO 20022—
The Risks, Concerns and Challenges

While some issues with ISO 20022 have been gleaned from the lessons learned, other challenges are anticipated to emerge as additional network participants with different resources and capabilities adopt ISO 20022.

FIGURE 12: RISKS, CONCERNS AND CHALLENGES WITH ISO 20022

The Initial Learning Curve – Devil in the Details

A topic not discussed enough is the learning curve associated with ISO 20022, particularly the interpretation, application and integration with U.S. formats. While many payments professionals acknowledge that the ISO 20022 standard is generally more user friendly than legacy formats, it is a significant departure from the processes of NACHA file formats and ANSI ASC X12 EDI formats that have been in use for more than 40 years in the U.S. The guidance on these formats is well documented. However, cohesive information on XML and ISO 20022 focused on U.S. payments is lacking. These include handling of return and reject messages to education on external code lists, international bank account number (IBAN) structures and so on. Banks that embarked on ISO 20022 read prodigious and disparate literature available from vendor partners, international market infrastructures to the book *ISO 20022 for Dummies* authored by SWIFT, a helpful introduction.

Not surprisingly, an issue that arose in the U.S. was in the integration process of ISO 20022 payment message standards to legacy formats for payments initiation. Banks began developing their own mappings to NACHA formats for ISO 20022 payment instructions from clients, which led to differing practices. To help standardize implementation of ISO 20022-formatted payment messages, NACHA released the ISO 20022 Mapping Guide and Tool in April 2015 to help banks map ISO 20022 credit

transaction payment instructions to corresponding NACHA file formats in customer-to-bank communications. George Throckmorton, Managing Director of NACHA, comments, "As part of addressing the needs of the present, we are facilitating the integration of ISO 20022 with ACH. We will continue to build out the Mapping Guide and Tool. We plan to add other ACH payment types. We also plan to map additional ISO messages in support of standardized ISO 20022 adoption in the U.S."

Beyond internal lessons and applications at the bank, the education of corporate clients can be another hurdle. Multinational corporate customers have more familiarity due to the SEPA mandate in Europe that is based on ISO 20022. They are also participants of industry forums such as the CGI-MP.

U.S. domestic companies have further to go to get up to speed. Particularly those that are converting from a native NACHA format or from an ANSI ASC X12 EDI format, more training is needed. "Playing with XML and how that even works can be a completely different animal," acknowledges one senior bank executive. It's not just the formats themselves, the new terminology and mechanisms associated with ISO 20022 differ vastly. Consider the practice of the U.S. ACH batch process in contrast to an ISO 20022 process flow—today's mixed U.S. ACH batch file of credit transfer and direct debit transactions cannot be transmitted in an ISO 20022 process flow and require two separate files in an ISO 20022 payments scheme.

Yet, one of the attractive features of ISO 20022 XML is the comparatively shorter learning curve. XML is readable even by people who have had no formal introduction to the language. Another encouraging trend is the move by ERP and other vendors to embed CGI-MP-approved ISO 20022 XML standards into their systems and core business applications, which will further enhance the education and standardization process.

Data Overpopulation

The CGI-MP recommends and supports the concept of "data overpopulation." In other words, the originator of the message may pass on more information than is actually required for a specific in-country payment method (such as providing a SWIFT BIC code for a SEPA message or sending addresses, which are not needed or cannot be passed along the chain in domestic U.S. ACH payments). The core principle of data overpopulation is to provide a foundation for multi-banking implementation and to establish a single, generic global harmonized template. Effectively, the corporate will provide not only the same information, but information needed for each of their target financial institutions. The expectation is that corporate customers already maintain this information in their ERP or TMS and will pass through this information, thereby reducing or removing the level of bank-specific or other data filtering.

The challenge now is that the business rules reside on the banking side. Each receiving financial institution needs to filter the message based on the requested payment method, clearing channel and any institution-specific requirements. Where the recipient bank may not actually require the surplus information—and the content cannot be mapped to the different payment application file formats—the data is typically ignored and archived as part of the original file by banks. The relevant information is then transmitted to the respective clearing house to execute the transaction.

Given the relative low maturity of the standard and lack of clarity associated with the risks of data overpopulation, U.S. financial institutions are choosing different approaches to handling the data. Extraneous data that are not mapped to different payment application file formats are typically dropped by banks. While some financial institutions are scanning the original file for OFAC requirements before the message moves through the internal chain, others perform OFAC scanning further along the payment process to validate the travel rules. Additional process reengineering and potential risks, including security and privacy issues, as well as possible heightened risk of data exposure, are of concern and will need to be evaluated over time.

Processing Bandwidth, Disk Space, Storage and Warehousing

Given the verbose nature of XML, as adoption increases it will ultimately generate higher volumes of transactional data. The larger ISO 20022 based XML files can require more bandwidth and are thereby less efficient to transmit and store. While most large banks are equipped to support higher capacity and throughput, smaller banks may not be. A senior can have a JSON (the JavaScript Object Notation) message or an ASN.1 message that is compliant with an ISO 20022 data model, even though it is not in an XML form. The FIX Protocol is another example. FIX is used in securities exchanges where the execution of trades need to occur in microseconds. Plans are in place to make FIX an ISO 20022-compliant syntax. The ISO 20022 standard is designed to allow the use of other syntaxes as new requirements or new business models emerge.

ISO 20022 Message Gaps

A broad appeal of ISO 20022 is that it spans the financial services ecosystem. However, that also means that there are also gaps in the set of ISO 20022 messages that still need to be developed by the user community.

Seth Blacher, Senior Vice President, Product Management Manager at Wells Fargo, admits, "We know that commercial card or card payments are not part of the CGI-approved format for ISO 20022, but we are not patient and neither are our customers. To the extent A/P control or commercial card data in an ISO file would enable us to better serve our customers, that is why we are looking for ways to expand beyond existing ISO 20022 standards. And our customers want to interact with us that way. It's all really customer driven."

Yet financial institutions in the U.S. that have implemented ISO 20022 for corporate-to-bank communications are finding they have to balance customer demand with the relative infancy of the standard through potential customizations. Cheryl Jacobs, Global Product Manager at Wells Fargo, observes, "Once customers have made the strategic investment in using ISO 20022 and FileAct[10] as the delivery method, they want everything to go through that channel. We have a couple of customers who would like us to start sending account reconciliation and positive pay information using an ISO 20022 XML format. Today, there is not a standard defined. We have customers who want to do FX market-to-market reporting. Again, there is not a standard defined. It is sort of like the chicken and egg problem.

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[10] FileAct is a secure single channel offered by SWIFT to transfer large volumes of financial data in different formats.

[It is the] customer who wants something in a format that has not yet been defined. And as a bank, we do not really want to build something custom only to find out that it is not the industry standard. And figuring out how we direct the interested parties to the right place to start the effort is a bit of a struggle."

Too Many Flavors – Competition and Collaboration

One worry with ISO 20022 is the potential risk of too many flavors. Implementations may vary for reasons that may be because of market practice, bank practice or corporate practice. Indeed, the choices that exist within the ISO 20022 messages contributed to the initial divergence in interpretation in the SEPA region. Some of the markets defined their own schema files for standard messages and that caused harm to ISO 20022. At the same time, banks tailored the fields to their specifications, for example, inserting custom codes that could not be processed by other financial institutions.

Likewise, many are wary of the potential challenges of different interpretations here in the U.S., likening it to today's issues with EDI. Robert Rosdorff, Group Product Manager of BBVA Compass, notes, "You buy a PC with a modern operating system and a standard printer and no matter what the brand, you can plug the two together and it works. It would be ideal if we could get to a place like that in the payments system where the ERP systems were so sufficiently interoperable with the banking system and each other that we could have something closer to a plug-and-play experience. A concern is that ISO 20022 does not go down the same road that EDI ANSI ASC X12 did to some extent. With financial EDI, we are just locked into this eternal 820 problem of lack of consistent conventions in the application of the standard. There are a lot of reasons for it. Everyone has a different ERP system. The way the different trading partners in different industries pay each other differ. The generally accepted accounting principles (GAAP) in the U.S. and foreign countries are different to the extent that it makes it enormously difficult to have the same experience with financial EDI as you would with the aforementioned PC and printer metaphor."

Having common guidelines helps to facilitate global interoperability. Rantanen notes, "That's why it has been so important in the payments domain that we have had the CGI-MP where all the stakeholders, vendors, infrastructure providers, financial institutions and end-users are together defining how to make a payment initiation message for different countries in a harmonized way; not in a way that one single country or one single bank or one single vendor would like to have it. It has to be discussed and tested" to avoid fragmentation in the market. With ISO 20022 spread in so many different parts of the world and at different stages of implementation, Rantanen, also Vice-Convenor of ISO 20022 Payments SEG, continues, "It is important that we share our experiences with others. In places where ISO 20022 has not been implemented, they need to look around. They can see that, yes, this is working. There is a proof of concept already done and they can use the best practices and avoid the pitfalls. Collaboration is a key element of the modern economy. You cannot do everything by yourself. You have to partner with your partners, customers and competitors for better capabilities, solutions and services."

Business Case – The Cost Factor

Modernization efforts such as the Vision 2020 Payments Strategy in Canada and the SEPA mandate in Europe have been the impetus for carrying out ISO 20022 payments system conversion projects or the commitment to do so. However, in the U.S., a commercial case is desired by many to move further. In a vast and diverse market of nearly 12,000 U.S. financial institutions, the ability to build a business case for ISO 20022 payments system modernization is highly dependent on the size of the organization, its resource level and technological capabilities.

Van Driessche points out, "The choice to adopt ISO 20022 will always be part of a bigger, strategic industry innovation project, and should not be brought back to one strictly based on the outcome of a number-crunching exercise. There will never be a unique business case to move to ISO 20022 in a market the size of the U.S. with such a variety of players and segments. But progressing the discussion should not be made dependent on a continued search for that one-size-fits-all business case, as delivering concrete quantifiable benefits for all will never happen."

Bigger banks are and have been able to justify the large capital expenditure of payments system modernization and ISO 20022 integration because of the corporate clients involved and to establish a competitive advantage. Others adopted the standard for corporate-to-bank communications in recent years at the request of corporate clients and prospects.

Payments system integration support has offered those banks an opportunity to acquire the large multinational corporations seeking the efficiencies and rationalization of processes and multibank integration linked with ISO 20022. The majority of RFPs from businesses in the past year required ISO 20022 capability as noted by multiple banks, which has helped recoup some of their investments.

Yet in moving down the scale to the smaller players, the economics and opportunities may not exist. Mills comments from the perspective of the small banks, which he also represents as part of The Clearing House Regional Payments Association, "First and foremost, The Clearing House understands and supports the benefits for implementing ISO 20022 for the development of real-time payments, and is developing a long-term strategic plan for wires and ACH. However, in interactions I have had with my membership, there is definitely some ambiguity and concern around the business case for ISO 20022. What is the tangible case for them to make that investment? If I'm a credit union and everyone moves to ISO 20022 in the U.S. that's going to take significant resources and significant expenses associated with that. We can talk about improved efficiencies and about our ability to be competitive in the global market, but if I am a credit union, that need does not exist today. That is not part of my business model. I am not attempting to compete on a global scale. I am fine with the efficiencies that are available to me today on a current platform."

Shelly Simpson, Director, Certifications & Continuing Education at Regional Payments Association EPCOR, notes other higher priorities are also a key factor in making a business case. "When you begin to see the other demands that are placed upon financial institutions from regulatory issues to keeping their products current, how do

you decide how you are going to invest those dollars and the people to work on those projects to move forward? When there are more urgent matters to address, coupled with the faster return on investment from other projects, implementing ISO 20022 is difficult to justify. Also unfortunately, in many cases, financial institutions are not really getting any return on investment."

Van Driessche offers, "For some players there is already a business case today and for others there will be one in the medium- to long-term. However, for a considerable portion of the market, there may never be a reason to consider the standard. Take a small bank in the middle of nowhere doing two wires a day or even a week. They have a system that works—very often a manual-based user interface. The community as a whole will need to discuss how to shield these players from the impact of adoption. And that might be as simple as minor upgrades to GUIs [graphical user interface] and online portals allowing them to continue filling out payments data manually on screen, being fully agnostic of the messaging standards that are used behind the screens and exchanged across the market infrastructure."

Generally, small-and-midsized financial institutions use Third-Party Service Providers or solutions to facilitate payments transactions. Simpson explains, "A lot of our members are not doing their own processing. They do not have a lot of homegrown products. They are using the services of the Fiserv, Jack Henry, and FIS of the world." For this demographic, the Third-Party Service Provider will need to drive any change.

The mass of smaller banks in the U.S. will view ISO 20022 as an issue of compliance. There may not ever be an appetite for the small community bank or credit union to move to ISO 20022. For this large contingency of financial institutions, they will require conversion tools and services to shield them from the impact of ISO 20022. In Europe, the software industry emerged with shielding solutions for the smaller banks for SEPA and the forthcoming Target2 EBA big bang migration to ISO 20022 in 2017. These are anticipated to be used for years and years by the large body of members. Likewise, the U.S. payments systems will need to explore similar solutions if a conversion to ISO 20022 happens.

How Do You Get Started? —
Best Practices for Implementation

Although many large U.S. banks with a global footprint support ISO 20022 in corporate-to-bank communications or are planning to, this does not mean that U.S. ACH infrastructures (FedACH and the Electronic Payments Network or EPN) will convert the domestic standard for ISO 20022. For those financial institutions that choose to support integration of ISO 20022 messages as part of their suite of standards capabilities, co-existence of legacy formats and ISO 20022 message standards will likely remain for many years to come.

Integration of payments system messaging standards has associated costs, but these are far less daunting and considerably lower in magnitude than would be if the U.S. ACH Network were converted to ISO 20022 payment messages. The approach can vary bank-to-bank and also depends on the institution's long-term strategy. The recommendations provided herein are based on the assumption that a business case justification has been approved with the decision to move forward in offering ISO 20022 messages for corporate-to-bank communications.

NACHA Meeting the Needs of the Present...
"With **ISO 20022 ACH Integration**, NACHA is providing industry tools and solutions that allow ACH users to *translate* and *integrate* the ISO 20022 Payment Message standard for both electronic payments *initiation* and payments remittance without making changes to the current NACHA formats and with the support of the *NACHA Operating Rules.*"

...While Preparing for the Future
"NACHA will continue to monitor, explore and engage with market participants with respect to ISO 20022 ACH Conversion—i.e., the current ACH file formats are converted to ISO 20022 Payment Messages for all ACH payment types to all endpoints with the support of the *NACHA Operating Rules*, as revised to accommodate the different ISO formats or messages. There are potential 'triggers' or events that will influence decisions around when, if or how to convert the current NACHA format to an ISO 20022 format."

Today, we are observing two approaches in the support of ISO 20022 in the U.S. ISO 20022 is not being implemented for the sake of implementing a standard, but rather as part of a broader initiative. In the first case, the investment in ISO 20022 is generally an enhancement to current messaging transaction processing for differentiated payables or receivables offerings. This means translation in a "like for like" or "equivalent" approach of clients' payment initiation instructions to existing formats and standards and cash management requirements that support ISO 20022. In the second scenario, financial institutions have larger payments modernizations efforts underway and ISO 20022 is an integral component of the new infrastructure and application environment to rethink and consolidate payments systems and operations.

In embarking on an ISO 20022 project as part of a financial institution's corporate offerings there are many areas to consider. Some high-level questions to ask include:

- What ISO 20022 message sets and versions should be adopted? Will your bank focus on payments initiation only or offer bank-to-corporate cash management messages as well? Or look beyond payments messages? Which geographies (and variants) will your bank support?

- What will be the approach to migration in ISO 20022 integration? Will it be "big bang" to include all payments messages from payments initiation to returns and rejects? Or a phased rollout of messages and specific business processes beginning with payments initiation for certain payment types, and expanding to include status notifications, cash management and the like?

- How will your bank handle versions of messages that are not supported by your organization?

- Are there implementation guidelines available and, if so, where can these be found? Do you have banking partners/solution providers with expertise in ISO 20022? What other resources can your bank leverage to enhance internal education, especially as it relates to ISO 20022 processes?

- What are all of the different touch points in the bank? What will be the business and technological impacts? What is the practical implementation roadmap to achieve the desired future state?

- Will existing IT architecture be adapted or new system(s) built? Done in-house or outsourced?

This is not intended to walk through the steps of a full impact assessment for ISO 20022;[11] however, three best practices relating to the two ISO 20022 implementation scenarios presented have emerged and specifically relate to: 1, education and training; 2, organizational structure; and 3, implementation strategy.

Education and Training – Building Internal Competency

Education is fundamental to any ISO 20022 implementation program. The educational and training program needs to be in place from the onset and happen across different stakeholders with varying capabilities throughout each stage of the implementation project:

- In the *Adoption Phase*, the learning curve can be steep as decisions on how the bank will implement to the development of the technical roadmap must take place. It is dramatically different hearing success stories at conferences and in the trade press to implementing in practice. Adopting ISO 20022 involves understanding its formats and processes and its impact to underlying technology and business flows.

- During the *Implementation Phase* when physical changes to the systems are made and standards are rolled out, IT and other technical resources are necessary to update

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[11] Valuable insights and details on implementation steps are offered by SWIFT. *Best Practice for Successful Implementation of ISO 20022 for Financial Institutions.* 2015. <http://www.swift.com/assets/swift_com/ documents/about_swift/Best_practice_ISO_20022_implementation_57108.pdf>.

the applications and systems dealing with the new standards, which require a different educational program.

* In the *Go Live Phase*, a separate, coordinated training effort is needed across the enterprise. An educational program should include areas such as Products, Customer Implementation Teams and Sales to develop and deliver consistent customer (or partner) education, on-boarding processes, and exchange of data between the bank and corporate clients.

Organizational Structure – Knowledge Management
Successful ISO 20022 projects share a common feature—a centralized organizational approach. Today, many departments still act in silos. Establishing a centralized management team helps ensure that tasks are streamlined and best practices are documented and shared across different business domains. Many ISO 20022 efforts are led by the Product Management or Product Development group with ownership over the data exchange platform. A single point of contact facilitates engagement of internal business partners and creates a favorable environment to incubate ideas for further application. Generally, this area also serves as a critical resource and internal consultant partner for groups less familiar with the standard in the transition to ISO 20022.

Holistic Approach
Depending on the project, the initial scope of implementation may be limited to a specific business line, such as payments and integrated payables. Look beyond ISO 20022 payments projects and requirements and consider its broader application. ISO 20022 spans several financial service domains. It is essential to engage in active dialogue with and/or involve other business areas to take advantage of the ability to reuse the ISO 20022 model across other lines of business and application owners. Collaboration with internal and external stakeholders can also serve as a platform for future innovations based on ISO 20022.

The Future Path

As the international markets march toward ISO 20022, in combination with the digital age and increasing Internet transactions, for certain segments of the U.S. financial services industry, ISO 20022 is an attractive standard for future U.S. ACH Network conversion. Yet, for the vast majority of the banking sector a strong need may never materialize.

Today, the financial services landscape is rapidly changing, and those organizations that have carried out ISO 20022 initiatives are achieving direct benefits from payments integration projects. Some that are future-proofing their internal architecture with ISO 20022 are gaining operational efficiencies from leveraging ISO 20022 definitions for internal communication needs in the intra-bank space. Likewise, ISO 20022 is helping to drive efficiencies in cross-border and domestic payments. Many are also observing longer-term lower costs with the consolidation of data formats as one-off formats are reduced in corporate-to-bank message communications. More importantly, the increasing rigorous regulatory and compliance requirements make the richer-structured information in ISO 20022 appealing for improved visibility and transparency in

payments processing. Meanwhile, the expansive nature of ISO 20022 remittance data, theoretically, has the potential to transform today's reconciliation challenges. Equally, ISO 20022 has become a platform for innovation forming the standards backbone to enhance corporate offerings in such bank products and services as e-invoicing and eBAM, among others.

Yet, integration of ISO 20022 also carries concerns, challenges and pitfalls. Co-existence between legacy formats and the ISO 20022 standard imposes prolonged cost, complexity, additional risk and burden. Beyond the initial learning curve with the different processes associated with ISO 20022, new issues with ISO 20022 are anticipated to emerge in the future. These include privacy and security concerns related to data overpopulation, and the corresponding increase in information may create additional data exposure risks as well.

The potential technological impacts on bandwidth, disk space and storage are also issues to be aware of. Other future challenges specific to the differing network participants and resource capabilities are also expected to become visible.

The increased activity of ISO 20022 in communities and market infrastructures from all corners of the globe look promising for convergence toward one standard. Though in the U.S. today, the business drivers for conversion of the U.S. ACH Network are not as clear. The decision will be influenced by potential "triggers" or events for when or how to convert the current NACHA formats to an ISO 20022 format.

Even without a full modernization effort of the U.S. ACH Network, U.S. financial institutions and the payments ecosystem can take incremental steps to better support the evolving needs of the payments system users. Tools and services are available today that include NACHA's ISO 20022 Mapping Guide and Tool designed to standardize ISO 20022 payment message mapping for ACH Network participants. With the industry at different points in their evolution of systems and business priorities, the foundation of an ISO 20022 integration plan will support the future transformation of the ACH infrastructure. Continued education within organizations of the capabilities, use cases and benefits of ISO 20022 will ultimately help drive the delivery of value to U.S. payments participants and conversion of the U.S. ACH Network.

Helpful References

Site	URL
ISO 20022	www.iso20022.org
Common Global Implementation – Market Practice (CGI-MP)	http://corporates.swift.com/en/cgi-mission-and-scope
NACHA	https://www.nacha.org/ISOresources
Federal Reserve Banks	https://fedpaymentsimprovement.org/get-involved/iso-20022/
SWIFT	www.swift.com
World Wide Web Consortium (w3c) (XML Technology)	www.w3.org/xml
SEPA Region	
European Payments Council (EPC)	http://www.europeanpaymentscouncil.eu/ http://www.europeanpaymentscouncil.eu/knowledge_bank_detail.cfm?documents_id=537
European Central Bank	http://www.ecb.int/paym/sepa/html/index.en.html
European Commission	http://ec.europa.eu/internal_market/payments/sepa/index_en.htm
Canada	
Canadian Payments Association (CPA)	https://www.cdnpay.ca/imis15/eng/Publications/News/eng/res/ns/ISO_20022_overview.aspx
UK	
Payments UK	http://www.paymentsuk.org.uk/policy/payment-industry-standards/iso20022