



**TEMENOS**  
THE BANKING SOFTWARE COMPANY

# **MX Messages**

A common language for all



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# I Introduction

Temenos believes in a connected world. We know that a connected world needs a common language for communication. The ISO 20022 standard defines a set of xml format messages for financial services, which define a common language that will allow connected systems to have an automated dialogue. We are not alone in this belief, and this standard has support from organizations such as SWIFT, Euroclear, Payments UK and OAGi among others, all of whom have submitted messages for inclusion in the ISO 20022 standard.

While there are benefits to the introduction of a common language of communication; generally, the introduction of ISO 20022 is not being mandated except where there is a genuine business change or market change. A good example of this is the Single European Payments Area (SEPA) which has replaced national payment systems in the Euro area with a common payments message set based on the ISO 20022 standard.

While financial institutions within a single national jurisdiction are generally already able to communicate with one another through national standards, the business driver behind the introduction of ISO 20022 messages is often the need for cross border communication. The ISO 20022 standard is being used as a reference for all the participants taking part in the cross border communication. As a global company, Temenos has been actively supporting our customers with the adoption of the ISO 20022 message standard for a number of years, and we are continually enhancing the Temenos product to support new messages

in advance of regulatory adoption where we believe it is prudent to do so. Our experience is that not only are financial institutions using the ISO 20022 messages to communicate with other institutions, we have found that many banks use the standard as a reference to communicate between integrated systems within the same bank.

Many existing IT systems are introducing add-ons to existing systems that either:

- Convert outgoing messages from an existing national or proprietary format to an ISO 20022 one; or
- Convert incoming ISO 20022 messages to an internal national or proprietary one

We recognize that the ISO 20022 messages are generally more functionally rich than the equivalent proprietary messages that they are replacing and some information is lost when doing this conversion. We also recognize that to make full use of the ISO 20022 standard means more than simply treating these messages as another message standard to be supported. It also means re-designing existing workflows to take advantage of the opportunities for automated error handling and cross-border automated processing offered by ISO 20022.

Our existing and evolving framework approach means that we can support customers with their current and future use of MX messages; whether the messages are used internally or externally by the bank, within a closed settlement network or as a cross-border securities order or payment initiation.





# ISO 20022 Standard

## XML Messages

ISO 20022 uses an XML (eXtensible Mark-up Language) syntax. Within the message, the XML data is marked up with opening and closing tags that indicate the meaning and structure of the information.

For example, `<Dt>2016-08-16</Dt>` is an XML representation of the date 16th August 2016 using the following format:

- `<Dt>` is the opening tag for the date
- `</Dt>` is the closing tag for the date
- The date is the data between the opening and closing tags

The opening and closing tags along with the data they contain is known as an element.

Elements can be grouped together into complex structures contained within a tag. For example, the tag `PostalAddress6` will contain the elements that make up an address as shown below:

`<PostalAddress6>`

```
<AdrTp>ADDR</AdrTp>
<Dept>5th Floor</Dept>
<SubDept></SubDept>
<StrtNm>Fenchurch Street</StrtNm>
<BldgNb>71</BldgNb>
<PstCd>EC3M 4TD</PstCd>
<TwnNm>London</TwnNm>
<Ctry>GB</Ctry>
```

`<PostalAddress6>`

The element `Postal Address` is defined from the elements that make up the postal address such as `Street Name`, `Building Number`, `Post Code`, etc. While there are issues with the use of XML; such as it being more verbose than other syntaxes and less efficient to transmit and store, the fact that it is an international open format makes it ideal for use in ISO 20022 messages. In addition, it has widespread support from different vendors and across industry boundaries (unlike the Swift proprietary format for example). Another benefit is that there are a wide variety of off the shelf tools available for editing, formatting and validation of XML messages.

Not to go into too much detail on XML here, but we will mention the following:

- Each XML message comes with a schema which defines the elements within a message and the contents of each element that makes up the message (such as length, character set, etc.). Thus the format of ISO 20022 messages produced by a system can be validated as part of testing against the message schema to ensure the validity of the message.
- The elements that make up ISO 20022 messages are common across message formats. Thus, the element `PostalAddress6` shown above is used in `Payments` messages, whereas the element `PostalAddress8` is used in `Securities Clearing` messages. However, where the tags used in the two elements are the same (for example `AdrTp`, `StrtNm`, `BldgNb`, `PstCd`, etc.), then the tags would have the same meaning and format. This not only means that common software can be used to produce both `Securities` and `Payments` messages, but also that the messages themselves can be stored in a common database and data mining tools can be used to return useful information from the big data stored in the message history.

## Framework Approach

As mentioned above, there are elements of the ISO 20022 messages that are consistent across the different business domains. Names and addresses are an obvious example, but other clearly identified elements are: `Currency Code`, `Cash Account`, `BIC`, etc. This means the production and processing of ISO 20022 messages clearly lends itself to the framework approach already employed by Temenos.

Outward messages are built by data handed off by the business application. Then a message is produced using standard framework APIs to perform the data joins required to populate the message with the required additional data that is not captured as part of the original business application. For example, populating a customer name from a customer number.





Employing a framework to support multiple business applications (payments, securities, trade services, etc.) ensures consistency of approach across the different business areas and provides the following:

- Reduction in training costs as skills gained in producing and modifying messages in one business domain are transferable to other business domains
- Reliable software as a framework where input and output against published schemas means automated testing can be introduced and maintained
- Consistency of design resulting in lower development costs

Similarly, deploying a framework to process inward transactions will allow the inward messages to be routed for processing by the correct applications based on message types and key data elements (for example payment messages from the SEPA or Securities Trades settling in the USA).

Once processed, the framework could be used to store the messages received or sent in a consistent database, which could then be used for data mining to return useful analytics with regards to inward transactions.

Storing information on the inward and outward ISO 20022 messages is important, as it allows the financial institution using those messages to analyze the number of each type of message, the number of errors associated with the message processing and where to make the investments regarding automation. For instance, if 90% of failed pain.001 payment initiation messages from customers are failing because of a particular error condition, then it makes sense to invest the resources into automating the processing of that error condition (either by rejecting the pain.001 messages with the error condition directly or by fixing the error condition in an automated fashion) rather than manually processing the rejections.

# Temenos Messaging Framework

Temenos is upgrading existing frameworks to support both the ISO 20022 standard and xml messages generally. The upgraded framework will use an industry standard transformation capability for transforming raw application handoff data from business application into MX messages in the ISO 20022 format. We are committed to the framework approach because all messages go through the same system which provides the following:

- Reduction in development costs by introducing a standard approach to build messages
- Improvement in reliability as any new messages are being introduced onto stable and reliable software
- Allows technical staff to easily transition between different business domains (between payments and securities for instance) without an expensive training program

It also allows us to build on our existing framework technology, Temenos Integration, reducing the risks associated with adopting new and untried software.

## Outgoing Messages

### Business Application Handoff

For outgoing xml messages, the upgraded Temenos MX Messaging framework will take data output from the business application and use an enhanced delivery application to emit an event to the Temenos Integration Framework. This workflow is shown below:

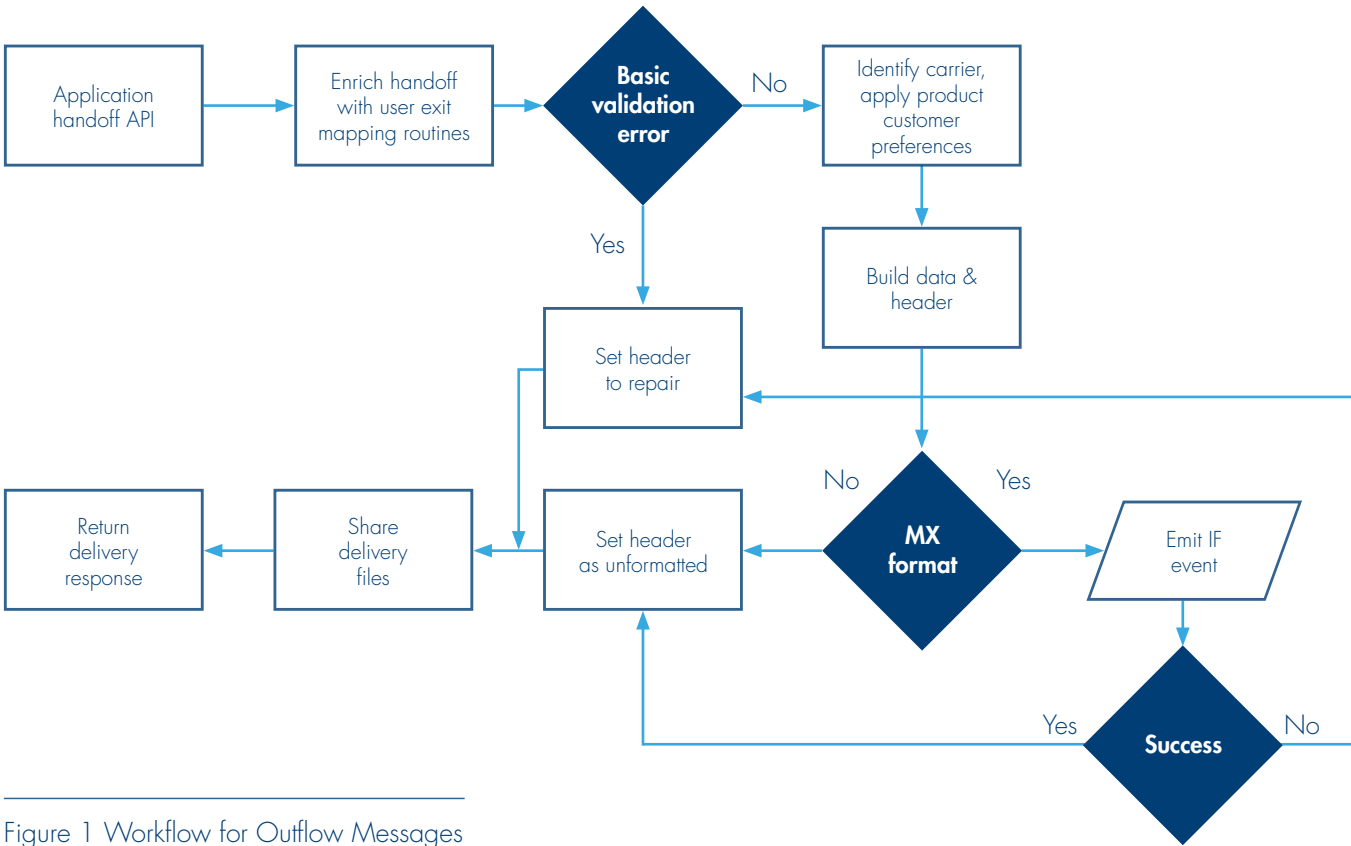


Figure 1 Workflow for Outflow Messages



XML Generation

The Integration Framework will transform the proprietary format xml to the target xml of the MX message using the xslt that was published at design time. This will push messages using integration service to message queues.

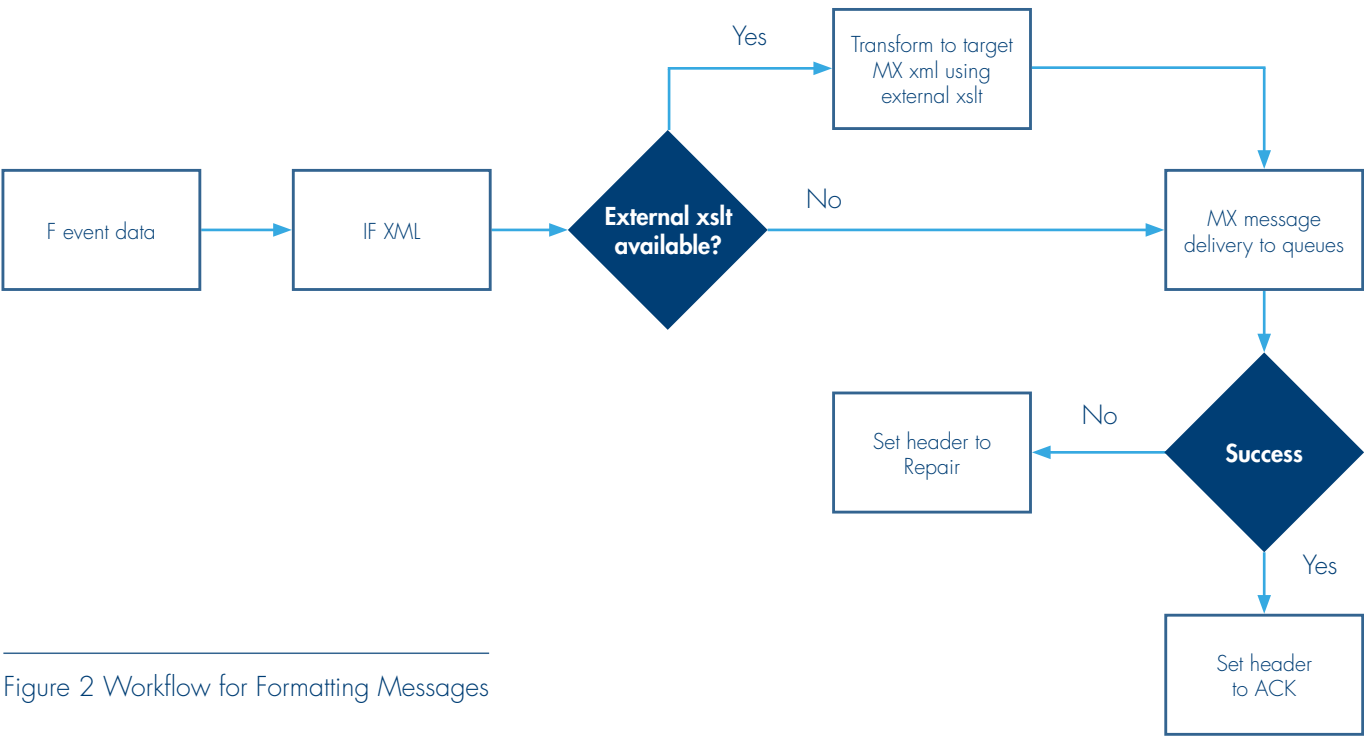
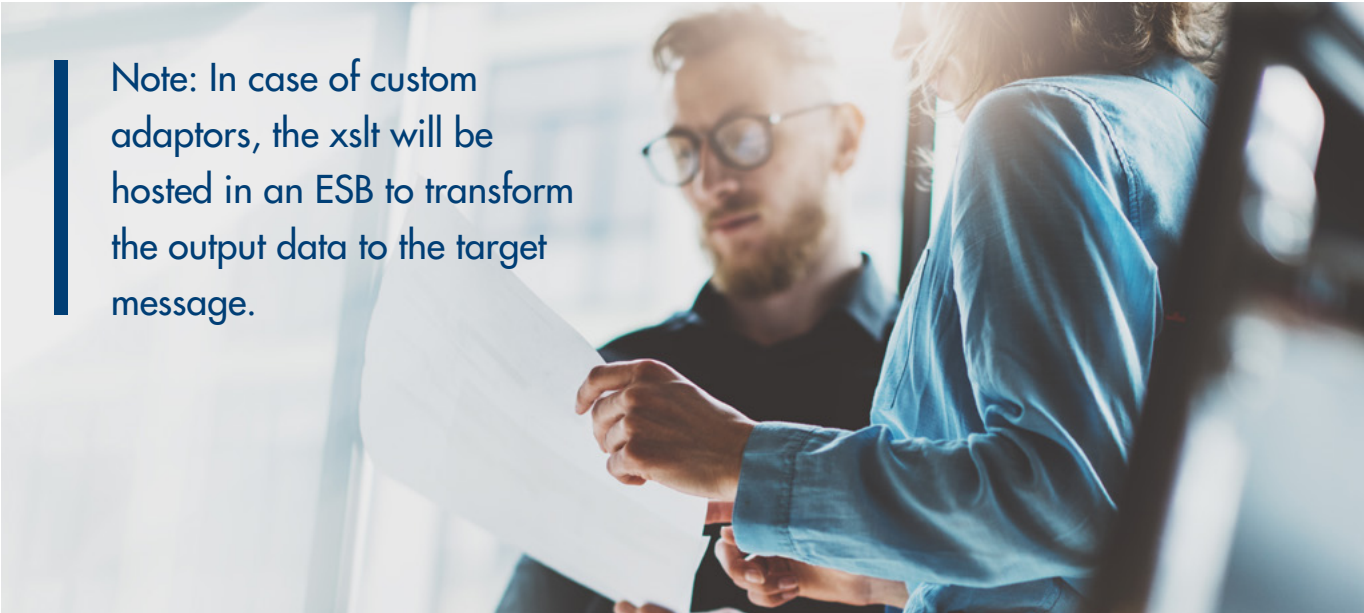


Figure 2 Workflow for Formatting Messages

While Temenos will release an xslt that can be used or modified as required, the use of this xslt is optional. If it is not used, the Integration Framework message will be sent out without being transformed. As a result, it will be possible to use your own mappers (e.g. IIB Mapper) if required to form the final MX message.



**Note:** In case of custom adaptors, the xslt will be hosted in an ESB to transform the output data to the target message.

Incoming Messages

The full end-to-end market processing envisaged by ISO 20022 requires support of incoming as well as outgoing messages.

Temenos has an existing framework to accept incoming messages which will continue to be used to support incoming ISO 20022 messages.

The existing inward xml carrier will be utilized to accept the incoming xml message and convert this into OFS processes to trigger the update of transactions.

Testing

To ensure the quality of any ISO 20022 message produced by Temenos software schema, validation is included as part of the standard Temenos regression testing suite. This will ensure that any ISO 20022 message produced by Temenos will conform to the associated message schema.

Including schema validation as part of the standard regression tests will ensure that any future changes and enhancements to the software do not result in invalid messages being produced. In addition to the standard schema validation testing as part of regression testing, Temenos also includes specific schema testing when a particular version of an ISO 20022 message is required by a particular enhancement.

In addition to schema testing for outward messages, the Temenos regression test suite also produces standard xml messages that are played into the system to ensure continuity of support for incoming messages.





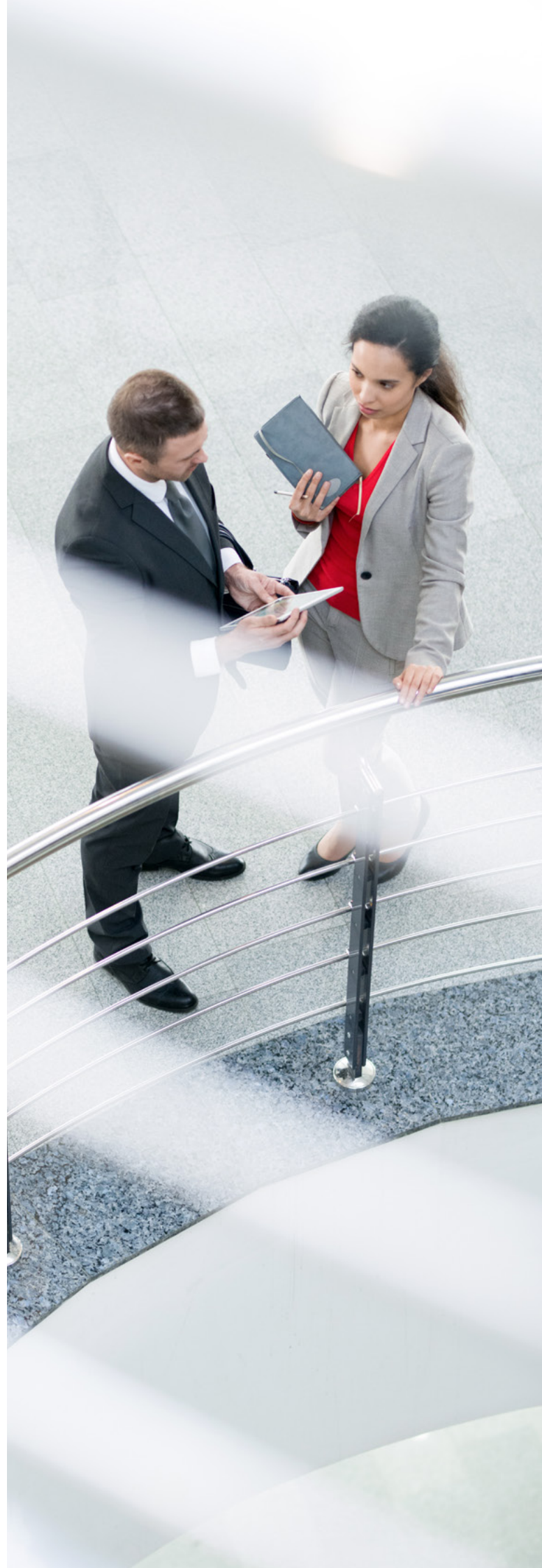
# Market Adoption

The ISO 20022 messages are divided into different business domains. Those included in the Temenos ISO 20022 roadmap are as follows:

- Payments
- Securities
- Trade Services
- Foreign Exchange

The rate of adoption of the ISO 20022 message standard varies in the different areas. The ISO 20022 is effectively becoming the de-facto standard for payments with payment systems based on the ISO 20022 already live in Europe, Singapore and the UK. There are new systems planned for Japan, Australia and the US, among other countries. However, for the other business domains the adoption has been slower. We do though note that the ISO20022 standard will be used in the Target 2 Securities changes currently being rolled out across the European Securities market, we therefore believe that the ISO 20022 standard will increasingly be used in the Securities domain.

As mentioned above, the biggest opportunities that come from the use of the ISO 20022 standard are in cross-border functionality and so we at Temenos see this as the immediate area of potential growth for the use of this standard. However, due to the widespread adoption of the ISO 20022 standard; we've increasingly seen the adoption of the ISO 20022 message standard within larger banks as a means of communicating between integrated systems within the institution.



# Payments

## Use of ISO 20022 in the Payments Domain

The Payments domain has been in the forefront of ISO 20022 adoption and it has quickly become the messaging standard for modern payments systems. The use of xml message formats is already established with the ISO 20022 standard having already been adopted by markets such as the SEPA, G3 System in Singapore and in the UK for Account Switching. It is also the recommended communication format for PSD2 messages based on the Consultation Paper on the Regulatory Technical Standards for PSD2 issued by EBA (European Bankers Association).

### SEPA

SEPA, which is supported by the European Payments Council, is a payment integration initiative of the European Union for Euro currency payments. This scheme was the first in the world to deploy the ISO 20022 message formats for mass Euro transactions.

The SEPA Credit Transfer (SCT) Scheme was launched in January 2008 and the SEPA Direct Debit (SDD) Schemes were launched in November 2009.

As the use of the ISO 20022 standard has now become mandatory for Euro currency payments in the SEPA area, the adoption of the ISO 20022 standard for SEPA payments messages gave a boost to the adoption, as it ensured that the majority of modern payment and banking systems introduced support for the standard.

### G3 System in Singapore

There are 2 payment systems in this initiative in Singapore:

- FAST - uses payments messages based on the ISO 20022 format to offer real time payments across 19 participating banks in Singapore. FAST went live in 2014.
- GIRO - used across 45 participating banks in Singapore GIRO for consumers to pay bills to government agencies and private sector billing organizations.

The reason for the adoption of the ISO 20022 format is that it has a more flexible message format that allows information to be provided for easy reconciliation of transfers by consumers and companies as well as the billing organizations. This provides for greater transparency and clarity of payments, for example, from a B2C or C2C perspective. This benefits both the billing organizations and retail customers.

This enhanced platform also opens up opportunities for the creation of more innovative and sophisticated payments offerings such as cross-border payments as it uses an international message standard.

### UK Account Switching

The ISO 20022 format has been used for account switching in the United Kingdom. This includes the following types of account switching:

- Cash ISA Transfer - this service automates the communication between the acquiring party and the ceding service. The central service delivers an automated messaging service replacing the need for paper transfer forms for participants and includes both transfers from one account holder to another and conversion from a cash ISA to a stocks and shares ISA.
- Current Account Switching Service (CASS) - this service was introduced by the Payments Council to improve competition between retail banks in the UK. It uses an ISO 20022 based messaging service that is inclusive of all UK payment types for both personal and small business customers and is open to all providers of current accounts in the UK market, allowing the switching process to be completed in a guaranteed seven working days.



## Payment Services Directive

The updated European Union Payment Services Directive (PSD2) will come into force in January 2018 and will regulate new platform and payment providers within the EU and EEA payments market. This directive opens up the payments market within the EU and EEA areas to third party payment providers. As part of this initiative, standard formats for payment initiation messages will be defined to allow the new third party providers to communicate with the banks who are the account service providers.

ISO 20022 payment initiation formats are the recommended communication format for PSD2 messages based on the Consultation Paper on the Regulatory Technical Standards for PSD2 issued by EBA (European Bankers Association).

As a result, we believe this adoption of the ISO 20022 payment initiation standard by third party providers will ensure that the ISO 20022 payment initiation standard becomes as widely used as the payment clearing and settlement formats. This is because the Europe-wide adoption of these messages will ensure that all the players in the payment initiation market will need to offer support for these messages.

## Worldwide Payment Adoption

Some of the other payment systems that are either in the process of rolling out or investigating the adoption of ISO 20022 in the future are below:

- In Switzerland, ISO 20022 format messages are due to become mandatory for use in the SIC payments system in 2018.
- The Canadian payments system plans to migrate 3 domestic payment standards into a single standard based on the ISO 20022 message formats.
- The US Federal Reserve Bank's Wholesale Product Office and The Clearing House (TCH) have initiated an industry consultation on use of ISO 20022 for High Value USD payments.
- The Southern African Development Community (SADC) is introducing ISO 20022 format messages for electronic funds transfers and mobile-to-mobile transfers.



## Temenos Payments Support

From the examples described above, it is clear that the existing use of the ISO 20022 standard is wide ranging in the payments domain and includes:

- Clearing and Settlement - SEPA
- Instant Payments - FAST
- Account Switching - CASS

In addition to the existing use of ISO 20022, Temenos is also actively involved in a number of the new initiatives that will use these messages including:

- Payment Initiation - PSD2
- Instant Payments in the Euro Area

The Temenos Payment Suite and legacy SEPA module already support payments messages using the ISO 20022 standard, and we will further enhance the existing xml payment message functionality by integrating the existing message processing with the payment initiation described above using our Payment Initiation module.

Through the use and ongoing extension of these existing Temenos products, we will continue to make the safe, incremental changes needed to support an evolving market. We will continue to offer software and guidance that allow financial institutions to make the most of the opportunities that come from the ISO 20022 message standard. More details of the existing and evolving software offered from Temenos are described further in the sections below.

## Payment Initiation

The advantages of using a non-proprietary, flexible and transparent format such as the xml ISO 20022 standard can clearly be seen in payment initiation. Payment initiation starts with a non-financial institution sending a message to a financial institution to either pay a creditor or initiate a direct debit from a debtor. To enable this ISO 20022 offers a range of payment initiation messages, such as:

- pain.001 – credit transfer initiation
- pain.008 – direct debit initiation
- pain.007 – message to cancel a payment initiation message
- pain.002 – status message for payment initiation message

Generally, the corporate initiating a payment or direct debit and the financial institution processing the initiation are very different. For example, a car manufacturer, advertising agency or government department, can initiate salary payments to pay their staff that are then processed by their bank. Not only are the businesses very different, but also their software and operating systems will be different. As a result, they need a common language to connect to each other. This is provided by the ISO 20022 standard.

For example, the pain.001 message will initiate a payment from the ultimate debtor to ultimate creditor. This message can be used in a direct scenario (message sent from the ultimate debtor to their agent) or used in a relay scenario (sent from the ultimate debtor to a forwarding agent). So in the case of a salary payment, the payment initiation can either be forwarded from the receiving bank to their agency bank or converted to a payment clearing and settlement message to be processed via the payment clearing system.

Similarly, the status of an initiation request (success or failure etc.) is communicated in a pain.002 message, which can be sent to inform the previous party in the initiation chain of the status of a payment message. If the initiation is part of a relay scenario, the pain.002 message can be used to communicate to previous parties along the initiation relay.

ISO 20022 is an international standard, so these messages can be used to initiate both domestic and international payments using the same message structure.

For these reasons, the ISO 20022 standard has been chosen as the payment initiation standard for PSD2 messages in Europe. We believe this will result in the standard becoming a de-facto international standard in the same way that the payments clearing and settlement messages have become internationally recognized standards. For this reason, Temenos is adding support for the ISO 20022 messages to its Payment Initiation module; with our vision for the final module offering to include:

- Support for the Payment Initiation messages described above
- Both single payment and bulk payment support
- Routing to internal or external payment systems

Payment Clearing and Settlement

Following on from payment initiation the payment clearing and settlement (pacs) messages provide a full set of functionality for payments being processed. These messages provide a full workflow, not only for credit transfers, but also for direct debits. This workflow includes returns, rejections and status request and status report messages.

Temenos offers support for ISO 20022 payment clearing and settlement messages in both the Payment Suite and the legacy SEPA module.

The supported SEPA workflow for credit transfers being processed using ISO 20022 messages is shown in the diagram below.

- The workflow for a credit transfer typically starts with a payment initiation message being received from a customer, or following a customer action, triggering a payment initiation on a digital channel.
- Once the payment initiation is received from a customer, the debtor bank will send a pacs.008 message to a clearinghouse, which will in turn trigger a pacs.008 message to the creditor bank. The outcome of the payment will be communicated using the pacs.002 and pain.002 status messages.
- If the payment was sent it error, a camt.056 can be sent to try and recall the payment.
- If the payment is then returned, this will be communicated using a pacs.004 message. If the payment recall was not successful, then the negative recall will be communicated using a camt.029 message.

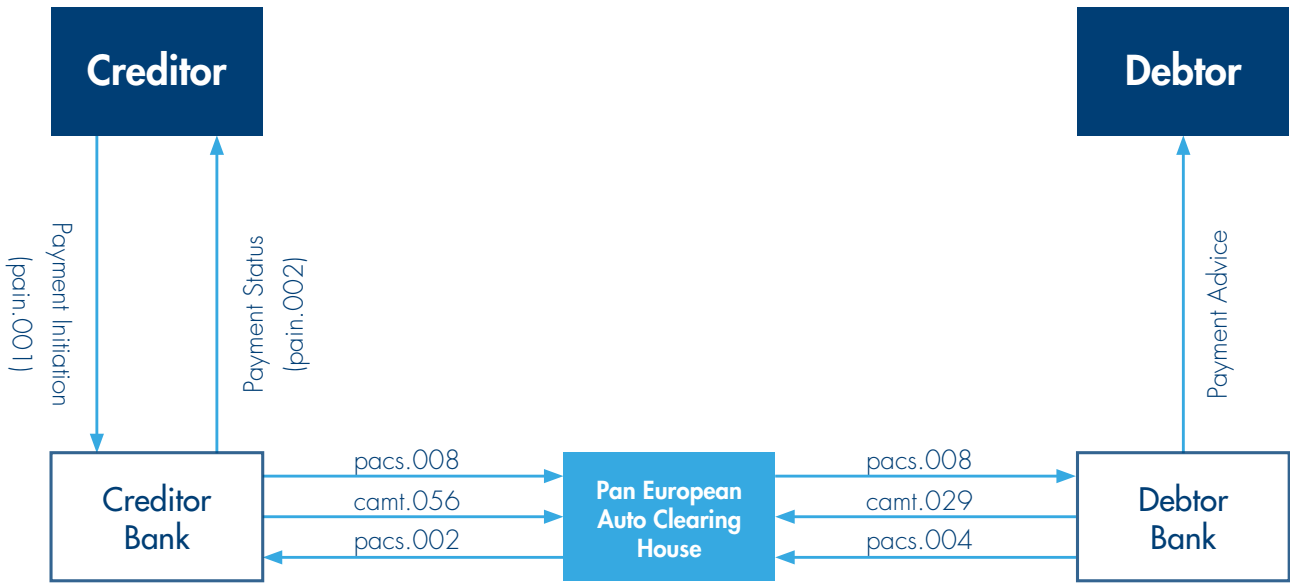


Figure 3 SEPA Credit Transfer Message Flow

Where:

- pacs.008 – Credit Transfer Payment
- pain.001 – Payment Initiation Message
- pain.002 – Payment Initiation Status Message
- pacs.004 – Return of a Credit Transfer payment
- pacs.002 – Payment Clearing Status Message
- camt.029 – Recall Negative Answer Message
- camt.056 – Credit Transfer Recall Request

While the example is taken from a SEPA credit transfer, this message flow is standard for payments being processed by a central clearing system using the ISO 20022 format. The same messages will be used in a similar workflow by other payment systems (though sometimes the elements used within the message will be different).

Together with the flow of messages using payment initiation, payment clearing and settlement and cash management messages in an automated flow show the end-to-end communication functionality provided by ISO 20022 messages. In fact, the payment initiation message sent by a customer can be routed to the correct clearing house by the debtor bank software and the mapping to a pacs.008 message can use a standard workflow applicable to many clearing systems that are using or planning to use the ISO 20022 standard.

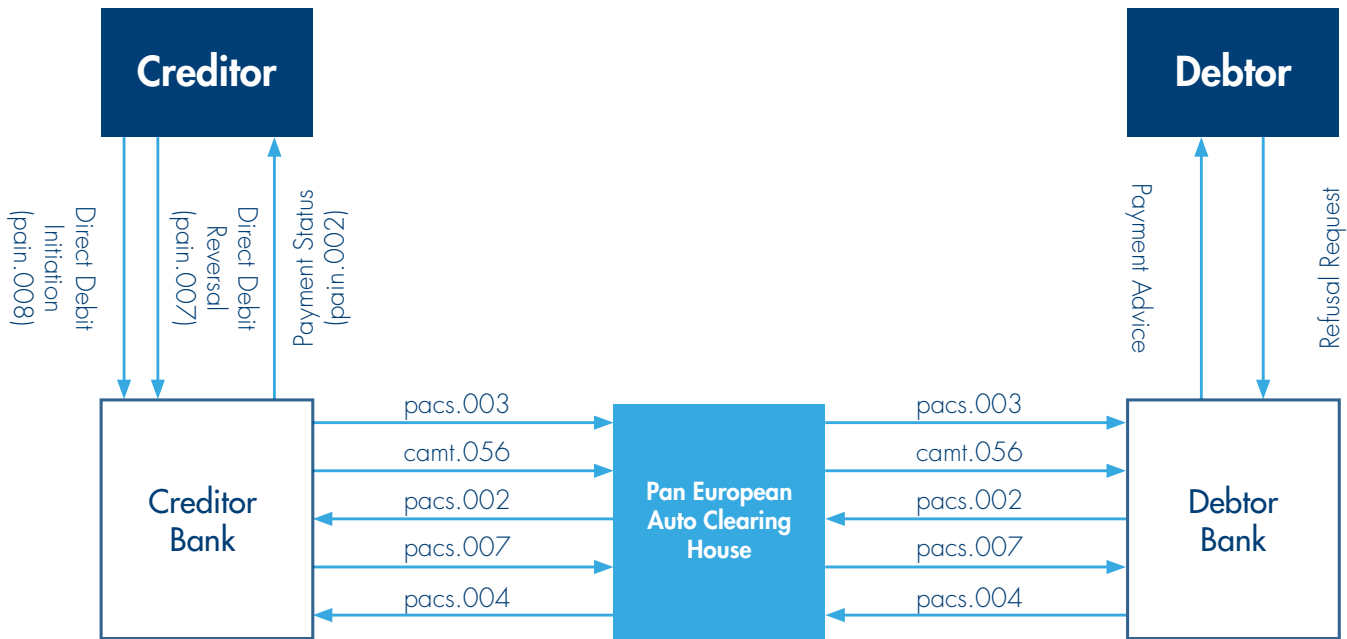


Figure 4 SEPA Direct Debit Message Flow

The supported SEPA direct debit workflow can be seen in the message flow shown below:

- The workflow for a direct debit typically starts with a direct debit initiation message being received from direct debit creditor or following a customer of a corporate triggering a direct debit initiation on a digital channel.
- Once the direct debit initiation is received from a customer the creditor bank will send a pacs.003 message to a clearing house which will in turn trigger a pacs.003 message to claim the direct debit from the debtor bank. The outcome of the direct debit claim will be communicated using the pacs.002 and pain.002 status messages.
- If the direct debit collection was sent it error, a camt.056 message can be sent to try and recall the payment.
- If the direct debit collection is returned unpaid, this will be communicated using a pacs.004 message.
- If the creditor wishes to reverse the direct debit collection then the pacs.007 message is sent from the creditor bank to the clearing system and then forwarded to the debtor bank by the clearing system.



Where:

- pacs.003 – Direct Debit Collection
- pain.007 – Reversal of a Direct Debit Initiation
- pain.008 – Direct Debit Initiation Message
- pain.002 – Direct Debit Initiation Status Message
- pacs.004 – Return of a Direct Debit Collection
- pacs.002 – Payment Clearing Status Message
- pacs.007 – Direct Debit Reversal
- camt.056 – Direct Debit Recall Request

Again, the example is taken from a SEPA direct debit message flow; however, this message flow is standard for any direct debits processed using the ISO 20022 format and the messages will be used in the same way by other payment systems (though sometimes the elements used within the message may vary).

The flow of messages using direct debit initiation, clearing and cash management messages in an automated flow show the end-to-end communication of ISO 20022 messages. In fact, the direct debit initiation message sent by a creditor can be routed to the correct direct debit system by the creditor bank software, and the mapping to a pacs.003 message can use a standard workflow applicable to many clearing systems that are using or planning to use the ISO 20022 standard for direct debit processing.

## Cash Management

The existing cash management module (IX) supports the following cash management messages:

- camt.052 – Bank to customer Account Report
- camt.053 – Bank to customer statement
- camt.054 – Bank to Customer Debit or Credit Notification

This Temenos product supports the mandatory tags as set by ISO20022 and also includes support for some regional requirements (such as support for the NVB rules – Netherlands). In addition to the tags supplied by the core product, additional tags can be added and configured according to local rules by the users of the IX module.

# Securities

## Use of ISO 20022 in the Securities Domain

While ISO 20022 messages are already mandated in some markets, such as the Swift formats for Securities Order processing, in many other markets the use of these messages is still either voluntary or the adoption of ISO 20022 is still at the planning stage.

However, during the next 5 years the adoption roadmap of many Securities markets foresee the existing regulatory messages being replaced by xml regulatory messages in major European and Asian markets.

## Target 2 Securities

The biggest planned change using ISO 20022 messages is Target 2 Securities settlement in Europe.

TARGET2-Securities, is a project promoted by the ECB, which will be managed by four central banks (Banca d'Italia, Deutsche Bundesbank, Banque de France and Banco de Espana). This project is one of the initiatives for the creation of the single European financial market following the introduction of the Euro, TARGET2, SEPA and PSD.

This market change is opening up the CSD (Central Security Depository) market to competition. Currently, in many cases, the CSD market in Europe is country specific (Italian stocks are held in an Italian CSD, French stocks in a French CSD etc.). This will change as a result of the rollout of Target 2 Securities where a competitive market will be introduced within a European Common Settlement zone. This will allow banks and other financial institutions to reduce settlement costs by consolidating their European settlement with a single CSD or moving between CSDs for the best price. The rollout of Target 2 Securities has already begun, and though there have been some delays, we believe the savings to be made in settlement costs are too great for the project not to be a success.

In their impact assessment, the European Union made an assessment of the savings based on a comparison between the European Settlement Market and the United States securities market. The United States securities market is served by 2 CSDs (DTCC and FedWire); whereas, the European market is served by 30 national CSDs and 2 International CSDs (Clearstream and Euroclear).

The impact statement estimated that following savings would be made:

- Between € 2 billion and € 5 billion of aggregate post trading costs for investors
- € 700 million reduction costs from market consolidation

While the introduction of ISO 20022 messages is not mandatory for Target 2 Securities settlement, both Euroclear and Clearstream are offering support of ISO 20022 messages and Euroclear has stated they expect the market to stop supporting the existing ISO 15022 messages within 5 years of T2S going live.

## Funds

SWIFT for Funds allows users to increase automation and straightthrough processing (STP) through the standardization of the following business flows:

- Account openings and maintenance
- Orders, statuses or cancellations of orders and order confirmations,
- Transfers
- Statements (of holding and transactions)
- Reporting on price
- Cash flow

It also covers standardized order flows for the alternative funds and pension funds industry, as well as specific standards for the exchange of Funds Processing Passports (FPP).

As from January 2013, the use of ISO 15022 format funds messages was restricted to existing users within a closed message user group. Membership to this closed message user group was automatically given to any user of the Fund Templates during 2012 and no system changes will be required by users to join. However, any new SWIFT user joining the SWIFT Funds solution as of January 2013 had to use the ISO 20022 MX Fund messages.





Japanese Markets

JASDEC (the Tokyo Stock Exchange) already has some support for ISO 20022 Securities messages with both corporate actions and posttrade messages being supported. One of the big drivers for the introduction of ISO 20022 messages in Japan is an attempt to open the market up to new entrants by moving away from local proprietary standards and adopting international ones.

Temenos Securities Support

Based on the previous experience of the change from the ISO 7775 and ISO 11521 syntax to the existing ISO 15022, we believe the existing ISO 15022 messages will run concurrently with the ISO 20022 messages for an initial time period. However, we do not believe the market will continue to accept the overhead of supporting 2 message standards for the same business domain and once a critical mass of use is reached then the new ISO 20022 standard will become mandatory.

Based on the published plans, it is our belief that during the next 5 years the existing regulatory messages will be replaced by xml regulatory messages in major European, Asian and North American markets.

To this end, we are using the MX Message framework described earlier in this document in conjunction with the Temenos Inflow and Integration Framework technology to supply an ISO 20022 compliant WealthSuite that will meet industry standards for the Securities domain. More details of our existing support for Securities domain messages and our plans for future enhancements are described in the sections below.

Swift for Funds

The Temenos WealthSuite has offered support for both inward and outward ISO 20022 Funds subscription messages since 2015. Existing support includes the following messages:

- setr.004 – Redemption Order
- setr.005 – Redemption Order Cancellation Request
- setr.006 - Redemption Order confirmation
- setr.010 – Subscription Order
- setr.011 – Subscription Order Cancellation Request
- setr.012 - Subscription order confirmation
- setr.016 - Order instruction status report

This allows the Temenos WealthSuite to support the redemption order workflow shown below:

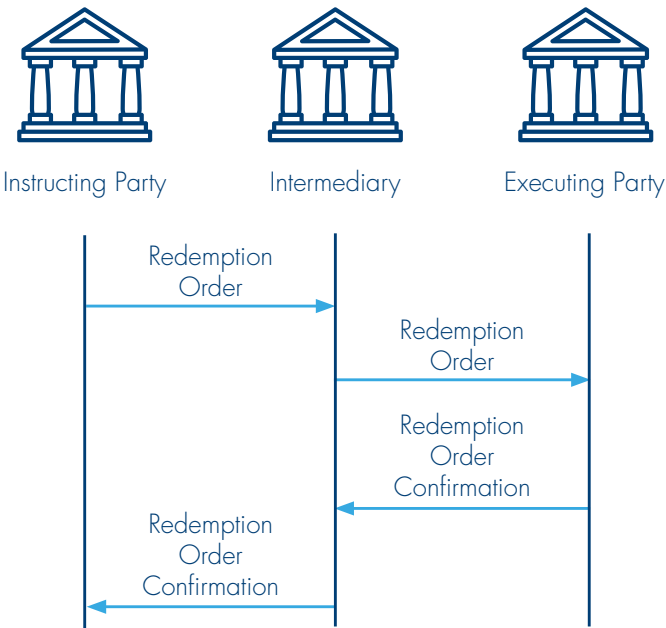


Figure 5 Redemption Order Workflow

Where the instructing party (a bank running Temenos software for example) sends a Redemption Order message (setr.004) to the intermediary party. The intermediary party will send the Redemption Order onto the Executing Party. Once the order has been executed, then to confirm the execution of the order, the executing party sends a Redemption Order Confirmation message (setr.006) to the intermediary party who in turn sends the message to the instructing party.

As can be seen from the list of supported messages similar support is offered for subscription orders.

Temenos Support for Securities Messages

Temenos is extending the support for Securities domain ISO 20022 messages. This will deliver ISO 20022 messages in the following areas:

- seev – Securities Events
- sent – Securities Management
- sese – Securities Settlement
- setr – Securities Trade

These messages are being released on the MX Messages Framework described in this document to deliver a comprehensive set of messages in the following business areas:

- Corporate Actions
- Securities Trading
- Securities Transfers
- Trade Settlement
- Management of static securities data

While Temenos provides existing support for the equivalent ISO 15022 messages for these business areas, there is not a one-to-one mapping from ISO 15022 message to an equivalent ISO 20022 message. So, for example, the ISO 15022 message MT 564 (Corporate Actions notification advice) has at least 4 equivalent messages in ISO 20022 formats:

- seev.031 – corporate action notification
- seev.035 – corporate action movement preliminary advice
- seev.039 – corporate action cancellation advice
- seev.044 - corporate action movement preliminary advice

While these messages have similar content, the sending of the different message types results in different outcomes within the corporate actions workflow. As a consequence of the increased information within these messages, it is possible to automate workflows within the Securities domain to a greater degree than was possible with the ISO 15022 messages. A good example of this is with the use of a sese.021 message (Securities Transaction Status Query), which can be sent when an expected confirmation has not been received (for example for a trade awaiting settlement). With the new ISO 20022 messages, the status message can be sent and a response (in this case a sese.022 - Securities Status or Statement Query Status Advice) received without human involvement. This allows errors to be processed automatically so reducing costs and errors.





# Trade Services

## Use of ISO 20022 in the Trade Services Domain

The use of ISO 20022 messages for Trade Services is based around 2 sets of messages:

- A group of ISO 20022 messages have been defined as alternatives to the existing MT Category 7 Documentary Credits and Guarantees series messages for Trade Services processing.
- A series of messages that make up the workflow for the Trade Services Central Settlement Unit.

### Trade Services Messaging

A full set of ISO 20022 messages to support the processing of Trade Services has been defined, but as yet the adoption of these messages has not progressed as quickly as the adoption of the ISO 20022 standard in the Payments or Securities business domains. This is probably because the real world drivers such as Euro Payments, Instant Payments or cross-border security settlement that are driving the change in these other business domains have not yet impacted Trade Services processing.

The messages that have been defined cover the following areas:

- Trade Services Initiation
- Trade Services Management
- Issuance, Amendment, Non-extension and Termination of Undertakings, including Status Reports

As such these messages serve as a replacement for the existing Swift Proprietary Category 7 Documentary Credits and Guarantees series messages to support trade services processing. However, SWIFT have issued advanced documentation for changes to these existing messages that are due for release in 2018 and 2019.

However, if the existing MT messages are being updated then this suggests that widespread adoption is some years off as why would anyone invest in changing a message that is about to be replaced?

David Dobbing from SWIFT has said that the adoption of the ISO 20022 messages “is anticipated to be progressive over a number years and dependent on market factors including vendor support and bank readiness.”

For this reason, the immediate plans of Temenos Corporate Suite is to continue to focus our support on the existing MT messages and ensure the support for these messages is up to date rather than making the investment into supporting the new ISO 20022 messages. However, we continue to monitor the market and we will ensure that we respond to any increased market adoption of the Trade Services ISO 20022 messages.

### Trade Services Central Settlement Unit

There are 50 Trade Services Settlement messages that are designed around a workflow, which is based upon a Centralized Trade Services Settlement Unit. These messages encompass the work trade services workflow including:

- Baseline Establishment
- Baseline Amendment
- Data Set Submission
- Intent to Pay
- Messages Specific to Secondary Banks
- Status Change and Extension
- Reports – including Activity, Transaction and Status reports

The submitting organization behind these messages is SWIFT. These messages are designed to:

- Support SWIFT’s Trade Services Utility (TSU). This is a centralized matching and workflow engine designed to compare data taken from underlying corporate agreements and related documents.
- Support the Bank Payment Obligation (BPO) which is a standardized irrevocable payment obligation within the framework of the TSU. Essentially, it is designed to allow banks to provide funding at various stages of the physical supply chain by allowing the financial supply chain to mirror the physical supply chain.

While the Trade Services Unit is live (and has been for some years), the volumes on it are small as it relies on corporates switching from Open Account Settlement to use BPO at a time when the cost of capital is increasing. The difference being that BPO is an irrevocable undertaking given by a bank to another bank that payment will be made on a specific date after successful matching of data by the TSU whereas as Open Account settlement relies on payment on receipt.

For this reason, we plan to continue to monitor the adoption of the TSU, but we currently have no timelines to develop these messages. However, we remain confident that if use of the SWIFT TSU increases, we are able to provide the messages required to enable us to offer support of the TSU to our CorporateSuite customers using the xml message framework described earlier in this document.

# Foreign Exchange

## Use of ISO 20022 in the Foreign Exchange Domain

Currently the Foreign Exchange treasury market is a key part of global economic activity; however, this market is currently a decentralized market with most activity relying on bilateral settlement. Bilateral settlement (direct settlement between the two counterparties within the Forex trade) obviously comes with an associated risk of counterparty default.

A solution to this comes through a central settlement system such as Continuous Link Settlement (CLS); the central settlement system for Foreign Exchange treasury transactions that is backed by SWIFT.

A series of ISO 20022 messages has been defined to support the Continuous Link Settlement (CLS) multi-currency settlement system. These messages follow the same ISO 20022 rules for the definition of xml messages that are used by the other Business Domains discussed above.

The messages themselves are post-trade messages and are broken down into the following areas:

- Foreign Exchange Trade Capture
- Foreign Exchange Trade Confirmation
- Foreign Exchange Trade Administration
- Cash Management
- Post Trade Foreign Exchange Instructions and Notifications

All of these messages have been submitted by CLS or CFETS (China Foreign Exchange Trade System) and are both related to central trade settlement of Foreign Exchange transactions.

Currently, the use of Central Trade Settlement for Foreign Exchange transactions is limited in scope and we believe the use of ISO 20022 messages in the Foreign Exchange business domain will be some time after the widespread adoption of the standard in business domains such as Payments or Securities. The reasons we believe this are:

- The publication of the Post Trade Foreign Exchange message formats has been later than the other business domains (February 2016)
- The concept of central trade settlement is newer in the business domain of Forex compared to Payments (where automated clearing house settlement existed before the ISO 20022) or Securities (where Centralized Securities Depositories have a long history).

For this reason, we will continue to monitor the adoption of the ISO 20022 standard in the Forex business domain but we have no timelines to develop these messages. However, if plans for the adoption of the ISO 20022 standard come to fruition we will be able to support these messages using the xml message framework described earlier in this document.



# Conclusion

Temenos' analysis is that in an increasingly inter-connected world, the ISO 20022 message standard allows computer systems to communicate with one another and extend the possibilities of automation. It not only extends the ability to communicate cross-borders (and so brings closer the likelihood of a worldwide retail payments system), but it also extends the ability to generate financial messages and process financial transactions beyond the financial services industry to non-financial services corporate organizations.

We believe that the ISO 20022 standard is already the de-facto standard for modern payments systems, that MX Messages will become the de-facto standard for financial messaging over the medium term in the Securities domain and increasingly, as these standards are adopted, ISO 20022 messages will be used not only in cross-border and inter-bank communication, but also for communication between systems within the same bank.

It is also our belief that once the cost savings and ease of use become increasingly evident, that the use of MX messages will also extend into the other domains. However, timescales are difficult to predict, as the adoption of MX messages in both the Payments and Securities domains benefited from a cross-border market change (in SEPA and T2S respectively).

Temenos will continue to work with our customers and partners to support their increased use of the ISO 20022 over the coming years and through the use of the enhanced Temenos Message Framework we will deliver:

- Reduced costs through greater automation
- Reduced timescales for new message adoption
- Increased reliability for both internal and external messages

We also recognize that the transition from the existing message formats (such as SWIFT MT proprietary formats) will be gradual and different markets will travel at different speeds. So not only are we committed to supporting the mandatory messages going forward by continuing to offer annual updates where required, we will also continue to support the existing message formats during the transition to the adoption of the ISO 20022 messages.

Our existing framework offers the ability to support both MX Message and proprietary MT formats concurrently. So our client base will be able to upgrade their Temenos software in advance for using the MX message formats. This will allow them to continue using the older formats while they gradually introduce the use of MX message as required without being forced into a "big bang" adoption.

In summary:

- Temenos is in agreement of the aims and approach of ISO 20022
- We have enhanced our existing framework approach to support the new MX Message formats
- We already offer support for the Payments domain
- We already support the existing mandatory Securities messages in those business areas supported by Temenos and have an active program to ensure we support Securities Domain messages ahead of their mandatory adoption
- We are positioned to extend the framework to the Trade Services and Foreign Exchange domains when required

## About Temenos

Temenos AG (SIX: TEMN), headquartered in Geneva, is the world's leader in banking software, partnering with banks and other financial institutions to transform their businesses and stay ahead of a changing marketplace. Over 3,000 firms across the globe, including 41 of the top 50 banks, rely on Temenos to process both the daily transactions and client interactions of more than 500 million banking customers. Temenos offers cloud-native, cloud-agnostic front office and core banking, payments, fund management and wealth management software products enabling banks to deliver consistent, frictionless customer journeys and gain operational excellence. Temenos customers are proven to be more profitable than their peers: over a seven-year period, they enjoyed on average a 31% higher return on assets, a 36% higher return on equity and an 8.6 percentage point lower cost/income ratio than banks running legacy applications.

For more information please visit [www.temenos.com](http://www.temenos.com).

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