Modernising Payments Messaging: The ISO 20022 Standard

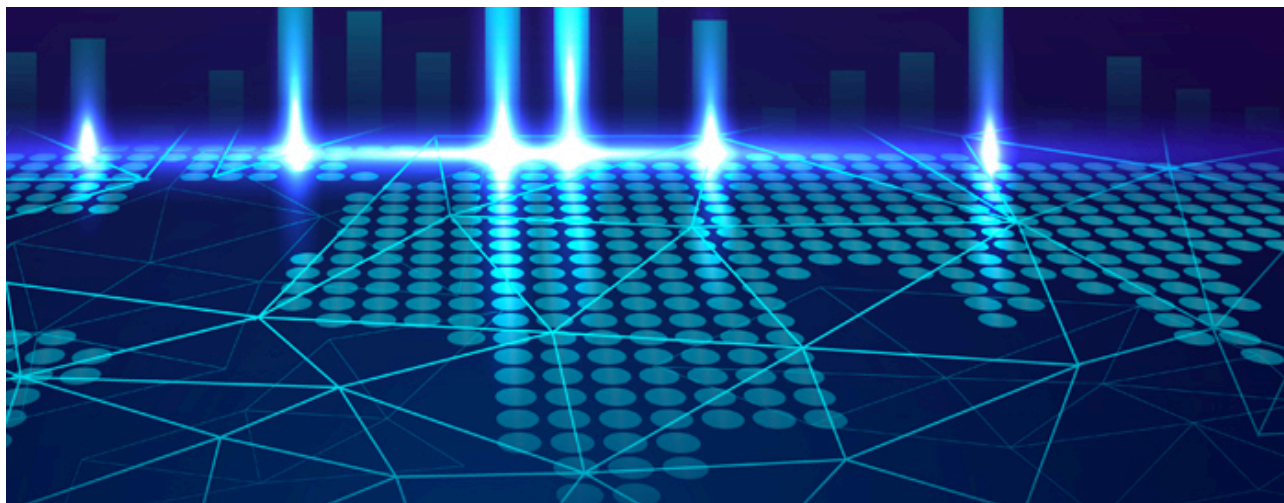Tarnia Major and Joseph Mangano[*]

Photo: Berkah – Getty Images

Abstract

Electronic payments rely on the exchange of messages to instruct the flow of funds between financial institutions. The quality of payment messaging data is important as it determines what payment information is received by financial institutions and their customers. Worldwide, there is movement to develop new payment systems using the International Organization for Standardization (ISO) 20022 messaging standard, and to migrate some existing systems to the standard. In Australia, an industry-led project to migrate the High Value Payments System to ISO 20022 commenced this year. This will provide a number of benefits, including improved transfer of payment information to beneficiaries, better fraud and financial crime management for payments service providers and greater opportunities for straight-through processing.

Introduction

Payment systems facilitate the transfer of funds between consumers, businesses and financial institutions. The communication of payment information between these participants of payment systems occurs via the exchange of payment messages. Electronic payment message standards create a common language to facilitate automated transaction processing between participants domestically or across borders. Currently there are many different 'open' (publicly available) and 'proprietary' (privately owned) message standards used across the world. Many high-value payments systems globally use proprietary standards designed by the Society for Worldwide Interbank Financial Telecommunication (SWIFT).[1] These SWIFT Message Type (MT) message standards are used across a range of domestic systems and are the most common standard used for account-to-account cross-border payments.

Over the past decade, there has been a global shift to adopt the ISO 20022 messaging standard in

payment systems. This shift has coincided with technology advancements and system renewals, which are transforming payment systems and payments processing. These changes allow standardisation, automation, improved reporting and carriage of data-rich payments, all of which are supported by the ISO 20022 messaging standard. Some domestic and international payment systems already use the ISO 20022 messaging standard, for example, Australia's New Payments Platform (NPP).[2] Several key Financial Market Infrastructures (FMIs) also have planned migrations over the next five years, including in the United States, United Kingdom, the euro area, Canada and Hong Kong. In accord with this trend, SWIFT has announced that it will cease support for SWIFT MT payment and reporting messages used for cross-border payments, and will migrate these to ISO 20022 by November 2025.[3]

In line with these developments, between April 2019 and February 2020, the Reserve Bank of Australia (RBA) and the Australian Payments Council (APC) conducted a consultation on the migration of domestic payments messages to ISO 20022.[4] The consultation was aimed at helping the Australian payments industry reach agreement on the key strategic issues related to the migration. The conclusions of the consultation presented the agreed industry position on the migration. The industry would commence a project for Australia's high-value payments system, known as the High Value Clearing System (HVCS), to implement ISO 20022 messaging. The HVCS is critical to the functioning of the economy. It processes high-value payments between financial institutions and their clients. These payments are mainly related to the Australian dollar leg of foreign exchange transactions. The HVCS processed around $131 billion on a daily basis during the 2019/20 financial year. Accordingly, in February 2020 the RBA's Payments System Board endorsed the planned industry-led migration project to modernise the messaging used in the HVCS, which it characterised as being strategically important.

The industry project to migrate HVCS messaging to ISO 20022 commenced in February 2020 and is expected to be complete by the end of 2024. This will involve the coordination of multiple financial institution participants to define and migrate to a new ISO 20022 message set. Financial institutions will also need to undertake projects to upgrade their internal systems to accommodate the change. Governance arrangements and the program management office have been established and work has commenced on planning, industry coordination and resourcing, and the design of the HVCS ISO 20022 message set. The industry migration is being led by the Australian Payments Network (AusPayNet), the industry administrator of the HVCS. The RBA will work with the industry on the migration project and has commenced preparations to make the necessary changes to its core settlement system, the Reserve Bank Information and Transfer System (RITS).

This article provides an overview of the ISO 20022 payment messaging standard and considers the benefits that the message standard facilitates. The article then focuses on the planned adoption of ISO 20022 domestically and in some jurisdictions internationally.

What Is ISO 20022?

ISO 20022 was introduced by the International Organization for Standardization in 2004. It is an open and general purpose global financial electronic communications standard. The ISO 20022 message standard is a data library of business components from which messages can be defined. It is used for the development of financial industry messaging covering payments, securities, trade services, cards and foreign exchange industries. The ISO 20022 message standard covers a variety of communication between financial institutions, FMIs and corporates, including:

- end-to-end payment processing between the sender and receiver

- standing payment authorities, such as direct debit authorisations for bill payments

- account management, such as statements and account balance reporting

- extended 'remittance' fields within payment messages, which allows more data such as invoice details.

The ISO 20022 message standard provides flexibility as payment messages can be adapted over time to evolving requirements. It supports structured, well-defined and data-rich payment messaging. This improves the quality of payment information contained in the message.

Key Benefits of ISO 20022

The ISO 20022 message standard delivers benefits to all users throughout the payments chain. In the HVCS, the benefits are realised by the financial institutions and their corporate clients who send and receive these messages. Over time, customers are expected to benefit from data-rich payments, more efficient and lower cost payment processing, and enhanced customer services such as improved remittance services. Among the benefits financial institutions may gain from the migration to the ISO 20022 message standard are:

Adaptability and flexibility

The ISO 20022 library of business components supports a flexible range of information that is independent of the underlying data language of payment messages. It therefore can be adapted to new technologies and evolving requirements over time.[5] This ability to adapt to new technologies means that ISO 20022 could form the basis for financial system messaging globally over the long term. The flexibility of the ISO 20022 message standard enables payment system administrators to design messages that are fit for purpose for their payment system.

One downside of a flexible message standard is that the different design of message sets across domestic and international payment systems can make it more difficult for those systems to interact seamlessly with each other. SWIFT and other coordinating institutions, such as central banks, have promoted the development of more standardised ISO 20022 message guidelines by international committees. These include the High Value Payments and Reporting Plus (HVPS+) and Cross-Border Payments and Reporting Plus (CBPR+) message guidelines that will be used for SWIFT cross-border payments.[6] International alignment aims to support the easier end-to-end processing of cross-border payments from the sender of a payment in one jurisdiction to the receiver in another jurisdiction.

Resilience

The payment messages used in some domestic payment systems can be aligned using the ISO 20022 message standard, and across common payment data fields. This is a step towards enabling payments to be more easily exchanged across alternate payment systems and networks. With ISO 20022 compatible technologies, payments can be more easily redirected to an alternative payment system in the event of an outage. This improves the resiliency of the domestic payments system as a whole.

In Australia, the alignment of NPP and HVCS messages may support resilience because it will be easier for each of these payment systems to accept and process messages as an alternative should the other system become unavailable.

Data structure and capacity

The ISO 20022 message standard addresses some drawbacks of SWIFT's existing MT message standard used in Australia's HVCS for over 20 years, including:

- limited data carriage, which restricts the amount of payment information that can be included in a message

- data string format, which limits the capability of automated technologies to read the information contained in the payment message.[7]

The improved structure and data capacity of ISO 20022 can be used in a number of ways to drive efficiencies and deliver an improved quality of service in the payment system.

Efficiency

The efficiency gains from the ISO 20022 message standard stem from the ability of automated technologies to collect, read and integrate ISO 20022 structured and data-rich payment messages into other services. This may include new customer services provided by financial institutions to their corporate customers. For instance, integrated

Figure 1: Unstructured Messaging Formats vs Structured ISO 20022 Messaging Format

	Unstructured Message Format	Structured ISO 20022 Message Format
Example: *Postal* field	<AdrLine>65MartinPlaceSydney2000Australia<AdrLine> ■ free text	<StrtNm>MartinPlace</StrtNm> <BldgNb>65</BldgNb> <PstCd>2000</PstCd> <TwnNm>Sydney</TwnNm> <Ctry>Australia</Ctry> ■ Street Name ■ Town Name ■ Building Number ■ Country ■ Post Code

Source: RBA

services with Application Programming Interfaces (APIs) could provide corporates with the ability to initiate payments, as well as obtain improved transaction and account reporting services.[9] Additionally, improved reporting, analytics and reconciliation processes are made possible for financial institutions with ISO 20022 messaging-based data. Reconciliation processes benefit from using structured data, while reporting and analytics are improved because specific payment data can be more easily retrieved.

More generally, the enhanced data structure and data carrying capacity of ISO 20022 messages improve the efficiency of end to-end payment processing and payment transfers. ISO 20022 payment messages allow automated technologies to read and target specific information. This automation can be used to speed up end-to-end payment processing (sender to recipient) and reduce the amount of manual intervention required for payments processing. There is also the potential to enable easier transfer across systems as more payment systems migrate to ISO 20022 and standardise across common payment information fields. As noted above, this can support the resilience of the domestic payments system. For international payments, alignment of payment messages helps facilitate the easier processing of cross-border payments between international and domestic payment systems.

An example of what is meant by structured content in an ISO 20022 message is shown in Figure 1. Unstructured messaging formats present information (in this case, an address) in a single uninterrupted string of characters. Structured content in ISO 20022 separates the address into its distinct components using tags (e.g. <Ctry> to identify the country). This level of precision makes it easier for automated payment processing systems to identify and select specific data from within the payment message to process the payment.

The ISO 20022 messaging standard also caters for investigation and reconciliation messages between financial institutions. This can aid efficiency by automating processes such as the investigation of incorrect payments (e.g. by using investigation and payment cancellation messages), lowering processing costs and improving resolution times for customers.

Innovation

By using the additional information in ISO 20022 messages, financial institutions may offer customers new services and improve the quality of existing services. One potential area for innovation is sending enhanced remittance information with the payment, such as including invoice details. Currently remittance advices, or invoices, are exchanged separately from the underlying payment in a different format (e.g. email) because of the limited data capacity of the current MT message standard. This lack of integration can make reconciling invoices and payments manual, time-consuming and error-prone for businesses. Additional data carried in payment messages can be used by financial institutions to offer new value-add services to their customers. These data could

include tax information, URL links to documents, defined payment purpose codes and payment and remittance advices.

Fraud and financial crime management

Implementing ISO 20022 can increase automation and enhance a range of compliance activities related to the management of fraud and other financial crimes. By using the enhanced data structure and capacity of ISO 20022 messages, fraud and financial crime management systems are better able to target specific information (such as the payment's sender and receiver) to perform the required screening. Not only does this capability result in increased efficiency and lower costs compared with manual exception checks, it also improves the quality of monitoring and screening.

International Developments

Over the past decade there has been an international push to migrate payments messaging to ISO 20022. This trend coincides with three key developments – the planned migration of SWIFT cross-border payment messages to the ISO 20022 message standard, numerous high-value payment system renewal projects and the development of fast payment systems. While SWIFT's focus is currently on cross-border payments, its long-term vision is to have the ISO 20022 message standard used across all SWIFT payments.

SWIFT's planned migration of *cross-border* payment messages affects financial institutions globally, including many in Australia. SWIFT's cross-border migration will occur from November 2022. It will feature a three-year period where cross-border payments can either use existing SWIFT MT messages or ISO 20022 messages. During the coexistence period, SWIFT will provide a translation service through a new 'Transaction Management Platform'. The service will enable compatibility between MT and ISO 20022 messages, as well as other translation options. At the end of this period, in November 2025, all SWIFT cross-border payments will use the ISO 20022 message standard.

A number of other jurisdictions are also migrating their *high-value* payments systems to ISO 20022 messaging. This includes the United States,

United Kingdom, the euro area, Canada, Singapore, New Zealand and Hong Kong. The majority of jurisdictions plan to complete their migration between late 2021 and 2025 (Figure 2). Some, such as the United Kingdom and Canada, are pairing their migrations to ISO 20022 with a renewal of the technology infrastructure underlying their high-value payments system. According to SWIFT, the vast majority of high-value payments globally will have migrated to the ISO 20022 message standard by 2025.

The ISO 20022 message standard has enabled a number of *fast payment* systems across various jurisdictions to deliver data rich and flexible and efficient payment processing. This includes the NPP in Australia, Singapore's FAST and Sweden's Swish. These fast payment systems are generally designed to process high payment volumes in near real time and maximise the efficiency of payments processing. The flexibility offered by ISO 20022 also enables more information to be sent with an NPP payment – for example up to 240 characters of remittance information. This is an expansion of the 18 character limit present in some other domestic payment systems, such as the Direct Entry system (used, for example, for 'Pay Anyone' transactions).

Migration for Australia's Payment Systems

The domestic migration

The RBA and APC's consultation program sought feedback on a range of strategic issues, including the scope, timing and approach for the domestic migration. Following responses received after the first phase of consultation, the scope of the domestic migration was limited to the HVCS.[9] Consideration was given to the advantages of coordinating the timing of HVCS migration with SWIFT's migration of cross-border payments; a high proportion of Australia's HVCS payments arise from a cross-border payment as the final inbound payment leg of the transaction. The first consultation paper released by the RBA and APC outlined three key objectives for the migration of payments messaging to ISO 20022:

- modernisation – to modernise the payment messages used in the HVCS to a more flexible

Figure 2: Unstructured Messaging Formats vs Structured ISO 20022 Messaging Format
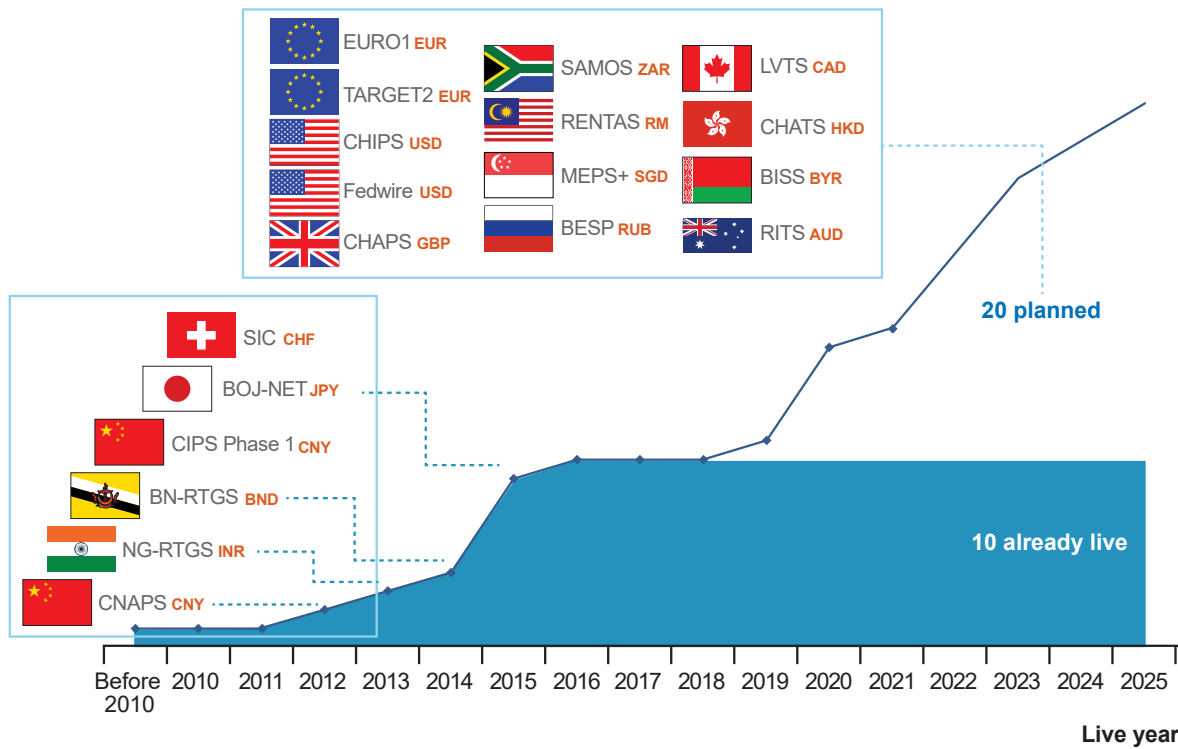
Sources: SWIFT, based on data from Bank of International Settlements

messaging standard that positions the payment system for the future

- simplification – to simplify payments processing and deliver efficiencies by facilitating automation through structured information, and, where possible, consistent service delivery across domestic payment systems

- use of enhanced content – to take advantage of the enhanced data structure and capacity in ISO 20022 messages to improve fraud and financial crime screening and monitoring, and increase competition in the delivery of payment products and services by enabling greater innovation.

To meet these objectives, the consultation program concluded that a number of key requirements should be incorporated in the HVCS migration. These requirements include the alignment of HVCS message guidelines with: CBPR+ standards that will be used for cross-border payments; SWIFT's HVPS+ guidelines for high-value payments; and, where possible, NPP message guidelines. This alignment lays a foundation for straight-through processing for

incoming cross-border ISO 20022 payments processed through the HVCS. It also supports the longer-term initiative of improving resilience between the HVCS and NPP, as noted earlier.

The domestic migration project will include a two-year coexistence period from November 2022 to November 2024, during which both SWIFT MT messages and ISO 20022 can be exchanged by HVCS participants.[10] This timeline was selected to coincide with participants completing work as part of SWIFT's cross-border payments migration and to align with global adoptions by other FMIs. Domestically, all HVCS participants are expected to fully migrate their HVCS payments to ISO 20022 by the end of the domestic coexistence period in November 2024.

The industry-led project to migrate HVCS payment messaging to ISO 20022 commenced in February 2020. This project is being coordinated by AusPayNet as the industry administrator of the HVCS. Operationally, the project is governed by an Industry Migration Steering Committee, which has an independent chair and representation from

across the HVCS and other key stakeholders such as SWIFT.

Key considerations for the domestic migration

The RBA and APC's consultation program highlighted a range of key considerations that will need to be managed across the industry as part of the migration of HVCS messaging to ISO 20022.[11]

Scale, timing and competing priorities

The migration of HVCS messaging involves significant work for financial institutions and potentially their corporate customers over an extended period. The new data structure and rich payment information impacts a range of processes, including monitoring, screening and analysis of payments, with flow-on effects for a range of supporting systems. These systems may need to be modified to process ISO 20022 transactions, and enhanced to be able to fully reap the benefits offered by the new message standard. The domestic migration also coincides with a range of other industry projects and international initiatives currently underway. These include several enhancements to functionality for the NPP, the ASX's CHESS replacement program, and SWIFT's cross-border migration initiative.

With the extent of this concurrent work in progress in the payments industry, it is important that the domestic migration is appropriately managed to ensure that it does not place undue pressure on participants, which could give rise to additional risks. The industry Steering Committee will play a key role managing these risks.

Alignment

The straight-through processing of SWIFT cross-border payments relies on the alignment of HVCS messages with those that will be used for SWIFT cross-border payments. Domestic alignment between the HVCS and the NPP is also a consideration, particularly with the longer-term objective to create resilience through closer compatibility of the two systems.

Data truncation during coexistence of old and new message standards

Both the domestic HVCS and SWIFT's cross-border ISO 20022 migrations will support coexistence periods for several years, where both MT and ISO 20022 messages can be exchanged in parallel. To facilitate this, some financial institutions may need to translate incoming payment messages from one message standard to another until they have upgraded their back office systems to fully support ISO 20022. Where translation is required from ISO 20022 to more restrictive SWIFT MT messages, some ISO 20022 payment information may be removed or shortened – referred to as 'truncation'.

Truncated message data can potentially cause issues for financial institutions' compliance obligations if the data used for screening and monitoring is incomplete. Financial institutions should perform all screening and monitoring using the complete payment messages, regardless of how the payment is processed in their back office system. Financial institutions are expected to maintain this practice during the coexistence period and to continue to comply with regulatory obligations.

Importantly, the consultation Conclusions required that from November 2022, HVCS participants that act as an intermediary and receive incoming ISO 20022 messages for cross-border payments must pass on the full ISO 20022 message for HVCS processing. Since the ISO 20022 messages will be richer in data content and more structured, data would be truncated if these messages were to be translated into an MT message for processing through HVCS. Aligning the launch of the HVCS with SWIFT's launch of ISO 20022 for cross-border payments in November 2022 and avoids the need for message translation.

The Way Forward on the Domestic Migration

The domestic migration to modernise Australia's HVCS payment system comes at a time when payment systems worldwide are changing rapidly.

The domestic migration project is being coordinated by AusPayNet which has established an industry Steering Committee with broad payments

industry representation. The Steering Committee has overall responsibility, accountability, and governing authority for the migration's delivery. AusPayNet has also established a program management office and has engaged key partners, such as SWIFT, to support the work of industry working groups. These working groups will cover: design and requirements; back office requirements; industry testing; project delivery; and governance and legal.[12] HVCS participants have also been encouraged to commence their own stakeholder engagement and project preparation, as well as to participate in the working groups.

The adoption of ISO 20022 message formats in HVCS is a substantial industry project, which is

being undertaken during challenging times. The ISO 20022 standard provides a platform that should take HVCS into the future, enabling this clearing system to offer efficiency benefits through improved transfer of payment information to beneficiaries, better fraud and financial crime management for payments service providers and greater opportunities for straight-through processing. The project also presents an opportunity to improve resiliency across domestic payment systems. It also allows closer alignment of HVCS and NPP messaging formats with those used overseas, to help facilitate a more seamless exchange of cross-border payments. ⚔

Footnotes

[*] Authors are from the Payments Settlements Department. The authors would like to thank Muhammad Ismail and Kylie Stewart for their help and suggestions.

[1] SWIFT is a co-operative organisation that operates a global network for the exchange of payment and other financial messages between its members (that are mainly financial institutions).

[2] The NPP enables consumers, businesses and Australian government agencies to make fast, versatile and data-rich payments 24 hours per day, every day of the year. See Rush and Louw (2018) for further details. Planned enhancements being undertaken by NPP Australia (NPPA) can be found in NPPA's Update on the New Payments Platform Roadmap.

[3] SWIFT cross-border migration programme <https://www.swift.com/standards/ iso-20022-programme>.

[4] The APC was formed in 2014 as the strategic coordination body for the Australian payments industry. The APC's role is to help ensure the Australian payments system continues to meet changing customer needs with innovative, secure and competitive payment services. See <https://australianpaymentscouncil.com.au/>.

[5] Data language refers to the rules, form and structure regarding the arrangement of data in a message. Extensible Mark-up Language (XML) is a commonly used data language.

[6] HVPS+ is a task force formed by SWIFT, major global banks and market infrastructures tasked with the ongoing evolution of global best practice message usage guidelines for high-value payments. CBPR+ is a SWIFT working group with responsibility for developing global message usage guidelines for cross-border payments.

[7] Data strings are an uninterrupted sequence of characters. These data strings can be difficult for application software to break up to target specific information for processing.

[8] APIs allow two systems to communicate with each other to access the features or data of a system, application or service.

[9] The RBA and APC consultation ruled out the migration of other payment system messages. See RBA (2019a), 'ISO 20022 Migration for the Australian Payments System – Issues Paper', April.

[10] Since the release of the Conclusions Paper, the ISO 20022 Industry Migration Steering Committee have delayed the start of the coexistence period due to a revision to the start of SWIFT's cross-border coexistence phase and the impact of COVID-19.

[11] RBA (2019b), 'ISO 20022 Migration for the Australian Payments System – Responses and Options Paper', September.

[12] Some working groups are still in the process of being stood up. The design and requirements working group has already commenced work.

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