SWIFT info paper
March 2019

The Asia-Pacific Securities Market Infrastructures landscape

Has ISO 20022 arrived yet?

The main objective of this report is to take stock of the ISO 20022 adoption progress amongst Asia-Pacific Securities Market Infrastructures (APAC SMIs) from 2010 to 2018 and to highlight what are the growth and implementation trends, the key drivers, costs and benefits and what the future developments are. The target audience is market infrastructures, custodians, brokers, asset managers, banks and vendors in Asia-Pacific or globally who are interested in the level of ISO 20022 maturity in the region or are interested in implementing the standard themselves.

The adoption of ISO 20022 around the world continues to grow. This is a trend also seen in Asia-Pacific and the majority of the ISO 20022 initiatives are driven by Market Infrastructures both in the payments and in securities space.

In the securities space, nine years have passed since ISO 20022 standards were first introduced. The early adopter then was the funds industry due to the influence of UCITS[1] and the need for standardised messaging for cross-border funds orders. Funds market infrastructures like the Hong Kong Monetary Authority (HKMA), Korea Securities Depository (KSD) and the Taiwan Depository and Clearing Corporation (TDCC) embarked on the journey to implement the new standard for connecting to (I)CSDs, transfer agents and global fund platforms like Euroclear's FundSettle and Clearstream's Vestima.

Since then, the ISO 20022 tide has grown from strength to strength with the pan-European settlement platform Target2Securities (T2S) and its European CSD participants embracing the flexible messaging standard as well as large CSDs like DTCC in the US. Currently, there are 27 securities market infrastructures (SMIs) live on ISO 20022 with 9 of them being in Asia-Pacific. There are 4 upcoming ISO 20022 SMI initiatives in the next 3-5 years with the Indonesia CSD, PT Kustodian Sentral Efek Indonesia (KSEI), Bank of Thailand (BOT), Hong Kong Exchanges and Clearing (HKEX) and the Australian Securities Exchange (ASX) planning to go-live. Table 1 below summarises the timing, coverage and adoption approach of the Asia-Pacific Securities Market Infrastructures (SMIs) that have or are planning to implement ISO 20022.

Questionnaire of Asia-Pacific Securities Market Infrastructures (APAC SMIs)

SWIFT conducted a questionnaire of equities and fixed income CSDs, exchanges and funds hubs around the region in August-September 2018 to get better insight into the experiences with the global standard. In total, eight SMIs responded on a series of questions around ISO 20022 adoption costs and benefits, implementation models, adoption drivers and future developments beyond messaging. The questionnaire results are presented in the paper to highlight the APAC SMI ISO 20022 adoption trends.

N.B. This questionnaire is unrelated to SWIFT's ISO 20022 Migration Study survey which was conducted in April 2018.

SMI	Business area coverage	Year of adoption	No. of ISO business areas	ISO Business areas	No. of unique ISO messages	Adoption
SGX	Settlement and reconciliation including earmarking, Payments	2016	5	sese, semt, pain, camt, admi	29	Phased adoption
	Corporate Actions	2014	1	seev	2	Co-existence
JASDEC	Pre-Settlement Matching System and Book-entry Transfer System	2014	6	sese, semt, setr, admi, camt, pacs	32	Co-existence
TSE	Corporate Actions	2014	1	seev	2	Optional new service
BOJ	Settlement and reconciliation	2015	1	sese	2	Big Bang
ASX	Clearing and Settlement, TPC, Collateral Management, ETC, Holder Management, Holding Movement, mFund, Miscellaneous, Operations Admin, Reporting, RTGS Settlement, Stock Lending, Take Over	2021 (planned)	11	setr, secl, sese, semt, seev, colr, acmt, reda, camt, admi, auth	78	Big Bang (planned)
	Corporate Actions	2014	1	seev	2	Phased migration
HKEX	Settlement	TBC	11		~80	TBC
	Corporate Actions	2019	1	seev	2	TBC
KSD	Funds	2012	2	setr, semt	13	Optional new service
HKMA	Corporate Actions	2016	1	seev	2	Phased migration
	Funds	2010	1	setr	7	Optional new service
TDCC	Corporate Actions	2018	1	seev	2	
	Funds	2012	1	setr	-	Optional new service
IDX	Corporate Actions	2015	1	seev	1	Phased migration
KSEI	Settlement and reconciliation	TBC	TBC	TBC	TBC	TBC
	Corporate Action	2021	1	seev	TBC	Phased migration
BOT	FI Settlement	TBC	TBC	TBC	TBC	TBC
TSD	Corporate Action, PSMS, OTC bond settlement	2022	TBC	TBC	TBC	TBC
TSD	Funds	2019 (planned)	1	setr	TBC	TBC

Table 1 - Summary of Asia-Pacific Securities Market Infrastructures Initiatives
Source: ISO 20022 Adoption report at www.iso20022.org and individual SMI sources

[1] Undertakings for Collective Investment in Transferable Securities

ISO 20022 adoption growth amongst Asia-Pacific Securities Market Infrastructures 2010-2018

ISO 20022 messaging volumes have been slow to ramp-up since the initial implementation by early-adopters. This describes Figure 1, as per on the right, page 4. Using SWIFTNet InterAct traffic[2] volumes as an indicator, growth in the take-up of ISO 20022 amongst Central Securities Depositories (CSDs), Central Clearing Counterparties (CCPs), exchanges and funds platforms have been mostly flat for the first 2-3 years since 2010. Annual volumes globally were 105.2 million messages in 2010 with a modest 2000 messages for Asia-Pacific. With the introduction of Target-2-Securities (T2S) in 2015, global and especially European ISO 20022 traffic has shot up to almost 2 billion messages annually in 2017. This represents a compound annual growth rate of 47% over the last 7 years.

Comparatively, the relative growth might look smaller but the 2017 annual volumes of 27.1 million messages actually translates to a higher compound annual growth rate (CAGR) of 286% because of the lower initial adoption figures. APAC, however still only comprises 1.8% of global SMI volumes and has much room to grow compared to the other regions.

Focusing on the Asia-Pacific bi-annual ISO 20022 messaging volume trend from June 2010 to June 2018 using SWIFTNet data, the uptick in growth in the last 4 years is more evident (Figure 2). In contrast to the low funds volumes in early 2010s, post-trade settlements and reconciliations have contributed significantly to the growth in ISO 20022 Asia-Pacific Securities Market Infrastructures volumes. With the implementation of ISO 20022 for post-trade for Asia-Pacific Securities Market Infrastructures like JASDEC and SGX from 2014, messaging volumes have now reached 21.4 million messages for the first half of 2018. Majority of those volumes is made up of settlement and reconciliation messages.

[2] Live traffic, excluding NACKED messages and excluding CREST
Source: SWIFT BI Watch

Figure 1 - Global versus Asia-Pacific SMI ISO 20022 annual messaging volumes from 2010 to 2017

CAGR Global 2010 – 2017: 47%
CAGR APAC 2010 – 2017: 286%

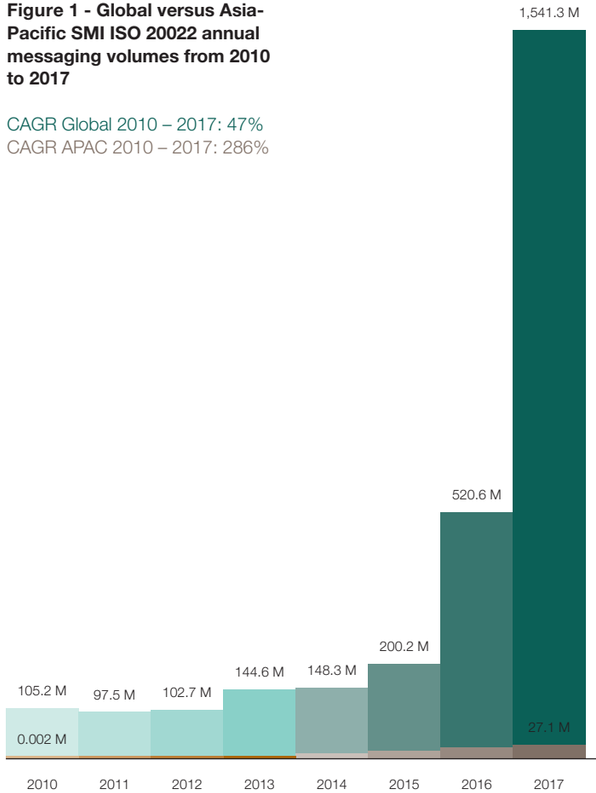


Figure 2 - Asia-Pacific SMI ISO 20022 bi-annual messaging volumes from June 2010 to June 2018

2010
HKMA goes live on ISO 20022 for funds

2012
KSD goes live on ISO 20022 for funds

2014
JASDEC goes live on ISO 20022 for BETS and PSMS

2017
SGX goes live on ISO 20022 for their post-trade system (PTS) refresh

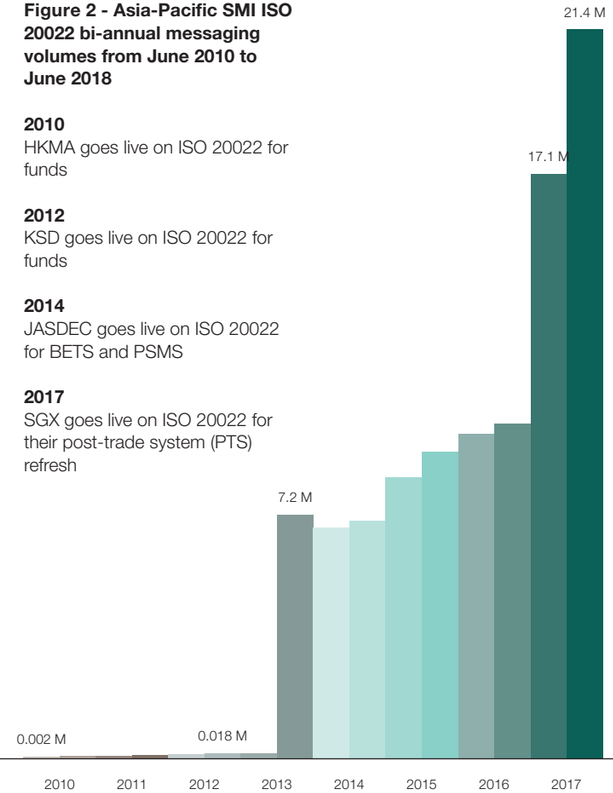
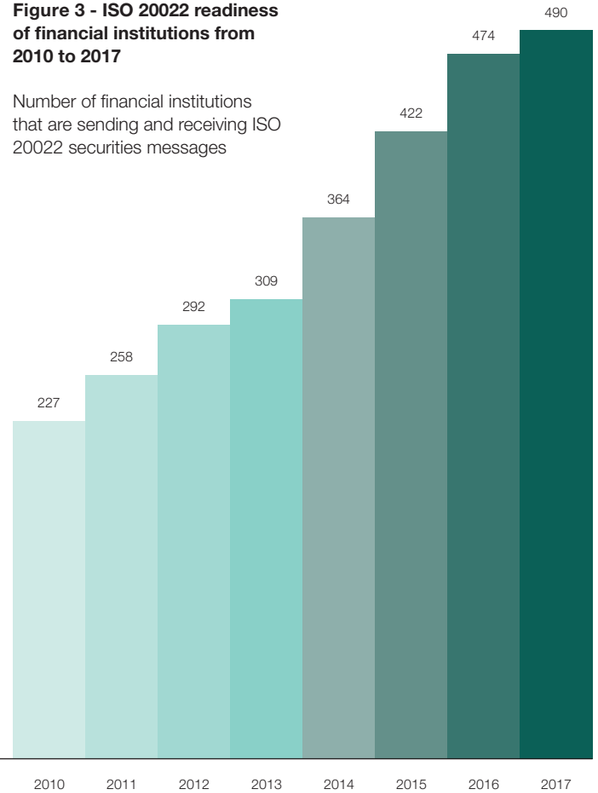


Figure 3 - ISO 20022 readiness of financial institutions from 2010 to 2017

Number of financial institutions that are sending and receiving ISO 20022 securities messages

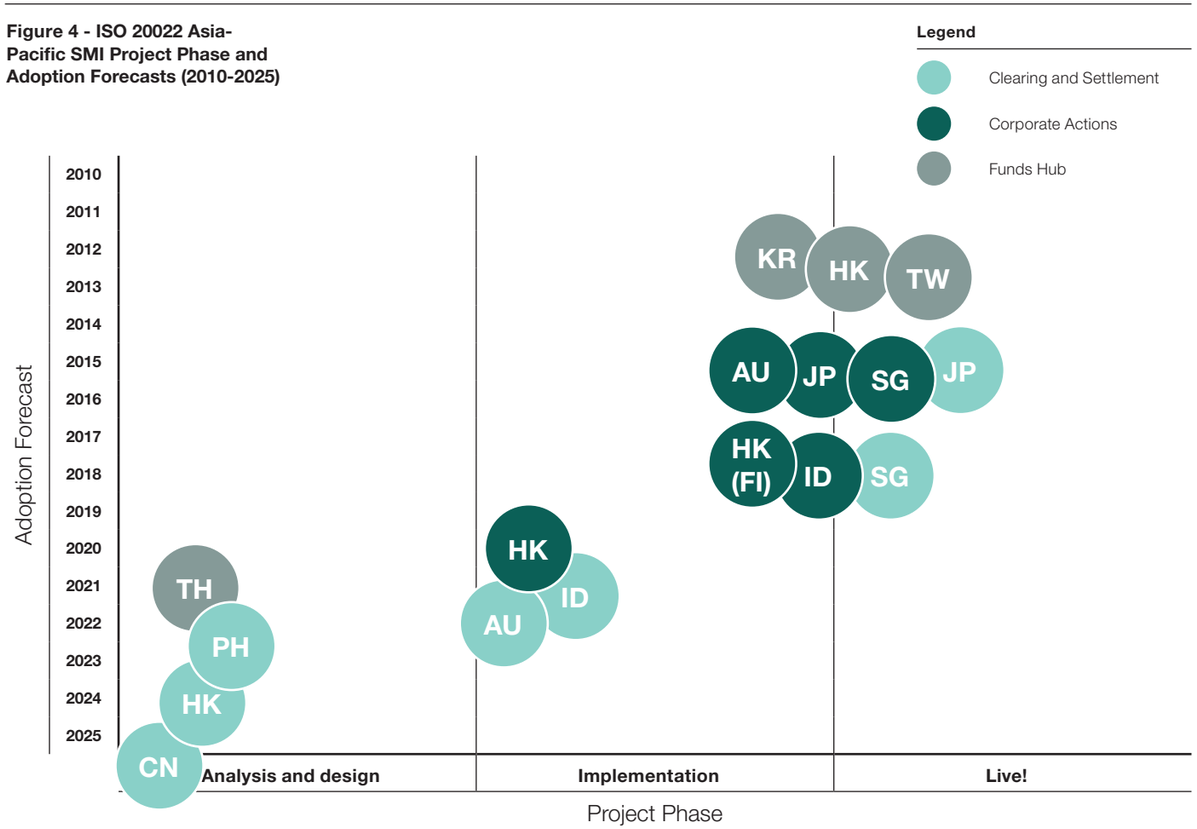


One important indicator which underlines the upward trend in ISO 20022 messaging volumes both in Asia-Pacific and globally is the readiness of financial institutions to send and receive ISO 20022 securities transactions[3]. As seen from Figure 3 below, the level of ISO 20022-readiness has doubled from 2010 to 2017. There are now 490 financial institutions[4] exchanging ISO 20022 securities messages. As more banks, custodians, funds players and asset managers upgrade their infrastructure and systems to the new standard globally, this trend should have a flow-on effect to Asia-Pacific. Having invested in the standard, global banks will want to leverage on that investment and standardise their means of financial communications as much as possible in other regions as well.

[3] Securities events (seev), securities management (semt), securities trade (setr) and securities settlement (sese)
[4] Financial institutions counted were Bank, Bank Owned, Broker/Dealer, Custodian, Funds Player, Independent, Insurance Owned, Investment Manager, Pension Funds, Transfer Agent/Fund Administrator

ISO 20022 adoption trends by Asia-Pacific Securities Market Infrastructures

Figure 4 - ISO 20022 Asia-Pacific SMI Project Phase and Adoption Forecasts (2010-2025)



Fragmentation has been more characteristic of Asia-Pacific's ISO 20022 adoption journey as compared to Europe. With Target2Securities (T2S) as the common denominating driver, Europe's adoption of ISO 20022 has been fairly coordinated and cohesive. Moving from proprietary formats and files to the flexible standard has also been a common theme in Asia-Pacific instead of moving from MT or ISO 15022 to ISO 20022.

In fact, most market infrastructures that are on MT/ISO 15022 like the Thailand Securities Depository (TSD), New Zealand Securities Exchange (NZX), LankaSecure, Monetary Authority of Singapore (MAS-SGS) and Hong Kong Monetary Authority (HKMA CMU) are still using the standard. This is partly due to the fact that some of these SMIs have not yet gone through major post-trade and technology system refreshes but also because the ISO 15022 standard meets their existing business needs.

For the market infrastructures that have implemented ISO 20022, the funds hubs like HKMA, KSD and TDCC were the early-adopters and were influenced by the European UCITS initiative and the SWIFT for Funds adoption. Securities exchanges followed next with Corporate Actions (CA) initiatives whereby the drivers for adoption were to achieve automated straight-through processing, golden source structured information from issuers, enriched data, real-time message delivery and to reduce manual processes. New CA services like SGXNews, ASX's ReferencePoint and TSE/JASDEC's Tokyo Market Information CA services were all launched in 2014. This was after DTCC had gone-live with their Corporate Actions Transformation Initiative and implementation of ISO 20022 with similar drivers. See timeline below in Figure 5 showing the Asia-Pacific adoption for market infrastructures.

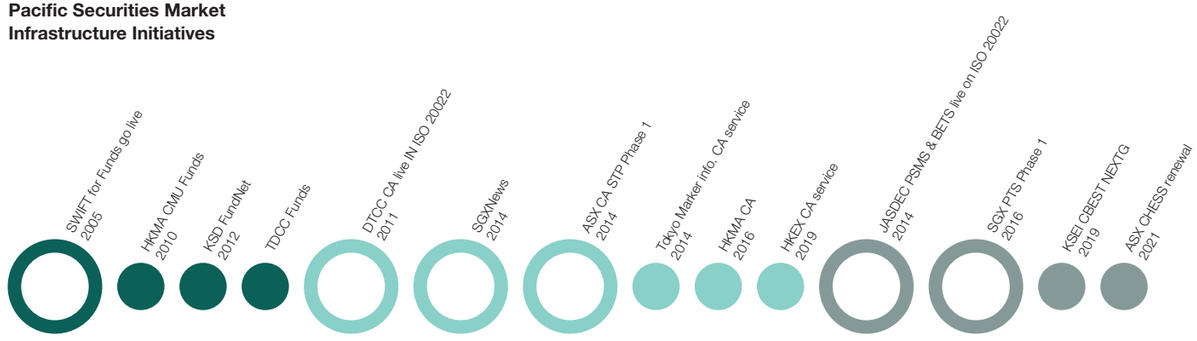
Both SGX and ASX have adopted the Issuer-to-Investor model where issuers fill up standardised announcement templates, which are delivered in ISO 20022 format messages to custodians and brokers. ASX's Corporate Actions STP phase 2 is expected to go-live in 2020. The Indonesia Stock Exchange (IDX) and HKMA have also implemented ISO 20022 for their CA services in 2015/2016. In implementation currently, the HKEX will also be launching an ISO 20022 CA announcements service in 2019.

With post-trade technology refreshes and system replacements as drivers, CSDs have also started adopting ISO 20022 in the clearing and settlement (C&S) space to future-proof their systems and to harmonise their markets with global standards and market practices. The first Asia-Pacific central securities depository (CSD) to do so was the Japan Securities Depository Center Inc. (JASDEC) in 2014. Increasing their international competitiveness, rationalising multiple proprietary formats across different business lines and enriching their service functionality were some of their key motivations for migrating to ISO 20022. SGX followed shortly in 2016 with their post-trade system refresh (Phase 1) on ISO 20022; they went live with Phase 2 in Dec 2018. Their reasons for selecting the standard include, to provide flexibility to participants' in terms of their choice of back-office systems with APIs and to adopt international standards and best practices. Enhancing the attractiveness ofthe local market for international brokers and custodians and facilitating greater STP were also considerations for implementing ISO 20022.

In the implementation pipeline, TSD, KSEI and ASX should be the next CSDs to embrace ISO 20022 for their post trade processes. KSEI's CBEST Next-G system is planned to cater for ISO 20022 international standards. ASX have also announced their implementation timeline for their CHESS replacement project targeted for 2021 which is a DLT-based system with the adoption of ISO 20022 global standards. Facilitation of future interoperability, greater innovation and flexibility in delivery of new services and cost reduction for participants were the main impetuses for ASX to adopt ISO 20022 and the new DLT technology.

Multiple CSDs, CCPs and exchanges are also currently undertaking analysis and high-level impact assessments on potential ISO 20022 implementations for Corporate Actions, settlement and collateral management. These include SMIs from India, China, Hong Kong, Thailand, and the Philippines. As more and more of their participants and counterparties implement the standard, there is increasing justification to align not only with other global platforms but also to those closer in the region. Figure 4 gives an overview of Asia-Pacific Securities Market Infrastructures ISO 20022 initiatives across the different phases of analysis to live.

Figure 5 - Timeline of Asia-Pacific Securities Market Infrastructure Initiatives



ISO 20022 migration and translation models adopted by Asia-Pacific Securities Market Infrastructures

Implementation and migration strategies are increasingly being looked at by Asia-Pacific SMIs to manage their community's transition to the new standard as ISO 20022 adoption matures.

In the questionnaire that SWIFT conducted amongst Asia-Pacific Securities Market Infrastructures, participant/community costs were ranked as one of the biggest costs in an ISO 20022 initiative. Being able to plan the timing, impact and onboarding of their participants through appropriate migration models is one way of managing such costs. This reflects Figure 6's information, as per on the right, also shows that 62.5% of the questionnaire respondents reported that the phased migration model was or will be their expected plan to migrate to ISO 20022; while 25% of responses said Big Bang was the preferred model. Co-existence with another incumbent standard was the least popular choice with only 12.5% stating that was or is their expected model. This could be due to the fact that co-existence is usually a more costly adoption path for the market infrastructure as they would have to maintain support for two standards over an extended period of time. Co-existence sometimes also disincentivises participants from transitioning in the early phases and can lead to lengthier projects.

For those market infrastructures that have already implemented ISO 20022, Figure 7 shows their chosen migration models.

Figure 6 - SWIFT Asia-Pacific SMI ISO 20022 questionnaire - ISO 20022 migration model

62.5%
Phased migration

25%
Big-bang

12.5%
Co-existence

Figure 7 - Asia-Pacific Securities Market Infrastructures Migration Models

Big Bang

- **ASX:** CHESS replacement (2021)

Phased

- **SGX:** Post trade system (PTS) refresh
- **ASX:** Corporate Action notification
- **IDX:** Corporate Actions messaging
- **KSD:** FundsNet

Co-Existence

- **JASDEC:** PSMS and BETS (5 years)
- **SGX:** Issuer to Investor Corporate announcements

Optional New Service

- **HKMA:** CMU Funds
- **TDCC:** Funds service
- **TSE/JASDEC:** Tokyo Market Information Corporate Action Data Service

Translation could also be a means to help a community transition to ISO 20022, especially if participants have indicated their lack of readiness. Our questionnaire showed that for those SMIs that had adopted ISO 20022, one-third of respondents stated that more than 75% of their community implemented the standard natively in the back-office; the other one-third of respondents said that between 0-25% and 50-75% of their community migrated directly to ISO 20022 (See Figure 8). For SMIs that are looking to adopt ISO 20022, either hosting central translation capabilities or encouraging vendors who provide such integration and translation services could thus be beneficial to their community.

Figure 8 - SWIFT Asia-Pacific SMI ISO 20022 questionnaire – native adoption versus translation

If you have adopted ISO 20022, what proportion of your community adopted the standard natively compared to those who translated?

0 – 25%	17%
25 – 50%	0%
50 – 75%	17%
>75%	33%
Not sure	33%

Drivers for ISO 20022 adoption for Asia-Pacific Securities Market Infrastructures

Figure 9 - SWIFT Asia-Pacific SMI ISO 20022 questionnaire – reasons for considering ISO 20022

Achieve greater STP	100%
Integration options with global vendors	63%
Adopt international standards and best practices	88%
Enriched data requirements	50%
Cost-reduction for global players	50%
Real-time and golden source data from Issuer	25%
Regulatory drivers	25%
Alignment with domestic MI's ISO 20022 plans	25%

ISO 20022 has gained in popularity as a financial messaging standard not only for securities but also for payments due to its robust and flexible business model and machine-readable format. Its ability to capture richer data is also why the financial industry has started to embrace the standard. There are many reasons and drivers why SMIs have or will decide to use ISO 20022.

Our questionnaire tried to capture which reasons were more compelling. Achieving greater straight-through processing (STP) was the top business driver according to SMIs surveyed with all respondents selecting it as the key driver for considering ISO 20022. This was followed by adopting international standards and best practices (88%) and introducing more integration options with global vendors (63%). Half of the respondents also selected enriched data requirements and cost-reduction for global players as the reasons why they will or have already chosen ISO 20022 for their systems.

Opening up the market to foreign players and vendors and enabling easier access through international standards and global vendor options seems to be a prevalent theme for adoption motivations. Automation is also a key factor especially for financial markets where manual, paper-based processes have resulted in expensive, costly exceptions and reconciliations. This becomes increasingly pertinent as the number of trades and settlements increases in the growing Asia-Pacific economies. Data quality enhancement was also an impetus for SMIs in the region to implement ISO 20022 for their initiatives. Real-time corporate actions announcements services by SGX, TSE/JASDEC, ASX and HKEX (upcoming) are evidence of this.

Costs and benefits of ISO 20022 adoption by Asia-Pacific Securities Market Infrastructures

Projects are usually defined by their business case and ISO 20022 initiatives are no different. Large-scale technology transformations like post-trade system refreshes are particularly complex and cost-sensitive. SWIFT surveyed SMIs in Asia-Pacific about how their business cases transpired and if their cost-benefit analysis was positive for their ISO 20022 projects. Eighty-percent of respondents said it was positive with twenty-percent answering in the negative.

Respondents were also asked what were the main benefits that they experienced with adopting ISO 20022; and additionally to rank their main costs of their initiatives.

Figure 10 - SWIFT Asia-Pacific SMI ISO 20022 questionnaire – cost-benefit analysis

	Yes	No
Was the cost-benefit analysis for your ISO 20022 migration positive?	80%	20%

Figure 11 - SWIFT Asia-Pacific SMI ISO 20022 questionnaire – main benefits and cost ranking

Main benefits	STP
	Increase operational efficiency
	Reduced risk and cost
	Better structured data elements and standards
	Better understanding of the schemas by end-users
	improved system development and test efficiency
Costs (ranked largest to smallest)	Participant / community costs
	Mapping and analysis from proprietary formats
	system upgrades
	Technical integration
	Training and education

Lessons learnt from past projects

There are different contributing ingredients in the recipe of ISO 20022 and these can be seen in past projects such as Target2Securities (T2S) in Europe, JASDEC in Japan, ASX in Australia and SGX in Singapore. Many of these ingredients involve community engagement activities.

For many ISO 20022 adoption initiatives, the market infrastructure begins by conducting a full review of its As-Is state with an open mind to assess what needs to be done to reach their desired goals or the To-Be state. From past ISO 20022 implementation projects, it has also proven to be useful for the market infrastructure to participate to industry working groups such as ISO 20022 technical committees for involvement in the ISO 20022 governance process, voice its requirements and contribute to the enhancement in the standard or messages.

To date, the ISO 20022 catalogue of messages includes over 400 base messages across all the different business areas. In addition to the base ISO 20022 messages, market practices define how the standard and messages are used to meet specific business needs. In order to achieve straight-through-processing and efficiency, there is a need for consistent and harmonised usage of the messages. As a result, a number of established global, regional and local market practice groups such as the Securities Market Practice Group (SMPG), the Payments Market Practice Group (PMPG), local national market practice groups (NMPGs) have helped define and document such market practices. Besides standardisation with international best practices, such established and well-documented market practices also make it easier when a market infrastructure or financial institution wants to implement ISO 20022 as a source of reference and eliminate the need to reinvent the wheel.

Community tools such as MyStandards[5] have also been utilised by many SMIs. Such tools help SMIs to update and manage their specifications over time and publisthem in a variety of formats to their participants to suit different audiences, from business analysts to engineers. Some of these applications also include reusable, customisable mapping logic as ‘Base Libraries’ which contain pre-populated schema libraries for all ISO 20022 messages. Usage of community onboarding and mapping tools can significantly reduce implementation costs and effort and drives community-wide harmonisation.

SWIFT plays an active role in supporting community wide management of ISO 20022 – one important responsibility is handling the yearly standards release maintenance process. In past implementation projects, where specific SMI requirements are not supported by the existing base ISO 20022 messages, the SMI can raise change requests to enhance the ISO 20022 messages and build for their needs.

Last but not least, from past implementation projects, another factor to be considered in the implementation of ISO 20022 is to have a clear adoption strategy. For example, to impose a deadline for the community to move to to the new standard. Figure 12 shows a summary of the best practices or factors from some of the past ISO 20022 adoption projects of Securities Market Infrastructures in Asia-Pacific.

[5] MyStandards is a collaborative web platform developed by SWIFT that helps customers manage global financial messaging standards and ensures that their internal specifications and guidelines are in line with market practice. It is used to create, maintain, document, publish, share, compare and consume ISO 20022 with their participants.

Figure 12 - Best practices for Asia-Pacific Securities Market Infrastructures ISO 20022 implementations

Best Practices	JASDEC	SGX	TARGET2-SECURITIES	ASX
Full review of current state with an open mind on what needs to be done and spent to reach goals	Yes	Yes	Yes	Yes
ISO 20022 registration authority (SWIFT) involvement from the start of the project	Yes	Yes	Yes	Yes
Early involvement in the ISO 20022 governance process to raise awareness and own the standard, not just use it.	Yes	Yes	Yes	Yes
Local and global community engagement	Yes	Yes	Yes	Yes
MyStandards	Yes	Yes	Yes	Yes
Raise change requests to evolve the ISO standard to match legitimate local needs	Yes	No	Yes	Yes
Adapt local practices to international ones as much as possible	Yes	Yes	Yes	No
Imposed deadline for migration	Yes	Yes	Yes	Yes

ISO 20022 beyond messaging amongst Asia-Pacific Securities Market Infrastructures

ISO 20022 messaging has now become a more common standard for financial transactions. In the last few years, ISO 20022 as a business model has also started to be investigated for other types of automation approaches and technologies like Distributed Ledger Technology (DLT) and Application Programming Interfaces (APIs). Three-quarters of our questionnaire's respondents said that they were investigating the usage of such technologies with just over half of those, stated that they are looking at ISO 20022 as a business model.

Some of the reasons stated were because ISO 20022 was a good business model, it was able to streamline siloed data and enabled easier mapping across different data elements. Facilitating alternate connectivity options via messaging [in DLT-based systems] was also noted down as a criteria and this can be observed in multiple DLT proof-of-concepts run by the CSD DLT working group, SWIFT and also by ASX's CHESS replacement system.

The next few sections take you through in more detail why ISO 20022 is being re-used beyond messaging.

Figure 13 - SWIFT Asia-Pacific SMI ISO 20022 questionnaire – blockchain or API investigation and ISO 20022

	Yes	No
Is your SMI currently investigating the usage of blockchain or APIs?	75%	25%

	Yes	No
If yes, are you also looking at ISO 20022 as a business model for those applications?	57%	43

Introduction – ISO 20022 reuse for new technologies
For decades, financial industry automation has been based on the exchange of structured financial messages. Messaging systems require consistent definitions of processes and data, and today, securities operations processing runs on a variety of open and proprietary business standards that evolved to meet this need.

This picture is changing rapidly however, as new automation approaches such as Distributed Ledger Technology (DLT) have emerged to challenge existing paradigms. Driven by regulation and competitive forces, more mature technology, including Application Programming Interfaces (APIs), are being widely deployed in the financial services industry. In the near future, we can look forward to business processes that span multiple automation mechanisms in which different steps in the value chain are realised using different technologies.

This interlinking allows appropriate technology to be chosen for each process step, but it brings the risk that data will be truncated, misinterpreted or corrupted in the end-to-end process if care is not taken to ensure overall consistency. Moreover, without some organising principle, the rapid proliferation of new technology solutions in the market risks creating a jumble of competing specifications and interfaces and an avoidable legacy of cost and complexity for the industry.

What is missing today is a concerted attempt to apply existing financial business standards like ISO 20022 to these existing toolsets. Much of the required content already exists. There are plentiful reference data standards for common identifiers, and ISO 20022 includes semantic and transaction definitions covering business processes as diverse as foreign exchange, securities lending, repo transactions, collateral management, securities settlement, asset reconciliation, trade finance, regulatory reporting, and more.

Work is ongoing on the logical layer of ISO 20022 standards that define logical message definitions and the technical layer that defines physical syntax to ideally produce outputs in any required format (Figure 14). For example, while the ISO 20022 data models were created based on a messaging paradigm, they need to expand to include concepts from DLT technology such as read and write permissions.

The high level recommendation is as follows. Since ISO 20022 is already established as a common business language for the financial world with market infrastructures adopting the standard widely as part of renewals, it is well placed to unify at a business dictionary level these messaging based technologies with newer different FinTech implementations such as Distributed Ledger Technologies (DLT) and Application Programming Interfaces (APIs). This way there will be alignment between the concepts exchanged, no matter the chosen technology. For example, a securities trade might be initiated using an API, logged in a DLT, and confirmations could be sent using messages – all re-using the same ISO 20022 business definitions. This reusability, independent of technology, is the true power of ISO 20022.

Figure 14 - Re-use of ISO 20022 business definitions for Distributed Ledger Technology (DLT)

ISO 20022 as a messaging standard The logical message layer references the business layer for semantic definitions	**Business / Conceptual**	Defines financial concepts, e.g., 'Credit Transfer' and business processes
	Logical	Defines e.g. credit transfer messages, to serve the business process
	Physical	Defines physical syntax, e.g. XML
Standards for DLT The logical DLT implementation re-uses business concepts to ensure interoperability with messaging	**Business / Conceptual**	Defines financial concepts, e.g., 'Credit Transfer' and business processess
	Logical	A 'logical' implementation - defines data and behaviour based on new paradigm assumptions
	Physical	A physical implementation using e.g. hyperledger, Ethereum

Application Programming Interfaces (APIs)
Interest in Application Programming Interfaces is increasing due to their importance in 'Open Banking' regulatory initiatives across the world, including in APAC.
Open Banking refers to the convergence of technology and regulation that will make the financial industry more open and more competitive. It is a trend best exemplified today by initiatives in Europe and the UK. API standardisation is important if open banking initiatives are to deliver on their promise of improved efficiency and fair competition. Without it, each bank must design its own implementation, leading to a great burden of complexity and risk. The overall recommendation is to re-purpose existing ISO 20022 components where possible and extend the methodology where necessary.

While general interest is increasing, in the SMI space there is currently less a regulatory push towards adoption of APIs. However some SMIs already adopt APIs. Two examples for Asia-Pacific: the Korean Securities Depository (KSD) uses APIs for securities information provision services, and the Singapore Securities Exchange (SGX) uses APIs for account information management and allocations.

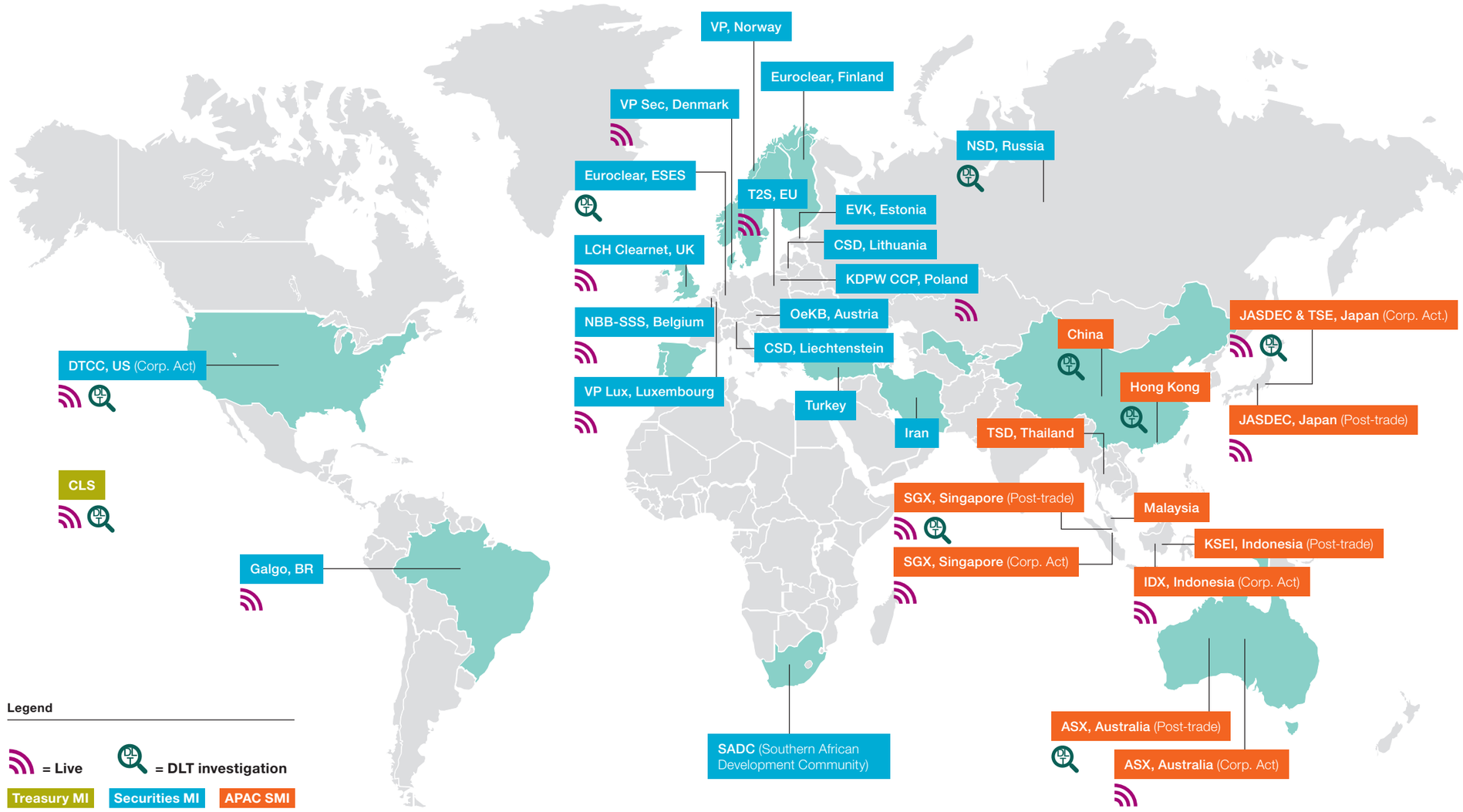
Distributed Ledger Technology (DLT)
Several securities MIs across Asia-Pacific are looking into DLT. In many cases, these are proof-of-concepts (POCs), for example SGX looking at DLT to make the trading and settlement of fixed-income trading cycle more efficient. When it comes to tangible, live implementations, ASX is the most advanced in its implementation, positioning DLT for its CHESS replacement. ISO 20022 messaging is available as an alternative access method.

As DLT matures, it is becoming clear that the likelihood of a DLT platform replacing a significant business process end-to-end in one step is not high. Rather it seems increasingly likely that DLT will take its place amongst other automation technology, including messaging and APIs.

As is becoming apparent, some of the first live implementations to reach industrial scale will offer system access to all but the largest participants using ISO 20022 messages. It's also clear that DLT will not replace the institution's back-office systems, but will integrate with existing back-office technology using APIs.

This has a couple of implications for the use of standards. The first is that much of the material in the previous section applies equally to DLT implementations, because many users will interact with DLT via APIs or messages. The second is that for those users that operate DLT nodes and interact with the shared ledger data directly, use of business definitions derived from ISO 20022 will facilitate interactions with internal systems and with other players.

Figure 15 - Asia-Pacific SMI ISO 20022 adoption and DLT investigation



Conclusion and future landscape

With almost ten Asia-Pacific Securities Market Infrastructures already live on ISO 20022, and with at least four more in the pipeline, the standard looks to have arrived in the region. As more CSDs adopt it for their post-trade settlement and reconciliation processes, ISO 20022 volumes are also expected to grow in the region. This is bolstered by the fact that the ISO 20022-readiness for securities transactions has now reached a high of almost 500 financial institutions[6].

As the ISO 20022 Registration Authority (RA) as well as a global network facilitating ISO 20022 transactions, SWIFT has been involved with the standard since the inception. From the initial development of the messages, to its current re-use in terms of business definitions for new technologies, it is rewarding to see the standard mature and be implemented not only in Europe but also in Asia-Pacific.

At a ground level, the national securities market practice groups (SMPGs) and the SMI ISO 20022 working groups in the region have also contributed to the evolution of the standard through their business requirements and change requests.

The SMI respondents of our questionnaire have also answered in the positive regarding whether ISO 20022 will be the prevalent standard amongst Asia-Pacific SMIs in the next 5-10 years. As one response puts it, “There are a growing number of SMIs adopting ISO 20022 and we believe it will continue to grow.” Perhaps this is a good sign that ISO 20022 will be here to stay.

Figure 16 - SWIFT Asia-Pacific SMI ISO 20022 questionnaire – ISO 20022 as prevalent standard amongst Asia-Pacific SMIs in the future

	Yes	No
Do you think ISO 20022 will be the prevalent standard amongst APAC SMIs in the next 5-10 years?	100%	0%

[6] According to SWIFTNet InterAct statistics of number of unique BIC8s sending and receiving ISO 20022 securities-related transasctions

About SWIFT

SWIFT is a global member owned cooperative and the world's leading provider of secure financial messaging services.

We provide our community with a platform for messaging and standards for communicating, and we offer products and services to facilitate access and integration, identification, analysis and regulatory compliance.

Our messaging platform, products and services connect more than 11,000 banking and securities organisations, market infrastructures and corporate customers in more than 200 countries and territories. While SWIFT does not hold funds or manage accounts on behalf of customers, we enable our global community of users to communicate securely, exchanging standardised financial messages in a reliable way, thereby supporting global and local financial flows, as well as trade and commerce all around the world.

As their trusted provider, we relentlessly pursue operational excellence; we support our community in addressing cyber threats; and we continually seek ways to lower costs, reduce risks and eliminate operational inefficiencies. Our products and services support our community's access and integration, business intelligence, reference data and financial crime compliance needs. SWIFT also brings the financial community together – at global, regional and local levels – to shape market practice, define standards and debate issues of mutual interest or concern.

Headquartered in Belgium, SWIFT's international governance and oversight reinforces the neutral, global character of its cooperative structure. SWIFT's international office network ensures an active presence in all the major global financial centres.

For more information about SWIFT, visit **www.swift.com**.

Contact us

Chermaine Lee
Director, Securities Markets, APAC, SWIFT
+61292258121
chermaine.lee@swift.com

Jean Chong
Senior Manager, Securities Markets, APAC, SWIFT
+65 6347 8034
jean.chong@swift.com

57399 - March 2019