



THE WEAKEST LINK

PLUGGING THE DATA MANAGEMENT GAP
IN CROSS-BORDER TRANSACTIONS

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EXECUTIVE SUMMARY

As the number of global payments (and thus cross-border transactions) continues to surge, so too has global financial messaging traffic. Banks, as the primary facilitators of cross-border transactions, are a critical enabler to this space.

Notwithstanding strong headline growth numbers in cross-border transactions, there are three fundamental issues associated with transaction data management that the financial services industry continues to grapple with, including: (1) market fragmentation due to the lack of an integrated cross-border payment system; (2) legacy IT systems with non-standardised processes and data formats; and (3) increasingly stringent compliance requirements with different messaging protocols / standards across jurisdictions.

These issues lead to a myriad of problems, with a critical implication being a lack of data transparency and visibility. As a result, when there are delays and / or failures in transactions, it is extremely difficult for banks to pinpoint the location of the issue (much less the issue itself), hindering the resolution process. In fact, we estimate that over 1.8 million cross-border transactions suffer from delays, issues, or failures on a daily basis. That translates to the world's banks spending over 19,000 hours daily on addressing these transaction issues, or 4.8 million hours per year.

In Asia, these challenges are exacerbated by the fragmented nature of the market. While financial institutions in Europe and America are supervised under more standardised regulations and have access to pan-regional transaction systems, Asian banks need to work with multiple regulators and localised infrastructure. This creates additional complexities when it comes to implementing processes and developing systems that are aligned with international standards.

These challenges all point towards an urgent need to address the underlying issues in transaction data management: To this end, a well-established transaction data management infrastructure, coupled with targeted process optimisation, is key to enhancing operational efficiency within the cross-border transaction space. We see the opportunity for the industry to reduce transaction issue rates by 72% and issue resolution times by 32%, translating to a total time saving of 4 million hours per year (or an 81% reduction in time wastage) in addressing cross-border transaction issues.

As global transactions continue to grow, both in terms of volume and complexity, data needs will inevitably increase in tandem. Now, there is no time to waste. For financial institutions that are struggling to keep up with data management requirements, it is time to address the weakest link.

SECTION 1

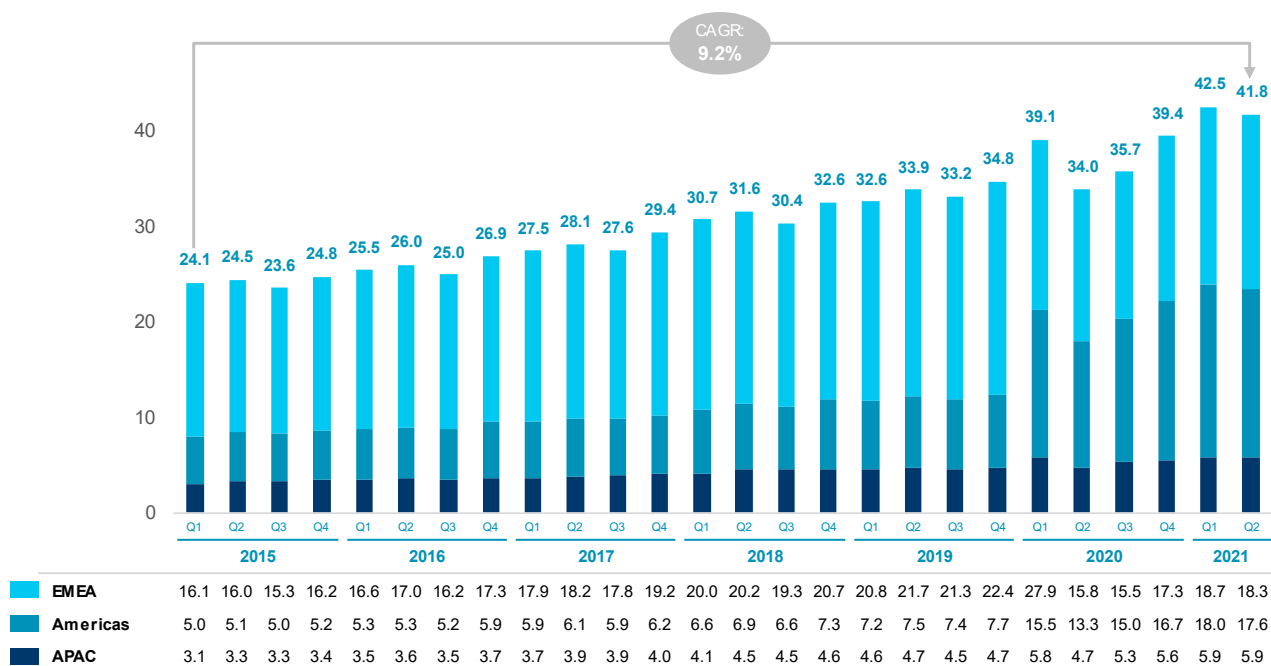
INDUSTRY GROWTH

GLOBAL TRANSACTIONS

Underpinned by decades of economic growth, the management and reconciliation of financial messaging of transaction data has been instrumental to the success of trade-oriented businesses worldwide. Whether looking at the number of trades executed in the financial services industry or payments for physical goods on e-commerce platforms, the data and messaging associated with this activity has continued to increase at an explosive rate.

Over the past 6.5 years alone, the SWIFTNet FIN messaging traffic has grown by a CAGR of 9.2% to reach 41.8 million daily messages in Q2 2021, up from 24.1 million daily messages in Q1 2015 (see Figure 1). Much of this has been driven by activity in the Americas and Asia Pacific, where messaging traffic has increased by a CAGR of 22.4%¹ and 10.9% respectively.

FIGURE 1: SWIFTNet FIN MESSAGING TRAFFIC (million)



Source: SWIFT, Quinlan & Associates analysis

Asia Pacific, in particular, has become an increasingly important region on the global stage, with mature markets (such as China, Japan, and Korea) continuing to expand their

economic and political influence, and developing markets (especially ASEAN) becoming more active in the global trade arena.

¹ Note that SWIFT re-categorised Americas to Americas and UK in January 2020, which may have skewed the growth rate of the Americas region

Within the financial services space, strong growth in the Asian population, coupled with rising wealth and financial sophistication, has spurred increased demand for wealth / asset management products. As a result, financial institutions have increasingly been adding to – and customising – their financial offerings for retail, corporate, and institutional clients. Asia is expected to experience the fastest growth in the number of ultra-high net worth individuals (“UHNWI”) over the next five years at 39%, relative to the global average of 27%,² which will continue to drive growth in transaction volumes.

On the physical trade front, China has served as the “world’s factory” for the last twenty years, producing most of the globe’s consumable goods. As the Chinese economy continues to evolve and shift its focus towards tertiary industries, businesses are seeking to relocate their manufacturing operations to ASEAN markets, such as Vietnam, Indonesia, Malaysia, and Thailand, increasing the volume of cross-border transactions to and from this region.

With rapid growth in both financial and physical trades expected to continue, financial institutions in Asia have to prepare their systems and processes for handling and managing an even larger volume of transaction data.

ASIA PACIFIC HAS BECOME AN INCREASINGLY IMPORTANT REGION ON THE GLOBAL STAGE, WITH MATURE MARKETS CONTINUING TO EXPAND THEIR ECONOMIC AND POLITICAL INFLUENCE, AND DEVELOPING MARKETS BECOMING MORE ACTIVE IN THE GLOBAL TRADE ARENA

² Knight Frank, ‘At a glance: Key findings from The Wealth Report 2021’, 1 March 2021, available at: <https://www.knightfrank.com/research/article/2021-03-01-at-a-glance-key-findings-from-the-wealth-report-2021>

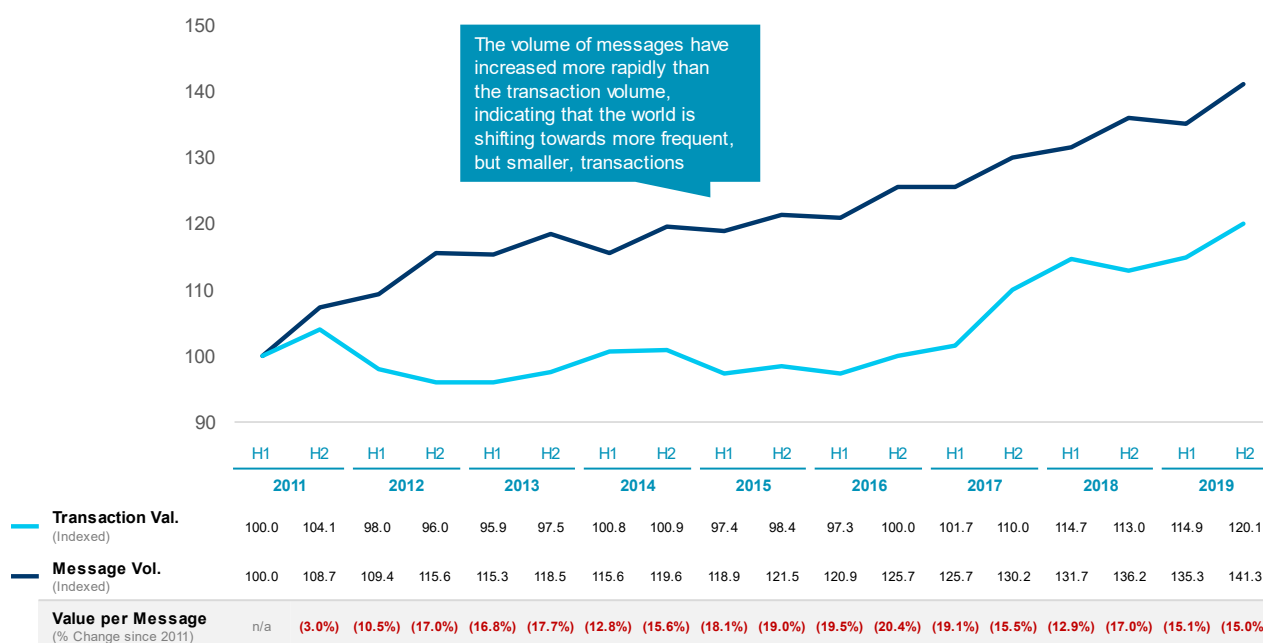
TRANSACTION TRENDS

In addition to broader macroeconomic dynamics, the nature of transactions themselves have continued to change over time. Most notably, transactions have become more frequent and complex, making it increasingly difficult for banks to process.

FREQUENCY

Between 2011 and 2019, the number of transaction messages increased by 33.4%, indicating a greater frequency of transactions (see Figure 2). However, the total value of transaction only increased by 15.1%, lower than the growth in transaction messages.

FIGURE 2: TRANSACTION TRENDS



Source: Bank for International Settlements, SWIFT, National Bank of Belgium, Quinlan & Associates analysis

With message volumes growing at a faster rate than transaction values, the average size of transaction (per message) has been on a declining trend; in short, transactions are becoming faster but smaller, imposing further data requirements on financial institutions.

COMPLEXITY

In addition to the rise in client activity, transaction complexity has also increased over recent years. This is especially obvious in frontier markets, as more sophisticated products developed in mature markets are now being offered in developing markets. This inevitably imposes additional data requirements, forcing frontier financial institutions to implement system upgrades to accommodate new data needs.

SECTION 2

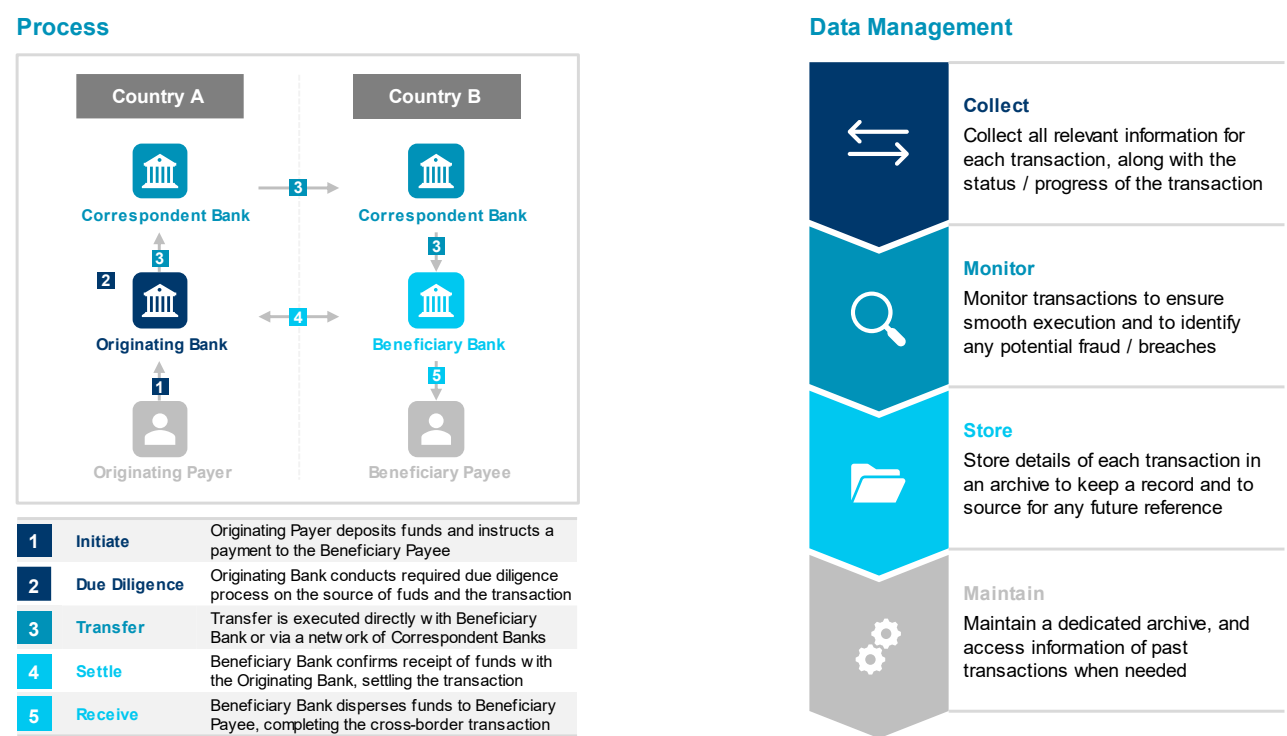
KEY CHALLENGES TO THE MARKETPLACE

FINANCIAL SERVICES INDUSTRY

While businesses rely on local banks for cross-border payments, banks turn to other banks,

through correspondent banking relationships, to execute these transactions (see Figure 3). The same process is also used for cross-border trading of financial instruments.

FIGURE 3: TRANSACTION MANAGEMENT



Source: Quinlan & Associates analysis

PROCESS

To initiate a transaction, the originating payer deposits the relevant funds at their bank (the originating bank) and provides instructions for the payment. The originating bank then conducts relevant due diligence, including know-your-customer (“KYC”), anti-money laundering (“AML”), and counter-financing of terrorism (“CFT”) checks, to ensure compliance with relevant authorities and regulations.

Depending on the originating bank’s relationships, the transfer may occur directly with the beneficiary bank or via a network of correspondent banks. In short, money moves from bank to bank, across borders, until the beneficiary bank receives the funds.

Upon receipt, the beneficiary bank confirms the delivery of funds with the originating bank, settling the transaction. Subsequently, the beneficiary bank dispenses the money to the beneficiary payee.

DATA MANAGEMENT

Financial institutions exchange multiple messages to communicate relevant requests and information for each trade. Trade data refers to the single piece of data stating only relevant information for the trade itself (including payer, payee, currency, and amount), while transaction data includes trade data and all ancillary information (such as system communication, process requests, settlement notification, etc.).³

Strong growth in both the volume and complexity of transactions has led companies across the world to increasingly turn to technology to manage their transaction data. The data management process can be separated into four key steps, namely: (1) collect, (2) monitor, (3) store, and (4) maintain.

As a transaction passes through a bank, the bank's systems collect relevant information, such as originating payer, beneficiary payee, banks involved, amount and currency of payment, and any additional data required for compliance. While the data is collected, the bank checks if there are any discrepancies or

suspicious information, in which case the transaction is flagged for further review.

The bank continues to monitor the progress of the transaction to identify any delays or issues as soon as they occur. If a problem does occur, the bank deploys relevant staff to address issues and communicate delays to relevant stakeholders, including the originating payer, beneficiary payee, and other intermediary banks involved.

Once the bank finishes processing the transaction, relevant data is cleansed and stored in a dedicated archive. However, because a transaction may be handled by multiple business units, each working with a different system, the data collection and cleansing processes may differ across teams. As a result, the archive may hold duplicate datapoints, with each copy storing different (or even conflicting) information in various formats.

The archive is maintained through regular check-ups and upgrades, to ensure data is safely stored and accessible by relevant parties when required.

STRONG GROWTH IN BOTH THE VOLUME AND COMPLEXITY OF TRANSACTIONS HAS LED COMPANIES TO INCREASINGLY TURN TO TECHNOLOGY TO MANAGE TRANSACTION DATA









³ This report will focus on transaction data as a whole and how demands around this data require change in the technology supporting data management

ISSUES IN TRANSACTION DATA MGMT.

With continuous growth in the space, management of transaction data has become critical for the success of many businesses. However, never before have markets faced so many issues in data management technology

(see Figure 4). These issues are not only driven by the fragmented nature of the market but are also caused by failures in systems and communications. In addition, these systems are being stressed even further as regulators increase requirements and accountability for greater transparency of all transaction data.

FIGURE 4: CORE ISSUES

		Limited Service Access	Lower Speed	Higher Cost	Lack of Data Transparency	Operational Complexity
Market Fragmentation	 Limited Cross-Border Systems Limited coverage of crossborder payment systems to facilitate international transactions	✓				
	 Multiple Intermediaries Reliance on networks of correspondent banks, resulting in long transaction chains		✓	✓	✓	✓
	 Non-Transparent Routing Transaction routing determined not by originating bank, but by correspondent banks along the transaction				✓	
IT Systems	 Legacy Systems Continued reliance on legacy systems, which lack certain functions and capacity to manage transactions		✓		✓	✓
	 Non-Standardised Processes Implementation of different systems and protocols, both within and across banks				✓	✓
	 Data Formats Lack of standardisation for data and communications within banks and across banking relationships				✓	
Compliance	 Weak Competition High barriers to entry, hindering the development of alternatives / substitutes for incumbent systems	✓				
	 Compliance Process Increasingly stringent compliance requirements, with differing standards across jurisdictions		✓			✓

✓ Key Implications

Source: Bank of International Settlements, Quinlan & Associates analysis

MARKET FRAGMENTATION

Due to the fragmented nature of markets and jurisdictions, there are only a few cross-border – single currency or multicurrency – payment systems across the world. Indeed, as of Q1 2020, there were only 10 cross-border payment systems in operations.⁴ Without “official” payments systems implemented by central banks and / or regulators, financial institutions need to rely on correspondent banking relationships to execute cross-border transactions.

As a result, a single transaction is broken down into multiple sub-transactions to be processed by various banks. This creates a long transaction chain and increases operational complexity. A key challenge is that the transaction route is not determined by the originating bank at initiation; instead, each bank within the transaction chain chooses its preferred route. As a result, the exact location of the funds / payments may not be visible to the originating and beneficiary banks (and therefore the originating payer and beneficiary payee).

IT SYSTEMS

Banks are notorious for operating complex IT environments composed of multiple systems, patched together to achieve minimal operational requirements. The non-standardised processes within a bank creates latency when transferring data across business units. Oftentimes, additional manpower is required to align information across systems. Moreover, the lack of standardisation across data adds on to the complexity in cross-border transactions, which affects the transparency of the process chain.

In addition, many financial institutions face complications due to the limitations of legacy systems. These applications often lack certain functions and the capacity required to efficiently manage, monitor, and maintain transactions. The industry also imposes a high barrier to entry, hindering the development of alternatives / substitutes for incumbent systems, forcing financial institutions to manually aggregate and translate data of different protocols prior to analysis. These frictions, generated from fragmented data and legacy infrastructure, hinder the efficiency in handling transactions, exposing counterparties to greater settlement risk. They also expose correspondent banks to reputational risks, especially given heightened demand for transparency in the cross-border payments space.

⁴ Bank for International Settlements, 'Payments without borders', 1 March 2020, available at: https://www.bis.org/publ/qtrpdf/r_qt2003h.htm

COMPLIANCE

Owing to the multijurisdictional nature of cross-border transactions, banks are required to add layers of standards, adopt complex frameworks, and enhance their supervision processes. Payment infrastructure providers across the world are constantly updating their standards and procedures to comply with evolving regulations. An example is the establishment and adoption of the ISO 20022 standard. During the transitional period to this higher standard, institutions are suffering from higher operational complexity and lower speeds for transaction processing.

Another major consequence of heightening regulatory requirements is the trend of offboarding. For example, in Europe, correspondent banks have revised their risk appetite to comply with regulatory expectations from the Financial Action Task Force (“FATF”) and the EU AML Authority. As a result, some banks opted to end correspondent banking relationships.⁵ Indeed, the number of correspondent banks fell by 20% between 2011 and 2018.⁶

OPERATIONAL IMPACT

Given these overarching problems in transaction data management, current transaction processes are sub-optimal, resulting in poor service offerings and customer experience.

Most notably, because of the inability to execute transactions (or the costs involved in executing transactions), these services may be restricted to core clients or high-value transactions only. Even for those with access to the service, transactions are slow and costly. Cross-border transactions may take up to five business days to clear, and the overall cost of the transaction may be high and uncertain due to the non-transparent routing.

For banks, transaction data is not transparent, especially after passing instructions to subsequent correspondent banks in the transaction journey. The inability to view fund location and transaction progress is troublesome, especially when there are delays and when customers enquire about the status of payment.

Furthermore, managing non-standardised data is complicated and time-consuming, which can lead to delays when it comes to extracting specific pieces of information for compliance or business intelligence purposes.

⁵ European Central Bank, ‘Eleventh survey on correspondent banking in euro’, November 2020, available at: <https://www.ecb.europa.eu/pub/pdf/other/ecb.eleventhsurveycorrespondentbankingeuro202011~c280262151.en.pdf>

⁶ Bank for International Settlements, ‘On the global retreat of correspondent banks’, 1 March 2020, available at: https://www.bis.org/publ/qtrpdf/r_qt2003g.htm

IMPACT ON SHAREHOLDERS

Issues in transaction data management affect customers (originating payer and beneficiary payee) and banks alike (see Figure 5). Senders

and beneficiaries bare most of the cost of transactions and the shortfalls of current processes, while banks suffer from operational complexities (and associated costs) when managing these transactions.

FIGURE 5: IMPACT ON STAKEHOLDERS



SENDERS AND BENEFICIARIES

Senders and beneficiaries bear most of the cost in cross-border transactions (and the consequences of any shortfalls)



Status Visibility

Lack of visibility on status of payments / transactions, especially with regards to when a beneficiary will receive funds



Cost Uncertainty

Cost of crossborder payments born by sender or beneficiary, but total charges applied to payments are not known upfront



Planning Difficulty

Challenges in cash flow management / planning, due to uncertainties in time of payment receipt



Compliance Complexity

Additional information may be required after initial instructions to satisfy compliance requirements of intermediary banks



BANKS

Banks suffer from operational complexities (and associated costs) when managing cross-border transactions



Management Cost

Significant expenses in implementing multiple systems for different messaging protocols and maintaining fragmented data



Service Transparency

Inability to provide current status of payments / transactions to customers and other stakeholders



Liquidity Issues

Delays in clearing and settlement, especially due to time zones, resulting in lock-up of funds



Financial Risk

Credit risk due to delays in settlement along with market / FX risk if transactions involve multiple currencies

Source: Quinlan & Associates analysis

SENDERS AND BENEFICIARIES

Because the route of a transaction is determined by correspondent banks along the transaction chain, the total cost of the transaction cannot be determined at initiation. Moreover, senders lack visibility on the status of a transaction since they do not know when the beneficiary will be credited with the assigned funds. As more intermediaries are involved, costs and clearance times also increase. These

uncertainties around total transaction costs and the timing of fund receipt led to difficulties in cash flow planning / management.

In addition to these complications, senders are oftentimes asked for additional paperwork and proof of submission of payment instruction, in order to satisfy due diligence or regulatory requirements enforced by different jurisdictions. This inevitably causes additional delays in the process.

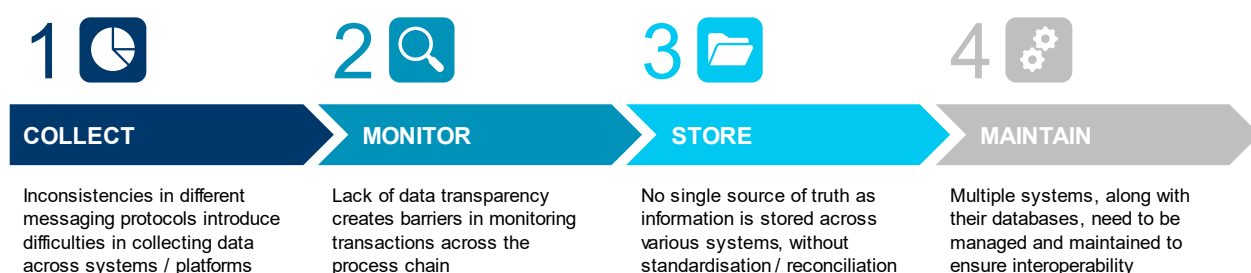
BANKS

As the result of multiple messaging protocols / formats, banks have to implement and maintain multiple systems, leading to higher data management costs. This also hinders service transparency, as banks have to dig up and reconcile relevant information to understand the status of a transaction, especially if there are process delays or failures.

IMPACT ON DATA MANAGEMENT

Data issues caused by the ever-increasing number and complexity of transactions are further exacerbated by the fact that financial institutions still rely on archaic / legacy systems, both within their respective organisations and in their communications with supporting organisations (see Figure 6).

FIGURE 6: IMPACT ON DATA MANAGEMENT



Source: Quinlan & Associates analysis

COLLECT

With banks implementing multiple systems to manage transactions (and relevant messages and data), inconsistencies across applications introduce difficulties in data collection. This also results in potential redundancies when different business units collect information on the same transaction using their own systems and processes.

MONITOR

Transaction information is scattered across systems. Without an integrated view, it is difficult for bank staff to monitor transaction information (and transaction statuses). This is a major pain point for compliance teams, as they need to understand money movements in an end-to-end manner to ensure all suspicious transactions are identified.

STORE

It is difficult for banks to capture and reconcile relevant transaction information from multiple systems. As a result, there is no “single source of truth”. Data is typically stored without standardisation and reconciliation, introducing complexities, especially during post-transaction processes such as process performance review and business intelligence analysis.

MAINTAIN

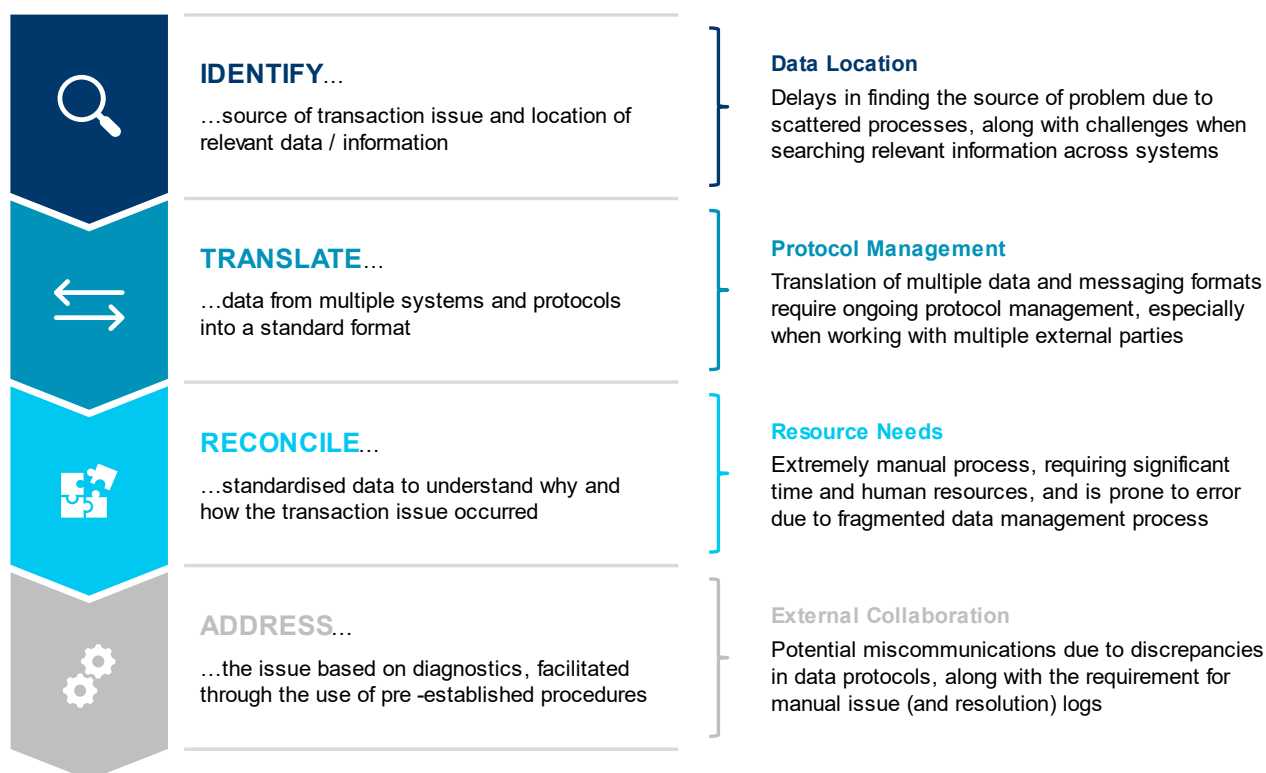
Banks work with multiple systems, and each system needs to be maintained both independently and as part of the bank’s overall infrastructure. While maintenance may be easy to carry out on individual systems, each update needs to be checked and tested with interlinked systems to ensure interoperability. This creates additional costs and is a major resource drain for many banks.

TRANSACTION ISSUES

The current inability of banks to track and trace data, coupled with complexities in managing scattered data silos, increases the operational

inefficiency of an organisation, especially when it comes to resolving transaction issues (see Figure 7). As a result, banks have to allocate more resources and time to monitor and repair any breaks in the communication chain.

FIGURE 7: ADDRESSING TRANSACTION ISSUES



Source: Quinlan & Associates analysis

IDENTIFY

Any resolution process begins with the identification of the issue or potential point of failure. Within the transaction management space, an “issue” refers to a break in the communication line. When a system identifies an issue, the system administrator and respective support elements are alerted, who will then evaluate the issue, in terms of the impact to both the communication chain and the communication package.

Time plays an integral part in issue identification, but as banks are fragmented, locating an issue among multiple processes is a time-consuming exercise. Despite the importance of real-time analysis, instantaneous issue identification is not always possible due to the reliance on legacy systems.

Another hurdle is the need to distinguish between system issues and data issues. This is a critical point of difference as most issues are relative to the data itself and not the system managing it. However, alert systems are typically defined and built as a system solution, instead of a data solution. This increases the time and resources required to uncover the underlying issue.

TRANSLATE

Irrespective of organisations' use of industry standards and protocols, the ability to normalise both internal and external messaging is critical for the success of transaction data management. Nonetheless, as some institutions – especially old-fashioned banks – still rely on archaic systems, messages from these banks tend to be error-prone and the source of even greater issues within the communication chain.

To accelerate systems' ability to translate information into actionable insights, protocols are put in place to standardise the format of messages. However, very few messages within the communication chain are actual "standards" that enforce strict compliance between parties. In fact, the majority of communications between organisations are conducted through varied protocols, with each party normalising the messages at the receiving end. The message normalisation process does not only add an additional level of complexity, but also introduces additional opportunities for failure.

The time and labour that banks dedicate to the management of protocol tables between all relevant parties – organisation to client, organisation to partner, organisation to organisation – are extensive. The issues that arise from managing variances of communication models with internal tables represent a significant loss of time and cost.

RECONCILE

Reconciliation is by far the most labour-intensive step of the issue resolution process.

In developing markets, these increasingly complicated issues are typically handled through expanding the headcount of back office and operational departments. As the number of transactions grows, more resources are added to deal with data and system reconciliation.

The challenge is exacerbated for transactions involving frontier / emerging markets, due to frequent false-positive flags. Significant human resources and time are required to understand the transaction chain, to distinguish between genuine warnings and erroneous notices.

On the other hand, in developed markets and internationally focused institutions, the majority of the reconciliation efforts are automatically handled by technological applications. Despite this, IT support teams that monitor and enhance systems are extensive in both size and cost.

ADDRESS

The procedures involved in addressing and resolving transaction issues depend on the type of issue in question.

For compliance-related issues, assessments are compared against issues tables, after which transactions can be controlled to align with specific requirements. In these cases, basic information can be produced, and relevant data can be auto generated.

However, if the issue is generated by a third party's rejection of information, the bank needs to engage directly with relevant entities. This process requires escalation and the use of manual issue logs, which need to be created and monitored.

ASIA PERSPECTIVES

Looking more specifically at Asia, the abovementioned issues are exacerbated by the fragmented nature of the market.

FRAGMENTED JURISDICTIONS

It is clear that western markets exhibit a higher level of regulatory harmonisation than Asia Pacific (“APAC”). This is especially true within the EU, where banks across EU countries comply with policies set forth by the European Central Bank (“ECB”) and the European Banking Authority (“EBA”). However, in APAC, payments clearing and settlement systems continue to operate at a country level. Contrasting the Single European Payments Area (“SEPA”) in Europe, the Asian market has not benefitted from any pan-Asian system harmonisation initiative to date.

The multi-jurisdictional nature of APAC adds to the complexities in both cross-border transactions and transaction data management, with the lack of a centralised governing body creating regional discrepancies around data

management expectations and compliance requirements. Asian banks need to keep abreast of changing rules and standards considerably more than their global counterparts in order to comply with all jurisdictions in which they operate.

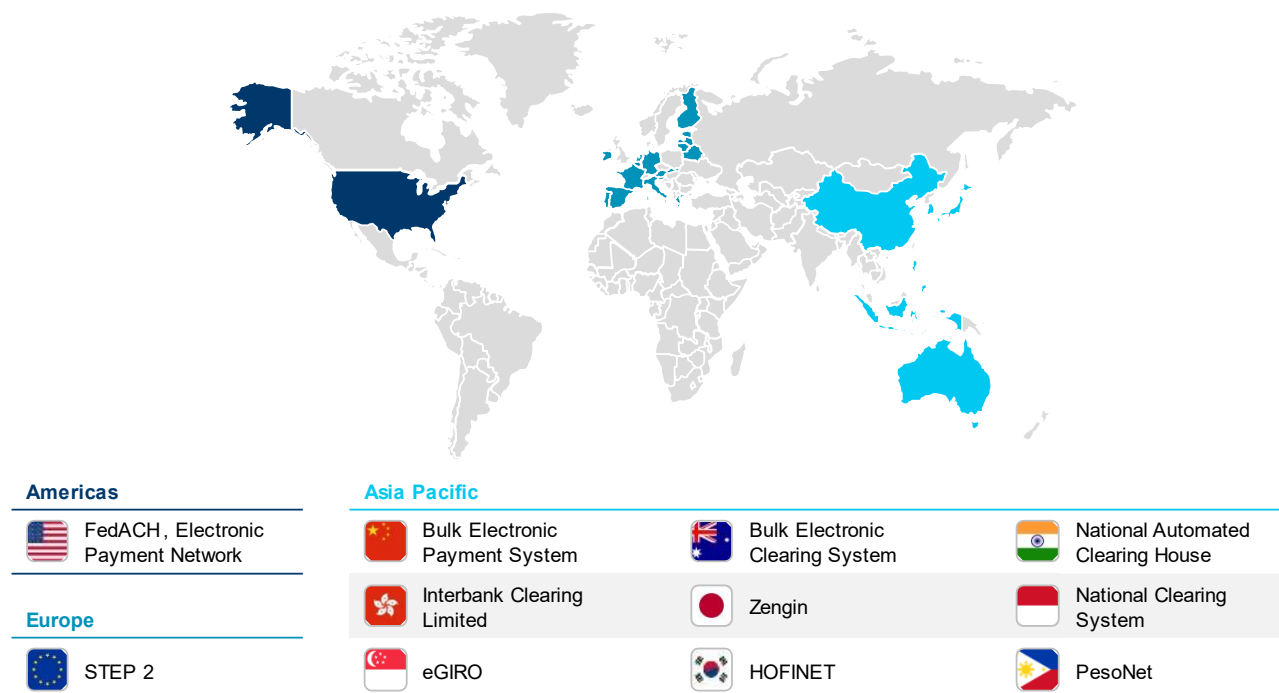
AUTOMATED CLEARING HOUSE

Automated clearing houses (“ACH”) provide financial institutions with a connectivity mechanism to support the multi-currency environment in which they operate.

As of 2020, there were around 110 ACH systems in operation covering 87 economies.⁷ Major markets, such as Northern America and Europe, have consolidated ACH systems; for example, there is a pan-Europe ACH, named STEP 2. In Asia, however, each market / jurisdiction typically runs its own ACH, resulting in a considerably more fragmented landscape (see Figure 8). Examples include China’s Bulk Electronic Payment System (“BEPS”), Hong Kong’s Interbank Clearing Limited, Japan’s Zengin, Singapore’s eGIRO, and South Korea’s HOFINET.

⁷ World Bank, ‘Summary Outcomes of the Fifth Global Payment Systems Survey’, June 2020, available at: <https://documents1.worldbank.org/curated/en/115211594375402373/pdf/A-Snapshot.pdf>

FIGURE 8: ACH FRAGMENTATION IN ASIA



Source: Quinlan & Associates analysis

ACHs process transactions in batches, resulting in the inability to provide individual payment-based functions and limited visibility / traceability of transactions. The fragmentation of ACHs in APAC exacerbates this problem, as a transaction may need to go through multiple ACHs (similar to how a transaction may be processed by multiple correspondent banks). As a result, issue resolution is extremely time-consuming, as banks are unable to locate the root cause of problems.⁸

In addition, the National Automated Clearing House Association (“NACHA”) estimated that 60% of ACH payments from businesses arrive separately from remittance.⁹ This results in the collection of unstructured data that needs to be

reconciled before any documentation and analysis can be produced. This process is made even more inefficient by ACH fragmentation in APAC, with different standards and formats being implemented by different systems in the region.

SUMMARY

All of these issues make a strong case for the need for better management of an institution’s transaction data. While establishing an efficient data ecosystem is critical for any institution to develop its business, ensuring that the organisation has a systematic approach to addressing frictions and points of failure is equally, if not more, important.

⁸ Finextra, ‘The Modern Issuer Processor: Delivering Embedded Finance Innovation in Emerging Markets’, Sept 2021, available at: <https://www.finextra.com/blogposting/20882/the-modern-issuer-processor-delivering-embedded-finance-innovation-in-emerging-markets>
⁹ PYMTS.com, ‘New Data: 67% of Insurance Carriers See Need to Digitize Payments’, 27 September 2021, available at: <https://www.pymnts.com/insurance/2021/insurance-carriers-see-need-to-digitize-payments/>

SECTION 3

OPERATIONAL INEFFICIENCIES

The multitude of issues outlined in Section 2 have severe implications for the financial services industry, especially correspondent banks. To better understand the impact, we approximated the amount of time these banks spend every year on addressing these challenges.

IMPLICATIONS

We took a three-phase approach to estimate the loss in time for resolving transaction issues, across (1) number of transactions, (2) issue rate of transactions, and (3) resolution time (should issues occur).

NUMBER OF TRANSACTIONS

We looked at the value of global cross-border transactions and the average transaction size to formulate a view on the number of transactions.

There are over USD 100 billion worth of payments being sent through SWIFT GPI daily (representing ~10% of SWIFT's cross-border traffic)¹⁰ and SWIFT handles approximately half of the world's high-value cross-border payments.¹¹ Taking these data points, we estimate that over USD 2 trillion worth of cross-border payments are currently executed per day.

Comparing the total transaction value against the average transaction size of USD 22,000,¹² we estimate there to be just over 100 million daily transactions.

We then categorised correspondent banks into three groups, based on their share of transaction volumes,¹³ and estimated their number of daily transactions accordingly (see Figure 9).

THE MULTITUDE OF ISSUES HAVE SEVERE IMPLICATIONS FOR THE FINANCIAL SERVICES INDUSTRY, ESPECIALLY CORRESPONDENT BANKS

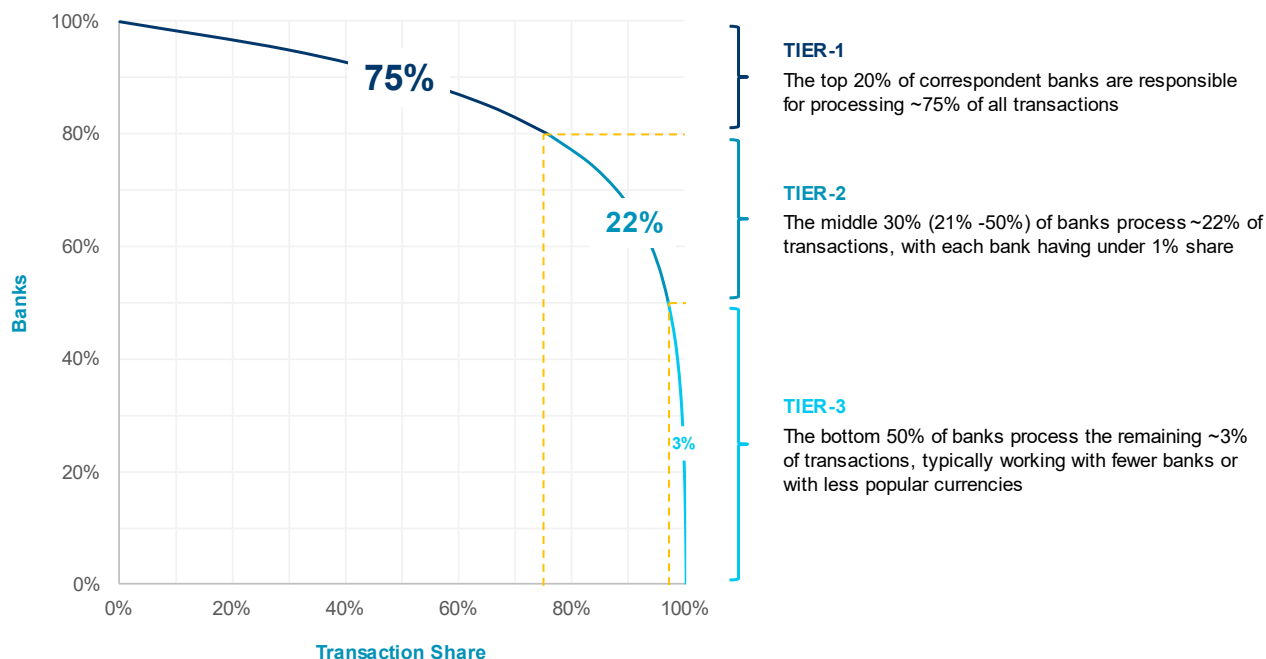
¹⁰ Global Trade Review, 'Swift speeds up cross-border payments, without blockchain', 28 February 2018, available at: <https://www.gtreview.com/news/global/swift-speeds-up-global-payments-still-without-blockchain/>

¹¹ Financial Times, 'Ripple and Swift slug it out over cross-border payments', 6 June 2018, available at: <https://www.ft.com/content/631af8cc-47cc-11e8-8c77-ff51caedcde6>

¹² European Central Bank, 'Eleventh survey on correspondent banking in euro', November 2020, available at: <https://www.ecb.europa.eu/pub/pdf/other/ecb.eleventhsurveycorrespondentbankingeuro202011~c280262151.en.pdf>

¹³ European Central Bank, 'Eleventh survey on correspondent banking in euro', November 2020, available at: <https://www.ecb.europa.eu/pub/pdf/other/ecb.eleventhsurveycorrespondentbankingeuro202011~c280262151.en.pdf>

FIGURE 9: NUMBER OF TRANSACTIONS



Source: SWIFT, European Central Bank, Quinlan & Associates analysis

Tier-1 institutions manage ~75% of all cross-border transactions, translating to ~76 million transactions daily. On average, tier-2 banks process ~22% (or ~22 million) transactions

daily, while the remaining players execute just over 3 million cross-border transactions on a daily basis.

WE ESTIMATE THAT OVER USD 2 TRILLION WORTH OF CROSS-BORDER PAYMENTS, OR JUST OVER 100 MILLION CROSS-BORDER TRANSACTIONS, ARE CURRENTLY EXECUTED PER DAY

TRANSACTION ISSUES

We interviewed a number of industry experts, including senior staff in the transaction banking space and various C-suite executives in transaction data management solutions, to better understand how often a transaction issue occurs.

We estimate that tier-1 banks have an issue rate of 1.8%, followed by 1.9% for tier-2 players, and 2.1% for tier-3 institutions. These translates to 1.3 million, 430,000, and 64,000 daily transaction issues for tier-1, -2, and -3 banks respectively, totalling up to 1.8 million daily transaction issues, representing an industry average issue rate of 1.8%.

ISSUE RESOLUTION

Whenever an issue occurs (especially if it is system / process related), it can affect multiple transactions simultaneously. Therefore, staff may need to resolve transaction issues in batches instead of addressing each problem independently.

In addition, transactions experience failures or delays due to a range of issues, such as incorrect data formats, insufficient / locked-up funds, and system failures. The time required for resolution depends on the cause. We grouped these problems into four categories according to their complexity: (1) basic; (2) simple; (3) intermediate; and (4) complex.

Basic issues occur most frequently but can be solved in near real-time (or even automatically). An example is a typo in the payment instruction, which can be automatically corrected by suitable applications if sufficient information is provided. On the other end of the spectrum, system-wide breakdowns (e.g. due to bugs) are extremely rare, but may take longer than 24 hours to address.

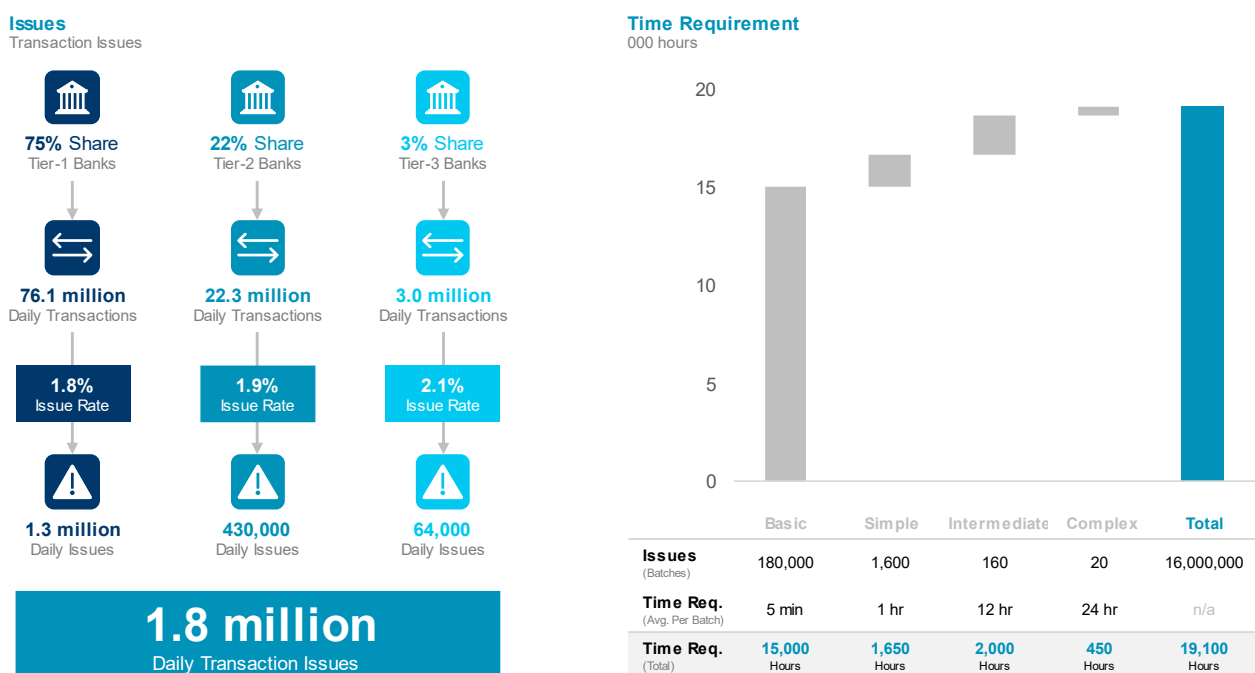
WE ESTIMATE THAT CORRESPONDENT BANKS GLOBALLY SPEND CLOSE TO 19,100 HOURS DAILY ADDRESSING THESE ISSUES, TRANSLATING TO 4.8 MILLION HOURS OF ANNUAL TIME WASTAGE

TIME WASTAGE

Combining the above analyses, we estimate that correspondent banks globally spend close to

19,100 hours daily addressing these issues, or ~4.8 million hours p.a. (based on 252 business days) (see Figure 10).

FIGURE 10: ADDRESSING TRANSACTION ISSUES



Source: Quinlan & Associates estimates

While APAC is a smaller market in terms of cross-border transaction traffic (relative to Americas and EMEA), it suffers from a proportionally larger share of issues due to the region comprising of many frontier / developing

markets and the fragmentation of jurisdictions. We believe the region bears just under 20% of the issues (albeit covering only ~14% of transactions), translating to an annual time wastage of ~900,000 hours.

SECTION 4

INDUSTRY RESPONSE

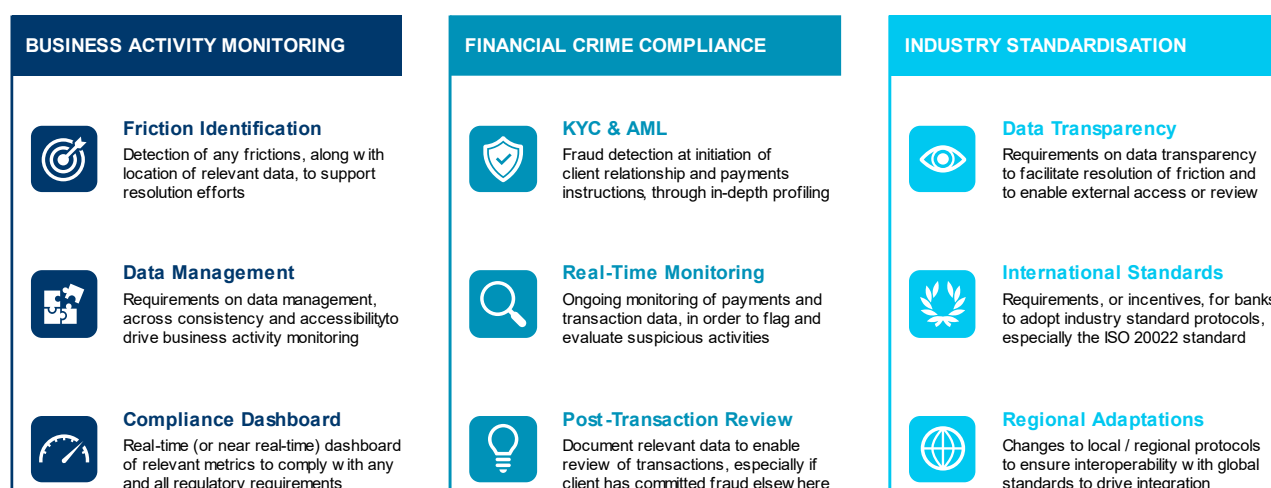
REGULATORY DEVELOPMENTS

With the gravity of these issues costing the banking industry 4.8 million hours annually, regulators are placing increased scrutiny on transaction data management, especially when it comes to transparency.

Regulators have recently been focusing on three pillars, namely:

1. Business activity monitoring (“BAM”);
2. Financial crime compliance; and
3. Industry standardisation (see Figure 11).

FIGURE 11: REGULATORY PILLARS



Source: Quinlan & Associates analysis

BUSINESS ACTIVITY MONITORING

Regulators are placing more emphasis on business activity monitoring, expecting banks to have a real-time, or near instant, overview of the relevant statuses and processes. Banks have to implement suitable systems, data management protocols, and dashboards, which enable management teams to collect, analyse, and view relevant insights on business activity.

For example, the Hong Kong Monetary Authority (“HKMA”) updated a statutory guideline in April 2021,¹⁴ requiring domestic systemically important banks (“D-SIBs”) to comply with the *Principles for Effective Risk Data Aggregation and Risk Reporting*.¹⁵ These principles were issued by the Basel Committee, with Principle 5 requiring banks to ‘generate aggregate and up-to-date risk data in a timely manner while also meeting the principles relating to accuracy and integrity, completeness and adaptability.’

¹⁴ Hong Kong Monetary Authority, ‘Supervisory Policy Manual: CA-B-2’, 23 April 2021, available at: <https://www.hkma.gov.hk/media/eng/doc/key-functions/banking-stability/supervisory-policy-manual/CA-B-2.pdf>

¹⁵ Bank for International Settlements, ‘Principles for effective risk data aggregation and risk reporting’, January 2013, available at: <https://www.bis.org/publ/bcbs239.pdf>

FINANCIAL CRIME COMPLIANCE

A key focus of regulators is the detection and prevention of fraud, especially as criminals continue to explore more creative ways to mask their fraudulent activities.

Regulatory requirements emphasise: (1) initial review through KYC and AML protocols; (2) real-time monitoring of transaction data and flagging of suspicious activities; and (3) regular and ad-hoc post-transaction reviews. The latter two regulatory themes impose stricter data management standards on financial institutions, as they have to store relevant data in a structured manner, in order to access information when needed.

For example, the Hong Kong Monetary Authority (“HKMA”) published a Guidance Paper in 2018,¹⁶ stressing the importance of and the regulator’s expectations on: (1) transaction monitoring systems; (2) management of transaction monitoring alerts; and (3) post-reporting actions. The HKMA requires financial institutions to ‘demonstrate that [a] transaction monitoring system is properly established, adequately resourced, and effectively applied’ and to meet expectations on transaction screening, transaction monitoring, and suspicious transaction reporting.

INDUSTRY STANDARDISATION

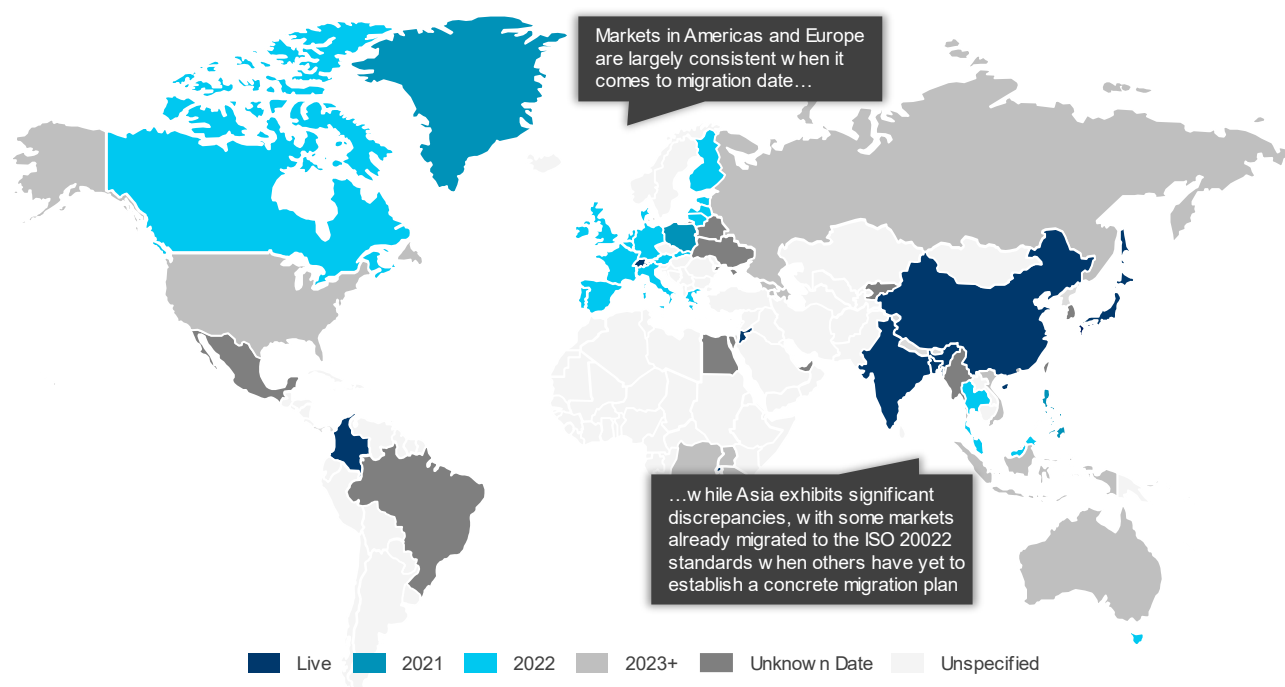
Recognising the need for stronger integration in terms of how banks manage and communicate data, regulators are also calling for industry standardisation.

The payments space is currently undergoing a transitional period, from using a wide range of messaging protocols to the adoption of the ISO 20022 standard. The standard facilitates straight-through processing (“STP”) while reducing the probability of transaction issues. The transition towards a common standard is proving to be more important, as a result of the demand for near-instant payments across multiple regions.

To support the industry evolution, regulators and market infrastructure operators across the globe have established guidelines and timelines for the adoption of the ISO 20022 standard (see Figure 12).

¹⁶ Hong Kong Monetary Authority, ‘GUIDANCE PAPER: Transaction Screening, Transaction Monitoring and Suspicious Transaction Reporting’, May 2018, available at: <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180510e3a1.pdf>

FIGURE 12: ISO 20022 MIGRATION



Note that Unknown Date refers to jurisdictions that have announced plans to migrate but without an established timeline / target date, while Unspecified refers to jurisdictions that have not announced any plans to migrate
Source: Azzana Consulting, Identitii, Quinlan & Associates analysis

Fedwire (owned by the Federal Reserve) in the US, Target2 (developed by Eurosystem) in the Eurozone, and CHAPS (administered by the

Bank of England) in the U.K. have all initiated procedures for accommodating the ISO 20022 standard.¹⁷

¹⁷ flow, 'Asian banks keep up to speed on ISO 20022 migration', July 2020, available at: <https://flow.db.com/cash-management/asian-banks-keep-up-to-speed-on-iso-20022-migration>

In Asia, a handful of financial institutions – especially those involved in high-value payments systems – have implemented protocols to comply with the standard as well. For example, HKMA’s Faster Payment System (“FPS”), a city-wide cross-bank and cross-eWallet retail payments system, has already adopted the ISO 20022 standard.¹⁸ HKMA has also announced plans for Hong Kong Interbank Clearing Limited (“HKICL”) to fully adopt the standard by late 2023.¹⁹

In addition, the Monetary Authority of Singapore (“MAS”) is migrating to ISO 20022 through a two-phased approach.²⁰ The first phase involves Like-for-Like++ ISO 20022 messaging on the existing RTGS, the MAS Electronic Payment System (“MEPS+”), and the second phase is the full adoption of ISO 20022 standards on the next-generation RTGS platform, the MEPS NextGen. Similarly in

Malaysia, Bank Negara Malaysia (“BNM”) has established a two-phased approach to for ISO 20022 adoption, with the aim of the first phase being co-existence with the existing RTGS, RENTAS, by June 2022, and the objective of the second phase being full ISO 20022 adoption by June 2024.²¹

The Americas and European markets are largely standardised in terms of ISO 20022 adoption timeline, with most targeting a migration date of 2023 and 2022 respectively. Looking at APAC, however, the timeline varies across markets; ISO 20022 is already live in some markets, such as China, while other markets, such as South Korea, has yet to establish an adoption date. The differences in migration plans will undoubtedly cause discrepancies across standards and protocols, reducing the expected effectiveness of ISO 20022 adoption in the region.

THE DIFFERENCES IN MIGRATION PLANS ACROSS ASIA WILL UNDOUBTEDLY CAUSE DISCREPANCIES ACROSS STANDARDS AND PROTOCOLS, REDUCING THE EXPECTED EFFECTIVENESS OF ISO 20022 ADOPTION IN THE REGION

¹⁸ Hong Kong Monetary Authority, ‘Implementation of a Faster Payment System in Hong Kong’, September 2018, available at: <https://www.hkma.gov.hk/media/eng/publication-and-research/quarterly-bulletin/qb201809/fa2.pdf>

¹⁹ Deutsche Bank, ‘Guid to ISO 20022 Migration’, September 2020, available at: https://corporates.db.com/files/documents/Guide_to_ISO_20022_migration_Part_3_Final.pdf

²⁰ Regulation Asia, ‘MAS to Migrate MEPS+ to ISO 20022 in June 2022’, 22 June 2021, available at: <https://www.regulationasia.com/mas-to-migrate-meps-to-iso-20022-in-june-2022/>

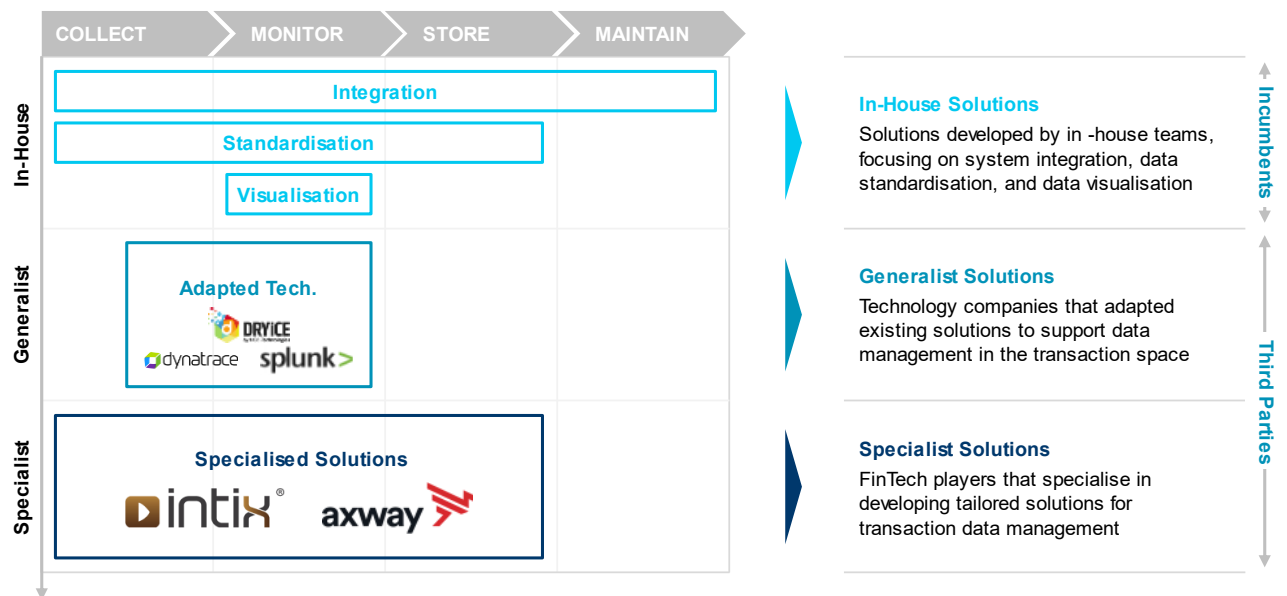
²¹ Bank Negara Malaysia, ‘Promoting Safe and Efficient Payment and Remittance Systems’, 2020, available at: https://www.bnm.gov.my/files/documents/20124/3026128/ar2020_en_ch1e_payments.pdf

INDUSTRY RESPONSE

To enhance transaction process and meet increasing regulatory hurdles, both incumbent institutions and the broader financial services

industry have responded with various solutions focused on driving greater efficiency of data management processes. Process adaptations, new applications, and FinTech solutions have all been explored (see Figure 13).

FIGURE 13: INDUSTRY RESPONSE



INCUMBENT RESPONSE

Incumbents have been addressing these challenges primarily through: (1) process adaptations; and (2) the implementation of new functions. Process adaptations are changes made to existing policies and applications, while new functions are additional software implemented to facilitate data management.

1. PROCESS ADAPTATIONS

A key enabler of data consistency is the implementation of suitable policies to ensure data inputs are standardised across systems. In terms of manual entries, this involves clear

instructions on the formatting of inputs for staff to strictly adhere to. Existing applications can also be outfitted with pre-filled answer boxes (e.g. drop-downs, check boxes, etc.), in order to reduce inconsistencies that come with free-text entries. Additional checks can also be put in place to flag inputs of the wrong format or automatically correct non-standard responses.

While more difficult to implement due to differences across systems, transaction-related information can be standardised and reconciled in near real-time to fill in gaps, detect and correct errors, and to remove any redundancies.

Existing financial institutions are constantly conducting regular reviews on their own databases to identify any potential data gaps or process shortfalls. Staff can locate the missing information more easily if data gaps are recognised early. If there are any process shortfalls, adaptations are designed, tested, and implemented.

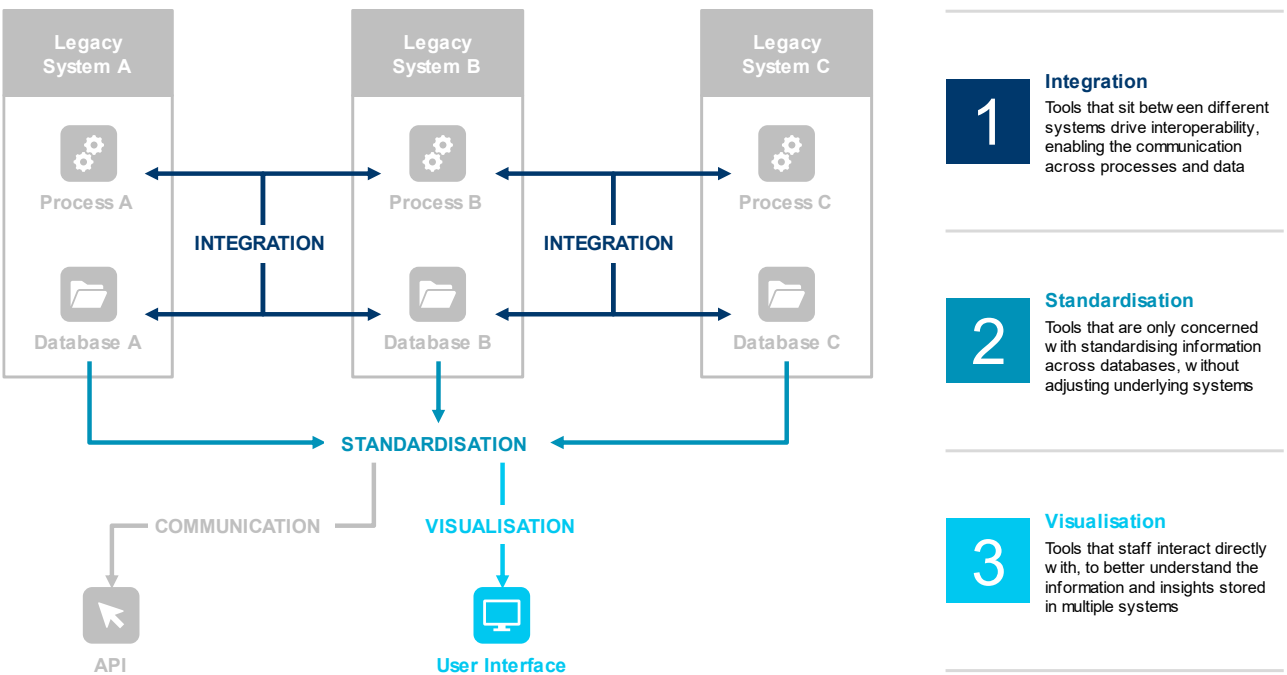
At their core, adaptations are made to manual processes and existing applications to maximise the level of data standardisation,

which in turn facilitates the resolution of delays and issues.

2. NEW FUNCTIONS

In addition to making changes to current policies and systems, banks have also attempted to develop new functionalities in-house to resolve the identified issues. Key functions include integration, standardisation, and visualisation (see Figure 14).

FIGURE 14: DEVELOPMENT FOCUS



Source: Quinlan & Associates analysis

2.1 INTEGRATION

As the legacy systems used by banks are typically fragmented, many incumbents have been exploring ways to integrate these applications. Ultimately, new applications are developed between existing systems or on top

of all systems to ensure interoperability across functions. This is particularly difficult as the integration tool needs to be tailored according to all existing systems, and any changes or additions to the underlying systems would result in an update requirement for the integration tool as well.

2.2 STANDARDISATION

Standardisation tools do not directly work between legacy systems and typically do not interact with any of the processes. Instead, standardisation tools extract information across databases from these legacy systems, and then conduct data cleansing, reconciliation, and standardisation. Ultimately, the goal of standardisation tools is to maintain a single source of information – instead of having to explore multiple data silos to locate a piece of information, staff can simply investigate the single, centralised data source.

Subsequent to standardisation, information may be passed to other systems through an application programming interface (“API”) for machine-to-machine communication, in order to facilitate end-to-end automation.

2.3 VISUALISATION

To facilitate the understanding of information, many banks have developed visualisation tools which generate dashboards and intuitive interfaces. These tools do not address any of the underlying system discrepancies and data issues; they simply present the given information in an easy-to-understand manner.

Nonetheless, if the input data is reliable – especially if previously processed by standardisation tools – the visualisation dashboard can offer real-time alerts or business intelligence, upon which bank staff can act.

THIRD-PARTY SOLUTIONS

Witnessing the industry’s struggles, a number of companies have developed solutions to resolve issues in the transaction data management space. These include both technology companies adapting existing solutions for transaction data, as well as FinTech companies that specialise in the space.

1. GENERALIST SOLUTIONS

Many technology companies have previously developed data management solutions across collection, monitoring, storage, and maintenance. However, the majority of these applications were developed with scalability in mind and therefore deployed as plug-and-play solutions, which works well in many industries with relatively simple data needs.

However, the financial services industry (and especially the transaction data space) has unique characteristics, such as fragmented systems and processes, large data volumes, real-time monitoring needs, and stringent compliance requirements. As a result, many of these solutions failed to be effectively deployed at incumbent banks, as they were designed to address data needs in a generic manner. Therefore, these technology companies had to make updates and refinements to their solutions, according to the “more sophisticated” needs of financial services firms. Examples include DRYiCE, Dynatrace, and Splunk.

Nonetheless, because these solutions were not originally developed as financial services-focused applications, they may be unable to provide full functionality.

2. SPECIALIST SOLUTIONS

New applications are being developed from scratch, typically by FinTech firms. These companies are usually founded by industry veterans, who have experienced the issues associated with transaction data management. As a result, their solutions are specifically designed to address issues facing incumbents.

Because these solutions are tailored to the industry, they typically cover more steps within transaction data management value chain, across collection, monitoring, and storage. These solutions are typically deployed on top of, instead of within, legacy systems, and function in one or multiple areas as follows:

1. Collection: locate data from underlying systems as transactions are processed, and reconcile information in (near) real time;

2. Monitoring: alert staff of suspicious activities or metric breaches, based on the reconciliated data as issues are detected; and

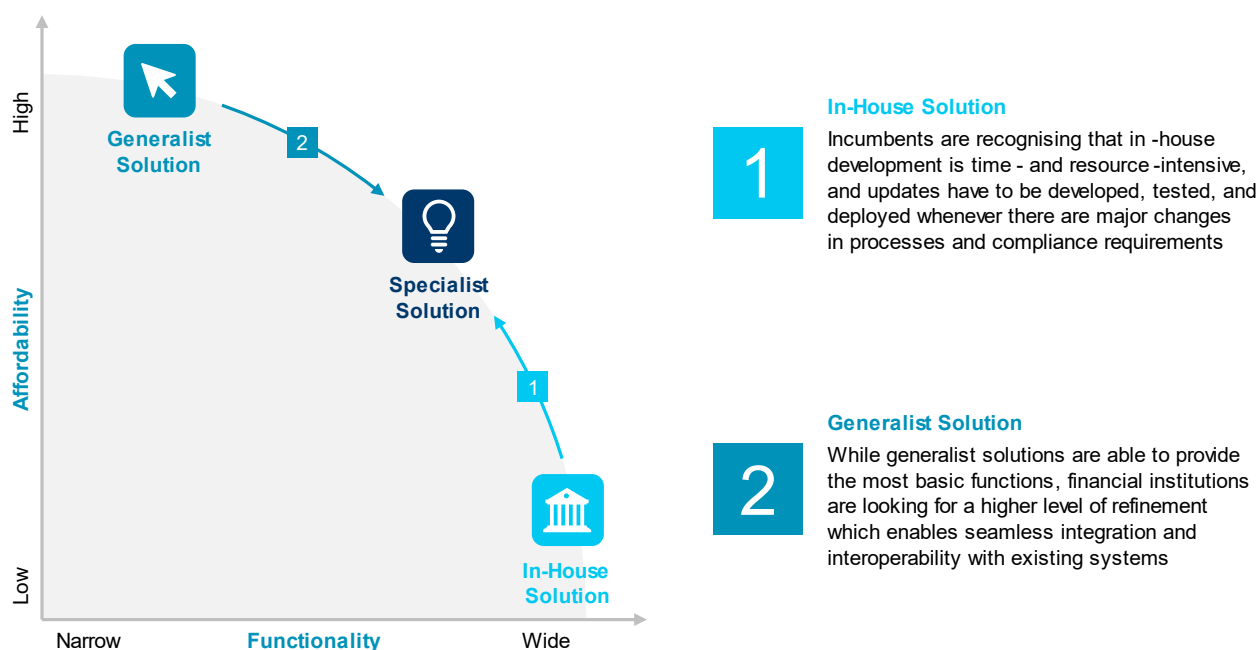
3. Storage: collate and store the information in an indexed manner, enabling rapid information extraction should the needs arise.

An example is Systar, a company specialising in business activity monitoring (Systar was acquired by Axway in June 2014).

BUILD VS. BUY DECISION

The industry has previously focused on developing in-house solutions and adopting generalist third-party applications. However, in more recent years, we have witnessed a shift in industry preferences towards working with specialist vendors (see Figure 15).

FIGURE 15: BUILD VS. BUY



Source: Quinlan & Associates analysis

IN-HOUSE SOLUTIONS

Despite internally developed solutions having customised functions, tailored to the processes of a bank, built to support its legacy systems, the development process is extremely costly in terms of both time and resources.

Dedicated staff are required to solicit requirements, develop and deploy solutions, and maintain the applications throughout their lifecycle. Our conversations with industry experts suggest that building a transaction data management system from scratch may take up to two years if not longer. This is exacerbated by the ever-changing regulatory environment, necessitating updates whenever compliance requirements or risk metrics are changed.

In addition, based on our own experience and supported by expert interviews, the market suggests that in-house solutions cost anywhere from 3-12x more than purchasing from a third-party vendor. While this number varies across banks, it highlights the cost involved in the “build” scenario.

Furthermore, because internal staff only have access to their own bank’s issues, the solutions developed are specific to the bank. While this may seem appropriate for the short term, these staff lack industry-wide visibility, including an understanding of best-in-class solutions. On the other hand, if they work with external parties, they can potentially learn from other incumbents’ practices.

GENERALIST SOLUTIONS

While some incumbents have previously explored generalist solutions, these only provide the “bare minimum” functions. Because these generalist solutions are based on adaptations to underlying applications, they also tend to lack the capability to collect and reconcile financial data across fragmented systems or the ability to understand how transactions should be flagged.

Furthermore, because generalists cover a wide range of industries, staff allocated to financial services may be limited, resulting in a lower level of awareness to changes in the space. Solutions may be slow to update to industry evolution, which may cause significant regulatory risk when changes are regulatory in nature.

SHIFT TOWARDS SPECIALIST SOLUTIONS

We are seeing a growing preference by incumbents towards exploring the use of specialist solutions. These service vendors are able to develop applications with a full suite of functions, all tailored to the expectations of the industry. In addition, as these companies specialise in financial services, they are fully aware of regulatory changes, enabling them to refine their applications rapidly. Moreover, these companies work with multiple clients, enabling them to understand a wider range of pain points while reviewing different industry practices. These all help develop a more in-depth understanding of best practice functions, enabling better solution design.

ASIA PERSPECTIVES

Banks globally rely on correspondent banking relationships for cross-border transfers, and Asia is no different. For Asian banks working

with international transactions, they are also recommended to adopt the ISO 20022 standards, in order to prevent data truncation risk which originates from translating different financial messages (see Figure 16).

FIGURE 16: ISO 20022 ADOPTION IN ASIA



Source: SWIFT, Quinlan & Associates analysis

In addition to having inconsistent migration timelines across the region, only 26% of Asian financial institutions have commenced their ISO 20022 migration efforts, of which half are still at preliminary stages.²² This points to the fact that Asia is lagging significantly behind their Western peers when it comes to adopting the new trend.

With this in mind, the acquisition of suitable tools to migrate existing systems to the ISO 20022 standard is a sensible first step. Key requirements for such tools include: (1) the provision of a holistic view on aggregated data across business units and (2) transparency and visibility of the transaction process.

²² Regulation Asia, 'SWIFT Sees Growing ISO 20022 Adoption in Asia Pacific', 3 April 2019, available at: <https://www.regulationasia.com/swift-sees-growing-iso-20022-adoption-in-asia-pacific/>

LEAPFROGGING

In addition to lagging behind Western markets in terms of ISO 20022 adaptation, Asian banks are also perceived to be less developed in terms of technological systems. However, this may be viewed as an advantage when it comes to adopting new solutions through leapfrogging.

Leapfrogging is a business concept whereby developing markets can skip certain stages of economic and/or technical development and implement the latest technologies of the newest generation. While this does not necessarily mean developing markets can overtake developed markets, they are able to catch up at a quicker pace and potentially avoid any negative effects driven by intermediate stages.

As it relates to Asian banking, the fact that Asian banks are relatively less advanced in the transaction data management space, relying heavily on additional headcounts and manual processes to address the many issues they face, may make them more open to leapfrogging into a better adoption of best-in-class data management.

REGULATORY STRATEGY

To avoid the pain of rushing to adjust and implement updates to existing systems whenever new regulations come into effect, financial institutions need to get the underlying system infrastructure right as soon as possible. Instead of a wait-and-see approach, incumbents should actively engage with regulators to understand new requirements that are likely to be imposed and refine systems accordingly. With authorities pushing for the adoption of new standards and the inevitable updates to regulatory requirements, financial institutions need to remain cognisant of potential changes.

This process is especially complex for large-scale banks with international operations, as they need to work with varying restrictions imposed by different regulatory authorities. Compliance departments across jurisdictions need to communicate with each other to ensure firm-wide compliance to all regulatory demands. As such, firm-wide standard systems and processes should be used based on common regulatory elements across jurisdictions, with adjustments being made to address local regulatory requirements.

Third-party service vendors should follow the same approach. However, these companies may not have the opportunity to directly speak with regulators as they do not operate directly in the financial services space. To overcome the lack of direct accessibility to regulators, they should work closely with their financial institution clients to review pain points and expectations of upcoming regulatory changes, allowing ample time for developing updates and new functionalities.

SECTION 5

CASE STUDY – INTIX

We had the opportunity to speak with the team at Intix, a FinTech company that specialises in business activity monitoring (“BAM”) in the transactions space.

Recognising that many internal systems of banks have outdated reporting capabilities, the Intix team developed a solution that enables real-time access to internal messaging data through a single, consolidated dashboarding solution, with numerical and graphical representation. In essence, the solution provides a complete set of data management capabilities dedicated to financial transactions.

BACKGROUND

Given the importance of transaction banking operations, Intix focuses on transaction management and works directly with different executives and teams in banks. Intix offers additional functionalities based on a financial institution's data, including real-time transaction tracking, message indexing, and legal archiving.

Intix focuses on two core propositions: (1) enabling instant accessibility to transaction data; and (2) instant traceability and monitoring of transaction data. Instant accessibility facilitates business intelligence and reporting, while instant traceability enhances operational efficiency.

xTRAIL

xTRAIL provides a single-window perspective on transaction data hosted in fragmented information silos, across departments and asset classes. Underlying this single-window access is a novel approach to transaction data indexing. Messaging data from all sources and of any type is indexed in real time, and xTRAIL maps out a continuous path to the underlying data source. Instant query and access to messaging data is provided, in order to support form-based searches, intuitive navigation-based searches, and API-based search access for third-party applications.

DATA CAPTURE

The sheer number of legacy systems creates hurdles when it comes to cross-business unit data collection and aggregation. xTRAIL captures all relevant data from existing systems in a non-intrusive way (i.e. without impacting existing systems and processes).

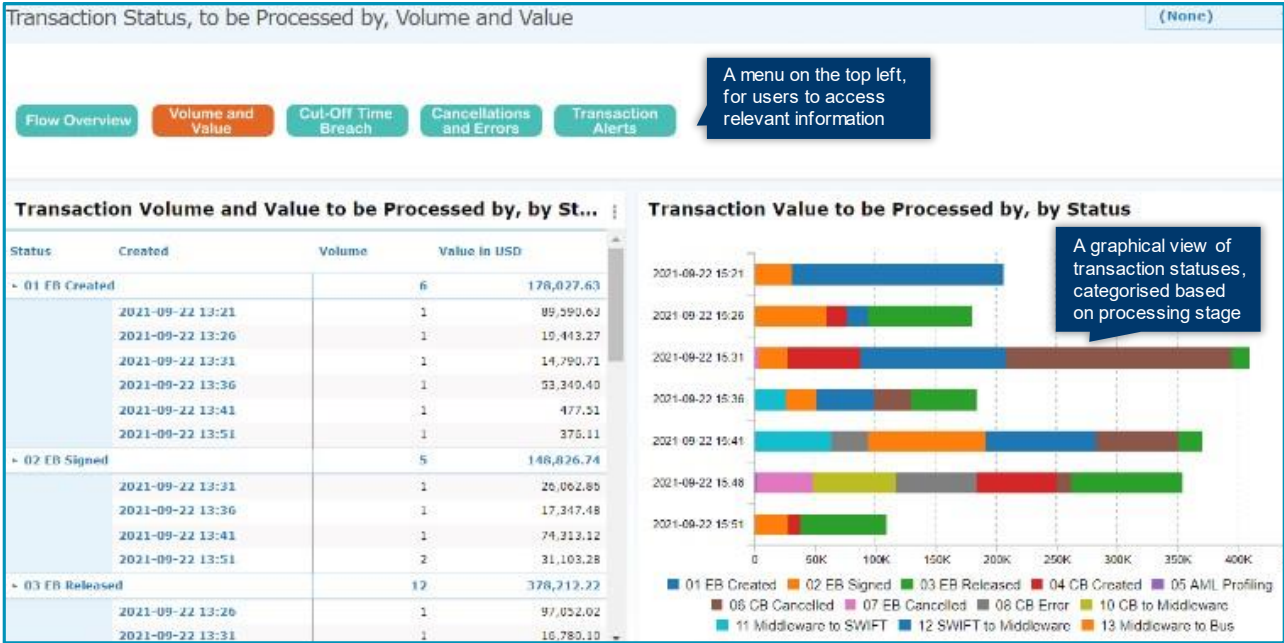
Users can then access relevant information through a number of search and reporting capabilities or via dashboards (see Information Dashboards). xTRAIL also offers third-party applications (e.g. a bank's web portal) an API-based access to the financial messaging data.

INFORMATION DASHBOARDS

The Intix solution provides various dashboards, all configurable to a user's specific needs and requirements.

A *Volume and Value* dashboard displays a collection of portlets (see Figure 17).

FIGURE 17: EXAMPLE OF VOLUME AND VALUE DASHBOARD



Source: Intix, Quinlan & Associates analysis

These portlets provide drill-down functions on the data, along with access to the collection of messages, transactions, and events. Staff can choose the most important information sets, with key highlights or insights to be displayed through a choice of 10 visualisation formats.

System / process performance can also be displayed post-transaction, for periodic system performance reporting / evaluation.

xTRACE

While xTRAIL provides instant access to transaction data for queries and (graphical) reports, xTRACE is a business activity monitoring and transaction tracking tool. xTRACE tracks in real time any type of financial transaction – including payments and securities data – then enriches, correlates, and consolidates them. If there is any unusual transaction event, the system is triggered automatically and will create relevant alerts. Any disruptions in the transaction lifecycle are detected at an early stage, soliciting resolution from relevant staff. Through this solution, fragmented data is turned into actionable insights across the transaction process flow for business activity monitoring, transaction integrity surveillance, and service-level monitoring.

TRANSACTION TRACKING & BAM

xTRACE focuses on transaction tracking – the core of business activity monitoring – through data analytics on historical transactions and the behaviour of the infrastructure processing transactions.

A *Flow Overview* dashboard uses colour codes to indicate whether payments are flowing through systems smoothly (see Figure 18). This represents an intuitive way to draw user awareness to key roadblocks and potential frictions.

FIGURE 18: EXAMPLE OF TUBE MAP



Source: Intix, Quinlan & Associates analysis

In essence, this tube map distils complex transaction flow(s) / information and summarises them in a simplified, intuitive

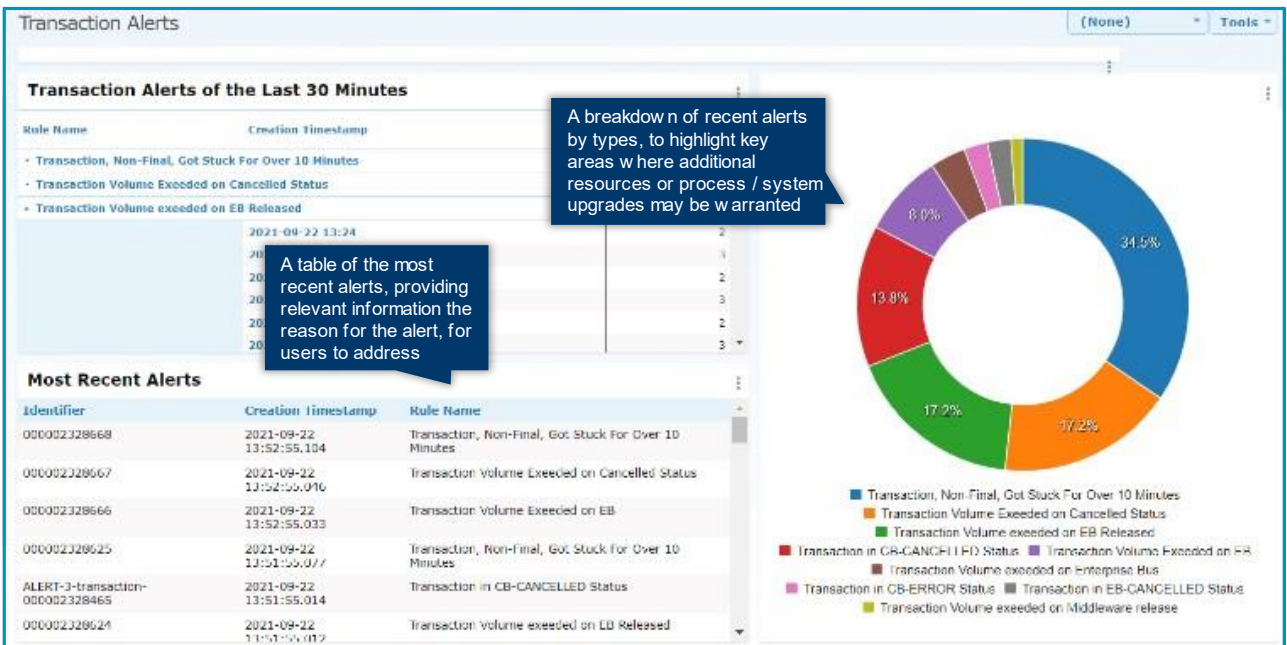
visual, through which users can directly access underlying data when required.

ALERTS & ALERT MANAGEMENT

Different metrics and alert rules can be implemented to facilitate business activity monitoring (see Figure 19). For example, there is a service-level metric that presents the

average and maximum end-to-end processing times for transactions, based on different time frames. Through data visualisation, users can better understand the level of service received from counterparties and other intermediary banks.

FIGURE 19: EXAMPLE OF ALERT DASHBOARD



Source: Intix, Quinlan & Associates analysis

xTRACE also offers an alert management function, along with tracking for the resolution process. The tracking report can be combined with / delivered to a third-party case manager for further follow-ups.

KEY BENEFITS

Intix's core proposition lies in the direct connection between dashboards and underlying data, providing users with instant access to relevant information. This offers bank staff a single system to access a consolidated and standardised set of data, increasing their

proactivity towards customers, especially during incidents in payments operations.

At its core, the Intix solution offers five functional benefits to banks, across: (1) information search; (2) business intelligence; (3) tracking; (4) monitoring; and (5) alert management.

Bank staff are able to conduct full-text search and structured search, based on hundreds of search fields, enabling a high level of customisation for queries. This facilitates information search and enhances staff efficiency.

With user-defined dashboards and real-time analytics through the business intelligence function, the Intix solution aggregates a massive volume of data and presents only the most relevant insights. Decision-making process can be facilitated, and if the user requires, underlying data can be accessed for further evaluation.

Through tracking, Intix provides end-to-end transaction twins and service-level metrics, providing real-time knowledge on the exact location of transactions. This works with monitoring, which provides automatic detection of anomalies. Once an alert is received, employees can identify exactly where the problem is and how to best escalate the issue.

Alert workflow process is also facilitated by Intix's alert management function. Through better management of different steps across alert, support status transition, assignment, commentary, and escalation, operational efficiency can be enhanced.

INTEGRATION

When it comes to introducing new solutions into existing infrastructure, the management team is mostly concerned with impact on existing systems and processes, and the new solutions' impacts on existing practices. However, the Intix solution focuses on the data level (instead of the system level) and operates in a non-intrusive manner.

The Intix solution does not interact with or impose any requirements / restrictions on existing processes, and instead directly extracts information from different systems. As a result, little to no changes are required for existing applications, limiting operational overheads and complications from integration. Given the industrialised approach and shared experience from the team, the integration efforts can be done in a very limited timeframe.

NEW TRANSPARENCY RISKS

New solutions and standards, such as the SWIFT GPI, the unique end-to-end transaction reference number ("UETR"), and the ISO 20022 standards, have continuously been developed and adopted by the industry. However, all of these focus on cross-bank data management. ISO 20022 enhances communications between banks, while SWIFT GPI and UETR provide tracking information on the status of a payment across various banks involved in the transaction.

Nonetheless, customer expectations – across end-to-end transaction process visibility, lower costs, and faster payments processing – are still not being met. This, in turn, introduces reputational risk and scoring risk (with payments platforms evaluating banks based on performance), affecting a bank's competitive position in the market. These point to the fact that problems do not just exist between banks, but also within banks.

Intix focuses on removing the last hurdle to enable frictionless transactions, by tracking internal transaction processing and alerting in case of frictions / failures, enabling immediate actions.

Industry solutions typically inform financial institutions of the location of a transaction (i.e. at which bank is the transaction located), but Intix offers banks granular status information on the transaction itself, along with relevant data should internal issues arise. As a result, Intix can be viewed as a solution that complements industry standards and protocols.

SECTION 6

CONCLUSION

CONCLUSION

Although cross-border transactions continue to surge, so too are the problems associated with transaction data management. These problems – driven by a range of factors, including market fragmentation, a lack of interbank standardisation, system issues, and operational failures – are costing the industry close to 5 million labour hours annually.

In addition, regulators across the globe are establishing more stringent compliance requirements and expecting banks to deliver improved data transparency, creating additional complexities around transaction data management. However, teams responsible for managing transaction data are typically deprioritised, and inefficiencies are addressed not by enhancing systems / processes, but by adding headcount.

These hurdles are even more apparent in APAC, as the market expands its global trading

footprint. And less sophisticated institutions in the region are playing catch up with respect to both their systems and processes to meet both regional and international standards.

Issues in IT infrastructure and data management processes are the largest contributor behind weakening a bank's business activity monitoring, the core area responsible for the detection and prevention of financial crimes. The inability of legacy systems to trace and reconcile transactions, the lack of standardised processes and data formats within and across banks, and complicated compliance procedures all contribute to these issues.

Through suitable process adaptations and the development / implementation of appropriate data management systems, we believe the industry can see significant reductions in both the issue rate of transactions and the time required to resolve these issues. We evaluated the potential reductions based on the four aforementioned issue categories.²³

THROUGH SUITABLE PROCESS ADAPTATIONS AND THE IMPLEMENTATION OF APPROPRIATE DATA MANAGEMENT SYSTEMS, WE BELIEVE THE INDUSTRY CAN SEE SIGNIFICANT REDUCTIONS IN BOTH THE ISSUE RATE OF TRANSACTIONS AND THE TIME REQUIRED TO RESOLVE THESE ISSUES

²³ See ISSUE RESOLUTION in SECTION 3

The majority of problems – basic issues – are typically caused by users, such as inputting incorrect information. A well-implemented system should be able to detect these at the input stage and alert staff to re-enter information. As a result, we believe 70% of these issues can be avoided. On the other hand, we expect a lower level of reduction in resolution times of 30%, given that it is currently easy to address these basic errors (resulting in lower potential to accelerate the resolution of these errors).

On the other end of the spectrum, complex problems are driven by system issues, such as

reconciliation failures and protocol management challenges. By standardising systems and enhancing interoperability, we believe 90% of these problems can be eliminated. In addition, with a streamlined transaction issue resolution process flow – especially across identify, translate, and reconcile – we believe staff can address these challenges 60% faster.

Reviewing across the four issue categories, we believe banks can reduce issue rates by ~70% and issue resolution times by ~32%, through process optimisation and system enhancements (see Figure 20).

FIGURE 20: REDUCTION IN DAILY TIME WASTAGE

1. Issue Rate Reduction

Issue Category (By Complexity)	Batches (Current #)	Reduction (%)		Batches (Target #)		Resolution (Hr per Batch)		Resolution (Total Hr)
Basic	181,000	70%	▶	54,200	x	0.08 (5 minutes)	=	4,500
Simple	1,600	77%	▶	380	x	1	=	380
Intermediate	160	83%	▶	30	x	11	=	330
Complex	< 25	90%	▶	< 5	x	24	=	< 50
Total / Average (Overall Failures)	183,000	70.1% (Weighted Avg.)	▶	54,600	x	0.10 (Weighted Avg.)	=	5,300 Hr (~13,800 Hr)

2. Resolution Time Reduction

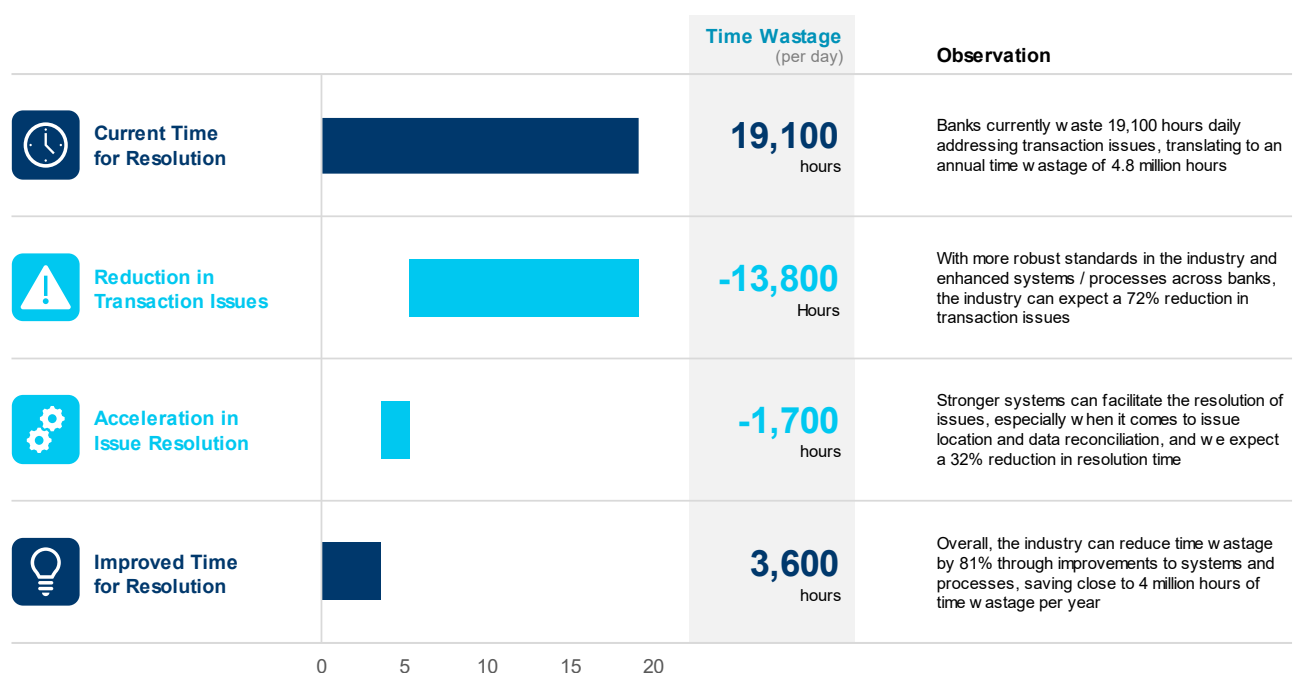
Issue Category (By Complexity)	Current Time (Hr per Batch)	Reduction (%)		Target Time (Hr per Batch)		Batches (Target #)		Resolution (Total Hr)
Basic	0.05	30%	▶	0.06	x	54,200	=	3,200
Simple	1	40%	▶	0.6	x	380	=	230
Intermediate	12	50%	▶	6.0	x	30	=	160
Complex	24	60%	▶	9.6	x	< 5	=	< 20
Total / Average (Overall Failures)	0.10 (Weighted Avg.)	32.2% (Weighted Avg.)	▶	0.07 (Weighted Avg.)	x	54,600	=	3,600 Hr (~1,700 Hr)

Note that numbers may not match exactly due to rounding
Source: Quinlan & Associates estimates

Overall, we see the reduction in issue rates and resolution times translating to a daily time savings of 13,800 hours and 1,700 hours respectively. This totals up to 15,500 hours of

time savings per day for the industry, reducing daily time wastage from 19,100 hours to 3,600 hours (see Figure 21).

FIGURE 21: TIME SAVINGS



Source: Quinlan & Associates estimates

Overall, this represents an 81% reduction in time wastage in resolving system / operational issues, saving the industry over 3.9 million hours each year in addressing cross-border transaction issues.

Given the ongoing growth in cross-border transactions, along with heightened complexity in payment chains, the problems associated with cross-border payments are only likely to magnify over time. And with this comes an urgent need for operational and technological change in the banking industry. It is time for the industry and its participants to address their weakest link.

SECTION 7

HOW CAN WE HELP?

Our consultants have extensive experience in optimising a financial institution's cross-border transactions operations. Our project work typically involves a number of key steps:

1. EVALUATE

Evaluate the bank's transactions business, to identify key gaps and potential opportunities, e.g.:

- Analyse existing correspondent banking network in detail, to identify key value-accretive and value-destructive relationships, including customer banks with the most attractive growth potential
- Review existing IT infrastructure, operational processes, and data flows, and benchmark against industry leaders to identify capability gaps (against key competitors and industry best-practice)
- Determine adequacy of internal capabilities to affect change, including legacy systems, data availability and consistency, and IT expertise / talent

2. ADAPT

Adapt business processes, focusing on staff and operational practice, e.g.:

- Determine and prioritise staff practices and / or steps in operational processes that drive issues in transactions
- Establish robust policies and protocols aimed at addressing and eliminating the identified shortfalls
- Conduct training to educate staff on best-practice processes and establish metrics against which to measure operational improvement

3. OPTIMISE

Optimise IT systems, exploring both in-house and third-party options:

- Evaluate the buy-or-build decision, taking into account technological requirements, existing infrastructure/ systems, and internal IT expertise
- Pinpoint key technological issues and establish a system enhancement strategy, detailing upgrade requirements and implementation timelines
- Determine operational and financial criteria to evaluate third-party solutions, along with RFP management and a shortlist of potential service vendors



STRATEGY WITH A DIFFERENCE

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ABOUT US

Quinlan & Associates is a leading independent strategy consulting firm specialising in the financial services industry.

We are the first firm to offer end-to-end strategy consulting services. From strategy formulation to execution, to ongoing reporting, communications, and employee training, we translate cutting-edge advice into commercially executable solutions.

With our team of top-tier financial services and strategy consulting professionals and our global network of alliance partners, we give you the most up-to-date industry insights from around the world, putting you an essential step ahead of your competitors.

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