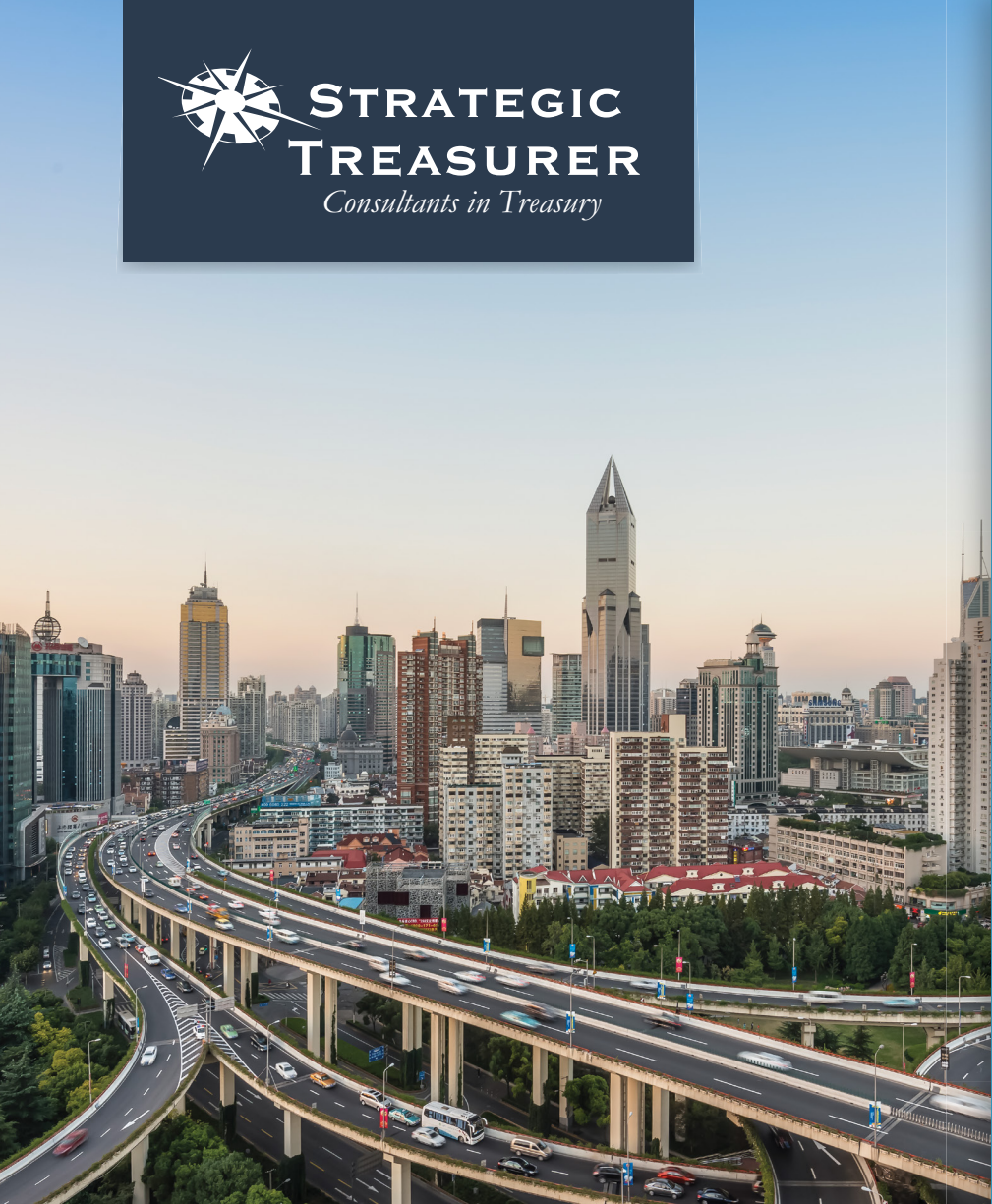
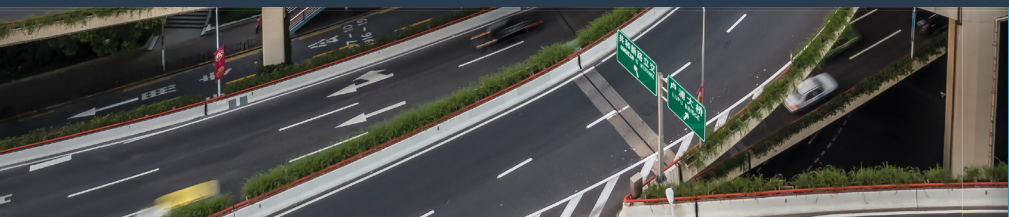




**STRATEGIC
TREASURER**
Consultants in Treasury



**ANALYST REPORT
2017**



TREASURY AGGREGATORS

Bank Connectivity Solutions

- Streamlined Payments & Reporting
- Enhanced Security
- Simplified Compliance

THE DEFINITIVE GUIDE TO TREASURY AGGREGATION
TECHNOLOGY SOLUTIONS

This 2017 Treasury Aggregator Analyst Report is part of Strategic Treasurer's annually produced Analyst Report Series.



ANALYST REPORT CONTENTS

Our mission is to **elevate & enhance** the practice of treasury **by advising** individual clients **& informing** the industry at large.

We hope you enjoy this report & find it useful.
Thank you for reading.

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Since Strategic Treasurer was founded in 2004, we have helped hundreds of corporate clients face real-world treasury issues. Our senior consultants have practical, hands-on experience in corporate treasury environments and have held senior management and leadership roles across numerous industries. Strategic Treasurer's consultants are known not only for their expertise in the treasury space, but also for their responsiveness to client issues, thorough follow-through on every project, and deep understanding of the industry. Our focus as a firm centers on maintaining true expertise in the treasury space, which is accomplished through a combination of annual industry surveys, industry discovery meetings, and insightful discussions with both corporate clients and treasury technology vendors. As a result, our awareness of the market is both global in scope and rich in detail.

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Purpose of Report

WHY IS THIS REPORT NECESSARY?

How many banking partners do you have? Do you use the same connectivity method for each of your banking partners? Are all of your banks connected to SWIFT, or do you have to connect to some of your banks through other networks or individual bank portals? In recent years, continued economic globalization and technological advancements are allowing today's organizations to transact with clients and partners across the world at a rapid pace. While these capabilities are valuable for firms looking to expand their global footprint, the comprehensive web of connections that now exists between corporates and their business partners can be difficult to maintain. This is particularly true for organizations operating in multiple world regions and dealing with high payment volumes across a number of bank relationships.

In most organizations, it is treasury's responsibility to manage the constant stream of global payments activity, much of which is originating in different currencies and passing through a variety of banking channels. Treasury is also tasked with ensuring that these payments are made in a secure environment and in compliance with the various sanctions and regulations that exist worldwide. Thus, for firms sending out thousands or even millions of payments every month, the process of managing payment activity can quickly escalate

in complexity and make it difficult for treasury to keep their payment processes up-to-date and in line with the evolving needs and expectations of the business. This global payments complexity leaves many treasury departments striving to increase efficiency, security, and visibility wherever possible, while also maintaining compliance with the various regulatory statutes that exist across the payments and banking landscape. It is due to these heightened payments and connectivity needs that the treasury aggregation industry has formed.

This report will provide in-depth analysis of the technology solutions referred to as "treasury aggregators" by Strategic Treasurer. Specifically, this report will help readers:

- Understand what a treasury aggregator is, and what differentiates these solutions from other financial technology offerings.
- Evaluate the business case for treasury aggregators, including a breakdown of specific drivers and industry challenges that have resulted in an elevated need for their services.
- Pinpoint the unique benefits provided through the use of treasury aggregation technology.
- Identify best practices regarding the selection and implementation of a treasury aggregator and its integration with a TMS, ERP, or other technology solution.
- Analyze the products and services suites offered by some of the leading providers of treasury aggregation technology.

IN THIS REPORT

There are two treasury aggregator checklists provided in this report. The first checklist, provided on page 7, has been created to help firms interested in adopting a treasury aggregator to identify the unique set of advantages and benefits that could be obtained through their use. The second checklist, provided on page 28, contains a set of questions that firms interested in undergoing a selection process can use to identify the scope of functionality that is offered by a particular vendor and to more effectively differentiate the range of services that are available across the aggregation landscape.

What Is a Treasury Aggregator?

WHAT IS A TREASURY AGGREGATOR?

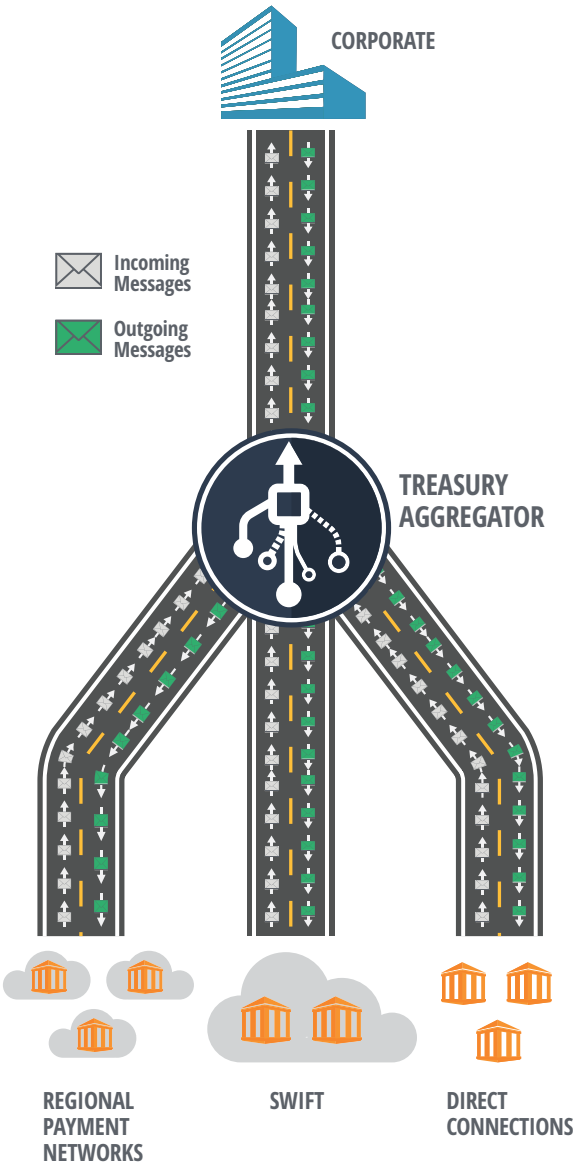
The term “treasury aggregator” may not be one that most treasurers or corporate practitioners are familiar with. Strategic Treasurer coined the term “treasury aggregator” to define the set of solutions that provide streamlined connectivity for all a corporate’s banking activity, including balance reports and wire transfers, through the SWIFT network, other networks, and direct connections. The connectivity services provided by treasury aggregators are desirable because they drastically reduce the complexity involved in managing multiple bank portals or payment systems. By offering a single connection point, treasury aggregators are able to provide corporates with simplified banking processes, enhanced cash management and visibility, streamlined payments and reporting features, and robust security and compliance tools. While there are a number of solutions that offer these functionalities, there was formerly no term or industry grouping that accurately classified them. Thus, the term “treasury aggregator” was created to group these solutions into a single, definitive category.

A helpful analogy to think of when envisioning the role that a treasury aggregator plays is to picture the treasury aggregator as a system of roadways that connect an organization to its banks. For optimal travel, a road must be large enough to handle all incoming and outgoing traffic and have specific

channels that direct traffic to the appropriate destination. If the road network is inefficient, transportation will be slow and harrowing. Similarly, if a roadway is not large enough to handle the amount of traffic passing through it, travel between destinations on the road will be impeded. However, if the infrastructure is well-established and up-to-date, a roadway system can be used to travel quickly and safely between two locations.

Just as the best roads allow for thousands and even millions of cars to travel between cities every day, so treasury aggregators serve as the major connectivity channels that allow corporates to efficiently and securely interact with all of their banking partners worldwide. In today’s world, most organizations connect to a variety of individual banks and bank networks. Treasury aggregators help with this process by connecting to each individual bank channel used by a client and managing the payments process from origination through to delivery and reporting. This includes formatting each message a corporate must send or receive into the preferred format of the recipient, ensuring compliance with all relevant sanctions and regulatory statutes, and providing a secure environment for payments and reporting activity. By building and maintaining the roadways through which corporates can interact with their banks, treasury aggregators are able to provide simplified, efficient, and secure connectivity services for their clients.

A helpful analogy to think of when envisioning the role that a treasury aggregator plays is to picture the treasury aggregator as a system of roadways that connect an organization to its banks.



Treasury Solutions & Available Functionality

ARE TREASURY AGGREGATORS & TMS THE SAME THING?

TREASURY AGGREGATOR: BANK CONNECTIVITY SOLUTIONS

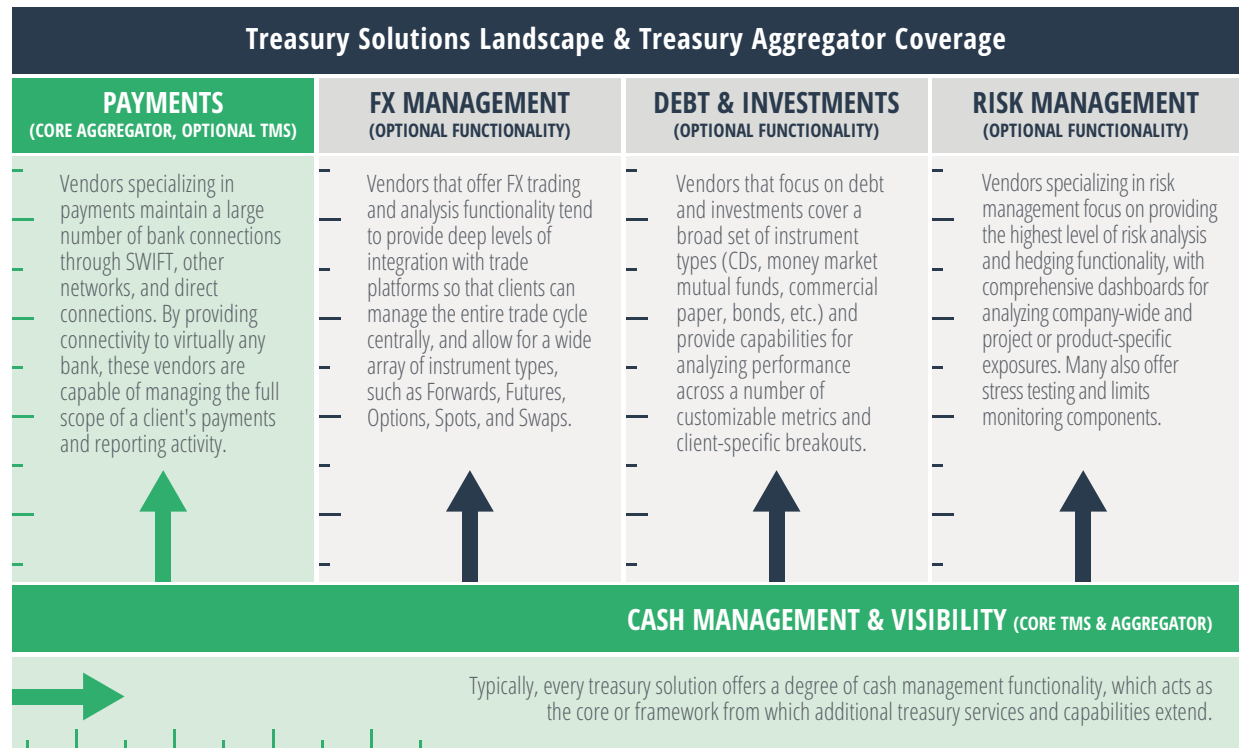
Treasury aggregators specialize in the area of bank connectivity. These vendors provide connectivity services to clients that rise beyond what is offered through a standard SWIFT Service Bureau or TMS. Treasury aggregators distinguish themselves by offering connectivity to SWIFT non-SWIFT banks, through direct (H2H) connectivity and other networks, so that they can connect a corporate to virtually any of their banking partners regardless of location, size, or complexity. Through these connectivity services, aggregators offer streamlined payments and reporting functionality, as well as cash management, compliance, and bank account management services. With regards to the treasury solutions landscape shown to the right, the provision of these services places aggregators in both the payments and cash management sectors.

When looking at the full treasury solutions landscape, there are five primary service areas or sectors that a particular solution could seek to cover. These sectors include cash management, payments, FX trading, debt and investment activity, and risk management. In most circumstances, a TMS will provide some degree of cash management functionality, and then may also offer functionality in one or more of the

other sectors. Depending on the TMS, functionality may span one or two sectors, or may cover all five. However, for a solution to be considered an aggregator, it is required that it provide full coverage in the payments sector. Additionally, most aggregators will offer cash management capabilities that complement their payments and connectivity services. While some aggregators may offer functionality in other sectors outside of payments and cash management, the provision of those services is irrelevant as far as their aggregator status is concerned.

There are several treasury solutions available that are capable of providing top-notch bank connectivity to their clients as part

of a broader set of treasury tools. These solutions would be classified both as a TMS and as a treasury aggregator. However, there is a larger group of solutions that, while offering a wide array of treasury functionality, are not able to provide this level of bank connectivity services. The provision of these high-end payments and connectivity services is ultimately what differentiates an aggregator from other treasury solutions; even if a solution covers virtually every treasury function other than bank connectivity, it would still not be considered a treasury aggregator.



CHECKLIST: WHAT CAN A TREASURY AGGREGATOR DO FOR ME?

While treasury aggregators provide a valuable set of services to organizations, it can be difficult to determine just how significant the value-add of such a solution would be. Generally, it is companies with a fair-to-heavy amount of global complexity and moderate-to-high levels of payment activity that see the most benefit through the implementation of a treasury aggregator. However, there are a range of connectivity needs that treasury aggregators are capable of addressing. If you are interested in understanding whether an aggregator would be beneficial to your organization, the following questions will help you identify the unique advantages that an aggregator could provide.

✓ 1. ARE YOU CONDUCTING BUSINESS ON A GLOBAL SCALE?

Today, over one-third of companies are operating in 20+ countries. This creates complexity in a number of banking and payments-related areas, as more banks, currencies, and payment types come into play. If you are operating in multiple countries and have yet to implement any sophisticated bank connectivity or payments solution, chances are your current banking, payments, security, and compliance processes are in need of an upgrade.

✓ 2. IS IT DIFFICULT TO MAINTAIN VISIBILITY TO ALL YOUR BANKS AND BANK ACCOUNTS?

Nearly half of all corporates today are originating payments using six or more banks, and over half of all companies use more than 100 bank accounts. Managing bank activity through multiple banks and bank channels can be complicated, especially if multiple bank portals or spreadsheets are used to view and analyze transaction activity. Companies relying heavily on bank portals and spreadsheets could have their processes simplified through the use of an aggregator.

✓ 3. DOES MANAGING PAYMENT ACTIVITY TAKE EXCESSIVE AMOUNTS OF TIME?

Half of all companies generate more than 10,000 payments globally every month. Many others generate more than 100,000 or even 1,000,000 payments monthly. Treasury teams that are burdened by the excessive time it takes to track and manage this activity could use a treasury aggregator to streamline and centralize their payment operations in order to increase end-to-end visibility and control.

✓ 4. IS FRAUD A TOP CONCERN REGARDING YOUR TECHNOLOGY INFRASTRUCTURE?

86% of companies have experienced fraud attempts within the past two years. Because of this, fraud prevention has become a top priority for treasury. For organizations looking to ensure that their payment processes are as secure as possible, adopting a treasury aggregator allows for additional layers of protection on payment files in transit and on payment information that is stored on a cloud or network.

✓ 5. ARE COMPLIANCE EXPECTATIONS PROVING TO BE A LARGE BURDEN?

Over the past decade or so, the compliance burden placed upon organizations has risen drastically as bodies like OFAC and FinCEN introduce more rigid regulatory requirements. Treasury aggregators provide enhanced sanctions screening and data validation checks on all incoming and outgoing messages and provide a central repository for bank account information that makes it easier to manage FBAR and other reporting requirements.

✓ 6. WOULD YOUR TREASURY TEAM BENEFIT FROM INCREASED PAYMENTS EFFICIENCY?

Over one-third of all corporate treasury departments consist of three or fewer employees, and many teams lack the staffing levels necessary to efficiently complete all their tasks. Treasury aggregators help reduce treasury's workload by consolidating all payment activity through a single portal and automating many of the payment generation and reporting tasks that have bogged down treasury in the past.

Widespread Economic Globalization

INDUSTRY CHALLENGES DRIVING TREASURY AGGREGATION

INDUSTRY CHALLENGE: WIDESPREAD ECONOMIC GLOBALIZATION

The topic of economic globalization is one that is frequently covered in Strategic Treasurer's Analyst Report Series. This is because the widespread globalization of business that has occurred over the past several decades has had a monumental impact on the everyday operations of most firms.

In the past, it was not uncommon for a company to operate exclusively in one country or region. Globalization efforts were limited by the technology of the era; it cost excessive amounts of time and money to expand operations overseas, and as a result, global expansion was only feasible for large firms. However, today's technology solutions are not only more affordable, but also allow for a greater degree of visibility and control across all business segments. This is allowing companies to pursue their globalization strategies more efficiently and at a much lower cost than their historical counterparts. Due to this "democratization

of technology," companies of all sizes are able to extend their reach beyond their country of origin and into entirely new world regions. In fact, as uncovered through a recent Strategic Treasurer survey, 83% of firms now operate in more than one country, 38% in 20 or more countries, and 20% in 41 or more countries. Furthermore, at least 30% of respondents to the same survey were operating in each of the 10 major world regions.

Although the opportunity to expand and grow their business worldwide is valuable to many firms, globalization does not come without its own set of challenges. Each new country a company enters has a unique set of regulations and compliance standards that must be adhered to. Entering new countries and regions may also mean that a company must add new banks, and subsequently new bank accounts, to support their operations. Furthermore, increased globalization tends to result in higher payment volumes as a firm's business grows. Finally, many firms involved in the acquisition of other companies find that each of their subsidiaries or new acquisitions are using different technology solutions, which can add to the complexity of the parent company's overall technology infrastructure. Subsequently, if a company's expansion efforts are not handled properly, the result can be a jumbled array of coexisting technology solutions, an unorganized, complex banking and payments structure, and an inability to effectively manage cash, protect against fraud, or ensure compliance with all applicable statutes.

Although the opportunity to expand and grow their business worldwide is valuable to many firms, globalization does not come without its own set of challenges.

Our Business Operates in This Many Countries:

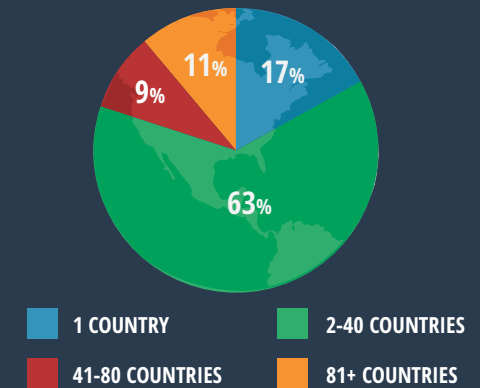


Figure 1

Our Business Operates in the Following Regions:

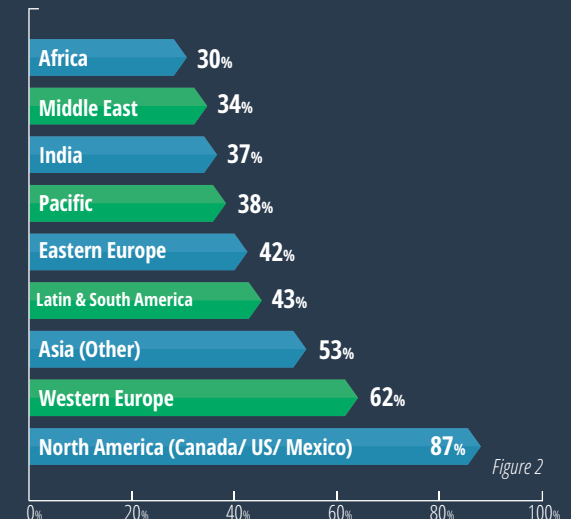


Figure 2

Figures 1 & 2: Based on a recent survey, 83% of organizations were operating in more than one country, and 20% were operating in 41+ countries. Additionally, at least 30% of organizations were operating in each of the major world regions.

INDUSTRY CHALLENGE: BANK & BANK ACCOUNT COMPLEXITY

At an organization's inception, it usually does not take more than a few Excel worksheets to keep track of company finances. Transaction volumes are low, and there are only a handful of banks and bank accounts through which activity must be tracked. However, as a business grows and expands, its banking structure tends to increase in complexity. New banks and bank accounts are added, which means that more bank relationships must be handled, and a greater spread of activity must be tracked and managed. These growing pains especially affect companies undergoing significant global expansion, as new bank partners and bank accounts must be added in regions where existing bank partners do not operate or have much expertise.

Within the past several years, continued global expansion has gone hand in hand with a rise in the number of banks and bank accounts that companies are using. According to a recent Strategic Treasurer Survey, 79% of firms were originating payments with three or more banks, while 45% used six or more banks, and 28% used eleven or more. Regarding individual bank accounts, 80% of firms had more than 25 accounts, and 54% had more than 100 accounts. At the top end of the spectrum, 24% had more than 500 accounts, and 15% had more than 1000.

While international payment networks such as SWIFT and regional networks such as EBICS, NACHA, and Bacs have helped reduce the complexity that exists in the banking landscape, there is still a ways to go. There are a multitude of banks that are too small or isolated to be connected to any network, and thus must be connected to via a direct (H2H) connection. In other circumstances, the high volumes of payments a corporate

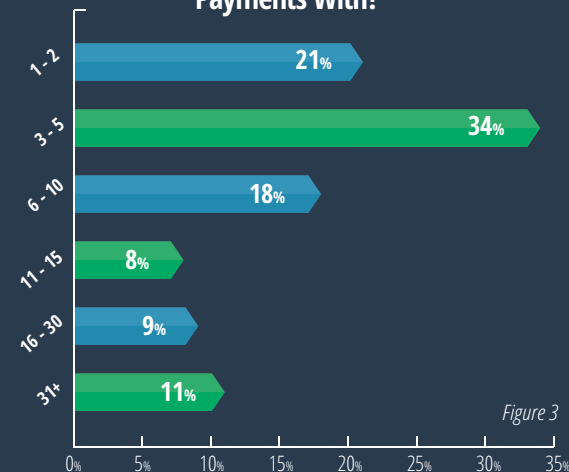
generates through a particular bank may necessitate the use of a direct connection rather than connectivity via a network. Furthermore, there are a variety of other international and domestic bank networks through which different types of payments are sent, which means that corporates may have to manage connections to an array of individual banks in addition to multiple bank networks.

The high number of banks and bank accounts in use by companies today increases the burden placed on treasury in managing payment activity and maintaining control and visibility over cash. Organizations operating without a central payments system must often use multiple bank portals and solutions to view activity and download reports, and will then export this information into Excel or another platform for further analysis. This is a manual and error-prone process that increases in complexity every time a new bank or bank account is added. It also does not appear to be getting any easier, as over the course of the past year, 76% of firms have either maintained or added to the number of banks they use. As the complexity inherent in the banking structures of many companies continues to beleaguer treasury, the need for greater efficiency, visibility, and control across the banking landscape is higher than ever.

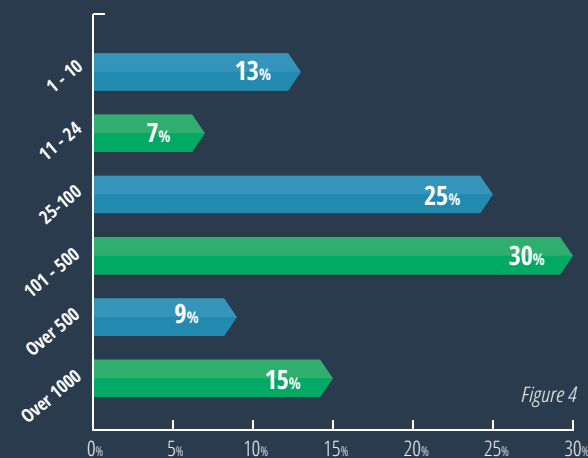
Organizations operating without a dedicated payments system must often use multiple bank portals to view activity and download reports, and then export this information into Excel or another platform for further analysis. This is a manual and error-prone process that increases in complexity every time a new bank or bank account is added.

Bank & Bank Account Complexity

How Many Banks Do You Originate Payments With?



How Many Bank Accounts Do You Have?



Figures 3 & 4: In the current business environment, nearly half of all organizations originate payments with six or more banks, and 54% maintain more than 100 bank accounts globally.

Payments Intensity & Complexity

INDUSTRY CHALLENGE: PAYMENTS INTENSITY & COMPLEXITY

An additional layer of payments complexity for firms arises from the high volumes of payments that are being generated and the diverse set of channels and formats through which this activity originates. For instance, 50% of companies in a recent survey were generating more than 10,000 payments globally every month, while 35% were generating more than 100,000, and 24% were generating more than 1,000,000. While these high payment volumes are difficult enough to manage on their own, the added burden of having to account for multiple currencies creates even more strain. In the same survey, 79% of firms were generating payments using three or more currencies, 51% using six or more currencies, and 21% using sixteen or more.

To make matters worse, it is not just one type of payment format that companies are dealing with. Rather, there are multiple payment formats that come into play for various banks and through different bank networks. For example, the SWIFT banking network has long championed the use of the ISO 15022 standard (commonly referred to as SWIFT MT). However, the newer ISO 20022 (XML) messages are now seeing increased adoption, especially in Europe. Other common industry formats include BAI for reporting and EDI for payments. Furthermore, many banks have their own set of proprietary formats that are used for corresponding via a direct connection. Subsequently, for companies transacting with multiple banks through a variety of connectivity channels, adhering to the specific formatting standards of each bank can cause significant headache on the corporate end, as messages must be continually reformatted.

The final nail in the coffin for many treasury teams with regards to payments comes from attempting to maintain visibility and oversight over the payment operations of multiple departments and subsidiaries. While exercising control over payments that treasury originates on their own is easy enough, other departments such as payroll and AP also regularly generate their own payments, as do the various subsidiaries and branches of a company. These payments may occur through a separate payment system, which results in a delay of payment information reaching treasury. This subsequently impacts treasury's ability to manage liquidity and maintain visibility to cash, two vitally important functions that they are held responsible for.

The challenges that are confronted when dealing with a global, high volume, and multi-faceted payments landscape can obstruct treasury from focusing on more strategic activities, and can also make it more difficult to identify fraud and remain in compliance with the various regulations that exist across the payments landscape. Moving forward, treasury aggregators are poised to play a pivotal role in simplifying these complexities by aggregating payment information through a central portal and providing a single interface or system through which all payment activity can be tracked.

The challenges that are confronted when dealing with a global, high volume, and multi-faceted payments landscape can quickly consume all of treasury's time and obstruct them from focusing on more strategic activities.

What Is the Approximate Volume of Payments You Generate Globally Per Month?

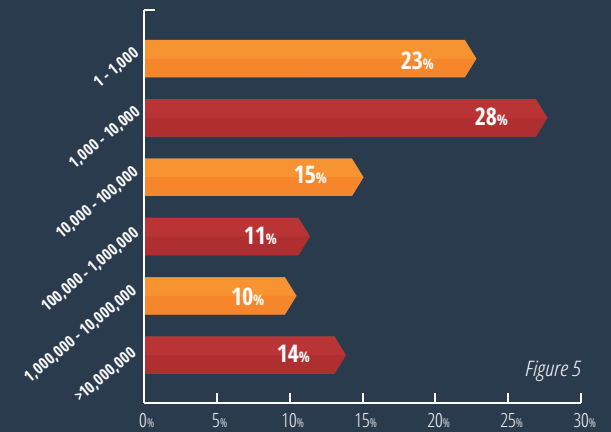


Figure 5

How Many Currencies Do You Regularly Make Payments In?

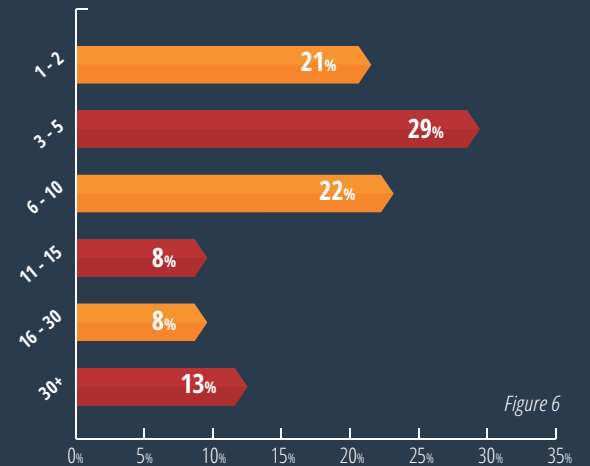


Figure 6

Figures 5 & 6: The payments complexity faced by treasury is amplified as organizations generate thousands and even millions of payments globally every month. These payments originate in a variety of currencies and through a number of unique payment channels.

Protecting Against Fraud

INDUSTRY CHALLENGE: PROTECTING AGAINST FRAUD

While fraud prevention has always been an item on treasury's radar, its importance has escalated rapidly in recent years. This is due to both the large number of fraud attacks that are targeting the business environment and the high payouts that many criminals are achieving as a result.

In 2017, Strategic Treasurer's Treasury Fraud & Controls Survey found that 86% of companies had experienced fraud attacks within the past two years. This fraud activity was perpetrated through multiple channels, with 79% of firms experiencing Business Email Compromise (BEC) or imposter fraud, 65% payment fraud, 47% cyber fraud, and 8% ransomware.

Fraud is more than just an inconvenience; it is a massive threat that is consistently experienced by the majority of organizations in existence today.

While some of these fraud attempts were successfully thwarted, other companies suffered substantial losses. With regards to BEC fraud, approximately 1 in 7 firms that were targeted suffered a loss. Regarding check fraud, attempts were successful 10% of the time for check forgery and 1 out of every 8 times for check conversion. In other payments-related areas, schemes such as ACH fraud resulted in loss for 1 in every 8 firms targeted, and wire fraud for 1 in every 4 firms targeted. Furthermore, while the average losses stemming from check fraud in 2016 was \$1500, BEC and wire fraud losses were closer to \$130,000 per successful attempt, and average losses for

more serious system-level fraud attempts were over \$1 million. These figures give credence to the fact that fraud is more than just an inconvenience; it is a massive threat that is consistently experienced by the majority of organizations in existence today.

In today's business environment, criminals are actively looking to infiltrate every layer of an organization's security. As a result of this activity, many firms' payment processes have come under intense scrutiny, especially as criminals introduce increasingly sophisticated methods of perpetrating fraud. The sophistication of these methods has been on full display over the past year, with the WannaCry ransomware attacks receiving global media coverage, and the recent Bank of Bangladesh heist garnering worldwide attention as well. Due to the heightened threat that fraud continues to pose, payment security has rapidly climbed treasury's priority list to the extent that, in a recent survey, fraud prevention was listed as a top payment priority by over two-thirds of treasury and finance teams. Additionally, as part of the 2017 B2B & WCM Strategies Survey, 61% of firms indicated that security concerns had a strong or very strong influence on their technology spend, and 46% of firms had higher or significantly higher payment security concerns than in previous years, compared to just 2% with lower security concerns. Given these developments, it is clear that there is an immense market need for robust payment security tools and fraud prevention technology.

Due to the heightened threat that fraud continues to pose, payment security has rapidly climbed treasury's priority list to the extent that, in a recent survey, fraud prevention was listed as a top payment priority for over two-thirds of treasury and finance teams.

Corporate Fraud Experience

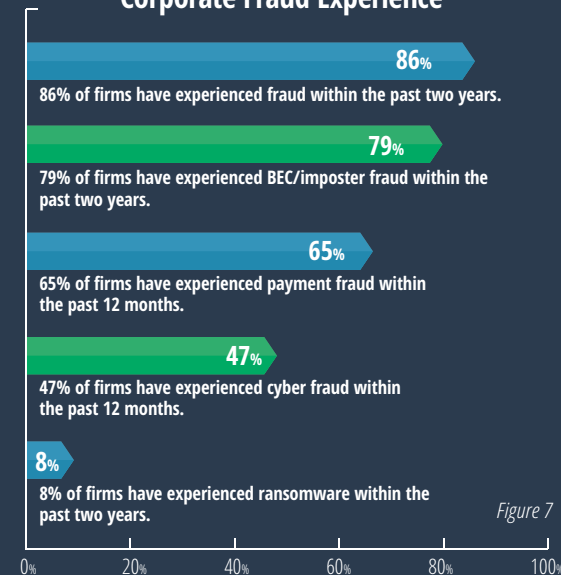


Figure 7

Impact of Fraud Concerns

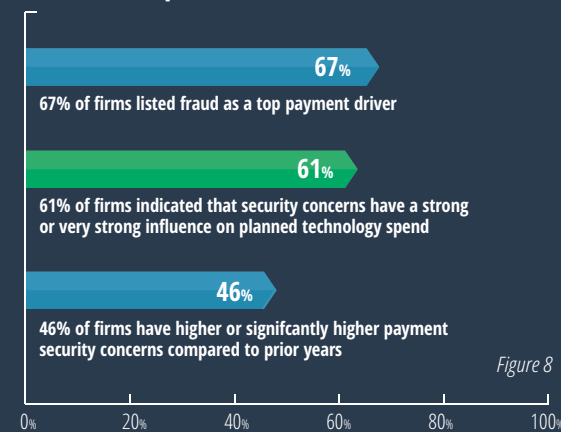


Figure 8

Figures 7 & 8: As fraud continues to ravage the corporate landscape, the security concerns that organizations have regarding their payment operations are prompting many to invest heavily in treasury security and fraud prevention technology.

Heightened Compliance Expectations

INDUSTRY CHALLENGE: HEIGHTENED COMPLIANCE EXPECTATIONS

At the same time that fraud concerns are causing an industry pandemic, the business environment is also being heavily impacted by escalating compliance expectations. Events such as the 2001 terrorist attacks and subsequent terrorist and criminal activity, as well as the 2008 financial collapse and resulting market volatility, have resulted in a number of new regulatory measures being implemented across the corporate and banking landscape. Regulatory bodies such as the Office of Foreign Assets and Control (OFAC) and the Financial Crimes Enforcement Network (FinCEN) have been created to target criminal and terrorist networks, and focus their aim on ensuring that companies are not funding known criminal organizations. This is done through the provision of a list of sanctioned parties and individuals that organizations are forbidden from conducting business with. Additionally, as a means of cracking down on tax evasion, the United States introduced mandatory Foreign Bank Account Report (FBAR) filings for companies and individuals with more than \$10,000 held in overseas accounts. These filings have caused widespread confusion and headache for organizations in North America, as they now must annually track and report on a large spread of information regarding their foreign account holdings.

In order to ensure adherence to these statutes, the governing bodies overseeing these regulations have placed severe penalties on organizations that fail to comply. In fact, when looking at sanctions violations over the past four years, nearly \$1.95 billion worth of penalties and fines have been assessed by OFAC. While some might think that the brunt of these penalties are levied towards banks, recent changes to

legislation have made it so that whatever party is found to be most negligent regarding a sanctions violation is the party that suffers a penalty. Thus, for the 35% of corporates in a recent survey that were found to not be conducting any sanctions screening, there is a heightened risk of being found at fault in a compliance violation. In fact, the 2016 Treasury Fraud & Controls Survey found that 12% of firms had either made or received a payment from a sanctioned party within the past year. In 2017, 6% of firms made similar mistakes.

The consequences of being found in violation of compliance standards are twofold. For one, it damages the reputation of the company and can hurt business as potential clients and investors look to avoid any fallout associated with the violation. The other consequence is the fine or penalty levied against the organization. Over the last year, individual penalties assessed against organizations or individuals by OFAC ranged from \$10,000 all the way up to \$100,000,000 (OFAC). Where FBAR is concerned, violations can be penalized by \$100,000 or half the value of the perpetrator's overseas holdings, whichever is greater. Thus, as the compliance environment continues to develop, the challenge of adhering to all relevant regulations and sanctions requirements is an issue that organizations must address.

The consequences of being found in violation of compliance standards are twofold. For one, it damages the reputation of the company and can hurt business as potential clients and investors look to avoid any fallout associated with the violation.

The other consequence is the fine or penalty levied against the organization.

OFAC Penalties Assessed Per Year (Sanctions Violations)

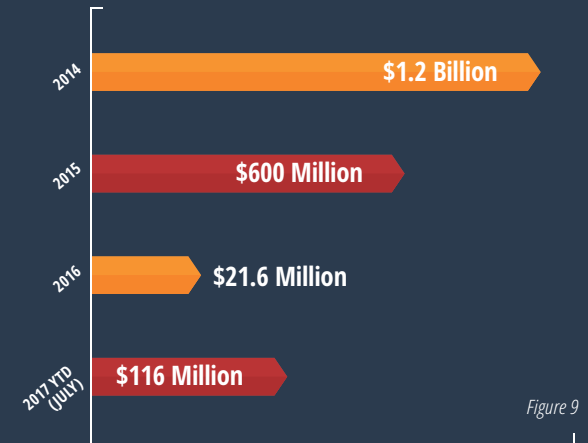


Figure 9

Corporate Sanctions Screening Practices

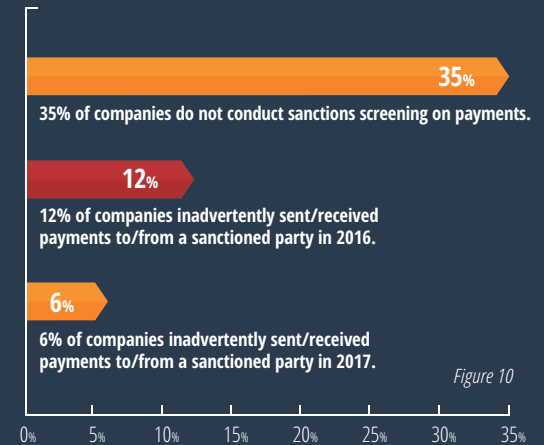


Figure 10

Figures 9 & 10: As regulatory bodies like OFAC and FinCEN put compliance practices under heavy scrutiny, the pressure is on for organizations to ensure their compliance with relevant sanctions and reporting requirements.

INDUSTRY CHALLENGE: UNDERSTAFFED TREASURY TEAMS

If every treasury team consisted of a dozen or so employees, perhaps there would be enough manpower to appropriately distribute all the tasks treasury must perform without the need for improved technological efficiency. However, this is wishful thinking for most treasury teams. In reality, 73% of global treasury organizations consist of 10 or fewer employees, and 51% consist of 6 or less employees. For almost two-fifths (39%) of treasury teams, the total staff size is 3 or fewer.

Across a large swath of the corporate landscape, treasury teams are being kept lean. At the same time, the responsibilities that treasury is tasked with have continued to increase.

Across a large swath of the corporate landscape, treasury teams are being kept lean. At the same time, the responsibilities that treasury is tasked with have continued to increase. The modern-day treasurer has a large stake in financial processes ranging from cash forecasting and visibility to FX trading, risk management, liquidity and working capital management, fraud prevention, bank account management, and payment management. For treasury teams consisting of only a few employees, attempting to manage operations across all these fronts simultaneously is incredibly difficult.

As the inverse relationship between treasury's responsibilities and the size of their team persists, most departments have no option but to increase efficiency wherever possible. To

ensure they have time to perform the more strategic roles they are entrusted with, treasury teams are looking to streamline and automate many of the daily tasks and processes they must perform. For many teams, payments represent an area where increased automation and Straight-Through-Processing (STP) would free up large amounts of time and also result in significant cost-savings opportunities. This is particularly true for organizations that are using heavily manual payment processes.

As organizations look to streamline their operations, it is no surprise that efficiency was ranked as the 2nd most important payments driver for treasury, behind only fraud management. With regards to this efficiency, 79% of corporate respondents saw value in making changes to their payment operations in order to reduce internal costs, 62% to reduce errors, and 59% to reduce external costs.

As the need for increased efficiency and control continues to be a top priority for treasury, technology is poised to play a huge role. For thinly staffed companies making hundreds or thousands of payments every day, manual payment processes are simply not an option. Instead, in the 2017 B2B & WCM Strategies Survey, five times more companies were planning to spend more on payments technology in the coming year than those planning to spend less. Regarding this spend, 50% of firms intended to invest more than \$50,000, with 28% planning to spend more than \$250,000, and 8% over \$1 million.

As the need for increased efficiency and control continues to be a top priority for treasury, technology is poised to play a huge role.

Understaffed Treasury Teams

How Large Is Your Global Treasury Organization, Including Analysts?

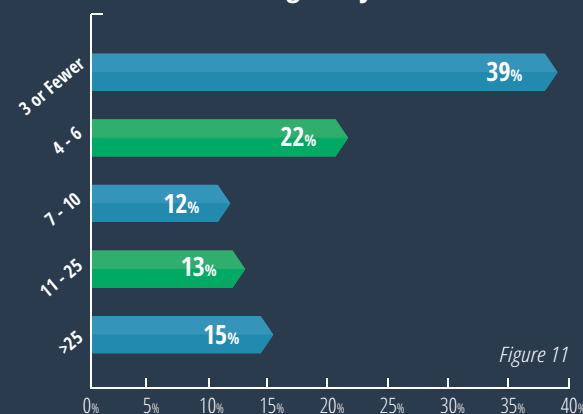


Figure 11

How Much Does Your Company Plan to Spend on Payment Technology In the Next Year?

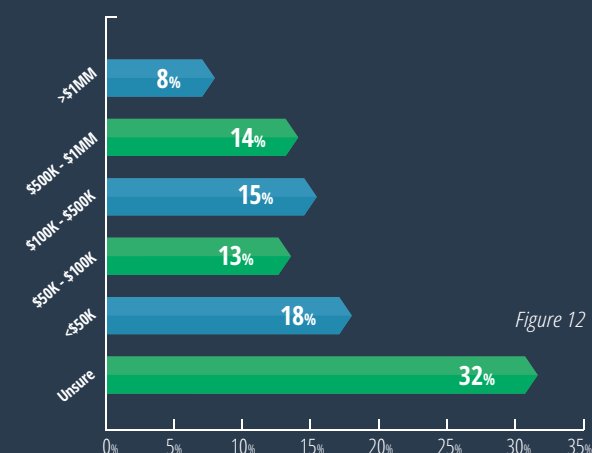


Figure 12

Figures 11 & 12: While the responsibilities delegated to treasury continue to increase, the staff sizes for many treasury departments have been kept lean. This is forcing many treasury teams to rely heavily on technology for automating and streamlining as many tasks as possible to achieve greater efficiency.

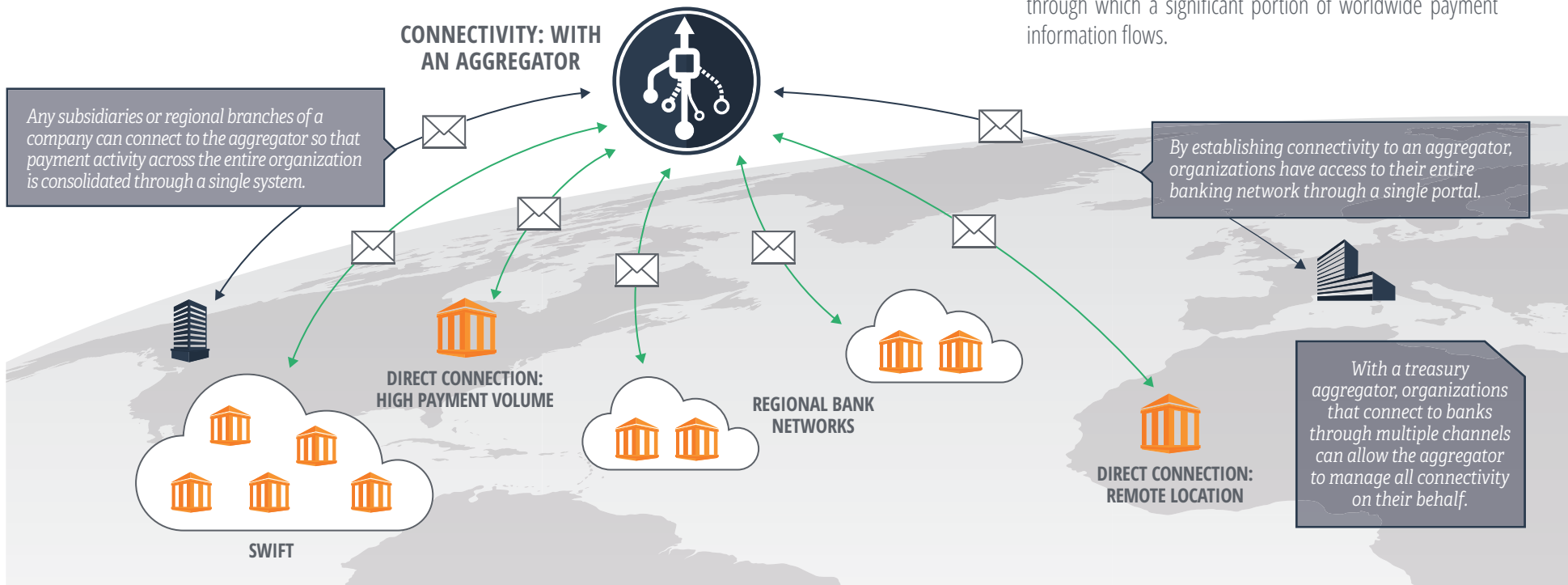
Simplified Global Bank Connectivity

WHAT BENEFITS DO TREASURY AGGREGATORS PROVIDE?

AGGREGATOR BENEFIT: SIMPLIFIED GLOBAL BANK CONNECTIVITY

Treasury aggregators specialize in bank connectivity. Resultantly, the benefits and advantages that are derived through the use of an aggregator stem primarily from the provision of these connectivity services. While practically any firm can benefit from the functionality offered by treasury aggregators, those companies dealing with heightened global complexity and a diverse set of bank relationships would find the functionality most valuable. The connectivity services offered by treasury aggregators can be broken down into three distinct categories:

SWIFT Services: Treasury aggregators are capable of connecting corporates to SWIFT via SCORE, and most will function as fully operational SWIFT Service Bureaus. This means that corporates have the option of using both SWIFT FIN and FileAct services directly through the treasury aggregator, and in some circumstances, they may even have access to the aggregator’s Bank Identification Code (BIC), instead of having to purchase their own. As all treasury aggregators have established connectivity to SWIFT, a corporate client can be confident that any banking partner that uses SWIFT will be accessible through the aggregator. For many corporates, accessing the SWIFT network provides them with connectivity to the majority of their banking partners and is the channel through which a significant portion of worldwide payment information flows.



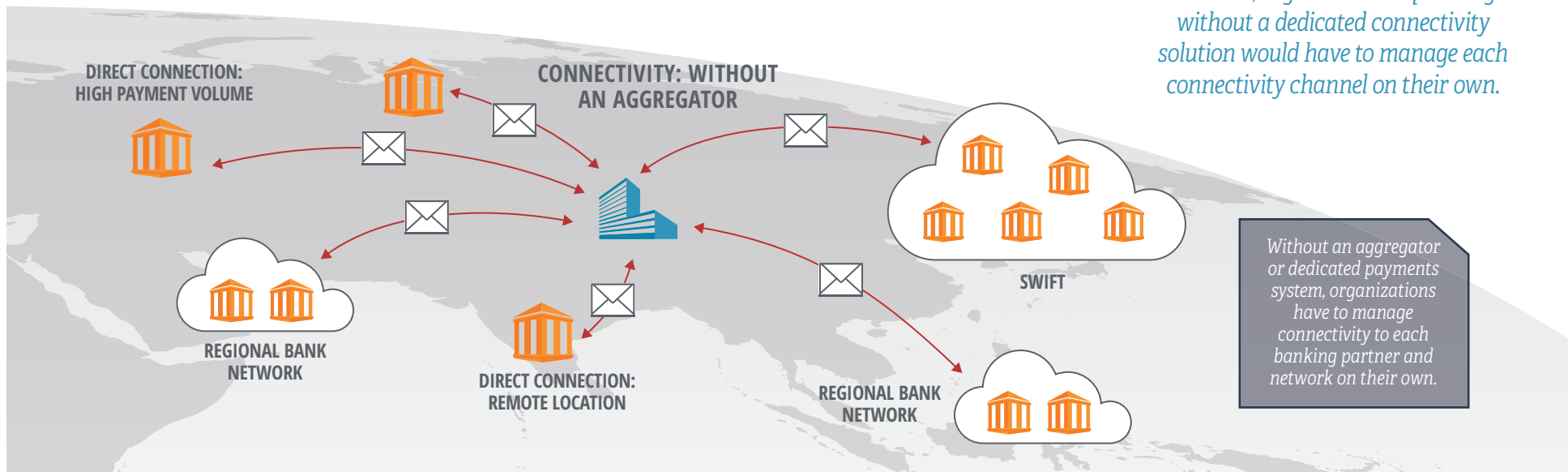
Simplified Global Bank Connectivity

Direct Connections: Although more than 11,000 financial institutions in 200+ countries utilize SWIFT, there are still large numbers of banks that are not connected to SWIFT or any other network. Additionally, some corporates maintain such high volumes of payment activity with their core banks that it makes more sense to connect directly to the bank's system rather than going through a network. In these circumstances, individual (H2H) connections have to be established between the corporate and the bank. Treasury aggregators simplify this process by handling each direct connection a corporate requires and routing all bank information and activity through their system to the corporate's TMS or ERP. Although many aggregators have already established a large number of direct connections to individual banks, they can establish additional connections to any bank a client requires.

Regional/Alternate Networks: Beyond SWIFT, there are a number of other payment networks that corporates may use to interact with their banks. For domestic payments, wires can be routed through regional networks such as NACHA in the USA, Bacs in the UK, and Zengin in Japan. Other examples of alternate payment networks include the use of Fedwire and CHIPS in North America, and EBICS as an alternative to SWIFT that is used by some organizations in Europe. Treasury aggregators are capable of connecting to each of these regional networks and to virtually any other established network in existence. For any payment exchanged through their system, treasury aggregators ensure that the payment details meet all relevant formatting and standardization protocols, such as the SEPA standards that apply in the Eurozone.

In today's world, most corporates interact with their banks through a combination of the aforementioned methods. As such, treasury aggregators play an important role in centralizing, streamlining, and simplifying the bank connectivity process. The provision of a single system for managing all bank interactions is advantageous because corporates only have to maintain one connection to the treasury aggregator and can then allow the aggregator to manage all subsequent support and maintenance tasks.

The provision of a single system for managing bank connectivity is advantageous because corporates only have to maintain one connection to the treasury aggregator. In contrast, organizations operating without a dedicated connectivity solution would have to manage each connectivity channel on their own.



Streamlined Payments & Reporting

AGGREGATOR BENEFIT: STREAMLINED PAYMENTS & REPORTING

Once all a corporate's banks have been onboarded to an aggregator, the result is a streamlined payments and reporting workflow that requires minimal levels of manual intervention. Treasury aggregators cover the electronic funds transfer (EFT) process, beginning with file origination and including steps such as message formatting, sanctions screening, and data validation all the way through to delivery and confirmation. Payments from any of a company's subsidiaries and departments, including treasury, AP, and HR, can be funneled through the aggregator's system for delivery to banks. Aggregators are capable of handling the full suite of ACH and wire activity generated by the various departments of an organization, including both high value, low volume payments typically conducted by treasury and also low value, high volume payments generated by other departments. For treasury, the majority of payment activity is conducted via wires or ACH, and includes FX trades, investment activity, debt payments, and hedging activity. For other departments like AP and HR, the majority of activity involves payments made to vendors and employees,

Treasury aggregators cover the electronic funds transfer (EFT) process from message formatting, sanctions screening, and data validation, all the way through to delivery. Payments from any department, including treasury, AP, and payroll, can be funneled through the aggregator's system for delivery to banks.

either through wires, ACH, or electronic checks. In either case, treasury aggregators can manage this payment activity, including the various payment methods, and can account for each of the various banks and bank formats that a specific department might use.

Authorized users can generate payments directly through the aggregator's portal at any time. Most aggregators allow for custom payment workflows to be designed by each client for initiation and approval, and offer the ability for payments to be generated via standard templates, as custom entries, or to flow from an ERP or TMS. For firms originating payments through another treasury solution, the payments tasks typically managed by an aggregator begin once a payment has already been created and approved. At this point, the payment instructions flow directly from the originating internal system (TMS, AP, ERP, etc.) to the aggregator's system. These instructions commonly have to be transformed from their original format into a standard that is accepted by the recipient bank. Depending on the location of the bank and also the bank's size and sophistication, the message formats that are accepted can differ widely. However, a treasury aggregator is capable of handling any message reformatting on behalf of their clients, and can support a number of different formats including EDI/BAI, SWIFT MT, and XML-based ISO 20022. Aggregators also maintain a library of proprietary standards commonly used by individual banks for direct connections. Maintaining compatibility with each "messaging standard" is pivotal for aggregators, as it ensures that clients will never run into issues regarding an unsupported format.

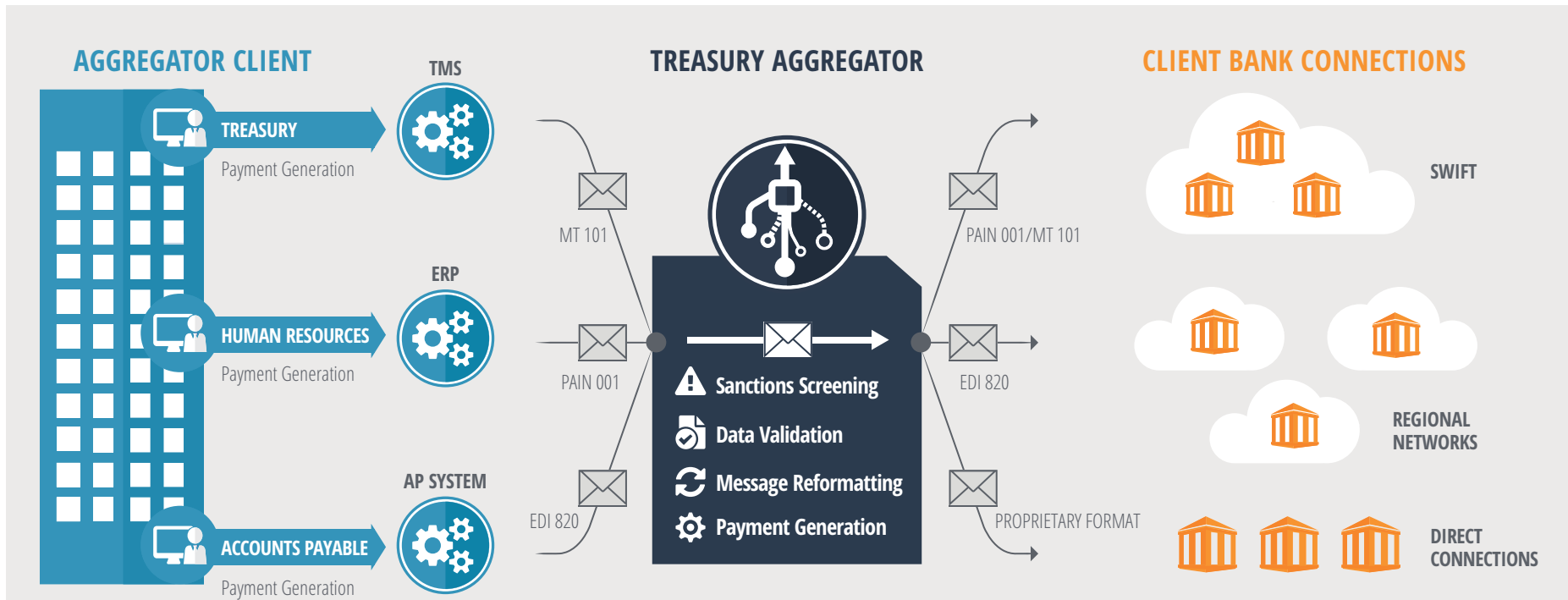
Once the formatting process is complete, aggregators will run sanctions screening and data validation checks on each

message before ultimately sending the instructions to the recipient bank. If any message is found to be non-compliant or to contain formatting anomalies, aggregators will halt the payment, send it to a resolutions queue, and notify the client that the payment details need to be reexamined before the message can be sent.

On the reporting side, treasury aggregators can direct messages received from banks, such as bank statements and transaction activity, back to the corresponding corporate system and end user. This process works similarly to how payments are sent and received. The bank sends a statement or report to the treasury aggregator, who then validates the contents and reformats the message into a standard accepted by the corporate's internal systems. For clients who request it, aggregators can export bank statements into formats such as Excel and PDF to make for easier reporting. Reports and statements can also be directly exported into a TMS or ERP. If the corporate isn't using a TMS or ERP system, they can log in to the aggregator's portal to view bank statements and activity. As a significant portion of clients routinely access their aggregator's portal for this purpose, many vendors have developed a robust set of interfaces for displaying cash balances and payment activity.

On the reporting side, treasury aggregators can direct messages received from banks, such as bank statements and transaction activity, back to the corresponding corporate system and end user.

Streamlined Payments & Reporting



1

Any department within an organization and any subsidiary of the parent company is able to generate and send payments using a treasury aggregator. Payments from any internal systems, including a TMS, ERP, or AP system, can be set up to pass through the aggregator on their way to banks.

For organizations without a TMS or ERP, the aggregator's system can be used for generating payments, viewing bank statements and activity, and maintaining visibility to cash positions.

2

Once an aggregator receives payment instructions, it performs both sanctions screening and data validation checks to ensure the validity and compliance of each message. If a message passes these checks, the aggregator converts the message into a format accepted by the recipient bank.

While treasury aggregators can facilitate the exchange of payments that are generated in other systems, clients can also use the aggregator's portal to initiate payments.

3

A treasury aggregator maintains connectivity to a number of bank channels, including SWIFT, alternate networks, and direct connections. For each payment generated by a client, the aggregator routes the message down the necessary channel and to the appropriate bank.

Once a payment has been delivered to a bank, any bank statements or reports are downloaded by the aggregator and made available either directly through the aggregator's portal or via the client's other internal systems (e.g. TMS, ERP, etc.).

Cash Management & Visibility

AGGREGATOR BENEFIT: CASH MANAGEMENT & VISIBILITY

As part of Strategic Treasurer's 2017 Treasury Technology Use Survey, respondents were asked to identify which functions they regularly used or needed in treasury. The resulting data found that the most needed and regularly used functionality was cash positioning, with 86% of respondents using it. In most treasury organizations, maintaining visibility to cash and cash positions is a daily responsibility that requires constant oversight. For organizations that maintain multiple bank relationships and dozens or even hundreds of bank accounts, this process can become quite complex. This is especially true given the fact that nearly half of all organizations in a recent survey were generating more than 10,000 payments globally every month, much of which is occurring in different countries and via a range of currencies.

For companies operating without any sophisticated treasury solution, the process of maintaining visibility to cash would

In most treasury organizations, maintaining visibility to cash and cash positions is a daily responsibility that requires constant oversight. For organizations that maintain multiple bank relationships and dozens or even hundreds of bank accounts, this process can become quite complex. This is especially true given that many organizations generate thousands or even millions of payments every month.

require the use of multiple proprietary bank portals to view transaction activity, and the exportation of this information into Excel spreadsheets for further analysis and upkeep. Although this process might be manageable for a few bank accounts, it is far from ideal for companies with hundreds or thousands of accounts worldwide. Additionally, for firms with multiple subsidiaries, receiving payment activity from these branches without a sophisticated connectivity solution is often delayed, which makes it practically impossible to achieve consistent visibility to all cash positions. Thus, for most firms, additional efficiency beyond these manual workflows is a necessity if greater control is to be realized.

As a treasury aggregator is capable of handling all payment and reporting activity for an organization, a primary benefit for treasury is increased visibility and control over cash. This advantage is provided by aggregators through direct management of all incoming and outgoing payment activity for an organization because the treasury aggregator is connected to all banks and bank accounts in use by the client. As an organization's payment activity passes through the aggregator, changes that occur in any of the client's bank accounts are registered in the aggregator's system. With this holistic view of payment activity, an aggregator is able to maintain updated cash positions and provide cash views either directly through their portal or through the client's other systems.

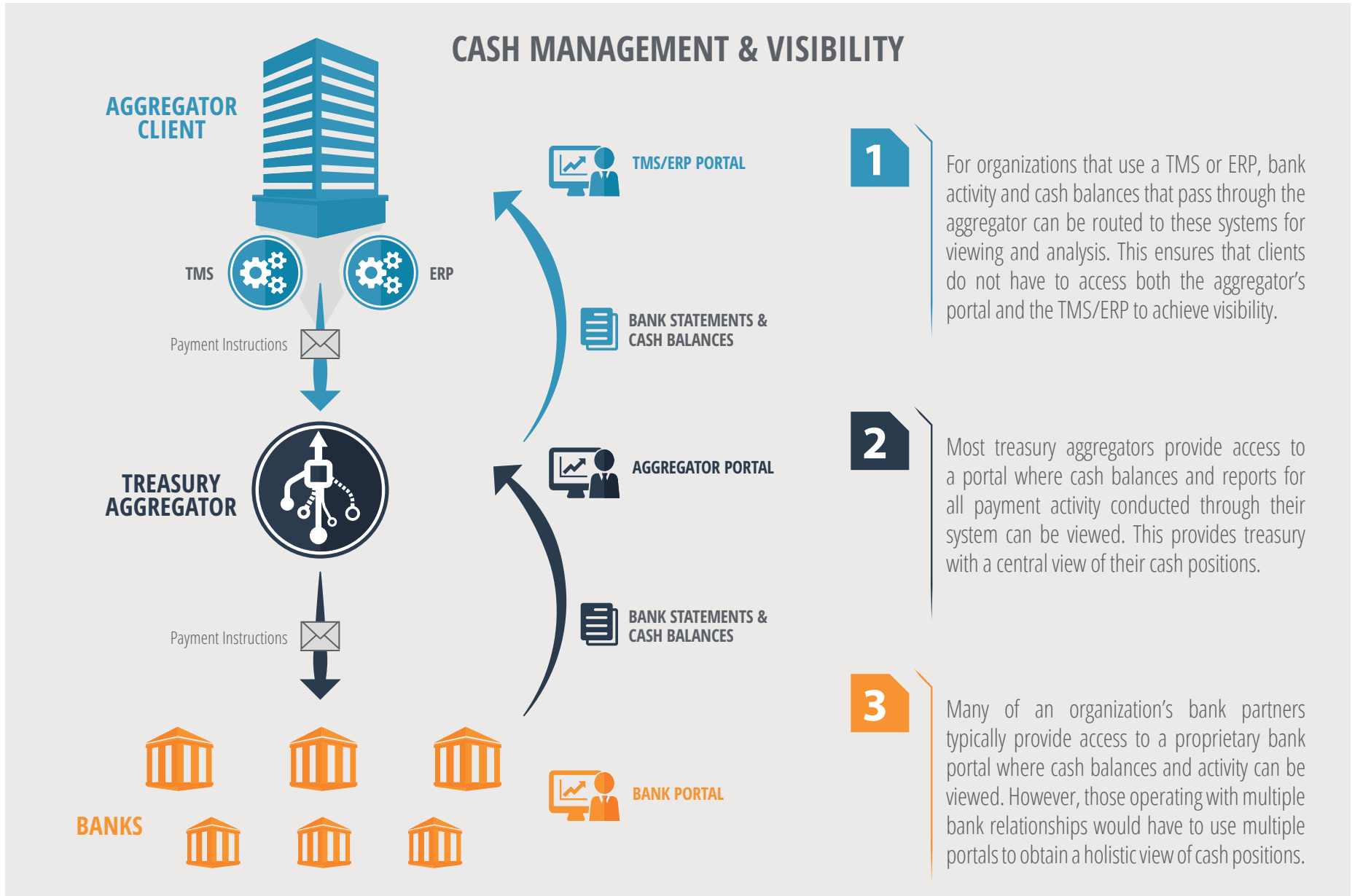
For organizations using a TMS or ERP, payments and reporting activity that is managed by the aggregator passes into these systems for purposes of updating cash management modules. This makes treasury's task of maintaining visibility to cash balances and positions much easier, as little to no manual intervention is required. Most aggregators regularly work

with a number of ERP and TMS providers, which makes the Straight-Through-Processing (STP) of information a simple process and one that can be set up with little difficulty. The end result for the company as a whole is that payment activity can be routed through the aggregator to provide treasury with a holistic view of cash balances and enhanced visibility and oversight to company-wide cash flows.

For companies not using a TMS or other treasury solution, an aggregator can fill the void by providing views of cash positions in their own system. Many aggregators have established interfaces that work similar to a TMS or ERP in that payment activity can be analyzed and managed through a set of interfaces. Some aggregators have extended the capabilities of their interfaces to contain dashboards that display cash positions and balances by country, currency, bank, and other metrics. For aggregators that also function as a TMS, payment activity can be routed into the other modules of their solution so that a single instance of data is used throughout the system, which reduces the chance of error or duplicate information. For instance, a payment conducted through the system in the payments module would automatically update the cash positioning module to reflect any changes in cash balances, and it would also update the G/L in the accounting module.

As a treasury aggregator is capable of handling all payments and reporting activity for an organization, a primary benefit for treasury is increased visibility and control over cash.

Cash Management & Visibility



Enhanced Security Features

AGGREGATOR BENEFIT: ENHANCED SECURITY FEATURES

One of the most crucial services a treasury aggregator provides is in the area of fraud protection. As year-over-year rises in fraudulent activity have become the norm, corporates are growing increasingly unsettled regarding the security of their payment operations and are wary of third-party providers who aid in the process, as these external systems are seen as potential exposure points. In fact, the 2017 Treasury Fraud & Controls Survey found that 78% of firms saw payments processing as posing a cyber threat risk to their organization. Additionally, third-party relationships posed a risk for 52% of organizations, and outsourced services, such as a TMS or SaaS-based fintech solution, were viewed as a risk by 24%. While these fears are natural given the current fraud environment, treasury aggregators have taken an active stake in fraud prevention and security by building out a variety of security layers that cover virtually every step within the payments cycle. This includes information being exchanged both internally and externally, as well as information at rest.

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The protection offered by aggregators for their clients begins with securing access to the portal itself. As a means of limiting entry into their system, many vendors utilize IP filtering support that restricts access to the server from unauthorized IP addresses, so that only those addresses registered to the client are able to gain entry. Next, for users that must log into the aggregator's portal, screen entry security or the use of digital keyboards prevents keystroke capture as usernames and passwords are entered. In other circumstances, the use of a token, such as a key fob or USB drive, is required for users signing into the system so that, in the case that passwords and usernames are stolen, criminals would still not be able to gain entry. This style of security where a combination of security techniques are used in conjunction with one another has become a popular approach. As part of these dual or multi-factor authentication approaches, any user attempting to log into the aggregator's portal must submit two or more forms of ID, such as a username/password combination and a key fob, before access is granted.

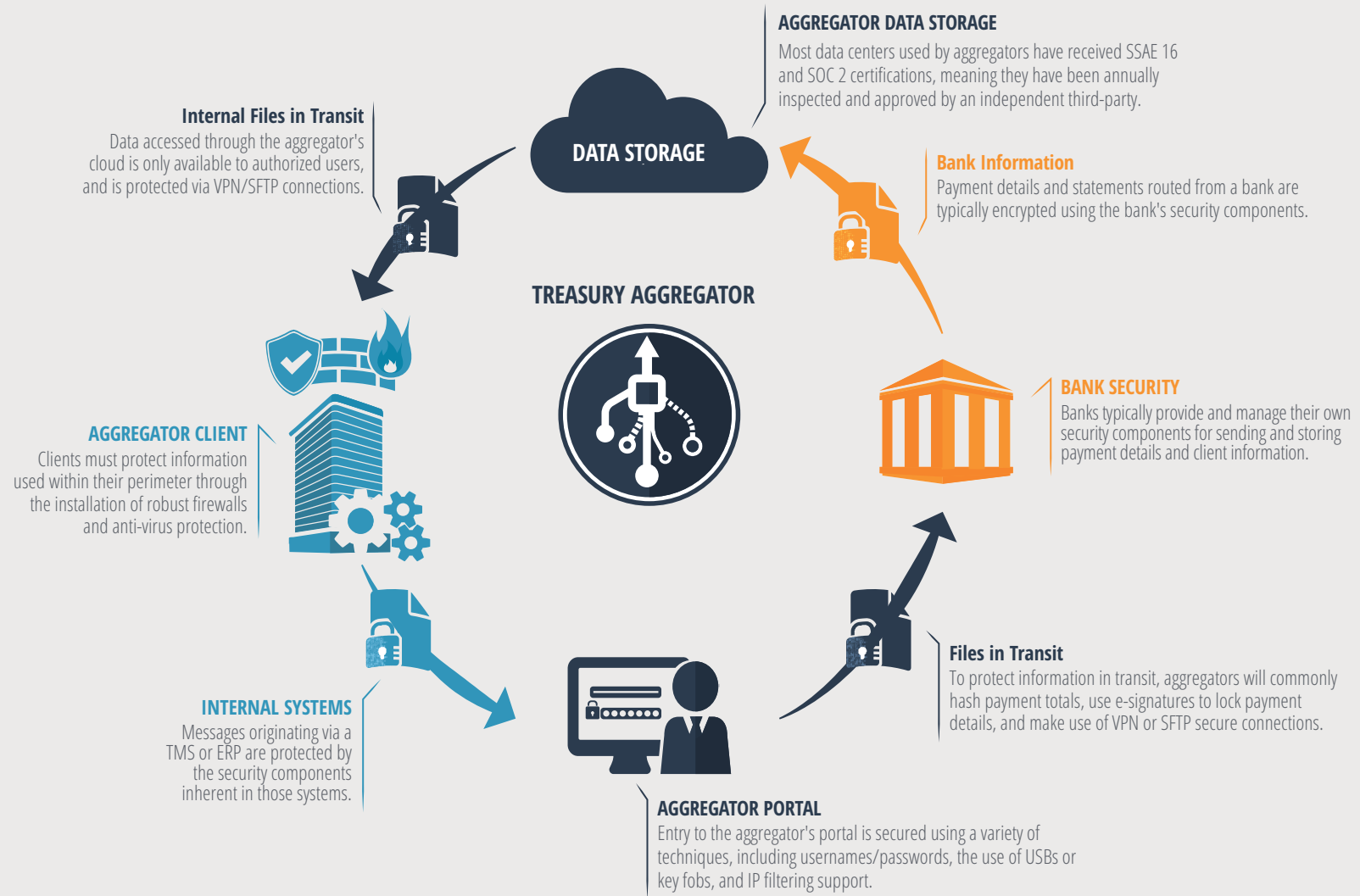
The next area in which aggregators provide security and protection is for files passing through their system, such as payment details and client information. For information in transit, most aggregators will hash totals on payment information as a method of identifying any anomalous changes to values or account numbers that occur en route to banks. Aggregators also typically require e-signatures on payments from authorized users, and will "lock" a file after it has been signed. Using this technique, alerts will be sent to employees if a message is altered in any way after a signature has locked it. System settings can also be formatted so that all payments or payments over a certain amount require dual signatures before being processed and delivered (e.g. all payments over \$25,000 require two signatures). Also, as a general standard, all information that

passes through an aggregator's system is encrypted, usually via an SSH File Transfer Protocol (SFTP) connection. For additional privacy, many aggregators will funnel SFTP traffic through a virtual private network (VPN) so that information exchanged between various company locations and subsidiaries is kept as secure as possible.

Regarding the security of information at rest and stored on an aggregator's server, there are a number of specific certifications or "standards" that come into play. Each standard represents a specific level of security coverage and a unique set of components that are used for data protection. These standards include SAS-70, SSAE 16, and most recently SSAE 18 certifications. The leading practices for security in data centers currently are the SSAE 18 (SOC 1 and SOC 2) certifications. In order to obtain SSAE certification, a company must have their data centers annually inspected and approved by an independent and professional third-party. Obtaining SOC 2 certification means that the controls used at the data center provide reliable system security, integrity, and privacy.

Treasury aggregators have built out a variety of security layers that cover virtually every step within the payments cycle. This includes restricting access into their system to authorized users and providing secure connectivity channels for information being exchanged or hosted through their server.

SECURITY FRAMEWORK: TREASURY AGGREGATORS



Enhanced Compliance Features

AGGREGATOR BENEFIT: ENHANCED COMPLIANCE FEATURES

Just as aggregators provide security and protection against fraud, they also work to ensure the compliance of all a client's payment activity with sanctions and regulatory requirements. Historically, the vast majority of all compliance-related responsibilities fell to banks. While banks continue to be burdened with an ever-growing list of regulatory requirements, the introduction of new regulation by governing bodies, particularly FinCEN and OFAC in North America, has resulted in heightened compliance expectations for corporates as well. Due to these regulations, corporates must now track a large set of bank-related data for purposes of filing FBARs and fulfilling other documentation requirement. At the same time, there is now a heightened responsibility placed on corporates for screening their payment activity against sanctions lists to ensure that business is not conducted with known terrorist or criminal groups. These lists cover thousands of individual names, aliases, and businesses, and are in a constant state of change as sanctions programs evolve. For instance, recent changes to the list saw new sanctions imposed against Iran, Cuba, and Russia for various infringements, and also additions to the list of Specially Designated Nationals (SDNs) who are known terrorists or criminals.

The introduction of new regulation by governing bodies, particularly FinCEN and OFAC in North America, has resulted in increased compliance expectations for corporates.

The penalties for violating a sanctions arrangement are quite severe if a corporate is found to be negligible, with fines against a single company having ranged up to \$100 million in the past year. Where FBAR is concerned, violations for organizations failing to report on their foreign bank accounts can be penalized by either \$100,000 or half the value of the account, whichever is greater. In order for organizations to avoid these penalties, the only option is to comply with sanctions requirements and to annually report their foreign bank account activity per FBAR. Understandably, for organizations with hundreds or thousands of foreign bank accounts and those that send numerous payments every day, ensuring compliance with all known requirements can be costly and time consuming.

Having a system that can screen hundreds, thousands, or even millions of payments against all relevant sanctions lists while also keeping track of all pertinent bank account information is a momentous advantage for companies.

To protect their clients from sanctions violations and penalties, aggregators screen all payment activity conducted through their system against relevant sanctions lists. They can also run a number of validation checks on messages to ensure that the formatting is correct and that there are no anomalies. The standard protocol for a message that does not pass these checks would be to halt its progress in the payments cycle and send it to a resolutions queue. The aggregator would then notify a list of authorized users that a message has been flagged and provide

details as to why the message was stopped (e.g. missing line item, suspicious recipient, etc.). These users could then log into the aggregator's system to analyze the problem, make any necessary changes, and resend the message. This process is helpful both for ensuring that payment activity remains compliant with sanctions lists and also for protecting against fraud, as an unapproved or "suspicious" payment has a greater chance of being identified through the data validation process of an aggregator than by the corporate acting alone. Examples of validation checks conducted by aggregators include duplicate message checks, delivery date checks, and unexpected fields or "empty" message checks. As an additional means of ensuring accuracy, aggregators will compare opening account balances and closing balances against all known payment activity, and will alert an organization if the balances don't add up. This process aids in identifying unauthorized or anomalous payments, in addition to any payments that have been delayed or halted throughout the day.

With regards to bank account management, some aggregators have dedicated BAM modules that allow users to open and close bank accounts, handle the administration of account signatories, and track account information for purposes of FBAR filing. Some may even take this a step further by providing bank performance analysis and relationship management features directly within their portal so that statements and fees between banks can be compared and analyzed. However, aggregators can also set this information up to flow into a TMS or ERP, such that companies with an already-established BAM module can manage bank activity without having to use two separate platforms.

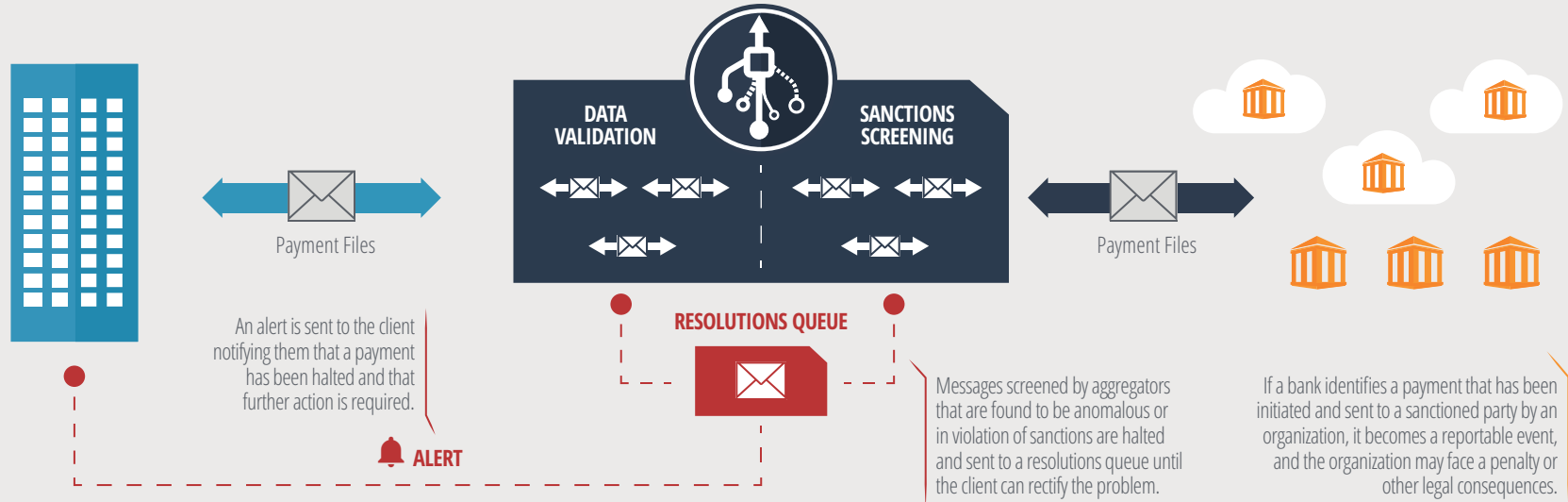
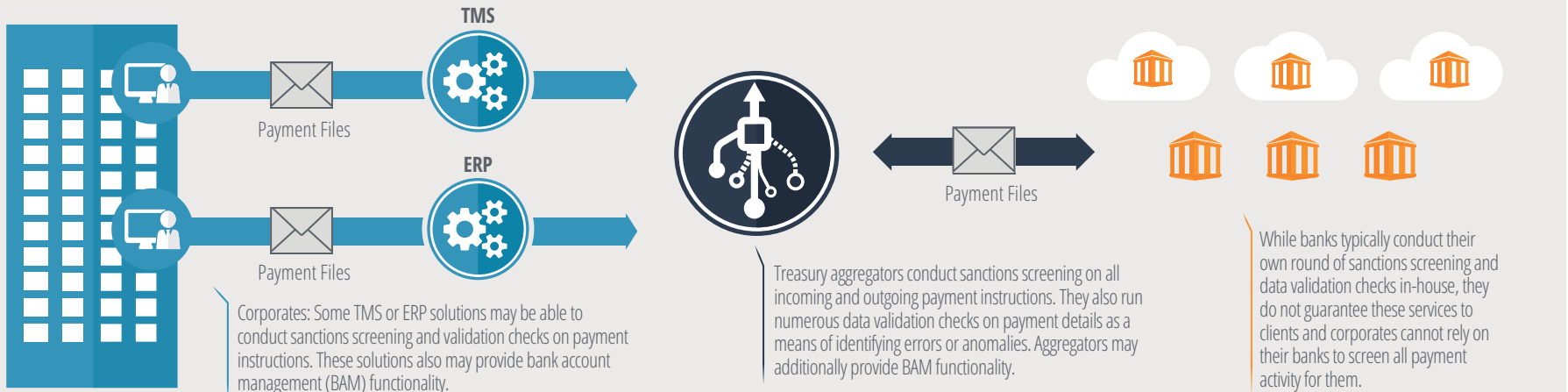
Enhanced Compliance Features

COMPLIANCE COMPONENTS: TREASURY AGGREGATORS

AGGREGATOR CLIENT

TREASURY AGGREGATOR

CLIENT BANK CONNECTIONS



Technological Benefits

AGGREGATOR BENEFIT: TECHNOLOGICAL BENEFITS

Although each of the previously discussed benefits are shaped by technology, it is important to touch on the advantages that stem solely from the adoption of a sophisticated technology solution, such as the increased automation of tasks, centralization of data, and enhanced Straight-Through-Processing (STP) of information passing through multiple systems. Furthermore, the provision of expanded functionality offered by some aggregators can be beneficial for corporates that do not already have a sophisticated treasury solution, as functionalities including FX trading, debt, investments, and accounting could be implemented to provide additional support beyond what is associated with bank connectivity.

⊕ **Automation:** A treasury aggregator can alleviate the strain placed on treasury and other departments by carrying out many of the payments-related tasks that have traditionally been performed manually. Rather than an employee repeatedly entering in payments, custom workflows can be configured once for specific types of payments, and then the aggregator will handle all subsequent transaction activity. Most aggregators also provide standard payment “templates” that streamline payment generation by allowing for payments that occur regularly to be preconfigured in the system, thereby eliminating redundant manual entry. Although this requires some setup at the beginning, such a process ensures that all subsequent payment activity occurs seamlessly and efficiently and requires as little manual input as possible. The same is true on the reporting side, as clients usually have to manually set up their reporting requirements and preferences in the system, such as what formats they want their reports made available in, whom reports are sent to, etc. However, once these preferences are fixed, treasury has their workload minimized

moving forward and can receive the majority of their reports and bank statements with little to no labor required.

⊕ **Straight-Through-Processing:** When thinking of implementing another technology system, the image that comes to mind may be one of increasing complexity with regards to the IT infrastructure. However, treasury aggregation technology was created with the idea of streamlining payments and reporting activity so that less manual intervention is required and so that a client’s systems can interact seamlessly with one another and with their banks. The integration of these systems with one another has been boosted further by the ongoing standardization of Application Programming Interface (API) protocols. Today, many of the top systems have been structured using the same set of APIs, which makes the exchange of information between each system more reliable.

As treasury aggregators increasingly penetrate the corporate landscape, they regularly come into contact with a number of ERP and TMS providers whose solutions are also used by the aggregator’s clients. As treasury aggregators and TMS/ERPs are often used simultaneously by clients, the solutions providers stay updated on developments occurring within each other’s systems so that integration between the solutions is streamlined. The same is true for bank systems. While it can be a complicated and time-consuming process to deal with individual bank solutions and portals, aggregators have a number of pre-existing bank connections available and can build out additional connections as necessary. This ensures that clients can have all their bank information flow through the aggregator without having to pull information from multiple bank systems.

⊕ **Centralization:** A crucial benefit for companies with employees disbursed globally is the availability of information

through a single portal. This benefit is derived mainly through the use of SaaS-based aggregation platforms, as authorized users can log into the portal from practically any location and at any time. The result is that a single instance of data is instantly available across multiple locations and subsidiaries, which eliminates the possibility of misinformation or of different locations or employees working off different sets of data. This ensures that employees always have a central repository of updated, accurate information to work from, and it alleviates the strain of having to manually export and group information from multiple systems and portals.

⊕ **Expanded Functionality:** In addition to their core bank connectivity services, many aggregators have built out additional areas of functionality as part of their system. Some even offer their aggregation services as part of a larger, more sophisticated system, such as a TMS. In these circumstances, the aggregator may provide modules or components for FX trading, debt and investment activity, risk management, accounting, cash forecasting, and others. This allows for an additional layer of automation, as a single instance of data flows through each specific module and updates all pertinent ledgers and balances. It also enables for more processes to be completed centrally through a single solution, cutting down on systems complexity. For example, a successful payment conducted through the payments module would update the cash management module and be recorded on the G/L in the accounting module, and any bank reports or statements would be recorded and stored as part of a bank account management (eBAM) module. Although this information can also easily be passed on to a TMS or ERP as well, vendors that provide all this functionality through a single system offer an additional advantage in reducing systems complexity and avoiding unnecessary maintenance and subscription costs.

TREASURY AGGREGATORS: TECHNOLOGICAL BENEFITS

AUTOMATION

A treasury aggregator can alleviate the strain placed on treasury and other departments by carrying out many of the payments-related tasks that have traditionally been performed manually. This includes the use of preconfigured payment templates for initiating payments, and also the exportation of statements and reports from bank portals directly into the aggregator's system. By automating these tasks, treasury can shift their focus to other responsibilities.



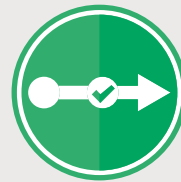
CENTRALIZATION

By providing a single portal through which all payments and reporting activity occurs, treasury aggregators ensure that a single source of data is available for managing and analyzing company-wide transaction activity, including that of multiple departments and subsidiaries. This benefits treasury, as it alleviates the strain of having to manually export group information from multiple systems and portals.



STRAIGHT-THROUGH-PROCESSING

Treasury aggregation technology was created with the idea of streamlining payments and reporting activity so that a client's systems could act seamlessly with one another and with the systems used by banks. Treasury aggregators regularly partner with TMS and ERP providers to ensure that the interactions between their systems are optimized, and they have also built out tools for downloading information from bank portals for exportation to their portal or another internal system.



EXPANDED FUNCTIONALITY

In addition to their core bank connectivity services, many aggregators also offer functionality in other treasury-related areas. This could include modules for FX trading, debt and investment activity, risk management, accounting and reconciliation, or cash forecasting. The provision of each of these modules through a single system provides a further level of automation for firms and offers additional advantages through the reduction of systems complexity and the avoidance of unnecessary maintenance and subscription costs.



Although each of the functional benefits provided by aggregators are in some part shaped by technology, it is important to touch on the overarching technological benefits that a sophisticated bank connectivity system offers.

Best Practices

TREASURY AGGREGATION SYSTEM USE: BEST PRACTICES

As with any financial technology solution, there are a number of factors to consider when undergoing an implementation or beginning a selection process. Where treasury aggregators are concerned, the following categories are notable areas that must be prioritized.

⊕ **Selection Project:** For firms considering a selection or RFP process for treasury aggregators, it is important to be aware of what questions to ask vendors as a means of differentiating one solution from the others. While all treasury aggregators offer the same core services, the specific components and features of each solution can vary. For instance, the cost structures for different vendors are often presented in a number of ways, with implementation costs for one being much higher but with lower subscription costs, and vice versa. The user interfaces also look quite different across the full range of aggregators, and any firm planning on using the aggregator's portal regularly should prioritize finding a solution with an appealing and intuitive display. Furthermore, each aggregator maintains their own unique set of bank connections; some might have thousands of connections, others may have hundreds. While aggregators can build out any connections they don't already maintain, this

can take time and may also add costs if a client requires multiple new connections. Other important items to consider include the customer service structure, additional functionality offerings, available security components, and compatibility with third-party systems. Finally, for organizations looking to ensure the long-term financial stability of their selected provider, performing due diligence on the number of clients they maintain, their size and position within the industry, annual revenues, R&D, and financial backing or resources is also recommended.

⊕ **Implementation Roadmap:** When structuring an implementation roadmap, it is important to understand that no two implementation projects are the same. When developing a timeline for implementation, some firms may choose to structure their roadmap based off an implementation they've done in the past. While this strategy can be of some help, it can also result in an inaccurate and unrealistic timeline. Implementations can vary largely from one project to the next, depending on the size of the company, the number of banks that must be connected to, the existing technology infrastructure of the firm, differences in regulations for operations in multiple countries, the resources (both financial and staff-related) of the vendor, and the existence of multiple subsidiaries or company branches. An implementation that requires integration with both a TMS and ERP, as well as connectivity to SWIFT and also 10-15 direct connections to banks dispersed worldwide, will take longer than an implementation involving no other systems and requiring connectivity to only four or five banks. For these reasons, any implementation roadmap should be based primarily on a company's specific needs and layers of complexity. It is also best to include a relative timeframe for specific steps, rather than hard cut-offs (e.g. 2-3 months for the testing phase, rather than exactly eight weeks). As a general rule, it is best to overestimate the timeframe for an implementation and

then exceed expectations than to set unrealistic deadlines that are constantly being delayed.

⊕ **Employee Training:** The period during which an aggregator is being implemented is the ideal time for clients and users to receive training on the solution. As any implementation typically involves a number of system demos and testing phases, these events can serve as opportunities for users to familiarize themselves with the specific components of the system and the layout of the interface. As the system is being configured, treasury should take every opportunity to test different payment scenarios to ensure each situation is handled appropriately by the system. For instance, if a payment is blocked, who receives an alert and how are exceptions handled? If a signer leaves the firm, how can the system be updated to reflect the change? How can new banks and bank accounts be added to the aggregator's system after an implementation? As a client usually has a greater access to the aggregator's support staff during an implementation, any questions or insights that the client requests can be answered more expediently here than after the "go-live" stage. For this reason, users should be proactive in identifying any potential issues or areas of concern that they have regarding the system during the test phase so that they are confident in their ability to use the system moving forward and so any lack of knowledge regarding system functionality does not impede use of the solution down the road.

⊕ **Internal Systems Integration:** Most companies that implement a treasury aggregator have a pre-existing financial technology infrastructure. This could include multiple solutions, such as a TMS, ERP, AP System, and payroll system, all of which may be used to generate payments. Thus, if the aggregator is to be utilized in its full capacity, integration with

each of these solutions must be established for purposes of centralizing and streamlining the payments process. Although the increased use of standard APIs has made it increasingly easy for these individual solutions to interact and share data, it is still necessary for treasury to adequately test the process through which data is exchanged via their internal systems to ensure its accuracy and validity. Common problems that can occur include messages being lost in translation, unsupported formats not making it to the intended destination, or messages being sent down the wrong channel. While these problems would be a large headache after a “go-live” stage, it is relatively easy to fix them during the implementation stage. Thus, ensuring that all these bugs are worked out ahead of time is a vital step in any integration project. As system integration is being carried out, it is also important for treasury to communicate regularly with the IT department and involve them in the implementation so that IT understands how the new solution fits into the existing technology infrastructure. While much of the system maintenance services are performed by the aggregator’s staff, IT still needs to be aware of the components of the solution to satisfy security concerns, monitor system use, and help report bugs or identify process anomalies.

⊕ Bank Onboarding: One of the most time-consuming tasks associated with the implementation of a treasury aggregator is the bank onboarding phase. This is often an area that proves to be more complicated than organizations originally estimate, and it can be a cause of significant delay when attempting to adhere to an implementation roadmap. While some organizations may be able to utilize SWIFT or other networks for the majority of their bank connections, others may have a number of direct connections that must be established with individual banks. This can be a laborious process, including steps such as the following:

- Finding the appropriate contact at each bank.
- Corresponding with each bank for purposes of completing documentation and KYC requirements.
- Accounting for the various proprietary and other messaging formats in use by each bank (direct connections often involve the use of a custom format developed and maintained by the bank).
- Establishing a method for downloading payments and reporting activity from the bank’s portal to the aggregator.
- Testing the connectivity channel to ensure that messages are being exchanged accurately and securely.

One of the primary reasons that bank onboarding can take longer than anticipated is due to the stringent documentation and regulatory expectations placed upon banks. These compliance-related tasks can cause unexpected delays in the onboarding process, and in extreme cases, can drag on for months. Thus, in order to avoid large discrepancies in the estimated-to-actual implementation timeframe, the period allotted for bank onboarding in an implementation should be given a large and flexible bandwidth.

As with any financial technology solution, there are a number of factors to consider when undergoing an implementation or beginning a selection process.

TREASURY AGGREGATION ITEMS TO CONSIDER

Selection Project

- Connectivity options and cost structures in use by each aggregator can vary.
- Perform due diligence on each potential vendor’s financial strength and industry position.

Implementation Roadmap

- No two implementations are the same. Each roadmap should be customized according to clients’ specific requirements.
- Provide banded timeframes for completing steps instead of using hard cutoffs.

Employee Training

- Best performed during the implementation stage.
- Serves as an opportunity for staff to become familiar with solution before “going live.”

Internal Systems Integration

- Users should adequately test the compatibility of their systems with one another before going live.
- Common problems include unsupported formats and messages being lost in translation.

Bank Onboarding

- Can take excessive time due to compliance and documentation requirements for banks.
- Allow for flexibility during the bank onboarding stage in an implementation to account for unexpected delays.

CHECKLIST QUESTIONS TO ASK A VENDOR

As a firm looks to begin a selection process, and ultimately an implementation, they must be able to make clear distinctions between vendors and products for purposes of identifying the solution that most adequately matches their needs. In order to help facilitate this process, the following checklist provides a set of questions that organizations can use to differentiate the services and solutions offered by particular vendors.

✓ 1. WHAT CONNECTIVITY OPTIONS WOULD BE AVAILABLE TO US?

Can you host a corporate BIC and/or allow us to leverage your BIC if we do not wish to obtain our own? Do you maintain and can you establish direct connections to non-SWIFT banks? What other networks do you connect to? Although most banks may be connected to via SWIFT, many firms require direct connections or connectivity via alternative networks as well. Selecting an aggregator that provides a range of options for bank connectivity beyond SWIFT will give you the most flexibility moving forward.

✓ 2. CAN YOU HANDLE DATA TRANSFORMATION AND MESSAGE FORMAT CONVERSION?

An aggregator that offers data transformation and message converters gives you compatibility with a wide range of payment formats. A TMS will typically offer you a variety of payment formats, but various countries and currencies require the use of unique format standards that the TMS may have to put into their development queue. Selecting an aggregator with data transformation capabilities ensures that you will never run into an issue regarding an unsupported format.

✓ 3. DO YOU OFFER SANCTIONS SCREENING ON SWIFT AND NON-SWIFT PAYMENTS?

Through a capable aggregator, all messages sent and received should be automatically screened to ensure compliance with all relevant regulations. With sanctions screening, a non-compliant payment could be stopped in its tracks prior to being sent to the bank, at which time it would become a reportable event. Thus, choosing an aggregator that offers sanctions screening provides a valuable safety net that could save your organization countless dollars in penalties.

✓ 4. WHAT ELEMENTS OF THE PROJECT WILL REQUIRE OUR IT DEPARTMENT'S INVOLVEMENT?

Treasury departments often turn to aggregators to decrease IT dependence. However, the implementation of an aggregator does not necessarily alleviate IT entirely. Understanding what will be required of your IT department up front is crucial to ensuring a smooth implementation and also long-term satisfaction with the selected solution. If you inadvertently select a solution that requires extensive support from your IT department, you'll find yourself back where you started.

✓ 5. WILL YOU PROVIDE A DEDICATED PROJECT MANAGER FOR OUR IMPLEMENTATION?

The implementation process and project management team employed by an aggregator are crucial to the timeline and ease of the implementation. The process will generally be quite smooth if you select a vendor who offers a dedicated project manager with good technical knowledge and adequate time to devote to your project. Conversely, vendors without a dedicated project manager or that are struggling to handle multiple implementation projects simultaneously can impede project success.

✓ 6. PLEASE DESCRIBE THE CUSTOMER SERVICE STRUCTURE USED FOR ONGOING SUPPORT.

After the successful "go-live" stage of an implementation, a vendor's implementation project manager will turn over all subsequent client support tasks to the customer service team. Thus, it is important to understand ahead of time what the customer service structure is, the hours of availability, and what methods are available for interacting with staff (email, phone, online chat, etc.). The customer support structures can vary widely across the aggregator landscape, so take time to understand how the support process works for each vendor.

✓ 7. WHAT SECURITY OPTIONS WOULD BE EMPLOYED TO ENSURE THE INTEGRITY OF OUR DATA?

Depending on the specific aggregator, a range of security methods and components may be utilized. There is no standard set of security functionality employed by every aggregator. Thus, firms must look for the specific layers of security coverage that are most appealing to them. Asking each aggregator specific questions about the extent of their security coverage for information at rest and in transit, as well as for safeguarding entry to their portal, will help identify those providers with the most robust security offerings.

VENDOR ANALYSIS

The first section of this report provided an overview of the treasury aggregation landscape. This next section will provide a more in-depth look at individual providers of aggregation technology, including an overview of each company, notable milestones in their development, and a breakdown of their solution set.

Each of the vendors highlighted in this report provide the level of bank connectivity services necessary to be classified as a treasury aggregator. However, some vendors have extended the functionalities offered through their system to include additional features and components, such as risk management, debt and investments, and accounting. While these functionalities are desirable to many treasury teams, they are not the focus of this report, and as such, are only briefly mentioned in the corresponding vendor sections. The primary focus of the vendor analysis from a functionality standpoint will be on bank connectivity, payments and reporting, security, and compliance.

While each vendor provided content for their own section, Strategic Treasurer maintained authority over the final version for purposes of providing, non-biased, accurate, and informational analysis.



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PAGES 38-45



PAGES 46-53



PAGES 54-61



PAGES 62-69



PAGES 70-77

Company Overview



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info@bottomline.com

PAGES 30-37

- + Company Overview
- + Company Snapshot
- + Headlines & Awards
- + Case Study
- + Product Overview
- + Customer Service & Implementation
- + Client Training & Event Attendance
- + Company Timeline

This content was produced by Bottomline Technologies and edited by Strategic Treasurer.

COMPANY OVERVIEW

Bottomline Technologies, a leading provider of financial technology, was founded in 1989 in Portsmouth, New Hampshire. Originally providing software for printing laser checks, Bottomline has transformed their portfolio as technology has evolved to now offer an array of innovative financial technology solutions used by banks, financial institutions, and corporations both domestically and internationally. Solutions currently offered by Bottomline include Universal Aggregator™, Payments and Cash Management, Cyber Fraud & Risk Management, Digital Banking, AP and Financial Document Automation, Legal Spend Management, and Healthcare solutions. For the first 10 years of operations, Bottomline was privately held. However, with their successful IPO in 1999, they have since become publicly traded (NASDAQ:EPAY). This transition enabled Bottomline to raise significant capital, and to date, the company reports annual revenues of over \$349 million. This available capital has allowed Bottomline to acquire companies whose products have provided valuable enhancements and client channels to complement their already robust solutions and extensive customer base. In addition, Bottomline is able to maintain a well-funded research and development wing for the continued advancement of their product line.

In 2016, Bottomline expensed over \$47 million in research, development, and engineering costs. Due to the constantly evolving payments landscape, Bottomline maintains a close relationship with key associations and regulatory bodies to ensure that all solutions remain compliant and that future payment needs are anticipated. The fast-evolving methods by which both consumers and businesses want to pay has led Bottomline to not just map required processes but add value through improved visibility, speed, security, and the ability to quickly and easily add functionality to suit different business needs. Recent innovation has focused on payment fraud and risk management and aggregated payment channels, now offered by Bottomline as the Universal Aggregator. In addition to their headquarters in New Hampshire, Bottomline has nine office locations spread across the United States, as well as an office and customer support center in Toronto, Canada. Outside of North America, Bottomline has multiple offices and customer service centers in Europe and Asia, with regional headquarters located in the UK, Singapore, and Australia. Collectively, Bottomline’s customer service centers operate 24/7 and are available by portal, phone, and email. Bottomline’s expanding footprint today employs 1,600 full-time employees and supports a global client base in 92 countries.



Founded:
1989



CEO:
Rob Eberle



Headquartered:
Portsmouth, NH



Ownership:
Publicly Held

PRODUCT SET



Bottomline Technologies
(Available as installed & SaaS-based products)

- Cyber Fraud & Risk Management**
- Payments & Cash Management**
- Financial Document Automation**
- Financial Messaging**
- Digital Banking**
- Healthcare**
- Legal Spend Management**

BOTTOMLINE AT-A-GLANCE



Bottomline has **more than 1,600 employees** serving across more than **two dozen offices** worldwide.



Bottomline's **annual revenue** in **2016** nearly totaled **\$350 million**.



Bottomline currently services more than **10,000 clients** across their entire product suite.

NOTABLE EVENTS



AFP Annual Conference



EuroFinance Conference



NextGen Banking Conference



SIBOS Conference

THINGS YOU SHOULD KNOW

Bottomline's current clients include **60 FORTUNE 100 FIRMS**.



In 2016, Bottomline was awarded **"BEST TECHNOLOGY INITIATIVE OF THE YEAR"**

AND



"BEST INSTANT PAYMENT SERVICE INITIATIVE"

for their recent **payments-related product innovations**.

Bottomline has active clients



operating in **92 COUNTRIES** around the world.



Since their inception, Bottomline has **acquired** more than a **dozen software** and **solution providers**.

Headlines & Awards



Bottomline Wins “Best Instant Payments System/Service Initiative” at 2016 Banking Technology Awards

In recognition of the efficient aggregated payment service, the Bottomline Universal Aggregator claimed the top award in its category at the 2016 Banking Technology Awards. The secure, fully outsourced multi-payment channel platform won the award due to its simplification of complex connectivity to an array of payment clearing and settlement systems around the world, enabling greater speed and efficiency in the payments process at a lower cost.



Bottomline Launches Payment Fraud Security Components for SWIFT

In response to mandatory controls brought in as part of SWIFT’s Customer Security Programme (CSP), Bottomline combined multi-factor authentication with new proactive machine learning capabilities to provide secure access and block user sessions and/or transactions flows where an anomaly or suspicious behavior has been identified. This real-time payment fraud detection capability can be extended to other non-SWIFT financial networks, and as of August 2017, is available to all of Bottomline’s users.



Bottomline Acquires Singapore-Based Decillion Group

In August 2017, Bottomline announced their acquisition of the SWIFT service bureau Decillion Group. The addition of Decillion Group, headquartered in Singapore and recognised as the largest SWIFT service bureau and financial messaging provider in the region, increased Bottomline’s presence in Asia and further enhanced their position as an organisation that has the expertise, scale, and resources to help customers around the world optimise their financial transactions.



Bank of Hawaii & Bottomline Provide Innovative Digital Experience to Business Customers

In September 2017, Bottomline Technologies and Bank of Hawaii announced the availability of a new digital banking platform for thousands of Bank of Hawaii’s customers. The platform, Bottomline’s award-winning Digital Banking 3.0 solution, will be offered by Bank of Hawaii for online and mobile cash management and business banking capabilities. The platform features customizable interfaces and dashboards to make day-to-day tasks easier for users and to provide them with the insights they need to make good financial decisions.

CASE STUDY

ABOUT THE CLIENT

- One of the world’s largest offshore drilling contractors. Headquartered in Switzerland; over 50 deep-water, mid-water, and high-spec floaters globally

PROBLEM

- Patchwork of legacy banking structures from merged entities, included redundant bank accounts and excessive bank fees
- Cumbersome manual processing and no STP

DESIRED SOLUTION CAPABILITIES

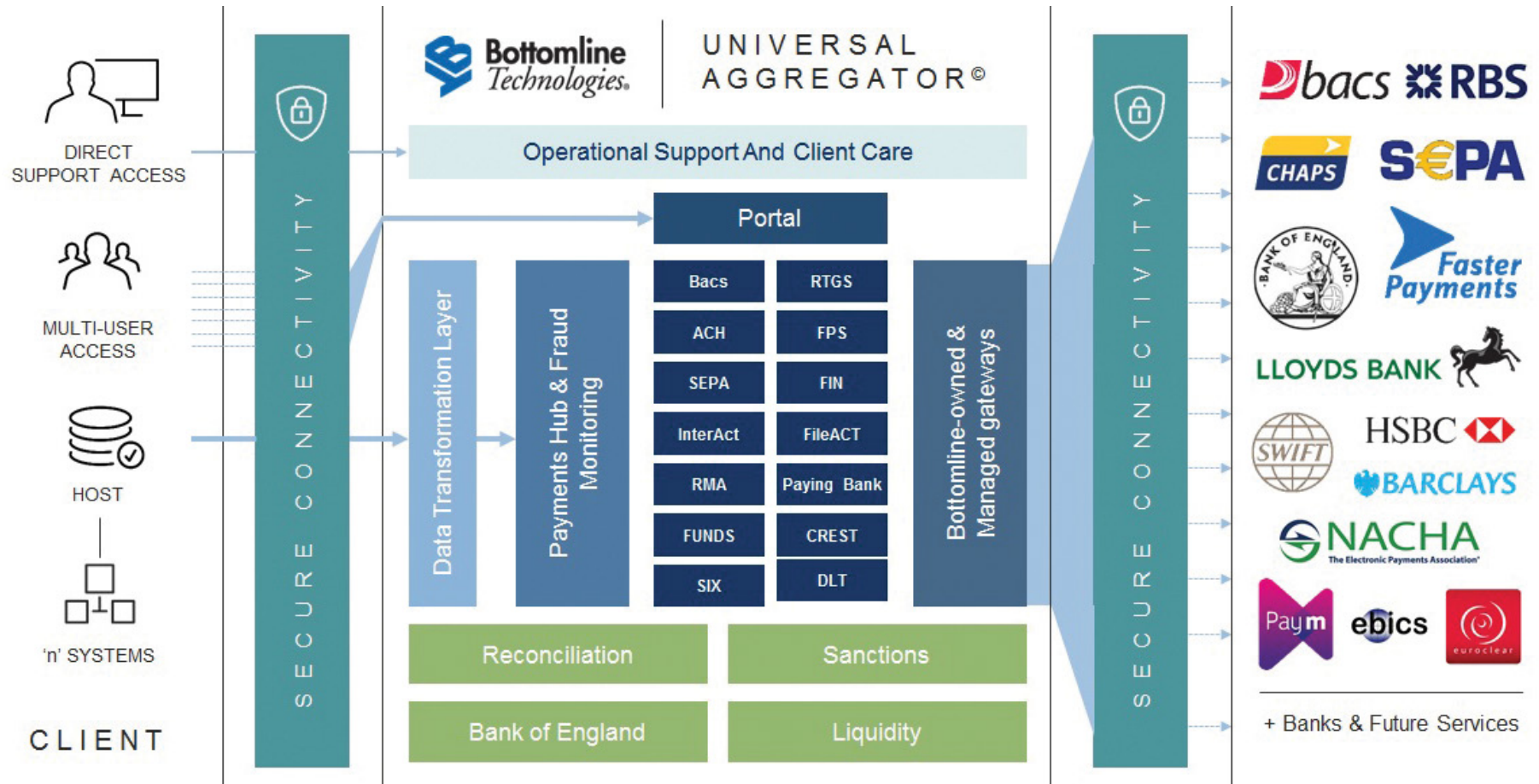
- Streamlined Bank Connectivity – an outsourced, hosted payment platform that connects multiple banks, handles multiple payment types and formats, and keeps abreast of regulation and security standards with value-add services

WHY CLIENT CHOSE BOTTOMLINE

- Followed a formal RFP process with 4 vendors; evaluated against six criteria
- Bottomline won due to highest rating in each of the six categories, including price, security, team size, and company background

FUNCTIONALITIES IMPLEMENTED

- Consolidated banking structure based on capabilities and geographic coverage
- Saved millions of dollars per year in bank fees through their ability to rationalize their banking partners
- Improved internal controls, auditability, and disaster recovery



PRODUCT OVERVIEW

Bottomline’s product suite is categorized based upon the services offered. Specific areas of coverage can be bundled into more sophisticated solutions, dependent upon client needs. Summaries of the services offered through Bottomline are provided in the following pages.

Universal Aggregator™

Universal Aggregator™ is a cloud-based service providing global reach and connectivity to a wide range of payment infrastructures and messaging networks. Enabling management and control of all global transactions through a standardised

single interface dramatically improves efficiency, lowers operating costs, ensures regulatory compliance, and delivers state-of-the-art real-time payments, reconciliation, and fraud protection. Robust cloud technology combines transaction messaging processes such as:

Product Overview

DEMO Organisation											
Group		Closed Balance		Available Funds		FX Rate		Closed Balance (in Group Ccy)		Available Funds (in Group Ccy)	
Belgium											
96296 - BEACC2 - RBOS123456	GBP	D	(667.00)	D	667.00	1.29	EUR	D	(862.03)	D	862.03
96294 - BEACC1 - BE123456	EUR	C	251,417.00	C	250,667.00	1.00	EUR	C	251,417.00	C	250,667.00
Bank Transactions:											
ID St. Num	Entry Date	Value Date	Type	Our Ref	Bank Ref	Details	Debit	Credit	Balance	Dr/Cr	
43762 2017-00001	21/09/2017	21/09/2017	Final	Opening Balance	940940940940				200,000.00	CR	
71539 2017-00001	21/09/2017	21/09/2017	MSC			DOLBY LABORATORIES DEBIT	582.00		199,418.00	CR	
71540 2017-00001	21/09/2017	21/09/2017	MSC			CUST123 INV123424		3,000.00	202,418.00	CR	
71541 2017-00001	21/09/2017	21/09/2017	MSC			CAR HIRE	4,000.00		198,418.00	CR	
71542 2017-00001	21/09/2017	21/09/2017	MSC			CUST2134 INV13312		46,872.00	245,290.00	CR	
71543 2017-00001	21/09/2017	21/09/2017	MSC			ELECTRICITY SUPPLIER	3,500.00		241,790.00	CR	
71544 2017-00001	21/09/2017	21/09/2017	MSC			CUST2091 INV09872		16,214.00	258,004.00	CR	
71545 2017-00001	21/09/2017	21/09/2017	MSC			SUPPLIER E DEBIT	6,587.00		251,417.00	CR	
43762 2017-00001	21/09/2017	21/09/2017	Final	Closing Balance	940940940940				251,417.00	CR	
							Total	51,417.00	Cr		
Records: 9 Pages: < < < < > > > >											
Intraday transactions:											
ID	Doc ID	Doc Type	Value Date	Sender Reference	Beneficiary Reference	Debit	Credit	Currency			
329057	329056	CREDIT_MESSAGE	22/09/2017		2727270		250.00	EUR			
329058	329058	PAYMENT	22/09/2017		20160317103630	1,000.00		EUR			
							Total	750.00	Dr		
Records: 2 Pages: < < < < > > > >											

Bottomline Cash Management: Liquidity View, showing a Belgian Business unit account "BE123456" and the intraday transaction for €1,000 made to company "Dolby".

+ Cash Management

An end-to-end cash and liquidity management solution that delivers accurate, real-time visibility into global cash positions regardless of bank, currency, or geography. For any type of treasury, a single consolidated window provides an overview that is completely customizable and can be aggregated by bank, currency, or business unit, enabling the optimum use of working capital. Central to Bottomline's cash management offering is a financial process automation platform that allows organizations to easily centralize and standardize the key payment and reporting processes critical to increase efficiency, visibility, and control of cash. The modular design and extensive array of dashboards and reports allow customers to tailor the solution to their specific requirements for managing liquidity across the enterprise.

+ Cyber Fraud & Risk Management

A suite of solutions focused on proactive management of fraud and risk. Included are comprehensive non-invasive payment activity and behavior monitoring tools that flag and stop suspicious activity in real time. Bottomline provides protection against a wide range of fraudulent activity such as payment diversion, payroll and invoice fraud, and deception and external cyber threats. Sanction filtering, against both public and client-specific lists, incident management, and compliance monitoring are also available. Case management capabilities centralize risk management, speed investigations, and facilitate compliance with regulations pertaining to Anti Money Laundering (AML), the Health Insurance Portability and Accountability Act (HIPAA), and Know Your Customer (KYC). Fraud and risk management solutions are highly configurable and now form an integral component in the Financial Messaging portfolio with dedicated monitoring for SWIFT and other networks.

- **Format Transformation** - Managing the co-existence of different standard message formats, sophisticated content, and event-driven workflows and business process automation. Regardless of format and protocol, Bottomline delivers interoperability between legacy, national, SWIFT, SEPA, XML messaging standards, and many other proprietary formats.
- **Multi-Network Financial Messaging** - Delivers an agnostic and seamless connection to a wide range of financial messaging networks, including SWIFT, FIX (post-trade), SIC, SECOM, SARIE, EBICS, secured email, Fax, and other proprietary infrastructures such as Faster Payments, Bacs, CHAPS, Bank of England, Paym, and Host to Host. Additional networks, whether real-time,

batch, or based on new technologies, are continuously added, underlining the scalability of this offering. Flexible and configurable organisations can now control high volume and complex message flows from multiple counterparties.

- **Transaction Reconciliation** - Delivers real-time reconciliation and facilitates rapid escalation and resolution of discrepancies with extensive exception and investigation queries. It includes comprehensive automatic matching for both internal and external data sources in any format, addresses regulatory compliance, and significantly reduces operational risks.

Highly configurable, the Universal Aggregator seamlessly integrates real-time payments schemes, domestic and cross-border, RTGS, and ACH.

Customer Service & Implementation

DEMO Organisation		Cleared	22/09/2017	25/09/2017	26/09/2017	27/09/2017	28/09/2017
Group							
Belgium	GBP	199,004.89	198,424.61	198,424.61	198,424.61	198,424.61	198,424.61
BEACC2 - RBOS123456	21/09/2017 ●●● GBP	(667.00)	(667.00)	(667.00)	(667.00)	(667.00)	(667.00)
BEACC1 - BE123456	21/09/2017 ●●● EUR	251,417.00	250,667.00	250,667.00	250,667.00	250,667.00	250,667.00
Add Adjustment Refresh							
Category : BANK : Group : 910 : 1	EUR	0.00	250.00	0.00	0.00	0.00	0.00
Category : CONFIRMATION : Group : PAYMENT : 1	EUR	0.00	(1,000.00)	0.00	0.00	0.00	0.00
BEACC3 - 64681466	21/09/2017 ●●● USD	7,321.00	7,321.00	7,321.00	7,321.00	7,321.00	7,321.00
	EUR	257,211.95	256,461.95	256,461.95	256,461.95	256,461.95	256,461.95
Switzerland	GBP	631,687.54	631,687.54	631,687.54	631,687.54	631,687.54	631,687.54
	CHF	896,010.69	896,010.69	896,010.69	896,010.69	896,010.69	896,010.69
UK	GBP	1,498,779.40	1,498,779.40	1,498,779.40	1,498,779.40	1,498,779.40	1,498,779.40
Canada	GBP	318,830.76	318,830.76	318,830.76	318,830.76	318,830.76	318,830.76
	CAD	600,774.00	600,774.00	600,774.00	600,774.00	600,774.00	600,774.00
USA	GBP	228,164.04	228,164.04	228,164.04	228,164.04	228,164.04	228,164.04
	USD	324,327.00	324,327.00	324,327.00	324,327.00	324,327.00	324,327.00

Bottomline Cash Management: 5-day forecast for a Belgian business unit account "BE123456" taking into account the €1,000 payment for company Dolby.

⊕ Digital Banking

Bottomline offers payments, cash management, and online banking solutions to financial institutions, including banks and credit unions. Designed for the needs of their customers, these organisations can in turn offer ACH and Bacs payments, wires, international payments, check production, customer acquisition, balance and information reporting, and other features that facilitate enterprise-wide cash management and customer interaction. Bottomline's Digital Banking customers are able to attract and service a full range of client segments, from small businesses to multi-nationals, with solutions that feature an intuitive user interface designed to simplify all aspects of payments and cash management through both browser-based and mobile channels. In line with Bottomline's strategy to routinely offer fraud protection technology, web-based payment fraud components integrate with the hosted payments and cash

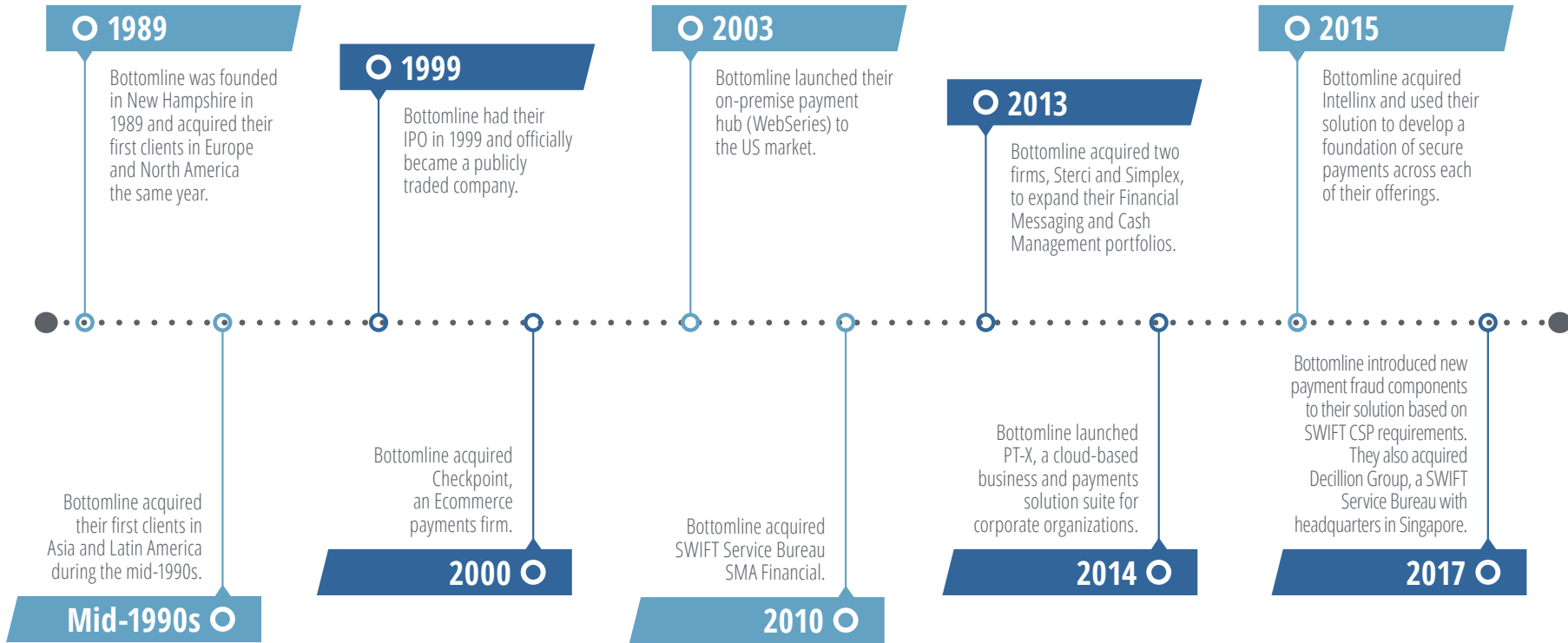
management platforms, providing real-time security monitoring and automated transaction blocking for fraudulent activity. Bottomline's Digital Banking products are now offered almost entirely on a subscription basis.

CUSTOMER SERVICE & IMPLEMENTATION

Customer support is a critical function for maintaining business and payment continuity for Bottomline's clients. Depending on the level of service required, customers have access to a variety of support channels ranging from a self-service knowledgebase and customer care portal, through to providing information on case status, patches available for download, FAQs, technical notes, and up-to-date user manuals. Phone and email support are also available 24x7 with real-time connectivity to Bottomline staff.

- **Standard Support** provides unlimited phone, chat, and web access to customer support during call center hours and unlimited access to Bottomline's Customer Care Portal. Product upgrades and releases are offered at no additional charge, although implementation support may be purchased separately. Secure transfer of any application or system files is also available.
- **24x7 Emergency Support** offers extra security if customers experience a production down emergency outside normal help desk operating hours. For customers that routinely execute business-critical activities out of hours, this option is beneficial. On-call technicians diagnose and address all system outages so that production can resume as quickly as possible.
- Bottomline's **Priority Support Program** goes beyond incident level assistance and provides advanced support services with direct access to senior technicians as a first line of support. Priority Support customers also benefit from proactive communication with technicians to review issues, action plans, release schedules, and address any support needs.
- **Out-of-Hours Support** is available for customers who require support outside of Bottomline's standard business hours and is typically used by customers moving into production on a new or upgraded system or when completing hardware upgrades. Bottomline's out-of-hours and implementation support provide blocks of on-call services with knowledgeable Bottomline technical representatives. Additionally, on-site weekend support is available.

Company Timeline



- **Premium Care** offers a bespoke support arrangement with dedicated contact numbers and a named key customer care manager, enhanced SLAs, priority incident resolution procedures, and optional 24x7 support.

Bottomline solutions can be purchased as one solution or individually and come as either installed or SaaS-based products. Bottomline has four bureaus across the UK, Geneva, and Singapore through which customers are connected to SWIFT and to a number of financial messaging networks,

including SEPA, EBICS, and regional payment networks such as Bacs and Faster Payments in the U.K., NACHA in America, and SIC in Switzerland. There are approximately 30 faster and/or same-day payment initiatives underway and there will be a further 20 in the near future. Via the Universal Aggregator, Bottomline provides connectivity, and in some cases infrastructure, to the existing payment options. For Bottomline customers, onboarding remains focused on matching project expectations within a given timeline. Project management is an essential element of successful implementations, and Bottomline’s deep domain expertise allows them to guide customers through the project

lifecycle, including integration assessment with business process review, project planning, solution configuration, delivery, training, and support. Our service offering plans for the entire engagement: deliverables, communication plans, and processes are established so both teams are in agreement on the implementation project plan. Connectivity to the appropriate SWIFT Service Bureau and banks participating in the client’s financial supply chain is fundamental to the project and is prioritized in the project planning phase. After an installation, an interim period involves the testing of the system with any bank-specific requirements and any final

Client Training & Event Attendance

adjustments required before going live. Depending on the scope of the solution purchased by the client, various levels of training are provided by Bottomline on an as-needed basis.

CLIENT TRAINING & EVENT ATTENDANCE

Bottomline has an educational program to suit the training requirements of both new and existing customers. Each training program is designed to increase knowledge and skills to ensure user productivity. Educational programs range

from basic “how to” client user instructions to custom training and certification on system development and administration. Bottomline offers options for classroom training on-site at a Bottomline facility, training at a customer site, as well as through mentoring programs. In person events are particularly popular for Bottomline clients and range from full customer conferences to workshops and breakfast meetings. The highly regulated and innovative fintech environment makes face-to-face engagement important, and many events focus on demystifying compliance requirements and providing support and guidance to meet

regulation deadlines. In addition, Bottomline’s Strategic Advisory Councils provide a forum for input into future product development. Customer requirements and requests complement discussions on payment best practice, regulation, and other environmental and economical influences, making these events an integral part of the innovation cycle at Bottomline.

Although they are headquartered in North America, Bottomline has experienced worldwide growth thanks to multiple fintech acquisitions and the establishment of nearly two dozen offices worldwide. Bottomline currently services more than 10,000 clients.

BOTTOMLINE GLOBAL SPREAD

N. America Offices

Alpharetta, GA; Englewood Cliffs, NJ; Garden City, NY; Marlton, NJ; Providence, RI; Raleigh, NC; South Portland, ME; Wilton, CT

Headquarters

Portsmouth, NH

EMEA Offices

France, Germany, Switzerland, The Netherlands, Israel

Headquarters

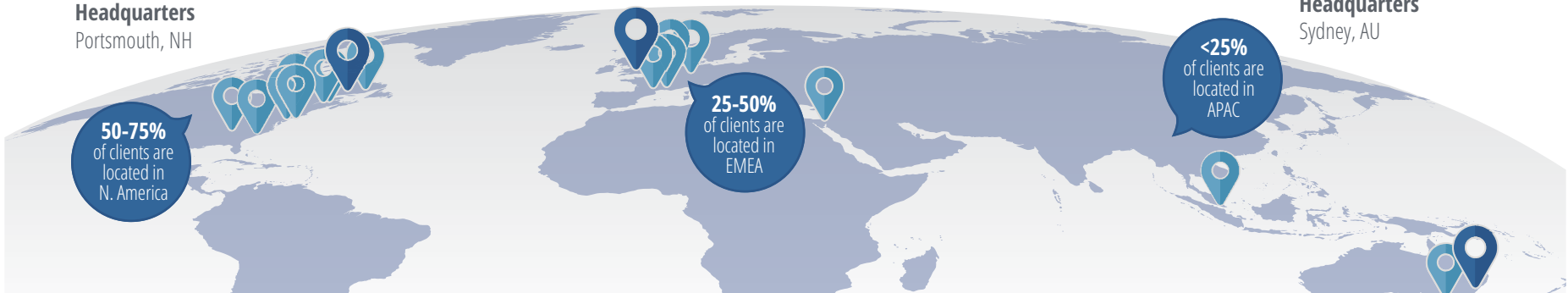
Reading, UK

Asia-Pacific Offices

Melbourne, AU; Singapore

Headquarters

Sydney, AU



Company Overview



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This content was produced by ECS Fin and edited by Strategic Treasurer.

COMPANY OVERVIEW

ECS Fin, an engineering firm that specializes in process optimization with a focus on transaction processing solutions, was created in 1999 in New York. The idea behind the creation of ECS began while a team of engineers was providing professional services to Fortune 100 companies. While this work was being performed, they noticed a number of inefficiencies related to application integration, enterprise messaging, transaction processing, data governance, and reporting. They believed that the processes in place were expensive, complicated, and time-consuming and often left users feeling dissatisfied with the functionality provided.

In 2006, they formulated the ideas of a solution series and branched out a development wing with the goal of assisting larger financial companies and corporates. In 2009, they deployed their first module and, ever since, have been adding customers and more modules to their Integrated Messaging Services (IMS). IMS consists of a series of message administration services, transaction processing modules, connectivity services, and supporting components. Customers can select and stack the flexible modules and services for building enterprise solutions. The modular approach

allows for the use of individual products or one of the complete solution sets - IMS Gateway, IMS Payments, and IMS Settlements. The products are either deployed at a client site or hosted on the IMS Cloud. Each application is supported with web-based interfaces, dashboards, data governance, and reporting.

The majority of ECS's client base is located in North America and LATAM, with strategic clients also located in EMEA, Africa, and APAC. They have offices in the United States, South America, Europe, the Middle East, and Asia. Each location has a customer service center, all of which are available via phone, email, and online chat. ECS's revenue has steadily increased since its inception, and the company has continued to expand their organization to stay in front of client growth. ECS chooses to market their products on a broad scale, targeting banks, corporates, investment managers, and other large global organizations. From a market segment perspective, financial institutions and corporates with annual revenue of several billion dollars and up are ideal clients for ECS due to their highly sophisticated, enterprise-oriented solutions.



Founded:
1999



CEO:
Jacob Aruldas



Headquartered:
White Plains, NY



Ownership:
Privately Held

PRODUCT SET



IMS Modules

(Available as installed, hosted, or cloud-based products)

- ⚙️ **Systems Integration**
- ⚙️ **Bank Connectivity**
- ⚙️ **Application Integration**
- ⚙️ **Data Transformation**
- ⚙️ **Financial Messaging**
- ⚙️ **Payments & Cash Management**
- ⚙️ **Data Governance & Reporting**
- ⚙️ **Trade Matching & Settlement**
- ⚙️ **File Management & Storage**

ECS FIN AT-A-GLANCE



ECS has **six offices** distributed throughout **the Americas, EMEA, and Asia.**



ECS's **senior management** originally **worked as financial and technology consultants** before founding their product wing.



Although ECS was founded in 1999, their **first IMS product** was **released in 2009.**

NOTABLE EVENTS



AFP Annual Conference



SIBOS Conference



NACHA Payments Conference



EuroFinance Conference

THINGS YOU SHOULD KNOW

ECS Fin has already introduced both **SWIFT GPI** and **real-time payments capabilities** with **The Clearing House.**



The **ultimate goal** of ECS Fin's functionality **is to achieve 100% STP RATES** for their clients.

Targeting primarily Fortune 1000 organizations, ECS Fin has acquired **50+ CLIENTS** since their inception.



Since the official release of their software in 2009, ECS has **acquired clients in each major world region.**



Headlines & Awards



Major Bank Selects IMS Gateway, ECS Fin's Enterprise Service Bus

In 2017, IMS Gateway, ECS Fin's Enterprise Service Bus and Message Hub, was selected by a large bank in Africa for enterprise messaging. The bank has streamlined all internal and external data flow while reaching STP with internal systems including core-banking, loan systems, and corporate payments while connecting to SWIFT and RTGS for clearing.



ECS Fin Releases SWIFT GPI Module

ECS Fin released their SWIFT GPI module in early 2017. The module comes with full workflows for banks and corporates. The main advantage of the module is that it can be implemented without any disruption to existing systems or internal technology infrastructures. The module provides SWIFT tracker information to the source systems and corporate customers in real-time.



Major Oil Company Based in Latin America Selects IMS Payments

In 2016, IMS Payments for Corporates, a module consisting of payment factory, application integration, connectivity, and SWIFT services, was selected by a large oil company in LATAM for automating treasury operations. The platform connects with domestic and international banks for automating integrated payables and receivables and for processing responses and statements.



IMS Securities Hub & SWIFT Service Bureau Chosen by Major Fund Administrator

In 2017, a major fund administrator hired ECS for automating payments and all supporting workflows for its investment management customers globally, as well as for transferring funds between multiple accounts, for making third-party payments, and for implementing complex payment workflows that include batching and sequencing. The project also included the engagement of IMS modules for collecting statements from a number of commercial banks in a variety of formats and delivering them to the fund administrator's customers in unified formats.



ECS Fin Gets Approval from The Clearing House for Real-Time Payments

ECS Fin released its real-time payments module in 2016. The Clearing House has declared this module as production-ready in 2017, following the successful testing of workflows including connectivity, preparation and transmission of payment instructions, receiving and processing of responses, and exception handling using MX message standards and formats. ECS Fin can engage banks and corporates instantly for real-time payments without having to make any changes on any of the source systems at either side.

CASE STUDY

+ ABOUT THE CLIENT

- Major hedge fund company based out of US
- Billions of dollars' worth of transactions annually

+ PROBLEM

- Manual preparation and transmission of payment instructions to Custodians/PBs
- Needed automation for receiving and processing acknowledgments, confirmations, and statements
- Difficulty in ensuring accuracy and internal security for various payment components

+ BENEFITS OF USING ECS FIN

- End-to-end processing of payments, all managed through a single platform/dashboard
- Addresses the needs of all stakeholders including operations, compliance, counterparty requirements, customer services, and all interested parties through roles and entitlements

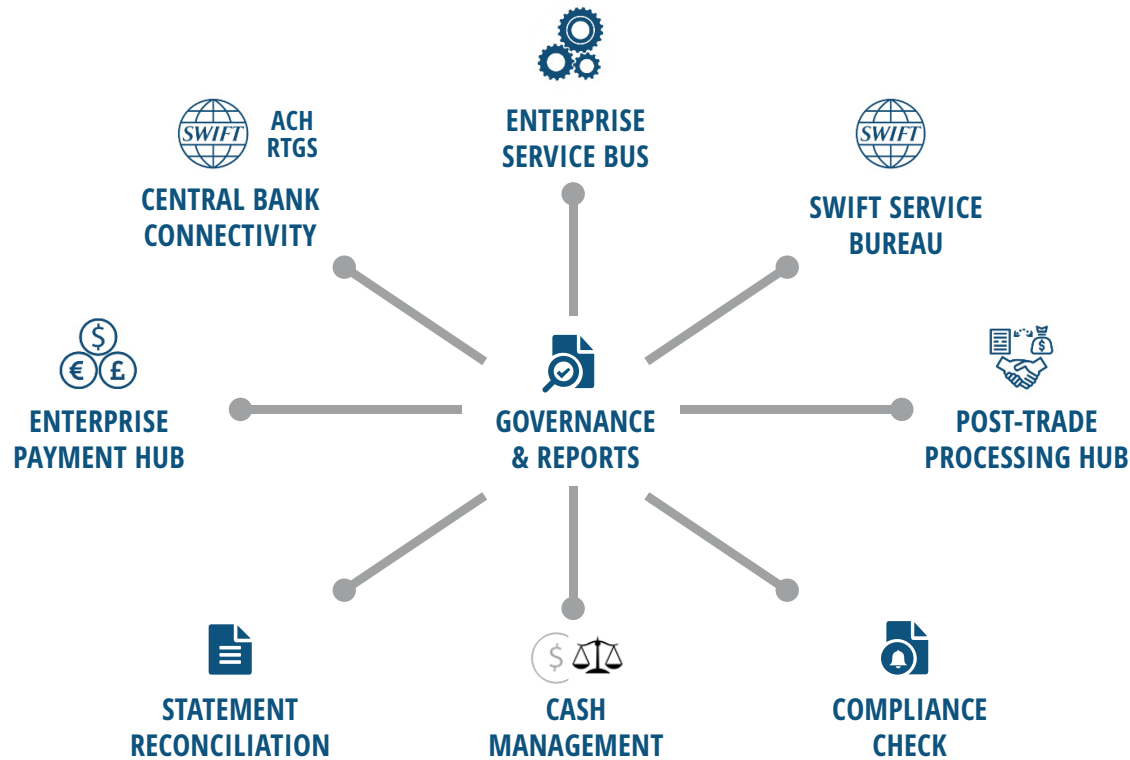
+ BENEFITS OF USING ECS FIN

- ECS offered a rapid implementation path, a few months compared to a few years as understood by the customer in evaluating other vendors globally
- ECS offered a completely integrated solution on a trial basis for users/operations to evaluate
- ECS's Test Simulator demonstrated system capabilities and performance prior to engaging target entities

+ FUNCTIONALITIES IMPLEMENTED

- IMS Payments, IMS Settlement

ECS Products & Services Landscape



Value-added services like duplicate checking and compliance checking can be engaged on specific types of data following different sets of rules. Connectivity services offer instant connection with any type of source system or external entities, supporting real-time, batch, synchronous, and asynchronous types of communication. The various functionalities of IMS Gateway service include application integration, message library creation and management, reference data management, data transformation, compliance checking, duplicate checking, data validation, and data subscriptions. Application integration refers to the easy and rapid integration between internal applications, external entities, and other services by providing instant connectivity, message transformation, data-flow modeling, workflow automation, and dashboards for internal controls.

Data exchanged through each channel can be viewed through enhanced dashboards that offer increased visibility to all areas of operation. Adding a connection with an internal application or an external entity can be completed instantly and in real-time through user-friendly configuration screens that allow the selection of connectivity protocols, message formats, and schedules. Similarly, adding a subscription for a specific type of data in any format or protocol can be performed instantly for a requesting party, which can be a machine or a user. Each connection or subscription added will extend its own dashboard, interface, approval cycles, exception handling, event management, and notifications. IMS Gateway can also assume the role of an Enterprise Service Bus. It can manage a series of connections with a number of source systems and re-sort data that should be transmitted to other source systems or a series of external entities. Clients of ECS can make use of enhanced data governance features that link

PRODUCT OVERVIEW

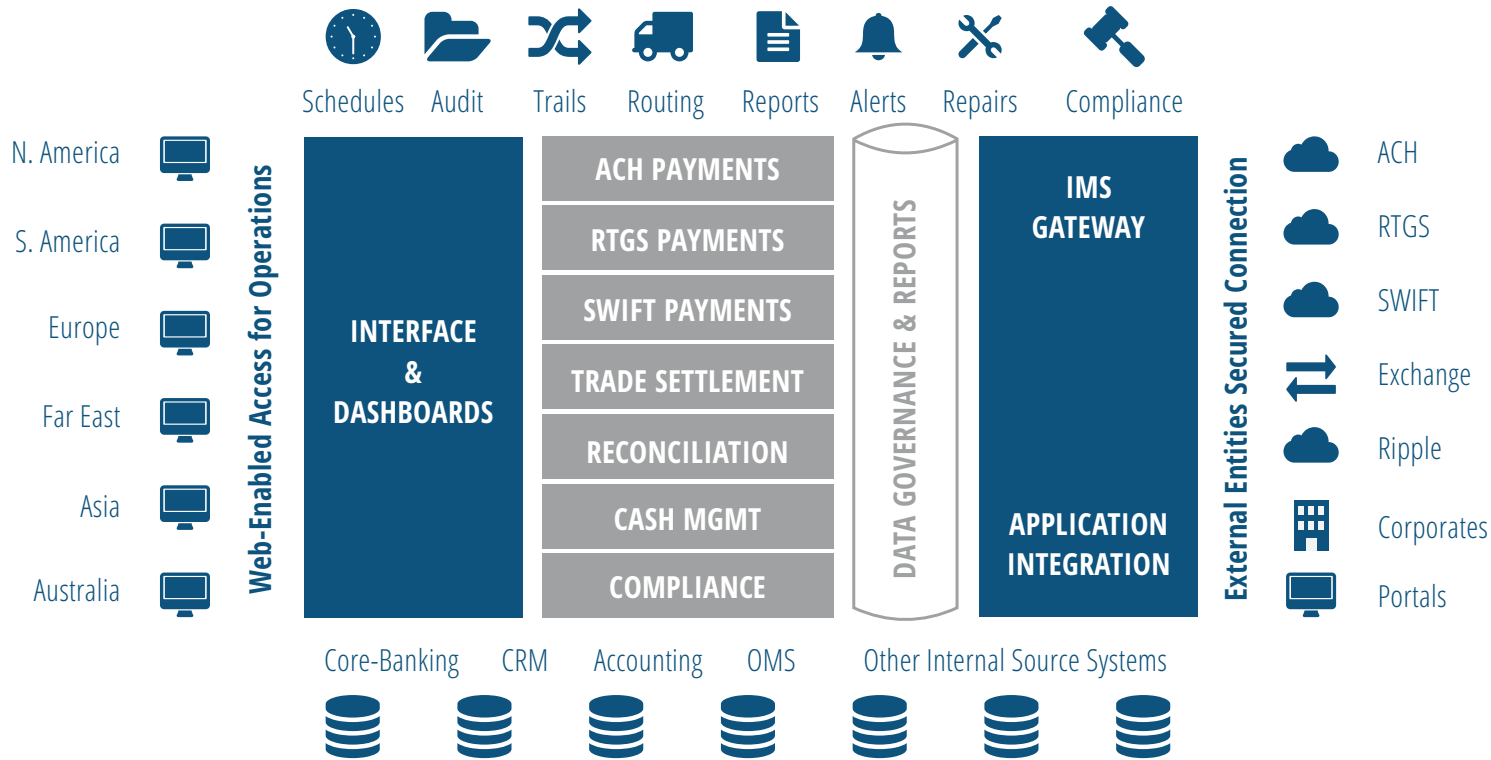
⊕ IMS Gateway

IMS Gateway, ECS's enterprise message hub, facilitates the efficient exchange of data between all internal systems and external entities for an enterprise. It introduces a well-organized control point supported by dashboards for visibility and an

interface for user actions on each channel of data exchange. It is equipped with a series of message administration and data workflow automation tools that perform data identification, categorization, enrichment, transformation, and validation.

Product Overview

Enterprise Message Hub, Payment Hub & Post-Trade Processing Hub



messages, documents, and events with reference data using the underlying transaction details for reports and audits.

IMS Payments

IMS Payments, a central payment hub from ECS, is a series of money movement modules, supporting components for treasury operations, and value-added services for instant implementation. IMS Payments automates the movement of money through all channels while addressing needs of

various user groups and back office operations from initiation through to reporting. IMS Payments is complete with separate modules for addressing different settlement channels such as ACH and RTGS networks, as well as SWIFT. It also distinguishes different types of money movements like customer payments, foreign exchange, institutional transfers, and direct debit. ECS is also currently in the process of adding a module for moving money through Ripple. Users can choose to keep separate dashboards for each module or have consolidated views that

combine transactions from multiple modules. IMS Payments includes modules for supporting components like cash management, compliance checks, statement management and reconciliation, and advanced reporting. The supporting components can be seen as individual modules from an operations point of view, although they are compatible with the core payment modules as value-added services. The system supports a number of different messaging formats and includes all known standard formats and most proprietary

Customer Service & Implementation

formats for core-banking, accounting, CRM, etc. The SWIFT library includes MX/MT conversions, and the ACH library includes various flavors of ACH formats for different regions. IMS Payments additionally supports all proprietary formats and allows clients to download information in Excel, PDF, XML, or CSV. Users can subscribe to specific transactions in any language—English, Spanish, French, Chinese, Japanese, Arabic, Hindi, etc.

⊕ **IMS Settlement**

IMS Settlement serves as a post-trade processing hub that hosts a series of data processing modules like trade affirmations, trade allocations, trade settlement, securities transfer, money transfer, statement management, statement reconciliation, and securities positions and balances. The interfaces and dashboards enable clients to perform a multitude of functions directly correlated to matching trades and moving securities. Specific adapters allow the exchange of data with trade matching providers like Omgeo and trade enrichment subscriptions like Alert.

Trade Settlements, one of the widely requested modules on IMS Settlement, automates the complete trade settlement cycle, covering creation of instructions, management of sanctions, enrichment and validation of settlement instructions, confirmation matching, status matching, request for status, request for cancellation, and processing of responses from counterparties. It has the ability to prepare instructions from trade details received in most formats from various source systems, order management systems, accounting systems, and trade matching platforms. The money transfer module can generate money movement instructions from forms, through requests from other modules of IMS, and

also from other internal systems of the firm. Notifications can also be prepared as part of the same transaction and transmitted to the parties receiving funds. Workflows are provided for trade confirmation, affirmation, settlement, and reconciliation, along with dashboards and interfaces for tracking, internal controls, exception handling, and report generation. IMS Settlement can connect to various counterparties of the trade via SWIFT or FIX, as well as ETC service providers like Omgeo and Accord. For incoming and outgoing messages, IMS runs a full set of sanctions filtering and data validation checks to ensure the compliance and integrity of the information contained within.

⊕ **SWIFT Service Bureau**

In addition to their modular product offerings, ECS operates as a fully-functioning SWIFT Service Bureau, which is a subset of their ECS Cloud service. Beyond offering the full range of SWIFT connectivity, ECS can connect clients to their banks through alternative networks like CHIPS, Bacs, and Canadian CPA (Payments Canada). ECS also offers clients direct (H2H) connectivity and can quickly accommodate for any banks a client needs access to. They support the full scope of messaging formats including both MT (ISO 15022) and MX (ISO 20022) messages, EDI, and BAI, among others.

CUSTOMER SERVICE & IMPLEMENTATION

ECS offers 24x7 support through their globally distributed team. Support staff are available in New York, India, Malaysia, and Colombia to answer client questions. Staff are trained to interact with customers in a variety of languages. ECS also offers an online portal for opening tickets, support telephone numbers covering each region, and email requests. Email requests are generally most effective at speeding up issue resolution, while

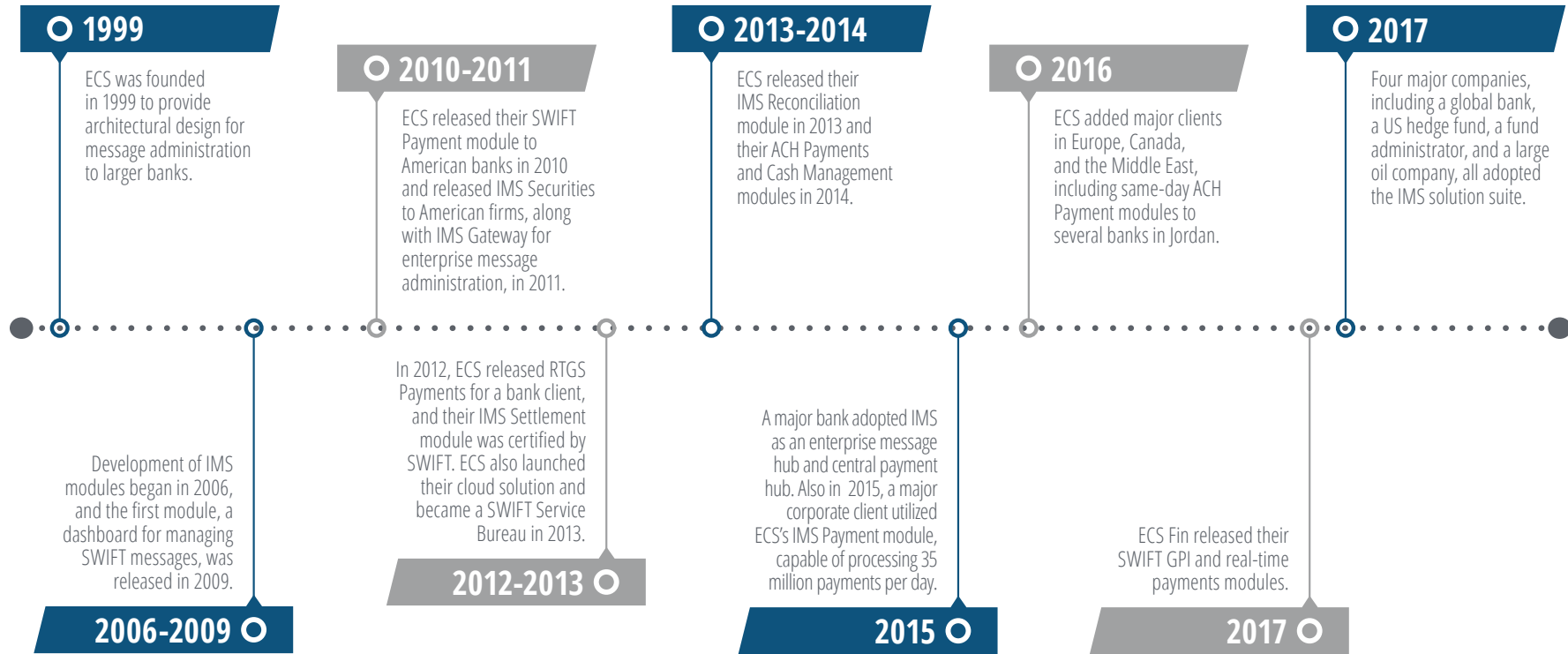
the portal is kept up-to-date, either by the customer or by ECS, to maintain accountability for every request that comes in.

ECS offers three different types of implementation:

- **Onsite Installation:** The application will be deployed at the customer's data center, and it will be fully integrated with relevant internal systems and external entities. The customer's client will have the option of directly connecting to the service at the bank or connecting via an ECS data center. When customers' clients connect via an ECS data center, they can send and receive data in any format/protocol, while the communication between ECS and the customer can be in a unified method that would not require additional work when new clients are added.
- **Hosted Solution:** The application will be deployed at the ECS data centers on dedicated instances. This allows the customer to maintain their data in an unshared environment, although connectivity services to the external entities like SWIFT and central banks could be shared.
- **Cloud Solution:** The customer could be added to the relevant services hosted by ECS in a shared environment. Although this option reduces maintenance costs, it is not recommended for mission critical services.

Regardless of the method used, the production-ready applications can be instantly utilized by the customer for evaluation and user-acceptance exercises. During this process, the configuration interface is utilized for addressing the

Company Timeline



needs of various departments, compliance divisions, and all interested parties who will have need for the services.

CLIENT TRAINING & EVENT ATTENDANCE

ECS Fin attends several events globally, most of which occur in either North America or Asia. SIBOS, the Annual AFP conference, Payments by NACHA, New York Cash Exchange, and EuroFinance are some of the major events that ECS

Fin regularly attends. In addition to these, DotFinance and MEFTECH are some of the events commonly attended in Asia. For client training, ECS Fin provides one full week of training during implementation before the go-live stage. ECS Fin typically will train a few individuals extensively, who can then train the others within their group moving forward. Users are also provided with user guides for reference whenever needed, and can contact ECS Fin support staff for further assistance.

Regarding the above timeline, one particularly notable milestone occurred just this past year, as ECS received approval from The Clearing House as a Real-Time Payments (RTP) service provider. They are one of the first vendors to develop this capability, and will begin offering the service to clients in November 2017.

TESTIMONIALS

“Moving to ECS Cloud was a good and valuable decision for us. Our cash wires, securities settlement, foreign exchange, and reconciliation statements STP rate increased by moving to ECS. The system is very user-friendly and allows our team to research and reconcile issues faster than our legacy systems. The client service team is knowledgeable and responsive to all our needs, and we see them as a partner rather than a vendor.”

“My staff report that the dashboards and interfaces of IMS products are easy, simple, and meet our needs. They allow secure access to multiple customers from anywhere in the world, which is so important for a global operation like ours.”

“What ECS offered sounded too good to be true – however, we decided to utilize it as an interim solution based on promises of rapid deployment cycle and production readiness. While doing our due diligence, we realized that we have the best solution in the industry.”

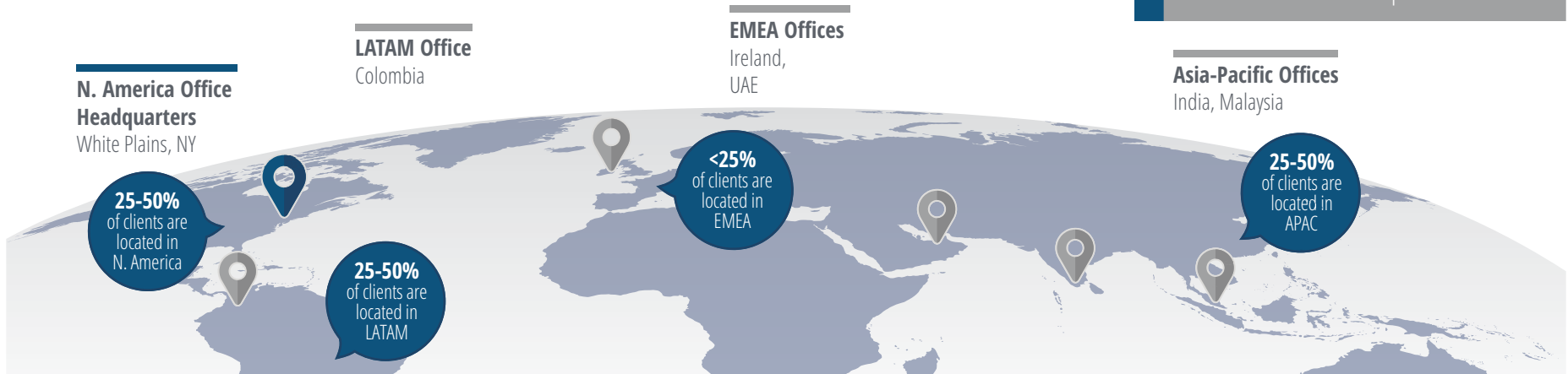
New York Corporation

Bank in South America

Major US Hedge Fund

ECS FIN GLOBAL SPREAD

Since the official release of their platform in 2009, ECS Fin has seen the strongest growth come through their North America and LATAM-based operations. However, between 2014-2016, groups of new clients were also onboarded in Europe and Asia.



Company Overview



Reach Further. Connect Faster.

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This content was produced by Fides and edited by Strategic Treasurer.

COMPANY OVERVIEW

At Fides, the primary mission is to centralize and simplify global multi-bank connectivity and transaction communications. Since 1910, their founding goal has been to connect people to the information that allows them to do business, most recently in the areas of multi-bank connectivity and transaction communications. Today, Fides is focusing their efforts on simplifying bank communication and connectivity for corporations. By delivering solutions that simplify the bi-directional communication between banks and corporates, Fides makes it easy for clients to securely execute and manage transactions regardless of their banking portfolio or geographic location. Fides' ventures in electronic multi-banking and connectivity began in 1985 with the launch of their bank account balance and transaction reporting service, Fides ARS (Account Reporting Service). This was closely followed by the launch of a funds transfer solution, called Fides EFT (Electronic File Transfer), a few years later, along with other subsequent enhancements and additions to their product suite. These include their establishment as a SWIFT Service Bureau in 1997, connection to the EBICS network in 2010, and the development of their ISO client channel, which gives clients the ability to send and receive messages/payment instructions via formatting structures based on the ISO 20022 standard (e.g. camt, pain, etc.).

Although Fides supports SWIFT for Corporates onboarding and hosting of corporate BICs as a member of the SWIFT Shared Infrastructure program, one feature obtained through a relationship with Fides is that a client does not necessarily need their own BIC to connect to SWIFT. As part of the Credit Suisse Group, Fides offers their clients the option of utilizing a Credit Suisse Group financial BIC instead of becoming a SWIFT member themselves or in addition to becoming a SWIFT member. Fides supports global connectivity and offers connections to alternative networks like EBICS, as well as H2H connections. Headquartered in Switzerland, Fides is an independently operated subsidiary of Credit Suisse. Fides has one of the world's largest bank connectivity networks and helps more than 3,000 active clients communicate with more than 10,000 banks globally. Their geographic reach currently spans 170 countries across the Americas, EMEA, and APAC regions. In addition to capitalizing on the client channel provided by Credit Suisse Group, Fides has partnered with a number of TMS (Treasury Management System) vendors as a means of more effectively providing and marketing its services to customers. Vendors including Reval, SAGE, TreasuryXpress, and others have incorporated Fides ARS/EFT software into their TMS in order to enhance their clients' global multi-banking capabilities.

Founded: 1910

CEO: Andreas Lutz

Headquartered: Zurich, Switzerland

Ownership: Credit Suisse Group

PRODUCT SET

Fides ARS & EFT
(Available as installed & SaaS-based products)

- Account Reporting
- Bank Messaging
- SWIFT Service Bureau
- Bank Connectivity
- Systems Integration
- File Transfer
- Payments & Cash Management
- Data Validation & Sanctions Screening

FIDES AT-A-GLANCE

Fides' professional services staff currently services more than **3,000 active customers**.

Fides is a **wholly-owned** subsidiary of global banking giant **Credit Suisse**.

Founded as Fides Trust in 1910, Fides has been solely **focused on multi-banking and connectivity solutions** since **1985**.

NOTABLE EVENTS

AFP Annual Conference

ACT Annual Conference

EuroFinance Conference

Finanzsymposium Mannheim

THINGS YOU SHOULD KNOW

Fides' payment platform processes **OVER \$5.5 TRILLION** every year.

Fides has won the award **"BEST MULTIBANKING SOLUTION PROVIDER"** twice in the past two years.

MORE THAN 160,000 SWIFT messages, including batch files, are processed through Fides' system every day.

With their **founding in 1910**, Fides has been servicing clients for nearly **107 years**.

Active users of Fides' system span **170 COUNTRIES** and connect to more than

10,000 BANKS worldwide.

Headlines & Awards



Fides Treasury Services Named Multi-Banking Solution Provider of the Year

Fides Treasury Services Ltd., a member of the Credit Suisse Group and a global leader in multi-bank connectivity and communications, was named as the 2017 “Multi-Banking Solution Provider of the Year” by The European Magazine.



Fides Treasury Services Appoints New CEO

Andreas Lutz was unanimously appointed by Fides’ Board of Directors as chief executive officer in January 2017. Lutz succeeds Fides’ previous chief executive, Alain Schmid, who announced his desire to step down in September 2016 to pursue continued service within Fides’ parent company, Credit Suisse Ltd.



IAIR Awards 2016: Best Multi-Banking Solutions Company of the Year Global

Fides was awarded “Best Multi-Banking Solution Company of the Year Global” award by IAIR. Over 50,000 readers of the online publications of IAIR nominated companies according to criteria such as sustainability, service quality, and innovation for awards in various categories. This receipt of the IAIR award signifies the second multi-banking solution award that Fides has won in two years.

PRODUCT OVERVIEW

⊕ **Account Reporting Solution (ARS)**

The Fides Account Reporting System (ARS) was designed to allow clients quick and easy access to viewing overall liquidity and account statements from their banks at any time. Fides ARS can be integrated with a client’s TMS/ERP system or managed through the Fides ARS web portal. Fides ARS improves upon the outdated process of manually collecting account data from a client’s banks by consolidating all account information, including balances, transactions, and booking texts, and providing it centrally via a set of user-friendly dashboards. The process involves converting all messages into a standardized format, verifying the account statements, allowing the customer to choose a preferred format (MT940/42, BAI, AFB120, camt.052/053/054, etc.), and providing options for downloading data, such as in Excel or as a PDF. One highlight of Fides ARS is that no special infrastructure or installation is necessary for use of the solution. ARS web access is available 24/7. Updates and upgrades to the solution are performed regularly, with the most recent ones focusing on statement validation and enrichment, along with additional format conversion options.

ARS Summary of Benefits:

- Centralized access for smooth account reconciliation
- Limitless bank connectivity
- Web portal access anytime, anywhere
- Statement normalization and consistent reporting
- Advanced validation services and features
- Compatibility with any TMS or ERP solution

CASE STUDY

⊕ **ABOUT THE CLIENT**

- A global provider of acoustic and thermal management solutions for vehicles
- 50+ worldwide locations and more than 10,000 employees

⊕ **PROBLEM**

- Dealing with 45 global bank relationships and more than 100 bank accounts
- Heavily decentralized payments processes that relied on an outdated technology infrastructure

⊕ **DESIRED SOLUTION CAPABILITIES**

- Implementation of a Payment Factory for greater control and visibility over payments and cash management processes
- Streamlined bank connectivity for purposes of reducing bank relationships and unnecessary/burdensome accounts

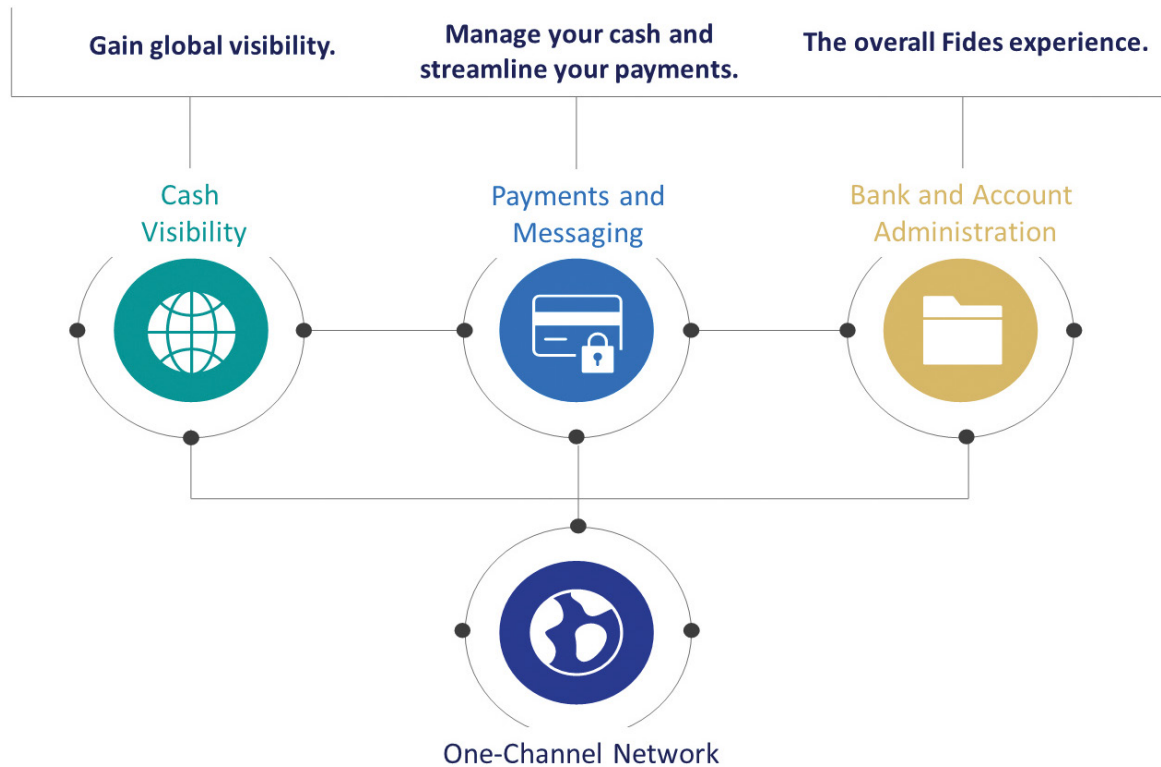
⊕ **WHY CLIENT CHOSE FIDES**

- Fides offered connectivity via SWIFT, EBICS, and H2H (direct) connections
- Fides was able to integrate seamlessly with client’s SAP infrastructure and with individual bank systems

⊕ **FUNCTIONALITIES IMPLEMENTED**

- Hybrid Fides connectivity solution (ARS and EFT)

FIDES COMPLETE MULTI-BANKING SOLUTION



Fides EFT serves as a central location to manage and execute payments and provides an efficient method of monitoring all payments. Automated access is available through a client's TMS/ERP, but a client can opt to manually enter and approve payments through Fides' EFT web portal. Fides EFT is able to process and send payment orders globally to a multitude of different banks and uses enhanced data validation and enrichment processes to ensure client information is delivered securely and quickly. Like the ARS solution, Fides EFT is regularly upgraded, with the most recent enhancements involving updated sanctions screening processes, enhanced support for ISO 20022 (XML) messaging, and upgraded payment templates.

EFT Summary of Benefits:

- Global bank connectivity
- Advanced payment security and fraud prevention
- Support for any file format regardless of bank or country-specific nuances
- Reduced payment and transaction costs
- Advanced validation services and sanction filtering features
- Flexible and consolidated transaction data management
- Web portal access anytime, anywhere
- Compatibility with any TMS or ERP solution

⊞ Electronic File Transfer (EFT)

Fides EFT simplifies the global transfer of individual and bulk payments to banks and consolidates the financial messaging process so that any and all messages can be sent and received by corporates through one portal. Although the majority of clients use Fides EFT for payment purposes, it can be utilized for the full range of MT and MX (ISO 20022 XML) formatted messages, including those used for trade finance or FX trades. Fides

EFT provides efficiency and organization for companies with multiple banking relationships and is a large improvement over current payment management processes. Generally, a company would be required to go through each of their specific banks' websites to execute payments from each bank portal. This task is time-consuming, and the number of steps performed manually makes it error-prone.

Product Overview

Whole Solution Highlights:

Messaging

Fides offers virtually every format that a company would need to use. However, Fides has the ability to implement any additional formats that a client could require, should the need arise. For bank reporting, messages can be converted and made available in a variety of standard formats such as BAI, AFB, MT940, camt, CSV, etc. Data can be made available through the Fides web application or through a client's TMS/ERP. Fides supports the full suite of payment formats, such as SWIFT FIN (e.g. MT101), FileAct, NACHA, FEDWIRE, Bacs, EDI820, AFB, ISO 20022 (pain.001/002/008), and Canadian CPA.

Validation Services

Fides runs a broad range of validation checks over all payment and statement types to ensure the highest level of data integrity and security. All data contained within

the Fides application is fully encrypted, whether at rest or in transit. Token support, file control, IP filtering, and digital signing for external transactions are additional data security measures. SAML 2.0 can be provided on client request. Fides also offers extensive sanction screening support for messages sent through its servers. They have a dedicated sanction filtering team that monitors the filtering software and can report flagged messages to clients within minutes of their appearance.

Simplified Bank Connectivity UX

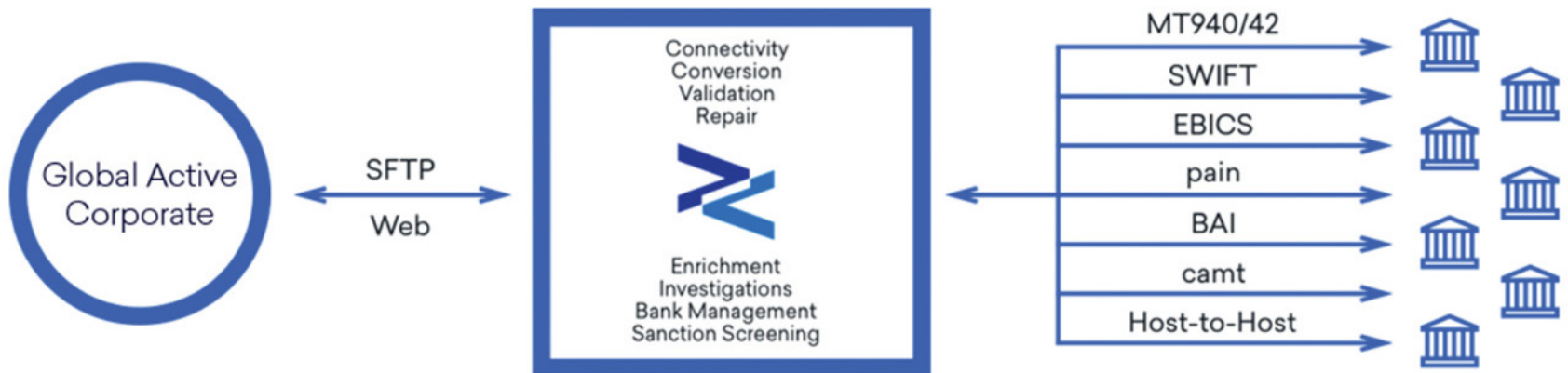
- ✓ **SWIFT Service Bureau Model** - Highly flexible and equally secure, Fides is a leading Certified SWIFT Service Bureau offering global multi-bank Connectivity-as-a-Service.
- ✓ **Concentrator Service** - Fides' Concentrator Service allows clients to send and receive messages through the Credit Suisse Financial BIC. This service

provides payment visibility and efficiency for clients without a need for their own Corporate BIC.

- ✓ **EBICS** - Fides provides their clients access to EBICS as an alternative to SWIFT for exchanging financial messages.
- ✓ **Host-to-Host (H2H)** - Fides offers direct H2H solutions that allow clients to meet bank-specific encryption requirements. Fides also provides conversion services.

Additionally, Fides' unique Hybrid Model offers a multi-network, dual-BIC solution that helps clients:

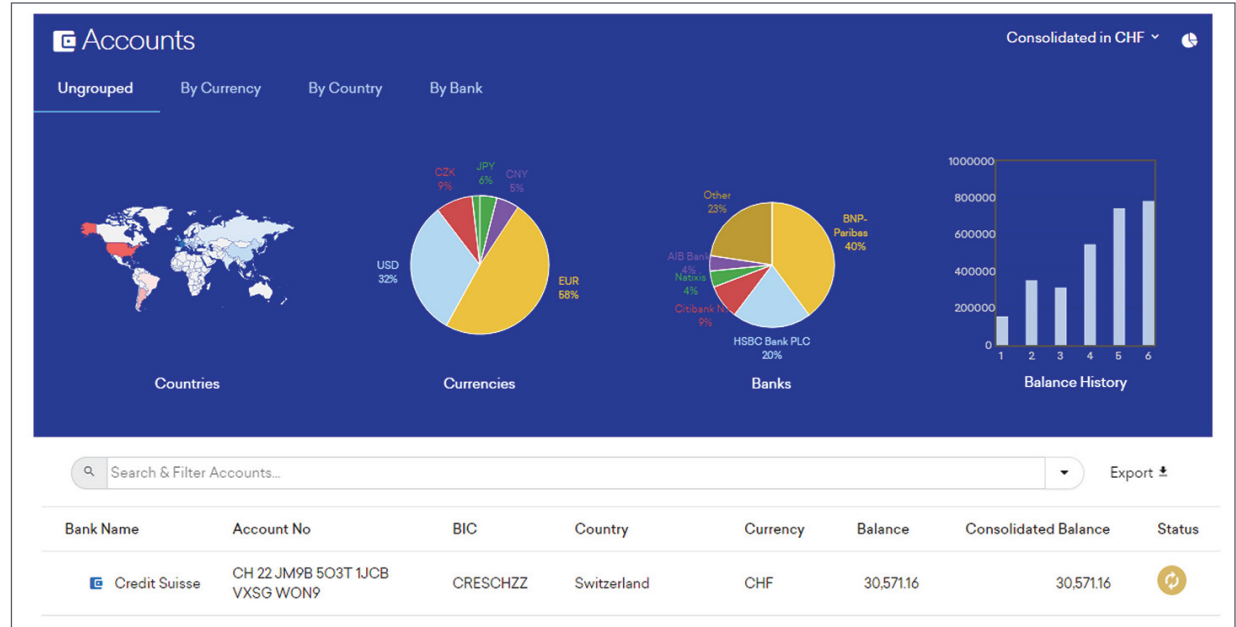
- Eliminate gaps in the SCORE readiness of banks
- Ensure global banking coverage
- Increase speed to market
- Reduce costs



CUSTOMER SERVICE & IMPLEMENTATION

Fides' entire operation is based out of Switzerland but is equipped with enough personnel to handle all areas of global operations. Fides is known for their ability to maintain existing clients while also expanding their operations to support additional customers. Their customer service team is available by email or phone Monday-Friday, 24 hours a day, and can communicate with customers in 11 languages, including English, German, French, Italian, Spanish, and Portuguese.

Fides provides a customized onboarding process for each of their clients through their project management team. This differentiates them from other providers in the space, as they work on each client's behalf to provide a tailor-made solution to determine bank capabilities, compatible reporting and payment formats, and the best connectivity method for each bank. An experienced project manager is assigned to each client, and everything begins with a detailed kick-off call where the entire project is reviewed, roles are explained on the client side and the Fides project management team side, and planning begins for each bank. Fides is careful to maintain even loads across the team so that clients receive ample attention and onboarding is completed efficiently. A deputy is also assigned at the beginning of the project, so clients find the experience seamless if their primary project manager is unavailable. The deputy is aware of the status of each bank and connection as well as most recent communication and is able to provide continued support to the client. Clients can choose from a range of deployment options – on-premises installation, hosted hardware, fully hosted, or SaaS delivery. After the onboarding process is complete, the project manager hands support over to client services. The project manager



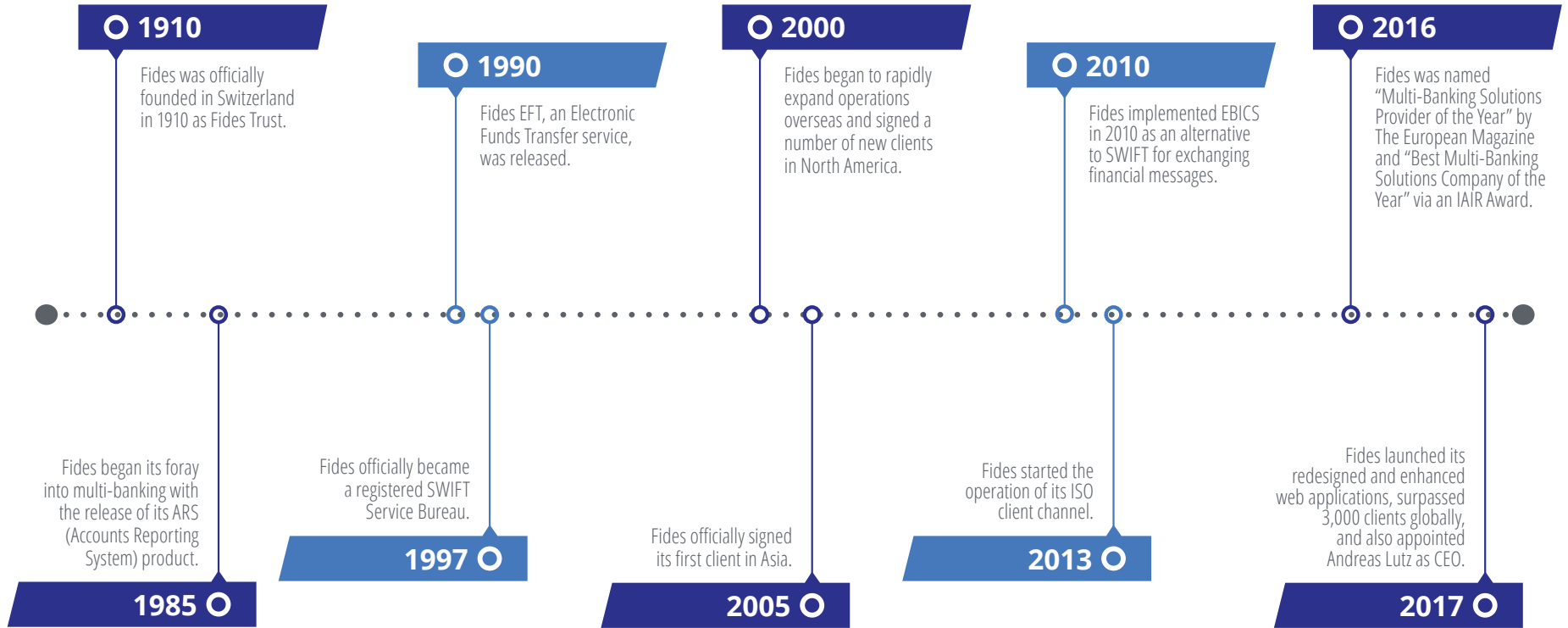
The 'Debit' tab displays a table of account details, including account names, IBANs, currencies, BICs, owners, and sign-off rules. The sign-off rules are represented by colored buttons with numerical values.

Account Name	IBAN or Account No.	Currency	BIC	Owner	Sign-off Rule
Account00001	AN00001	CHF	BCITITMMCMU	AccountAddress00001	10 XTC 10,000 20 15 XTC 1,222,222 10
Account00002	AN00002	CHF	BICXXXXX	AccountAddress00002	10 XTC 10,000 20 15 XTC 1,222,222 10
Account00003	AN00003	CHF	BICXXXXX	AccountAddress00003	10 XTC 10,000 20 15 XTC 1,222,222 10
Account00004	AN00004	CHF	BICXXXXX	AccountAddress00004	10 XTC 10,000 20 15 XTC 1,222,222 10

ensures the client feels comfortable with next steps and provides detailed instructions and explanations for interacting effectively with the client services team. The project manager is responsible for ensuring that knowledge transfer to the client services team takes place so that the client's experience through production

is excellent and customized. The relationship manager assigned at the beginning of the project remains with the client throughout their time at Fides, including through their transition from the project management team to the client services team. To extend the number of clients they are able

Company Timeline



TREASURY AGGREGATOR: BANK CONNECTIVITY SOLUTIONS

to reach, Fides partners with various organizations who offer Fides' services as part of a bundle with their own offerings. Fides has perfected this approach through their partnerships with a large number of TMS vendors, who have incorporated Fides solutions into their products. These vendors have integrated with Fides on varying levels, which can include data integration, statement aggregation, connectivity, conversion, implementation, and file transfer, among others. Fides also

has a close partnership with its parent company, Credit Suisse, through which it offers all services to Credit Suisse's corporate clients for EBICS, SWIFT, and proprietary channels.

CLIENT TRAINING & EVENT ATTENDANCE

For clients wishing to connect with Fides personnel individually or receive training on products and solutions, there are a multitude of

opportunities to do so. Fides attends about 12 events annually, which are held in a variety of locations globally and serve as a means for clients to learn more about Fides, personally meet with company staff, and receive training on the products and services offered. Additionally, Fides offers a host of online and onsite training courses including an annual Client Community Conference.

TESTIMONIALS

“The Fides bank connectivity is a truly system agnostic solution. When we switched from one TMS provider to another, we were able to save a lot of time and money due to the fact that the already existing setup with Fides could easily be reused in the new TMS. Moreover, thanks to Fides’ extensive knowledge of all the major system vendors, we were able to avoid several pitfalls in the transition phase.”

**Mike Leamy, Global Treasury Operations Manager
Kellogg Company**

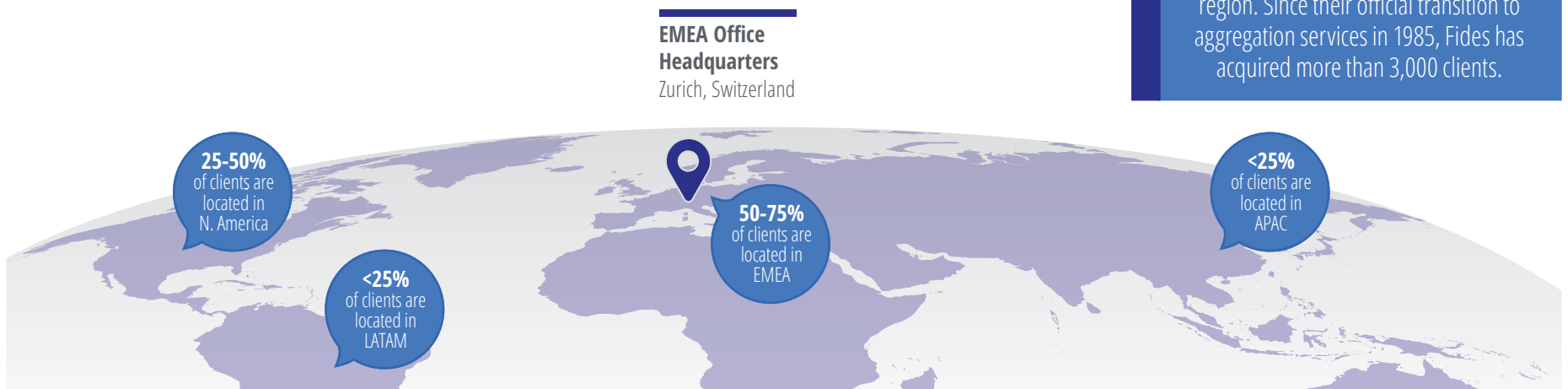
“Fides is the true one-channel solution. The Credit Suisse / Fides Treasury transaction forwarding model allows us to manage all our international payments without the need of our own SWIFT Corporate BIC. The 24/5 client service and their multichannel possibilities further support our setup comprehensively.”

**Gregor Mueller, Global Head of Treasury
Trafigura Group**

“Fides Treasury Services offers an effective and robust bureau solution that the Partnership utilizes to access the SWIFT system. The Fides team was incredibly supportive throughout the implementation phase and have continued to provide a high quality and reliable level of service, delivered at modest expense.”

**Sean Privilege, Treasury Manager
John Lewis Partnership**

FIDES GLOBAL SPREAD



With the financial backing and support of Credit Suisse, Fides has been able to expand their sphere of influence beyond Europe and into Asia, North America, and the LATAM region. Since their official transition to aggregation services in 1985, Fides has acquired more than 3,000 clients.

Company Overview



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office@hanseorga-group.com

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- ⊕ [Company Snapshot](#)
- ⊕ [Headlines & Awards](#)
- ⊕ [Case Study](#)
- ⊕ [Product Overview](#)
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- ⊕ [Client Training & Event Attendance](#)
- ⊕ [Company Timeline](#)

This content was produced by Hanse Orga Group and edited by Strategic Treasurer.

COMPANY OVERVIEW

Hanse Orga Group is a Germany-based independent and privately held software and consulting firm for treasury management and bank reconciliation solutions. Since their inception in 1984, Hanse Orga Group has developed software solutions for treasury and accounting across all industry sectors and today has over 2,000 organizations utilizing their solutions, many of whom are international companies. As Hanse Orga Group has grown, they have continued to expand their capabilities to include bank connectivity and payments functionality, as well as bank account management, cash management, and risk features. Moving forward, Hanse Orga Group aims to continue providing clients with functionality to address the full suite of financial operations. Hanse Orga Group's first software products included a solution for cash management and liquidity planning, and an automatic cash application solution. In 1999, Hanse Orga Group's product suite was further expanded due to a request by global software solutions provider SAP, for whom Hanse Orga Group created a liquidity solution specifically for the SAP application. Due to the success of the project, Hanse Orga Group developed a strong partnership with SAP. As a result of the close-knit relationship formed with SAP, Hanse Orga Group recently underwent a rebranding effort that saw their solution set regrouped and

reintroduced to the market as FS², which includes functionality that addresses the entire financial value chain, such as O2C, P2P, Treasury, Corporate Performance, Tax, Compliance, and Data Management. Each of their products have been fully certified by SAP and are easily integrated into SAP's application, making the implementation process streamlined and efficient. In 2015 and 2016, Hanse Orga Group's robust SAP integration model was recognized as part of the TMI Awards, where the company was awarded "Best ERP Based Solution." In addition to these SAP-integrated services, Hanse Orga Group is also capable of providing their solution set as an ERP-agnostic and independent treasury and payments solution. Moving forward, Hanse Orga Group intends to continue building out their solution set and expanding their global footprint. These intentions have been evident in recent years, as Hanse Orga Group established an office in Spain to support local clientele, received significant investment from Waterland, and announced the acquisition of four leading financial software providers: Dolphin Enterprise Solutions, e5 Solutions Group, Tembit Software, and Soplex. With the added capabilities of these solutions, Hanse Orga Group continues to pursue its strategy of providing clients with services that address the full financial value chain.



Founded:
1984



CEO:
Sven Lindemann



Headquartered:
Hamburg, Germany



Ownership:
Mixed Ownership

PRODUCT SET



Hanse Orga Group

(Omni-deployable solutions available as both SAP-integrated & ERP-agnostic products via SaaS, installed, or hosted models)

Hanse Orga Group's solutions cover all areas of the financial automation value chain including:

- ⚙️ **Order-to-Cash Cycle**
- ⚙️ **Procure-to-Pay**
- ⚙️ **Treasury**
- ⚙️ **Corporate Performance Management**
- ⚙️ **Tax & Compliance**
- ⚙️ **Data & Document Management**

HANSE ORGA GROUP AT-A-GLANCE



Hanse Orga Group's solutions are available to clients both as **SAP-based & ERP-agnostic** solutions.



Hanse Orga Group has grown substantially since their founding to now service **more than 2,000 customers** worldwide.



Hanse Orga Group acquired **four leading financial software providers** within the past year for purposes of expanding their capabilities & strengthening their solution set.

NOTABLE EVENTS



AFP Annual Conference



SAP Financials



EuroFinance Conference
International Treasury Management



SAP SAPPHIRE NOW

THINGS YOU SHOULD KNOW



Hanse Orga Group has **consistently achieved double-digit growth** over the past decade.

Hanse Orga Group's solution has won **FIVE UNIQUE AWARDS** in the **last two years**, while successful



client projects have been recognized three times.

Hanse Orga Group utilizes the skillsets of **OVER 550 EMPLOYEES** across **16 OFFICES** worldwide, including those in the **USA, Hong Kong, Germany, & the UK.**



Customers that use Hanse Orga Group's FS² Payments cumulatively process **OVER 1.2 BILLION**



transactions each year, totaling **OVER \$500 BILLION**



to **400+ BANKS** in 200 countries.

Headlines & Awards

***Tembit Software & Hanse Orga Group Join Forces***

In May 2017, it was announced that Tembit Software, a provider of cloud and mobile payment applications for companies in the financial and corporate sectors, has joined Hanse Orga Group. Tembit Software offers strong and ERP-independent cloud-based solutions that enable customers to manage and execute large volumes of payment transactions in a secure and efficient manner. They are a perfect fit for Hanse Orga Group's existing solutions. The joint fintech company is able to offer an integrated set of solutions for managing cash flows and payments.

***e5 Solutions Group Joins Hanse Orga Group***

In May 2017, it was announced that e5 Solutions Group, the leading experts for SAP Treasury in North America, have become a part of Hanse Orga Group. e5 delivers best-in-class services and software add-ons that enable and augment SAP standard treasury functionality to enterprise customers in North America. The firm's focus on treasury management, in combination with Hanse Orga Group's existing expertise in delivering international solutions to clients for the management of cash flows and payments, will create a unique fintech company which is able to serve customers along the whole financial automation value chain within SAP.

***Dolphin Enterprise Solutions Corporation Joins Hanse Orga Group***

In May 2017, it was announced that Dolphin Enterprise Solutions Corporation (Dolphin), a leading provider of process automation and data management solutions for SAP customers, joined Hanse Orga Group. Dolphin's solutions focus on the optimization of accounts payable and accounts receivable processing, as well as data volume management for companies running on SAP. In combination with Hanse Orga Group's existing products, the group will be able to serve customers along the whole financial automation value chain by providing proven expertise in cash flows and payments and a deeper integration with a supporting technology stack to better manage data and documents.

***Hanse Orga Group & Two Clients Receive TMI Awards***

In February 2017, Hanse Orga Group announced their receiving of the TMI Award for Innovation and Excellence at a ceremony in London. The SAP-embedded software family FS² of Hanse Orga Group was recognized for the second year in a row as "Best ERP-Based Solution." At the same time, two clients of Hanse Orga Group, the German airline Lufthansa and the Canadian mining company Cameco, received TMI Corporate Innovation Awards for their respective innovation projects. The TMI Awards for Innovation & Excellence recognize outstanding achievements of companies bringing innovation and efficiency to corporate treasury and finance.

CASE STUDY**ABOUT THE CLIENT**

- Large global aviation group with 540 subsidiaries, 1,500 bank accounts
- Annual revenue of €32 billion

PROBLEM

- Heavy reliance on bank portals for payment approval and execution
- Regionally fragmented and excessively manual processes for bank communication

BENEFITS OF USING HANSE ORGA GROUP

- Achieve greater visibility and control over its 540 global entities
- Centralize and standardize payment processing through a single system

WHY CLIENT CHOSE HANSE ORGA GROUP

- Availability and commitment of project manager and support teams through RFP process
- Robust and flexible message format translation tools for converting iDOC, XML, and local bank formats into a standard message type
- Offered payment factory capabilities to consolidate and automate payment processing between all of the client's affiliated companies and their banks

FUNCTIONALITIES IMPLEMENTED

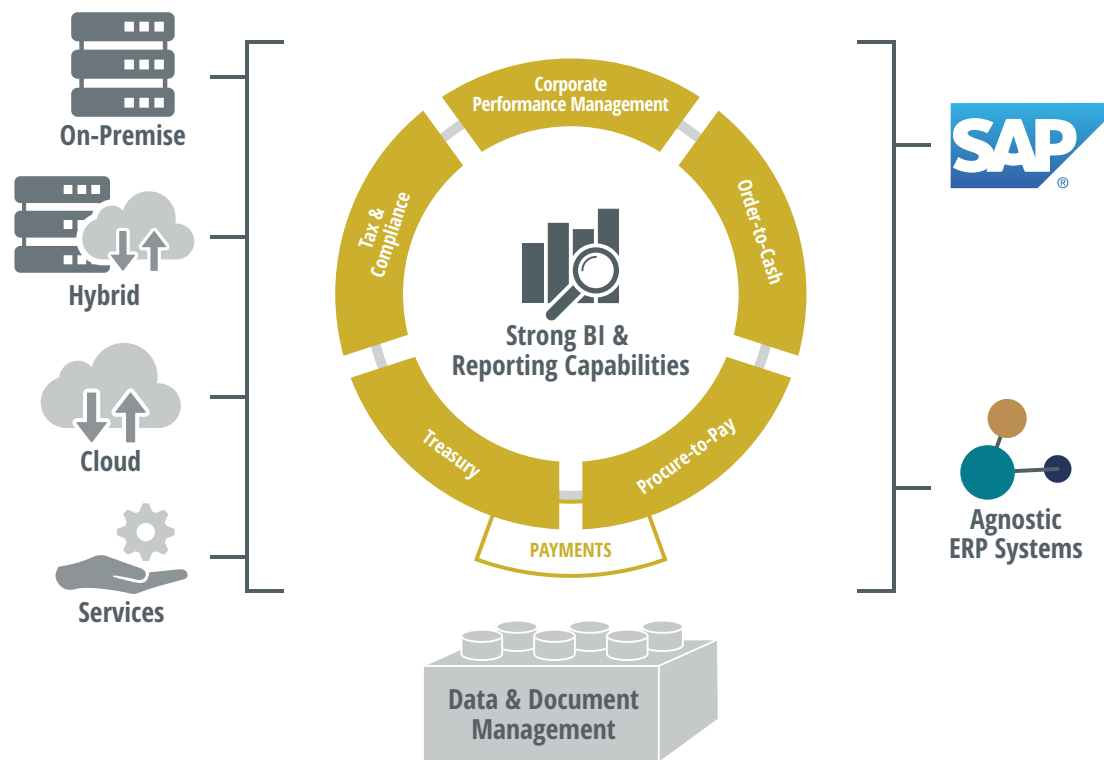
- FS² Payments, Treasury, Cash and Liquidity modules - all integrated with the client's existing SAP infrastructure

PRODUCT OVERVIEW

Hanse Orga Group focuses on delivering automated solutions for the full suite of financial operations. By integrating the solutions of companies like Dolphin Enterprise Solutions, e5 Solutions, Tembit Software, and Soplex Consulting, Hanse Orga Group has recently strengthened their product portfolio and is developing further innovations. The solutions cover the key areas of financial operations including order-to-cash and procure-to-pay processes, treasury payments, bank connectivity and bank account management, record-to-report, and data & document management.

While Hanse Orga Group's solution set covers a wide array of functionalities, the solutions particularly relevant to their aggregation status focus on providing an end-to-end process for the accounts payable and payments processes, while also supporting data management and compliance-related requirements. This includes full coverage of the Order-to-Cash, Order-to-Pay, and Procure-to-Pay cycles, as well as other core treasury and finance operations. From capturing invoices in any format to validating, routing, and processing invoices, to managing liquidity in a central hub, the solutions deliver a full suite of payments, liquidity, and bank connectivity functions to treasury. The solutions come as fully SAP-embedded solutions, as well as ERP-agnostic, web-based solutions. The SAP-embedded FS² solutions are fully compatible also with SAP's latest technology S/4HANA and are certified for their integration. All modules are offered via a secure, cloud-based environment, but can also be implemented as installed solutions should a client request it. Overviews of Hanse Orga Group's aggregation-related functionalities are provided in the following pages.

The Leading Expert for the Entire Financial Automation Value Chain, Providing Solutions for Process Automation & Data Management Globally



Payments

FS² Payments is used by over 1,000 customers and 30,000 users in more than 200 countries. Global in scope, the payments module provides an all-encompassing view of a client's payment statuses, such as import, file creation, approval processes, and distribution to banks. It also displays confirmations by receiving and processing status messages from banks. Users are able to set up approval workflows to comply with internal audit regulations

and defined business rules, such as requiring dual signatories or having external approvals performed by banks via electronic signatures. Organizations are able to import their SAP master data directly to the payments module so that they don't have to maintain multiple platforms or portals. Connectivity and integration to other SAP systems is supported for importing, managing, and sending payment files, as well as for gathering

Product Overview

and distributing account information. With regards to payment formats, the full suite of messaging formats are supported through the system, along with the ability to translate incoming or outgoing messages into the preferred format of the recipient. Hanse Orga Group maintains full compliance with SEPA in the Eurozone and supports the required ISO 20022 XML payment formats (pain) for use worldwide. Users are able to connect to their banking partners through a variety of channels, including SWIFT, EBICS, and direct (H2H) connections and are provided with a set of visual dashboards that allow for quick and easy viewing of transactions, payment activity, and reports.

By integrating these processes with the new **Fraud Monitor & Embargo Screening** tool for the FS² Payments solution, companies can set certain criteria that are most relevant to their situation to automatically detect any fraud attempts and block any suspicious amounts from payments. Following the invoice capture, auto-posting, and fraud monitoring, the Hanse Orga Group's FS² Payments handles the approvals of all invoices and the automatic selection of the most cost-efficient payment methods.

The key benefits of FS² Payments include the following:

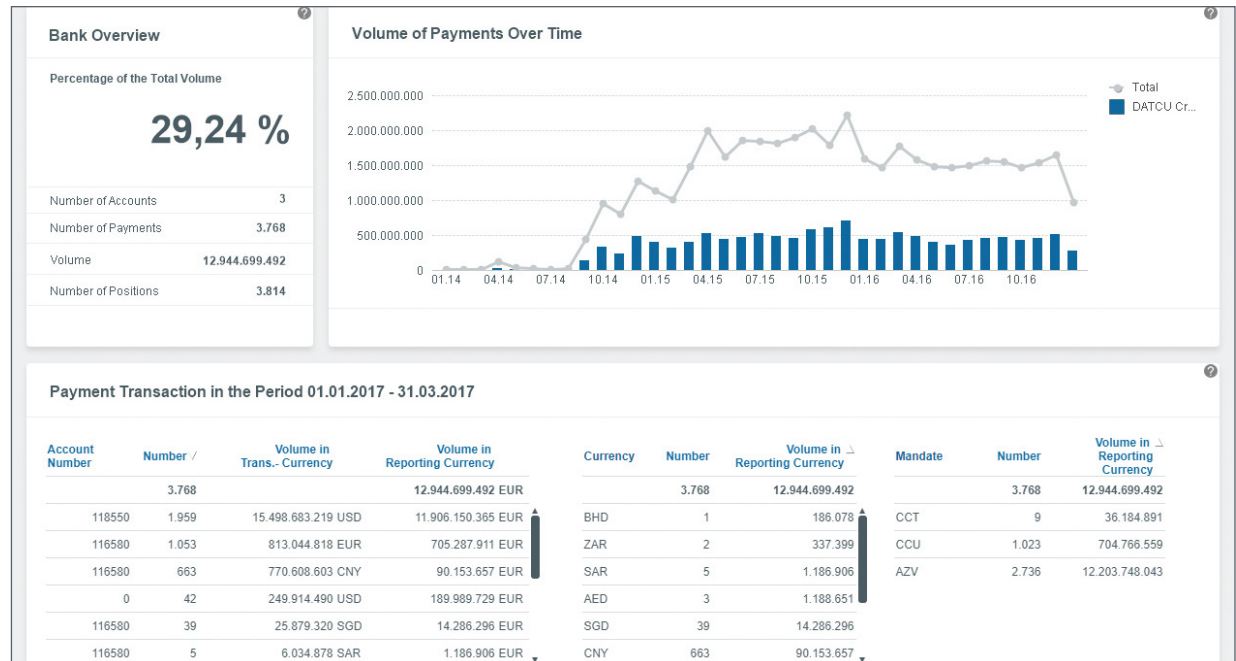
- All processes in one system thanks to the full integration with SAP
- Centralized management, control, and transparency over company-wide payments and cash flows
- Bank communication directly with the central SAP system – instead of numerous banking communication portals – saving fees
- Monitoring and reporting on the status of payments with robust analytics

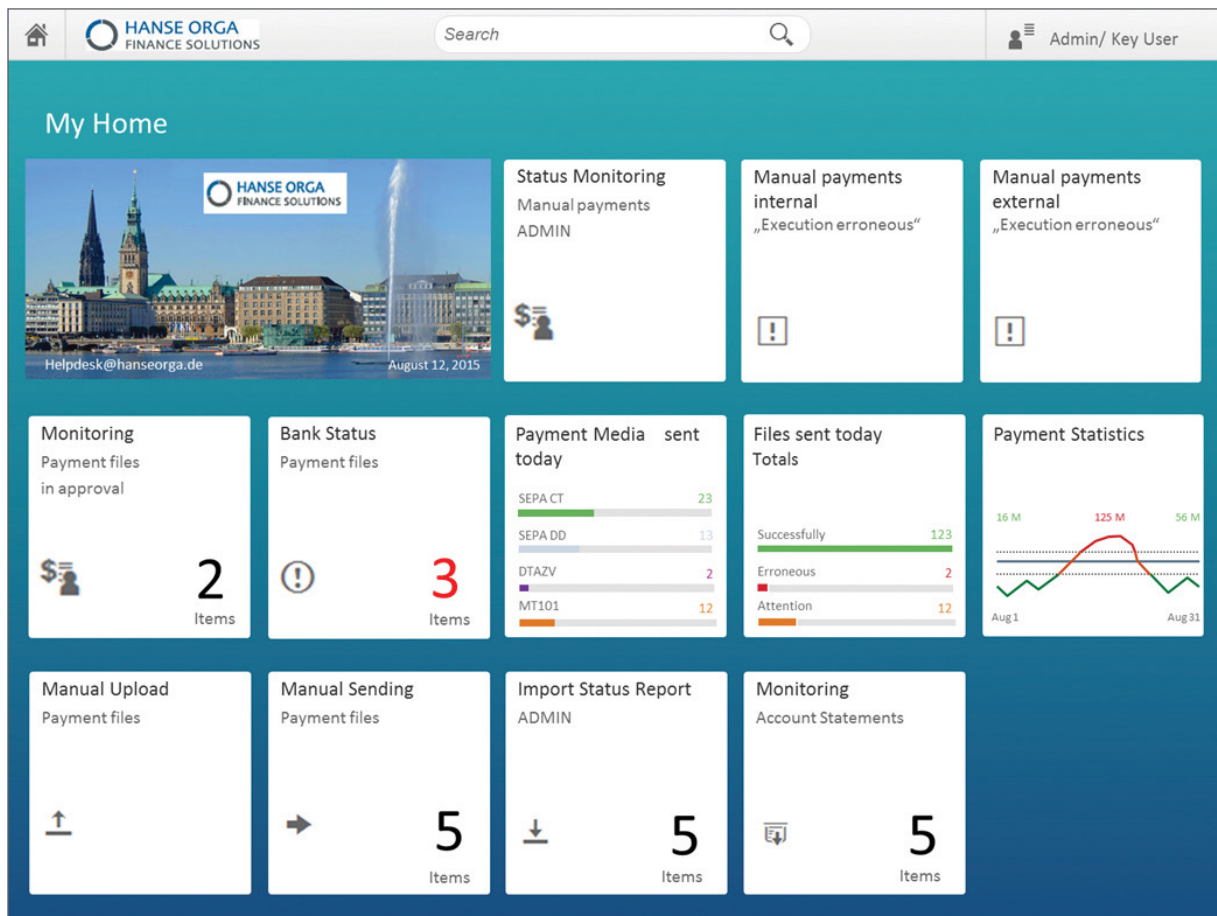
- Data transformation and optimization features that handle all types of payment formats and protocols
- High levels of protection from fraud and security of payments
- Compliance with international rules and regulations
- Flexibility – it can be installed on-premise, in the cloud, or as a hybrid solution
- Mobility – accessible on any mobile device anywhere, anytime

+ Cash & Liquidity Management

FS² CashLiquidity works by retrieving all data from a client's bank statements within SAP and other modules of the FS² and

reformatting the data to display in the preferred format of the client. The module is then able to match the bank data with the forecasted data for reconciliation purposes and allows users to view any discrepancies that exist between forecasts and actuals. Forecasts can be created for both short-term and long-term planning and allow users to create multiple plans and plan groups for different types of forecasts. Users are also provided with a cash position worksheet that offers a company-wide overview of their cash position spanning across all departments and subsidiaries globally. Furthermore, the cash and liquidity management module is able to generate automatic posting proposals using a set of flexible posting rules established by the client for cash pooling and will suggest internal transfers wherever possible to provide savings on





bank costs. The module automatically calculates the most favorable interest rates or credit line costs for bank accounts and cash positions and includes costs such as transfer fees, check payments, and exchange rate differences in the calculations. Before transactions occur, users can simulate, validate, and modify any suggested proposal made by the system. For reporting, users are able to generate and extract

custom reports of their positions and balances and are also provided with dashboards directly within the system that make for easy viewing.

⊕ Accounts Payable

In the area of P2P and treasury, Hanse Orga Group offers an end-to-end approach that enables a high degree of process efficiency

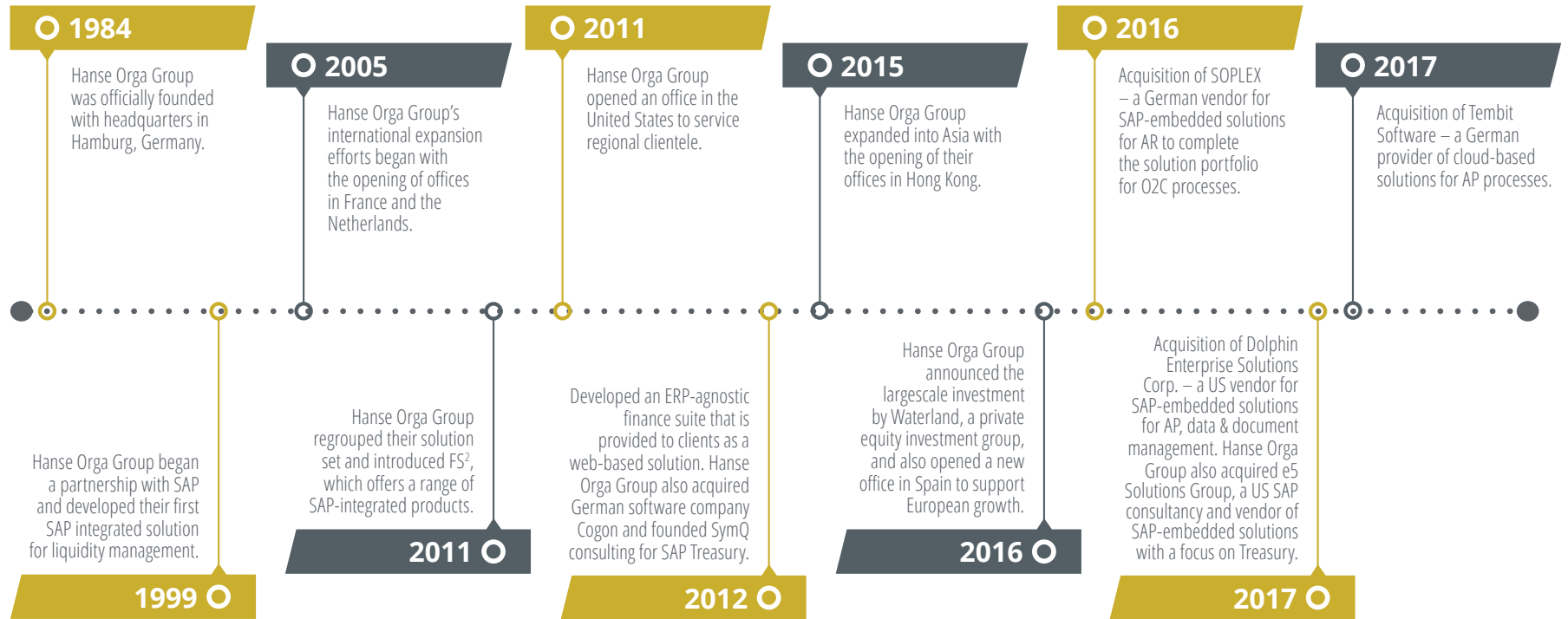
and transparency. Their AP solution, FS² Accounts Payable, automates the processes from invoice delivery and capture, through to processing and analytics. Thanks to high levels of automation, the solution significantly accelerates the AP process and allows finance professionals to make better use of early payment discounts or to pay invoices at a later time when it best suits the corporate cash position. For current clients, the solution reduces the average cost per invoice by 40-60% and contributes to a more holistic and accurate approach to cash management. Auto-approval of invoices based on pre-defined rules and thresholds by the AP department takes many of the menial manual tasks away. Companies can decide which kind of threshold or circuit-breaks are most suitable for their individual company, and then the system will reflect those thresholds. For example, if a company receives huge numbers of invoices with differing amounts, they can decide that all invoices below the amount of \$500 can be auto-posted and even auto-approved. By integrating this process with the new Fraud Monitor & Embargo Screening tool for the FS² Payments solution, companies can set certain criteria that are most relevant to their situation to automatically detect any fraud attempts and block any suspicious amounts from payments. Following the invoice capture, auto-posting, and fraud monitoring, the Hanse Orga Group's FS² Payments handles the approvals of all invoices and the automatic selection of the most cost-efficient payment methods.

⊕ eBAM

FS²'s eBAM module offers bank account administration, bank performance analysis, reporting, and bank relationship management features. The system works by integrating financial data from all a client's banks and displaying the information centrally through a set of user-configurable

Company Timeline

TREASURY AGGREGATOR: BANK CONNECTIVITY SOLUTIONS



dashboards. Organizations are able to track activity amongst their signer list, change the authority of account signatories, and open and close bank accounts. Hanse Orga Group regularly updates the eBAM module to maintain compliance with the most recent financial regulations so that clients can adhere to the appropriate guidelines. Using the bank performance analysis feature of the module, users can aim to reduce bank fees by checking statements against contracted rates for mischarges, and compare bank fees across all their bank relationships to ensure they are not being overcharged.

The analysis feature takes into account all fees, including interest rates and communication costs, and allows users to view their activity by bank for different currencies, type of account, and other metrics. Additional features of the eBAM module include a bank relationship management tool that allows clients to store legal documents and other bank-related details, and a reporting tool that allows users to automate a significant portion of FBAR reporting for individuals with signature authority over certain accounts.

CUSTOMER SERVICE & IMPLEMENTATION

Hanse Orga Group has multiple customer service centers in Europe, as well as centers in the United States and Hong Kong. Collectively, the centers provide 24-hour support for clients throughout the business week and can communicate with clients in English, French, Romanian, and German. Customers are able to reach each center via phone and email and additionally are given access to an online portal within the application where they may submit service requests. Each

Client Training & Event Attendance

individual client inquiry is given a ticket number, which is used for identification in the following correspondence for easier tracking of information. For more in-depth support, clients can schedule a remote session with Hanse Orga Group's professional services. For implementation, Hanse Orga Group uses the "Accelerated SAP" (ASAP) project methodology. Each implementation begins with the assignment of a dedicated project manager, who jumpstarts the process with a preparation stage that involves discussion between the client and Hanse Orga Group to determine the scope of the project and the required deliverables. Using this information, a project blueprint is created, and subsequent implementation of the software begins. This is followed by a testing phase, user

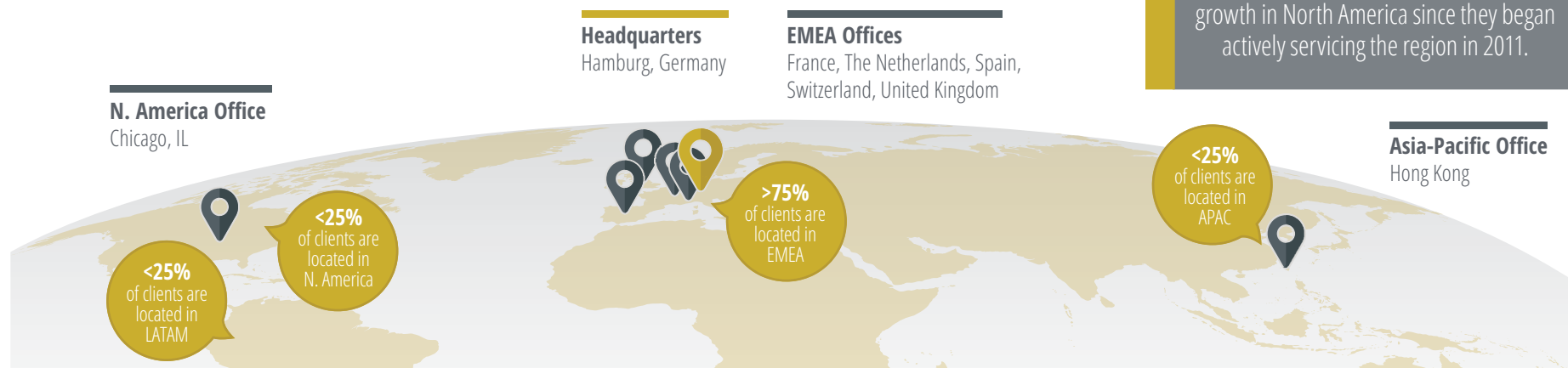
training, go-live preparation, and finally the switch over phase, at which point the implementation is officially concluded, and the project manager hands over support to the customer service team. Implementation projects conducted by Hanse Orga Group can range from one week for a simple update, to several years for a large and sophisticated installation. Generally, implementation projects take between 6-18 weeks to complete.

CLIENT TRAINING & EVENT ATTENDANCE

In addition to the training provided during the implementation stages, the Hanse Orga Group Training Academy provides both basic and in-depth training courses for the SAP-integrated and

ERP-agnostic products offered. Courses are conducted by Hanse Orga Group's professional services team and are hosted at their headquarters in Hamburg, Germany. For event attendance, Hanse Orga Group attends a large number of conferences in the EMEA region, as well as several larger events in North America and Asia. Staple events attended by Hanse Orga Group annually include the AFP Annual Conference, SAP Financials, SAP SAPPHIRE NOW, and EuroFinance. In total, Hanse Orga Group will have attended 49 events worldwide in 2017, and will have hosted a total of 60 online webinars covering various treasury and finance topics.

HANSE ORGA GROUP GLOBAL SPREAD



With their headquarters in Germany and over 30 years of experience in Europe, Hanse Orga Group maintains a vast and constantly growing client base in their home region. However, the company has also seen promising growth in North America since they began actively servicing the region in 2011.

Company Overview



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treasury@kyriba.com

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This content was produced by Kyriba and edited by Strategic Treasurer.

COMPANY OVERVIEW

Kyriba is a leading provider of cloud treasury and financial management solutions. The privately held company was founded in 2000 and is led by CEO Jean-Luc Robert, with support from an array of high-profile investors, including Sumeru Equity Partners, Bpifrance, HSBC, Daher Capital, Upfront Ventures, and many more. Some of the largest companies in the world rely on Kyriba's leading SaaS (Software-as-a-Service) platform for a range of mission-critical capabilities that protect and unlock value for modern treasury and financial professionals.

Kyriba officially entered the Treasury Management Systems (TMS) category in 2004, offering one of the first cloud-based solutions on the market. Kyriba experienced rapid growth and expansion from the outset. Their SaaS (Software-as-a-Service) delivery model, coupled with its competitively priced pay-as-you-go modular approach, quickly caught on among organizations looking for relief from traditionally manual processes in the areas of bank account connectivity, cash management, and forecasting. Over the next decade, Kyriba dramatically expanded the scope of its operations, including opening offices in key locations worldwide, investing heavily in product development and security, and beefing up customer service and support.

As part of its rapid growth, the company began adding to its core solution for cash management with new capabilities for payments, risk management, FX trading, and debt and investments. Another critical addition to the company's solution set was the addition of supply chain finance (SCF), a collaborative platform that manages invoices through early payments to help unlock working capital for both buyers and suppliers. It features two supplier financing solutions: dynamic discounting, using a company's own excess cash and liquidity, and reverse factoring, which leverages external funding sources. Kyriba offers one of the only solutions that enables organizations to manage their own cash while supporting the working capital requirements of all their vendors from the same platform. Thanks to Kyriba's mission critical financial management capabilities, the company has experienced unprecedented growth, with more than 1,600 clients and 50,000 active users in 100+ countries around the globe. The company has 450 employees in key locations throughout Europe, North America, South America, the Middle East, and the Asia Pacific region. Kyriba's platform has also been embraced by strategic partners, and the company continues to work towards expanding its large and diverse ecosystem of service partners, technology partners, ERP vendors, banks, and global solution partners. Current strategic partners include Oracle + NetSuite, Accenture, RSM, SWIFT, Infor, Capgemini, HSBC, and many more.

kyriba™



Founded:
2000



CEO:
Jean-Luc Robert



Headquartered:
New York, NY



Ownership:
Privately Held

PRODUCT SET



Kyriba Treasury Solutions
Kyriba is 100% SaaS-based, delivering a true, multi-tenant infrastructure

- Cash & Liquidity Management**
- Cash Forecasting**
- Payments & Reporting**
- Risk Management**
- FX Trading**
- Debt & Investments**
- Bank Connectivity**
- Supply Chain Finance**

KYRIBA AT-A-GLANCE



Kyriba is comprised of **450+ staff** across **12 offices** worldwide. Their team collectively supports **1,600+ active clients** and **50,000 individual users**.



From **2013-2017**, Kyriba has been named among the **World's Best Treasury and Cash Management Providers** by Global Finance Magazine.



Kyriba's system processes **5,000,000+ bank transactions** every day, and imports **9,000,000+ transactions** from client ERPs every day.

NOTABLE EVENTS



AFP Annual Conference



ACTS & ATC Treasury Forum



EuroFinance Conference



Kyriba Live! Customer Conferences

THINGS YOU SHOULD KNOW



2015: Kyriba officially began operations in the **Middle East** with the opening of offices in **Dubai**.



2016: Kyriba was named **"BEST CASH FORECASTING SOLUTION"** by Global Finance Magazine in January 2016.

2017: Kyriba charted record first quarter growth worldwide, surpassing

1,600 GLOBAL CLIENTS in **100+ countries**.



2017: Kyriba gained rapid adoption among top NetSuite partners, including **Capgemini, Clustin, NetSoft, & RSM**.



2017: Sumeru Equity Partners, a leading technology focused private equity firm, leads a **\$45 MILLION** equity round at Kyriba.

Headlines & Awards



Kyriba Makes the Inc. 5000 List for the Sixth Time

In August 2017, Kyriba announced that Inc. Magazine has placed the company on its 36th annual Inc. 5000 list, which honors the nation's fastest-growing companies. Kyriba recently announced record sales growth, as the demand for cloud-based treasury and finance solutions continues to grow among global CFOs and treasurers looking to navigate complexity and unlock bottom line value.



Kyriba Corp. Delivers Record 43% 1H 2017 Sales Growth

In July 2017, Kyriba announced that sales bookings soared to a 43 percent year-over-year increase. Satisfying the demand for a comprehensive, cloud-based approach to treasury and finance, the company added more than 100 new clients during the period.



Kyriba Named to Fintech 250 by CB Insights

In July 2017, Kyriba was named to CB Insight's Fintech 250, an annual ranking of the most promising, privately-held financial technology companies. The winners were picked from a list of more than 2,000 finalists. CB Insights is a venture capital database and research company.



Kyriba Gains Rapid Adoption Among Top Netsuite Partners: Capgemini, Clustin, Netsoft, & RSM

In April 2017, Kyriba announced that its platform was gaining strong momentum among global NetSuite solution providers in the US, Europe, and Latin America. These partners include RSM, Capgemini, Clustin, and NetSoft, all of whom recommend Kyriba for its world-class suite of solutions covering treasury, payments, and supply chain finance.



Sumeru Equity Partners Leads Strategic \$45 Million Investment Round

In September 2017, Kyriba announced that it had raised \$45 million through a strategic investment round headed by Sumeru Equity Partners (SEP). Additional funding was provided through existing investors including Bpifrance, Iris Capital, Daher Capital, and HSBC.



Kyriba Enters into Strategic Alliance with GlobalTrade Corporation

In September 2017, Kyriba announced that they had entered into a strategic alliance with GlobalTrade Corporation (GTC), a Toronto-based, multi-bank trade finance platform provider. GTC and Kyriba will join forces to bring together trade finance and treasury management solutions to empower global finance leaders to better manage high volume cash and trade operations.

CASE STUDY

+ ABOUT THE CLIENT

- A \$6B global manufacturer with eight treasury staff members across three treasury centers in the United States, Belgium, and Singapore
- 230 bank accounts across 18 cash management banks and five payment banks

+ PROBLEM

- The CFO lacked visibility across all banks and bank accounts, leading to sub-optimal cash and liquidity decisions
- Treasury required a single system of record to manage domestic and international bank accounts

+ BENEFITS OF USING KYRIBA

- Treasury increased cash visibility to 100% of the 230 global bank accounts, reducing idle cash and minimizing working capital in each region by 75%
- Reduced IT resources dedicated to treasury by 90%

+ WHY CLIENT CHOSE KYRIBA

- Experience with SWIFTNet and global bank connectivity
- Format transformation of existing payment files into ISO 20022 XML PAIN
- Local support in each region, including a multilingual product interface

+ FUNCTIONALITIES IMPLEMENTED

- Cash Management, Bank Account Management and Reporting, Payments, and SWIFTNet Alliance Lite2

PRODUCT OVERVIEW

Kyriba offers a comprehensive cloud platform for treasury and finance that includes connectivity, payments, cash management, treasury, risk management, and supply chain finance. Unlike other treasury systems, connectivity is fully integrated into the treasury platform. And unlike other connectivity aggregators, cash management, payments, and

treasury are fully integrated into the connectivity platform. Connectivity and payments can be separately subscribed to or implemented as part of a larger treasury project.

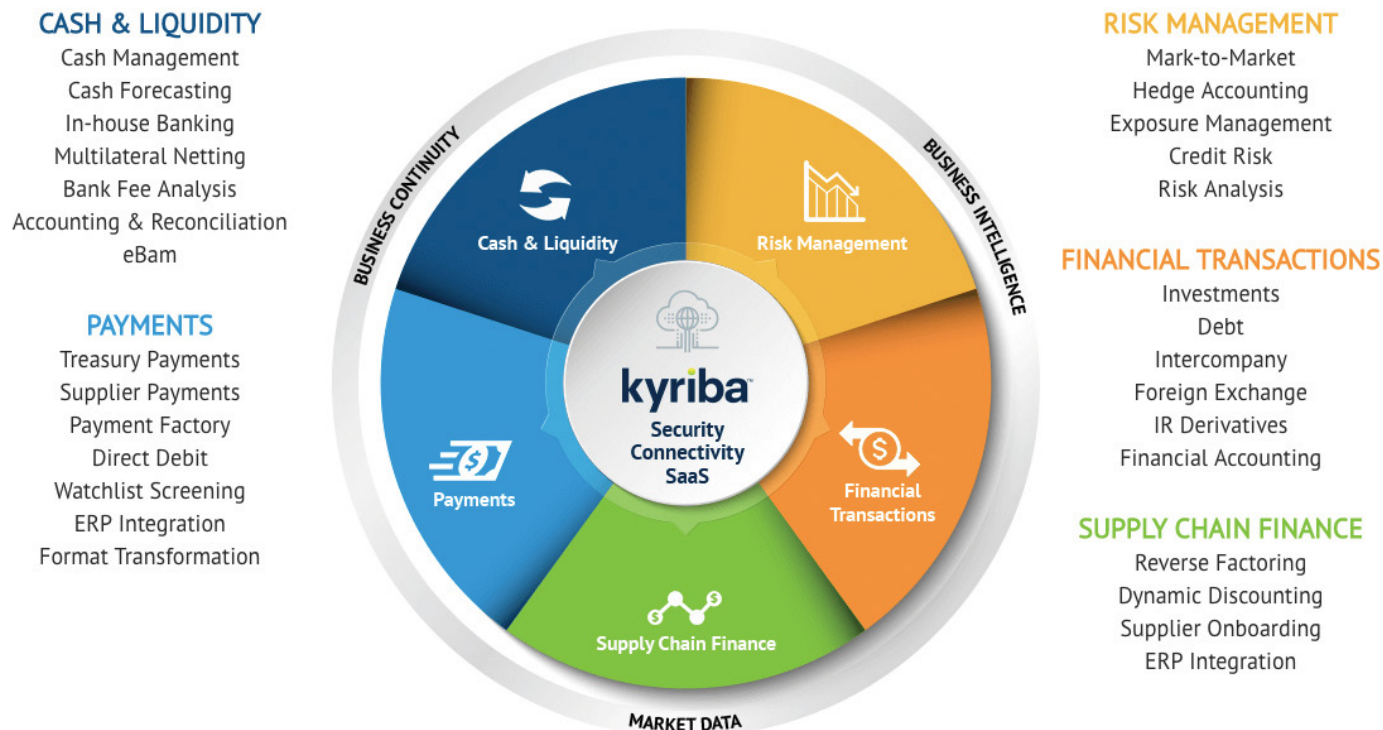
☒ **Kyriba Connectivity**

Kyriba is a SWIFT-certified global cash management provider offering multi-bank connectivity as a service as well as integrated connectivity within its cloud treasury management system.

Kyriba manages millions of transactions every day, to and from banks, to support cash management, payments, and trading workflows.

A unique differentiator for Kyriba is the variety of connectivity solutions that can be offered, independently or often in combination. Kyriba's connectivity strategy is to determine the ideal connectivity solution based on the customer's banking

KYRIBA TREASURY COMPONENTS



Product Overview

profile. Sometimes one connectivity solution will meet those needs, while more often, a combination of connectivity services will optimize costs, automation, and security.

All connectivity services are fully managed and monitored by Kyriba on behalf of its clients, so no additional resources are required by the client to automate connectivity and integration. Kyriba offers the following connectivity services:

- **MT Concentrator**
- **SWIFT Alliance Lite2**
- **SWIFT Service Bureau**
- **Regional and Country Protocols**
- **Host-to-Host Connections**
- **Bank Format Transformation**
- **Connectivity Workflow**

+ MT Concentrator

For organizations that prefer to leave their SWIFT membership to Kyriba, the company delivers an MT Concentrator service that allows organizations to utilize a SWIFT BIC specifically provisioned for Kyriba clients instead of becoming a SWIFT member. This service is optimal for organizations with low account-to-bank ratios and minimal payment requirements that are looking for minimal costs to support lower activity or want flexibility in their ability to add/remove banks. Because MT Concentrator uses a financial BIC, it allows potential access to all 10,500 SWIFT members.

+ SWIFT Alliance Lite2

Kyriba is a SWIFT Alliance Lite2 certified partner, which enables its clients to become a SWIFT member via SWIFT's

Alliance Lite2 solution. Kyriba will manage the onboarding, the internal system connectivity, the bank format transformation and maintenance, as well as the monitoring of connections. Because Kyriba can integrate its connectivity service into its cloud treasury management solution, Kyriba serves as a one-stop shop for connectivity and workflow. If clients determine that Alliance Lite2 is the right SWIFT solution for their banking needs, then Kyriba can manage everything.

+ SWIFT Service Bureau

Kyriba's SWIFT Service Bureau offering also enables clients to become SWIFT for Corporates members, fully managed by Kyriba. Leveraging MQ messaging for higher transmission speeds, this service is specialized for those with higher volumes of bank transactions, payments, banks, and bank accounts.

Organizations benefit from having their own fully transferable SWIFT BIC supported and managed by Kyriba, as well as complete monitoring of connectivity to provide a worry-free SWIFT experience for any organization.

+ Regional & Country Protocols

Depending on the banks to be connected to, it may be beneficial for an organization to augment SWIFT Connectivity with other connectivity solutions. Kyriba's Connectivity-as-a-Service platform offers additional connection options, including country-specific protocols such as Zengin, EBICS, Bacs, and EDITRAN, as well as others.

+ Host-to-Host Direct Connections

Kyriba also offers 'direct-to-bank' host-to-host connections,

The screenshot displays the Kyriba web application interface. The top navigation bar includes 'Payments/Direct Debits', 'Tasks & Reports', 'Bank Relationship', 'Cash & Liquidity', 'Financial Transactions', 'Payment', 'Trade Solutions', 'Fraud & Compliance', 'Core Data', and 'My receivables'. The main content area shows a 'Pending approval - (Pending approval)' screen with a table of transactions. The table has columns for 'Third party', 'Amount', 'Reference', 'Payor', 'Next action', 'Date', 'Reason', and 'Debit account'. The transactions are as follows:

Third party	Amount	Reference	Payor	Next action	Date	Reason	Debit account
JPM Chase (JPMCHASE)	2,355,636.00 USD		USA	Sign (Level 2)	02/28/2017		WELLS-44
International Blue Cross Blue SH	1,560,000.00 USD		USA	Sign (Level 2)	06/15/2017	Ins. Payment	BOFA-6701
HK Vendor (ASIA-VENDOR)	777,777.00 USD		FDMS	Sign (Level 2)	07/18/2017		BOFA-8509
International Blue Cross Blue SH	6,000,001.00 USD		USA	Sign (Level 1)	07/20/2017	Ins. Payment	BOFA-6701
International Blue Cross Blue SH	65,000,000.00 USD		USA	Sign (Level 1)	07/24/2017	Ins. Payment	BOFA-6701

The detailed view on the right shows the following information:

- Transaction type: Domestic transfer
- Transaction number: USFEDW000887
- Status: Signed (level 1)
- Next action: Sign (level 2)
- Third party: JPM Chase (JPMCHASE)
- Modified since transaction creation: No
- Third party account: 00000000000454512177
- Amount: 2,355,636.00 USD
- Transaction date: 02/28/2017
- Value date: 02/28/2017
- Payor: US Entity (USA)
- On behalf of: NORTHEAST_US
- Debit account: WELLS-44
- Account id: 00000000000454512177
- Issuing institution: Bank of America N.A. (BOFA-NC)

Customer Service & Implementation

which are ideal for connecting to global banks that support direct connections with bank-specific encryption, such as FTP or API. Direct connections offer full automation and require no intermediary services or networks that otherwise may incur additional transaction costs or bank fees.

+ Bank Format Transformation

Kyriba offers bank format transformation for ERP-to-bank connectivity to eliminate customizing file exports from ERPs to meet the unique format requirements for each of your payment banks. Kyriba maintains an inventory exceeding 10,000 pre-defined formats and format variations for global and domestic banks to completely outsource the bank format generation process.

+ Connectivity Workflow

For clients choosing Kyriba only for bank connectivity and not for broader treasury system implementations, Kyriba includes select functions to deliver a workflow for clients to manage their bank balances, transactions, and payments policies, and to enable real-time fraud detection. These capabilities include an interactive control center, payment dashboard, fraud monitoring, and menu maps to build a documented workflow and manage the user experience for primary and secondary users.

CUSTOMER SERVICE & IMPLEMENTATION

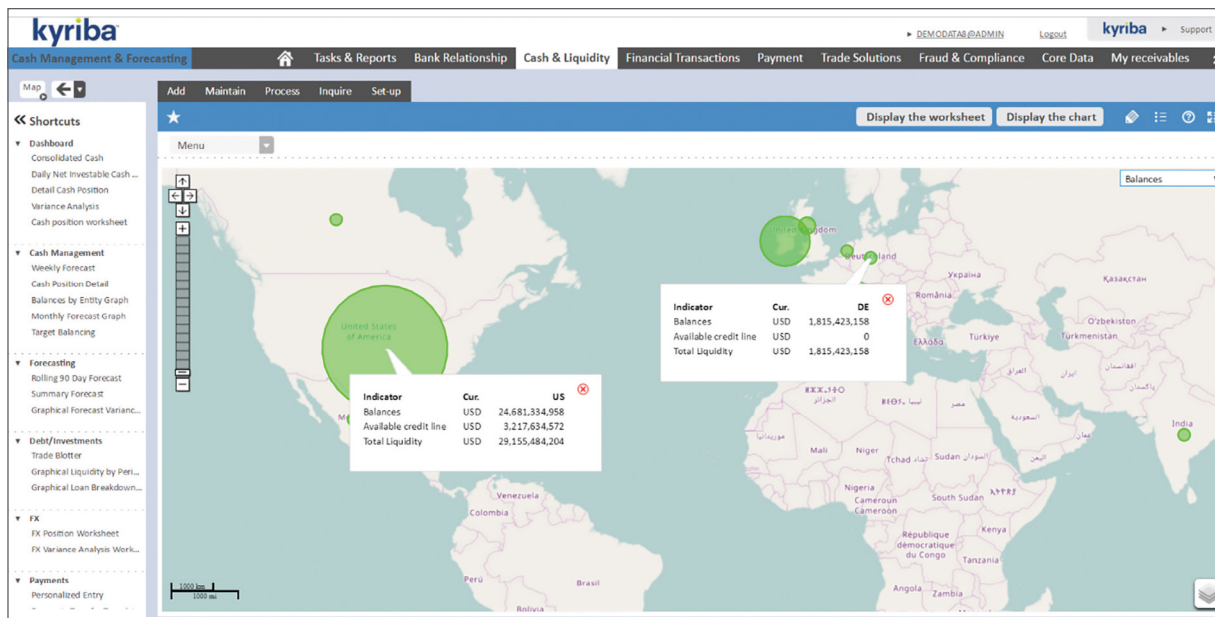
Kyriba has customer support centers dispersed globally that handle client questions in the languages most commonly used in the regions where they are located. For instance, the Chinese

support center offers English and Mandarin, the Tokyo center offers English and Japanese, and the New York center provides English and Spanish. European support is in a multitude of languages including English, French, and Spanish.

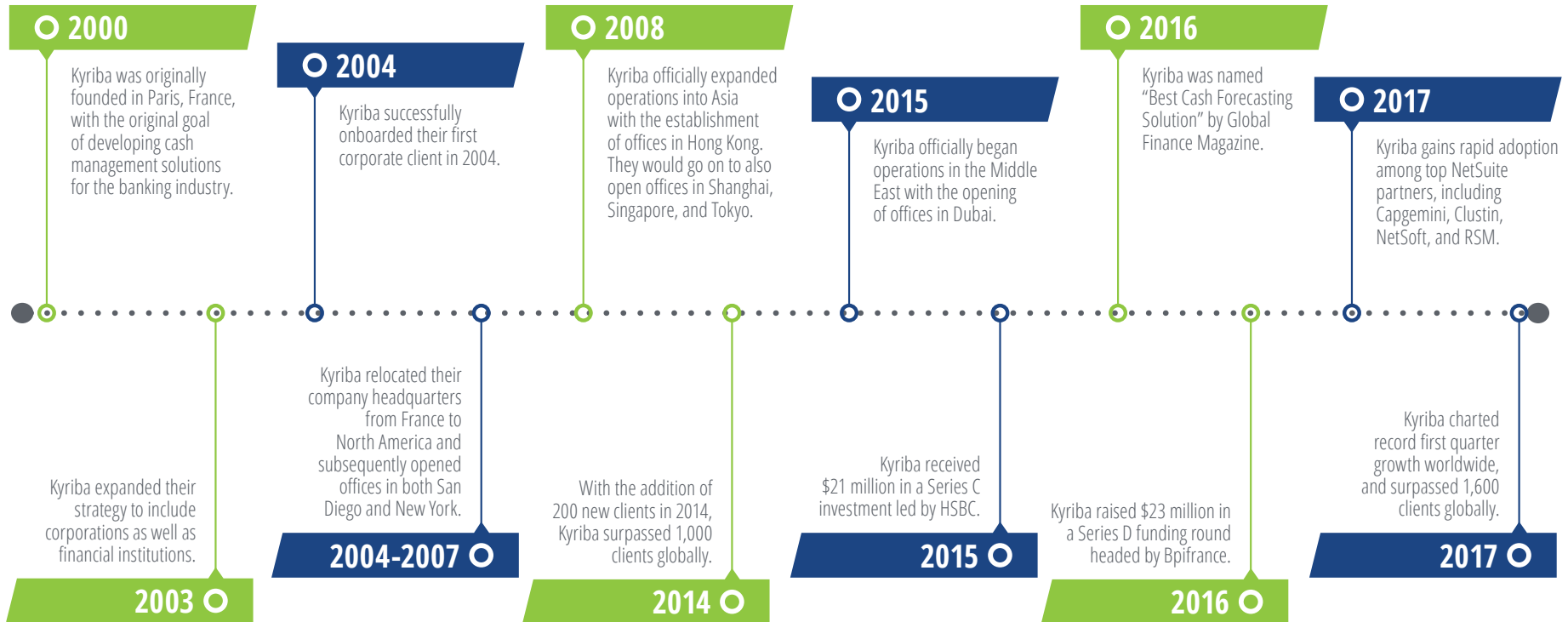
Collectively, these centers provide 24/7 support to clients via phone and email. Additionally, Kyriba's clients are provided an online incident platform within Kyriba Social, which allows both logging and resolution of client incidents alongside an extensive knowledge base and an interactive user forum.

Kyriba is 100% cloud-based and delivered through a SaaS model. Kyriba's entire solution, including connectivity, is seamlessly integrated on one cloud platform, improving security and simplifying the integration process with other treasury workflows. The average project takes less than six months to implement as part of a phased approach. Since Kyriba is a modular solution, the recommendation is to implement the solution sets in a phased approach, where key features can be quickly implemented with efficient employee adoption. Kyriba's iterative process, described below, ensures that each deployment is designed to meet initial needs and deliver the scalability to support future requirements.

- **Phase 1 – Discovery:** Kyriba's implementation team confirms project requirements with the client's core team and conducts detailed interviews to capture functional and technical requirements. The outcome of the discovery phase is the project plan, which will include prescribing the bank onboarding plan and identifying where any client involvement is needed.
- **Phase 2 – Configuration:** This phase is managed by Kyriba to implement and configure the software,



Company Timeline



including the onboarding of a client’s banks and testing of reporting and payments. Kyriba will configure the system to ensure workflows align to the client’s requirements.

- **Phase 3 – Delivery:** Kyriba provides core user training, giving the client’s designated core users the knowledge needed for day-to-day use of the system. The client participates in user acceptance testing and parallel testing with their existing system to ensure the system meets all project requirements.

- **Phase 4 – Go-Live:** Once everything is validated, Kyriba confirms all user authorities and access, so that the client’s users can begin using Kyriba as their day-to-day system. When the system is live, the client’s previous system can be deactivated. At this point, the client is officially transitioned to client support with a dedicated hand-over for knowledge transfer and continuity of service. The client will begin using the Kyriba Social online client portal as a collaborative knowledge base, user forum, and incident platform.

Overall, Kyriba manages the entire implementation process including onboarding of banks as well as development and testing of bank formats. Client involvement is limited to initial service selection with the bank and final testing of connectivity to validate delivery of the project.

CLIENT TRAINING & EVENT ATTENDANCE

Kyriba regularly attends a number of globally distributed finance and treasury events, many of which occur in either North America or Europe. These include global industry events such as AFP and EuroFinance, as well as regional conferences like the Windy City Summit and New York Cash Exchange in the United States. In addition to these conferences, Kyriba also hosts a global series of regional client conferences, Kyriba Live!, which are held in the US, Europe, and Asia. Kyriba Live! serves as an opportunity for clients to gather and network with each

other, while additionally receiving education on new upgrades and enhancements to the Kyriba application and learning how to most effectively utilize the system's functionality. In terms of client training, Kyriba offers a multitude of training courses to the core users of its platform during implementation, as they prepare for the go-live stage. Training workshops are also offered online and in conjunction with Kyriba Live! user events. This is in addition to Kyriba's recently updated online user documentation, which offers step-by-step usage of the system.

TESTIMONIALS

"It is refreshing to work with a technology company that has a similar vision to ours, and that has world-class cash management and bank connectivity solutions that enable financial professionals to create a better solution for their organization."

**Gabriella Verde, CFO
Clustin Group**

While the majority of Kyriba's 1,600+ clients are located in North America and Europe, they have continued to expand their reach globally, most recently through the opening of offices in Shanghai in 2015 and Dubai in 2016.

KYRIBA GLOBAL SPREAD



Company Overview



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info@tis.biz

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- ⊕ **Company Snapshot**
- ⊕ **Headlines & Awards**
- ⊕ **Case Study**
- ⊕ **Product Overview**
- ⊕ **Customer Service & Implementation**
- ⊕ **Client Training & Event Attendance**
- ⊕ **Company Timeline**
- ⊕ **Testimonials**

This content was produced by TIS and edited by Strategic Treasurer.

COMPANY OVERVIEW

Treasury Intelligence Solutions (TIS), a treasury software provider headquartered in Walldorf, Germany, has been providing companies with SaaS-based payments and cash management solutions since 2010. Owned and managed by Jörg Wiemer and Erol Bozak, TIS has seen steady growth over the past 6 years and is continuing to expand their footprint in Europe as awareness of their solution spreads. Over the past four years, TIS has quadrupled the number of clients they service and most recently achieved a 66% growth rate in Q2 2017 compared to a year ago. This high growth experienced by TIS has stemmed largely from expansion efforts throughout Europe, and the company has continued to open new offices and support centers throughout the region to accommodate their growing client base. This includes offices in Bulgaria, Berlin, and Amsterdam, in addition to their headquarters in Walldorf. An additional factor that has contributed to TIS's high growth rate is the number of partnerships they have formed with other financial services companies. These partnerships have created a number of joint customers for TIS, either through the integration of their software with other platforms or through successful consulting relationships. Key partnerships of TIS include BearingPoint, Ernst & Young, SAP, and Deutsche Bank. Outside of Europe, TIS is expanding into North America and actively generating leads and opportunities through various marketing

campaigns. TIS is also attending conferences such as the Windy City Summit, TMANY, and the 2017 AFP Conference in San Diego to increase its network with organizations in the United States. To date, TIS services approximately 100 customers and is comprised of over 80 employees distributed across their European offices. Moving forward, TIS has plans to solidify their presence in North America by opening an office in Boston, Massachusetts, in 2018.

TIS offers a leading cloud solution for managing corporate payments and cash flows. They enable companies to make more efficient, more secure, and more cost-effective payment transactions. In addition, TIS enables customers to make better decisions when analyzing financial and operational performance, based on real-time payment flows. All mission-critical processes related to payment transactions are integrated into a multibank-capable, audit-proof cloud platform. This is a single point of contact for enterprise customers when managing and analyzing their payment flows across the organization. TIS takes care of managing various payment formats, establishing communication channels with banks, and ERP-agnostic integration. Offered as Software-as-a-Service (SaaS), the ISO certified TIS solutions are quickly up and running without the complexity and cost of a long IT project.



Founded:
2010



CEO:
Jörg Wiemer



Headquartered:
Walldorf, Germany



Ownership:
Privately Held

PRODUCT SET



TIS Solution Components

(Entire product set is offered via the TIS Cloud)

- ⚙️ **Bank Account Management**
- ⚙️ **Payments**
- ⚙️ **Business Discovery Manager**
- ⚙️ **Liquidity & Cash Flows**
- ⚙️ **Smart ERP Integration**
- ⚙️ **Security & Certification**
- ⚙️ **Bank Statement Processing**

TIS AT-A-GLANCE



TIS services their clients through **5 offices located in Europe.**



TIS's products are offered on a **SaaS-based platform** known as the **TIS Cloud.**



After realizing a **compound annual growth rate of close to 70%** in their **first four years**, TIS has continued to achieve strong growth at a **66% rate since 2014.**

NOTABLE EVENTS



AFP Annual Conference



EuroFinance Conference



Experts Evening



Windy City Summit

THINGS YOU SHOULD KNOW

Using the TIS platform, clients are provided with connectivity to **OVER 9,000 BANKS.**



TIS has processed **MORE THAN €480 BILLION**



worth of payments for clients using their solution.

TIS currently has clients located in

67 COUNTRIES



worldwide, and most recently added a number of new clients in **North America** and **EMEA.**

TIS clients have won **4 ADAM SMITH AWARDS**



in the past two years, including **"BEST FINANCE SOLUTION"**

AND

"TOP TREASURY TEAM."



Headlines & Awards



TIS Achieves 66% Year-Over-Year Growth in Q2 2017

In the second quarter of 2017, TIS, the leading SaaS solution for the management of company-wide payments and cash flows, has recorded the quarter with the highest turnover to date since the formation of the company. TIS achieved a growth rate of 66% in comparison with the same quarter in the preceding year. The steady positive trend in the revenue figures continues.



Two TIS Clients Win Adam Smith Awards

In 2017, two TIS customers won the coveted award from among 211 nominations from 30 different countries. Dirk Schreiber, Head of Treasury at Fresenius, and his team placed 1st in the category "Harnessing the Power of Technology." This category rewards outstanding technological implementations in treasury – from the "do-it-yourself" produced spreadsheet down to complex TMS developments. Another TIS customer, Luca Hammel, Global Treasury Front Office Head at Dufry, also won an award in the category "A Rising Star."



TIS Achieves SWIFT Certification

Another highlight in Q2 2017 was the re-certification of the TIS Bank Transaction Manager (BTM) through the SWIFT network for connectivity with local and global banks for companies with the label SWIFT Certified Application Corporates – Cash Management 2017. Version 17.7 of the BTM was validated this time. SWIFT Certified Application Labels are awarded for a period of one year according to the successful technical and functional validation by SWIFT experts.



TIS Launches Business Discovery Manager Module

In May 2017, TIS introduced the Business Discovery Manager module to their platform. The business intelligence tool BDM, using state-of-the-art technology and real-time reporting capabilities, enables CFOs and strategic finance and treasury professionals to gain better insights into cash flows and liquidity statuses across subsidiaries and complex organizational structures. Thanks to easy-to-use dashboards and reports with drill-down capabilities, anyone using BDM can easily focus on the most important facts, thus enabling them to make better decisions.

CASE STUDY

+ ABOUT THE CLIENT

- A leading provider of transport logistics, warehousing, and customized services with headquarters in Kempten, Germany
- Annual revenue of over €5.3 billion in 2014, with 25,000+ employees and over 430 locations worldwide

+ PROBLEM

- High costs and inefficient work due to manual intervention between SAP and bank portals
- Excel-based reporting systems were heavily manual and error-prone

+ BENEFITS OF USING TIS

- Harmonization of payment processes in connection with SAP
- Reduction of complexity due to bank formats, decentralized accounting, and local release and authorization of payments

+ WHY CLIENT CHOSE TIS

- Web-based architecture allowed for global access via a web-browser
- "Master User" approach saved costs due to centralized administration
- Multi-bank capability that handled the full scope of bank activity

+ FUNCTIONALITIES IMPLEMENTED

- Full TIS solution with emphasis on bank connectivity for payments and reporting

PRODUCT OVERVIEW

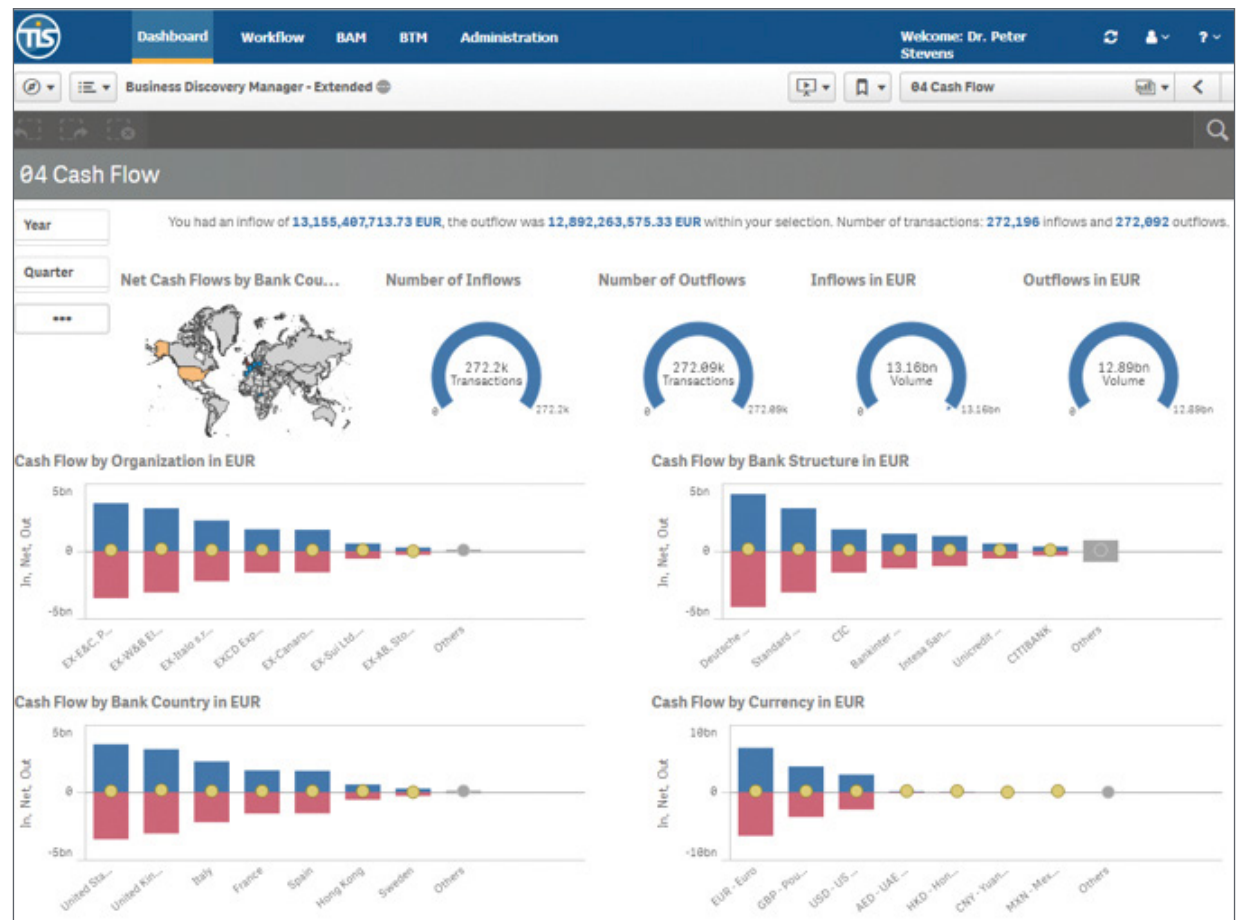
TIS's treasury solution is designed to aggregate the payment processes of an organization and its subsidiaries centrally through a single platform. In many ways, TIS crosses the line between a treasury aggregator and a TMS, as their solution offers functionality for monitoring organizational liquidity and cash flows while also providing bank connectivity, ERP integration, and payments functionality. While many treasury management systems must go through a treasury aggregator to establish connectivity to banks for payments and reporting, TIS is able to perform the entire payments lifecycle in-house, thereby providing their clients with Straight-Through-Processing (STP) in the payments and reporting arena. In addition to ERP integration and payment channel aggregation, TIS also provides a Bank Account Management module that works to automate the reporting and risk management sector of payment transactions and provides global access to all account details for a client's various branches and subsidiaries. Each of TIS's modules are delivered to clients through a private, cloud-based platform that is accessible as a web application. TIS has specialized in delivering cloud-based solutions since their inception and continues to host all of their clients through their ISO 27001 certified data center. Overviews of each solution offered by TIS are provided in the following pages.

Bank Transaction Manager

The Bank Transaction Manager (BTM) is the central module of the TIS Cloud platform and is a web-based, multi-bank payments and analysis platform that helps organizations standardize and automate their payment processes across all company departments and subsidiaries. As a web-based solution, the software can be easily accessed by a

company's offices and subsidiaries via a web portal. This central access ensures that payment processes across a client's entire organization are consolidated, which in turn increases visibility and transparency into their transactions and payment activity. The BTM module is able to integrate with each of a client's ERP, HR, accounting, and treasury systems and features SAP certified connectivity for SAP ERP and SAP ByDesign. TIS is also able to

connect to each bank a client needs access to across various networks including SWIFT and EBICS, as well as through direct (H2H) connections. For transactions being conducted within the Eurozone, TIS features full SEPA compliancy using the required ISO 20022 XML formats for both payments (pain) and reporting (camt). With regards to financial messaging, the Bank Transaction Manager can handle the vast majority of all



Product Overview

payment and reporting formats, such as IDOC, XML, SWIFT MT, and various international and domestic formats, and can convert incoming and outgoing messages into the required format of the recipient.

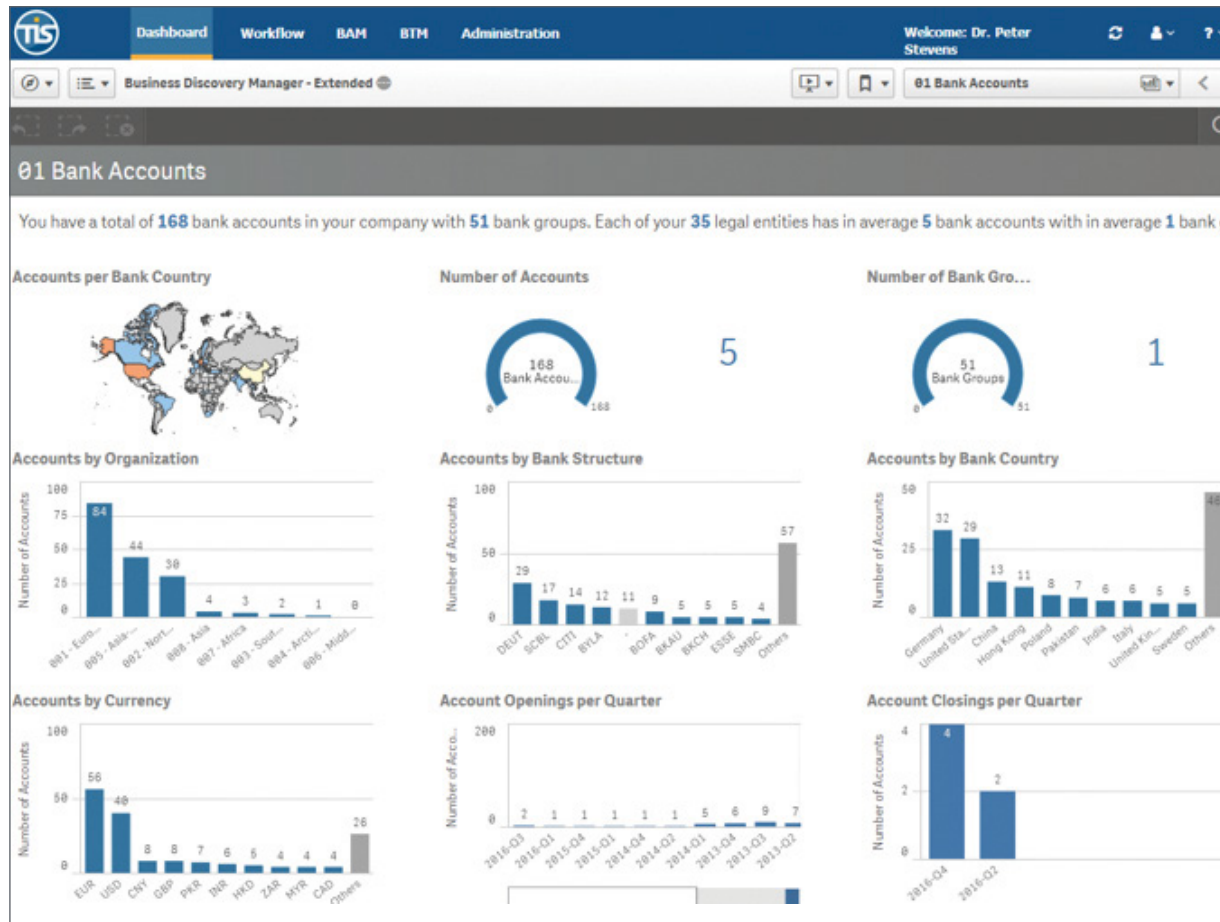
Business Discovery Manager

The Business Discovery Manager component of TIS's solution works to unify the process of analyzing company-wide cash flows, liquidity, and working capital across all company departments and subsidiaries. The module works by connecting to all of the ERP systems used by an organization, as well as all of their banks, to provide visibility to all transactions and activity

that occurs through the organization. The Business Discovery Manager then takes the transaction information and displays it centrally, using a set of visual dashboards that make for easy viewing and analysis. The dashboards provided by TIS are customizable according to metrics such as cash position by bank and currency and can be set for various time intervals so that users can view their net cash flows over specific periods of time. TIS is able to capture and display a large variety of information through their system, much of which can be imported from the ERP systems of a client, including information related to the amount of working capital required by their various subsidiaries, the amount of available liquidity at each of their banks, and dates when suppliers were paid and who paid them. The level of analysis available through each metric can be as general or specific as a client needs, with data available for a company's overall cash position, down to the net cash flow for a specific bank or bank account, for a specific currency, and over a specified time interval. Using its ERP integration features, TIS can also provide comparative analysis for the data contained within each ERP, such as the amount of payment activity originating from each ERP system and the number of deposits that were processed through each ERP.

Bank Account Manager

The Bank Account Manager module enables users to manage information related to their bank accounts, including master data, signature rights, and associated bank documentation. TIS's cloud-based web portal allows clients to manage all of this data centrally, and the solution can use its ERP integration functionality to import data from other internal systems to handle the approval processes for opening accounts and changing the authority of signers over accounts. The



provision of a central repository for handling company-wide bank account information and legal documentation helps ensure that all pertinent audit information is readily available to users. In addition to the data management and storage functions, TIS's Bank Account Manager module can create Office and PDF documents for internal communication of account information, and ISO 20022 XML messages for bank communication. When a client's account information needs to be updated, as when changing the authority of a signer, TIS uses an electronic workflows cooperation platform to notify the responsible party, who can then easily implement the appropriate changes to their account structure directly within the Bank Account Manager module. Overall, TIS's Bank Account Manager enables clients to adhere to their compliance guidelines through the use of a central, unified administration structure for all account-relevant information.

CUSTOMER SERVICE & IMPLEMENTATION

While TIS maintains four offices in the European region, the majority of their customer support staff are located in the Walldorf, Germany, and Sofia, Bulgaria, locations. These offices collectively offer 24/6 support for clients in both German and English. Customers may also reach TIS's support teams via email.

As a SaaS solution provider, there is no on-site implementation or installation required through TIS, and the entire process can be handled remotely by TIS from their headquarters in Germany. The bank onboarding process is handled by TIS's connectivity team, who offer a variety of onboarding packages depending upon the different bank networks a client requires connectivity to, as well as the number of bank relationships they maintain. For clients wishing to integrate TIS's solution with their existing ERP

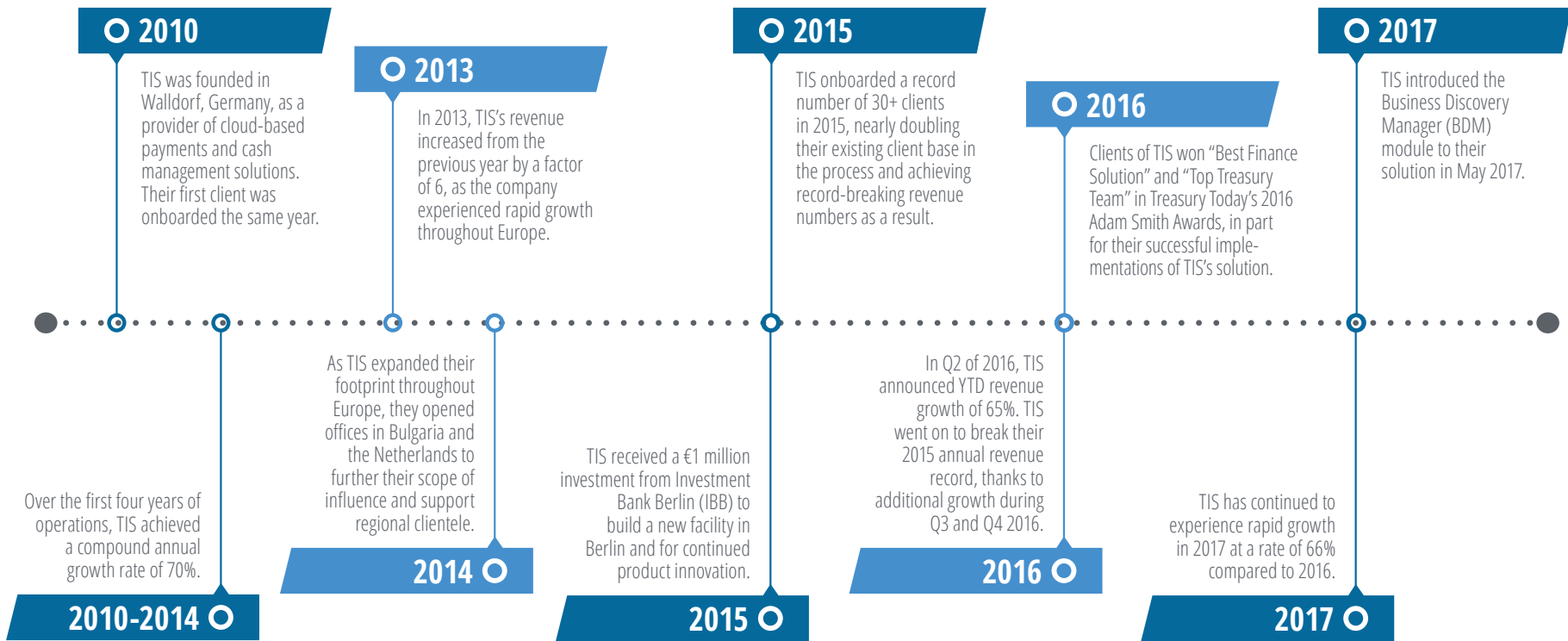
infrastructure, TIS uses their partner ecosystem, comprised of companies including SAP and BearingPoint, to assist in the integration and management of the project. The timeframe for each implementation conducted by TIS varies dependent upon the number of banks required for onboarding and the level of integration with existing ERP systems. Throughout the implementation process, clients are given access to a professional services senior representative, who acts as their point of contact until the project is completed and also serves to train users on the system's components.

CLIENT TRAINING & EVENT ATTENDANCE

For client training during the implementation stages, the client's assigned professional services representative handles the new user training, which is separated into two categories: power user training and standard user training. Power users are individuals who will have administrative capabilities for monitoring activity and setting the rights for other users. Training is typically conducted at the client site. In addition to client training, TIS hosts a number of webinars on topics related to their product set and the functionalities they cover. For event attendance, TIS attends a very large number of conferences throughout Europe, including the Swiss Treasury Summit, Finanzsymposium, EuroFinance, the DACT Treasury Fair, and the IACT. Recently, TIS has also begun attending largescale events in the United States, such as the annual AFP Conference.

Currency	Value Date Balance	Account Balance	Interim Transactions	Current Balance
HKD:	+23,787,762.64 HKD	+23,151,871.71 HKD	+652,603.34 HKD	+23,804,475.05 HKD
USD:	+48,475,197.79 USD	+47,864,513.31 USD	-668,241.53 USD	+47,196,271.78 USD
CNY:	+1,655,652.59 CNY	+1,453,146.53 CNY		+1,453,146.53 CNY
EUR:	+142,181,501.97 EUR	+147,165,561.77 EUR	-1,057,764.82 EUR	+146,107,796.95 EUR
MXN:	+16,387,213.68 MXN	+16,387,213.68 MXN		+16,387,213.68 MXN
CHF:	-5.39 CHF	-5.39 CHF		-5.39 CHF

Company Timeline



COMPANY PROGRESSION

This graphic portrays TIS's progression as a financial technology provider, beginning with their inception in 2010 through to the present day. TIS was originally founded in Walldorf, Germany, as a provider of cloud-based payments and cash management solutions. From 2011 to 2015, TIS received significant VC investments from a variety of well-known players in the market. As a result, TIS was able to

achieve rapid growth in Europe and in 2015 onboarded a record 30+ clients to their solution, which nearly doubled their existing customer base and resulted in record-breaking revenue numbers. As their customer base in Europe expanded, TIS continued to add additional support staff to the region through the opening of offices in Bulgaria, the Netherlands, and Germany. In 2016 and 2017, TIS expanded their global

footprint further by launching a largescale entrance into North America, where they have seen success in garnering clientele. TIS's most recent company milestones include achieving 66% year-over-year growth in Q2 2017, and the introduction of a new product component, the Business Discovery Manager module (BDM), to their solution set in May 2017.

TESTIMONIALS

“TIS offers a ‘one-stop’ solution for bank connectivity, which enables us to centralise and automate our payments. In the final stage, we achieved complete transparency over bank account authorisations. Through global visibility over all account movements, we can better control corporate liquidity. With TIS we achieved a new level regarding control and compliance for our corporation.”

**Katja Zimmerman, Head of Corporate Treasury
Heidelberger Druckmaschinen AG**

“Implementing the TIS BAM and BTM solutions (TIS Cloud platform) has made a big difference to our ability to monitor and analyse payments and bank accounts throughout the firm. The ability to collect and analyse data in real time is a priority for BearingPoint, hence why I am partnering with TIS to adopt their new BI solution.”

**Eveline Stam, Group Treasurer
BearingPoint**

“With the integrated solution from TIS and TIP, we have automated and centralised our payment processes while, at the same time, keeping control of our treasury data – a good and efficient interaction of the two systems.”

**Dieter Bellinger, Head of Corporate Treasury
DACHSER Group SE & Co. KG**

TIS GLOBAL SPREAD

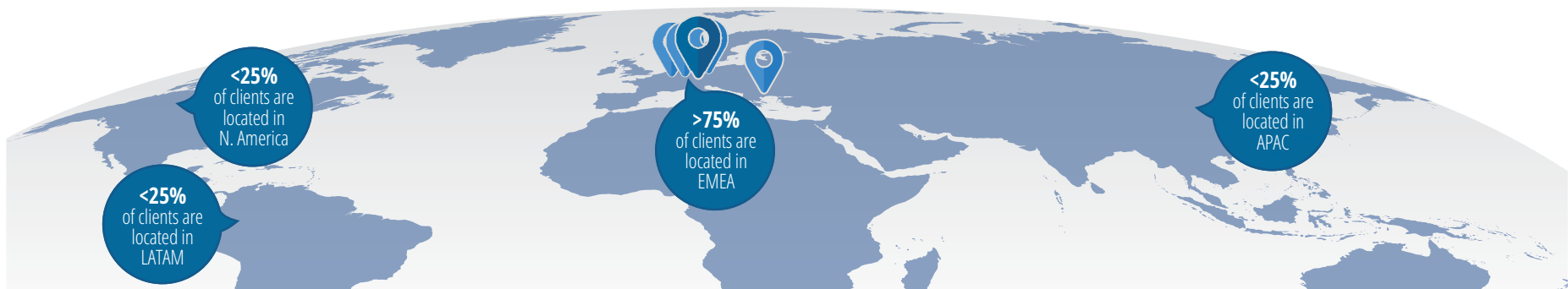
EMEA Offices

Berlin, Krefeld, Bulgaria, The Netherlands

Headquarters

Walldorf, Germany

Having been founded in Germany in 2010, TIS experienced a compound annual growth rate of 70% during their first four years of operation and nearly doubled their clientele during 2015 as well. While practically all of this growth has been obtained through the European market, TIS also launched a widescale entrance into North America during 2016.



WORKS CITED

- **Figures 1, Page 8:** *Bank of America, Bottomline Technologies, & Strategic Treasurer 2017 B2B & WCM Strategies Survey.*
- **Figure 2, Page 8:** *Fides Treasury Services & Strategic Treasurer 2016 Global Payments Survey.*
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STRATEGIC TREASURER MARKET INTELLIGENCE

ANNUAL INDUSTRY SURVEYS

Strategic Treasurer conducts 9 annual industry surveys designed to evaluate and analyze various strategies and practices across a number of key areas of operation, such as bank account management, compliance, treasury security, cash forecasting, payments, risk, technology use, and supply chain finance. These surveys are completed by a host of financial professionals from banks, non-profits, corporations, and other organizations across a number of different industries, locations, and sizes. Strategic Treasurer reports their findings through survey results webinars and by publishing survey summary reports. Strategic Treasurer is also able to use this data for aiding organizations in conducting benchmarking and for identifying the leading practices across various segments of the industry.

BAM & FBAR

Bank account management is one of the pivotal processes performed by treasury to ensure compliance with regulations and achieve account visibility for purposes of reporting, maintaining security, and managing risk. With the number of new regulations continually on the rise, this survey seeks to gauge treasury's reaction to the increased regulatory restrictions and compliance expectations that surround the industry and to measure the effectiveness and popularity of bank account management and FBAR services as offered through treasury technology.

CASH FORECASTING & VISIBILITY

For treasurers, an accurate view of available cash is mission-critical. Transactions are taking place in a variety of markets across a number of currencies, and it can be difficult to gather and store all bank information for purposes of forecasting cash flows and maintaining adequate visibility. This survey seeks to gauge the methods by which organizations are seeking to achieve reliable cash forecasting and accurate visibility despite the growing complexity of banking structures. It aims to evaluate the effectiveness and use of technology in addressing these needs.

GLOBAL PAYMENTS

This survey seeks to measure and calibrate the practices, plans, and priorities for payments on a global basis from the view of corporations and banks. There are many changes and challenges confronting these industries, including the heightened risk of fraud, enhanced regulatory measures, and increasing complexity through the creation of additional payment networks. This survey covers a range of important payment structures and practices, along with developments in faster payments, cross-border innovations, and new technology influences, including blockchain.

TREASURY FRAUD & CONTROLS

This survey covers a broad range of current practices and seeks to determine future methods of preventing fraud and implementing a strong controls system for treasury. This survey topic is of particular importance and highly dynamic given today's climate of new and changing methods of fraud and attack. Key areas of coverage through this survey include control framework and policies, cyber fraud, bank account and transaction level controls, fraud experiences, and policies related to mobile and personal device use.

LIQUIDITY RISK

This survey seeks to evaluate current liquidity risk mitigation practices and capture both major and minor shifts in corporate strategies as macroeconomic changes and new regulations continue to impact how treasury operates. Key areas include corporate policies and procedures for measuring counterparty exposure, changes in investment policies, evaluations of investment channels, how new regulations are affecting corporate risk strategies, and what levels of visibility organizations maintain into various areas of exposure for purposes of managing their risk.

TREASURY TECHNOLOGY USE

This survey focuses on actual treasury technology use and will be used to determine current market awareness of solutions providers and the need for various modules/functions that they provide. The key aims of this survey are to measure the market's awareness of current TMS and Treasury aggregation providers, evaluate the industry's need for specific functionalities as they are performed by treasury technology providers, and pinpoint areas of the market where growth can be expected or where improvement is required.

B2B PAYMENTS & WCM STRATEGIES

As the B2B landscape evolves, continued economic globalization is having a momentous impact on the strategies through which organizations manage working capital and handle their payment operations. This annual survey captures the responses of both bank and corporate practitioners regarding their views on new payments technology, payment security, working capital management, and the current regulatory environment, as well as how they are thinking about payments and working capital today and tomorrow.

ADDITIONAL SURVEYS INCLUDE:

- **Treasury for Higher Education**
- **Supply Chain Finance**
- **Treasury Operations**
- **Benchmarking & Diagnostics**

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