TREASURY TECHNOLOGY
ANALYST REPORT

2023

Fides

STRATEGIC TREASURER

The Definitive Guide to Treasury Technology Solutions

→ Treasury and Risk Management

→ Treasury Aggregation

→ Supply Chain Finance and Cash Conversion Cycle

→ Enterprise Liquidity Management

This special edition provides an exclusive look at the solution set offered by Fides.

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2023
Analyst Report

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Welcome to the 2023 Treasury Technology Analyst Report! This document is intended as a definitive guide for thoughtful financial stewardship in the digital age, aiding practitioners in exploring how treasury technology meets treasury needs.

Treasurers considering digitizing their processes often face a learning curve. AI, ML, API, BI, and many other technological terms can sound like alphabet soup, and few feel confident about navigating selection, buy-in, and implementation efficiently. This report can help.

NAVIGATING THE DIGITAL REPORT:

Please note the following tools, which we hope will make it easy and convenient for you to reach different parts of the report quickly and cross-reference other sections as needed:

Clickable Table of Contents

You can use the table of contents on the following page to click to each section.

"Contents" & "Vendor" Buttons on Every Page

Pages 1-62 each have two tabs along the left or right margin with buttons reading "Contents," which will pull you directly back to the table of contents, and "Vendor," which will direct you to the beginning of the vendor coverage section. If at any point you find yourself somewhat lost for the section you wanted, you can return to the table of contents.

Color-Coded Sections

Each solution category has its own color. You can see this in the table of contents, and colored tabs on each page of the sub-reports will help you to identify which section you're scrolling through.

Links

Some words throughout the report are linked to other relevant pages within the report. We are not able to include links returning you to the page you clicked from, but in some PDF readers, the Alt key in combination with the left arrow key can be used to navigate to a page you have clicked away from.

Contents

Chart and graph numbers may not add up to 100% due to rounding.

Technology Solution Category: TA

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Founder/CEO:
Andreas Lutz

Introduction

Whether to their chagrin or to their delight, treasurers are increasingly finding that they must have a fairly high level of familiarity and capacity with technology. While there is an abundance of information available about technology online, it is typically too deeply technical, too broad, too out of date, or too lacking in relevance to treasury to suitably fit the need.

The annual Treasury Technology Analyst Report fills this gap, providing up-to-date information that

treasurers need to know. This includes what types of technology are available that could help your company, how they might help, what your peers are doing, what's on the horizon, and how to proceed.

Within the following pages, you will find first a discussion on treasury's current situation, what challenges are most driving digital adoption, and the overall technological trends and innovations that are important for treasurers to understand. Following this,

the report will lay out leading practices for the business case, selection, and implementation.

The next sections focus in on specific solution types, followed by a vendor analysis section.

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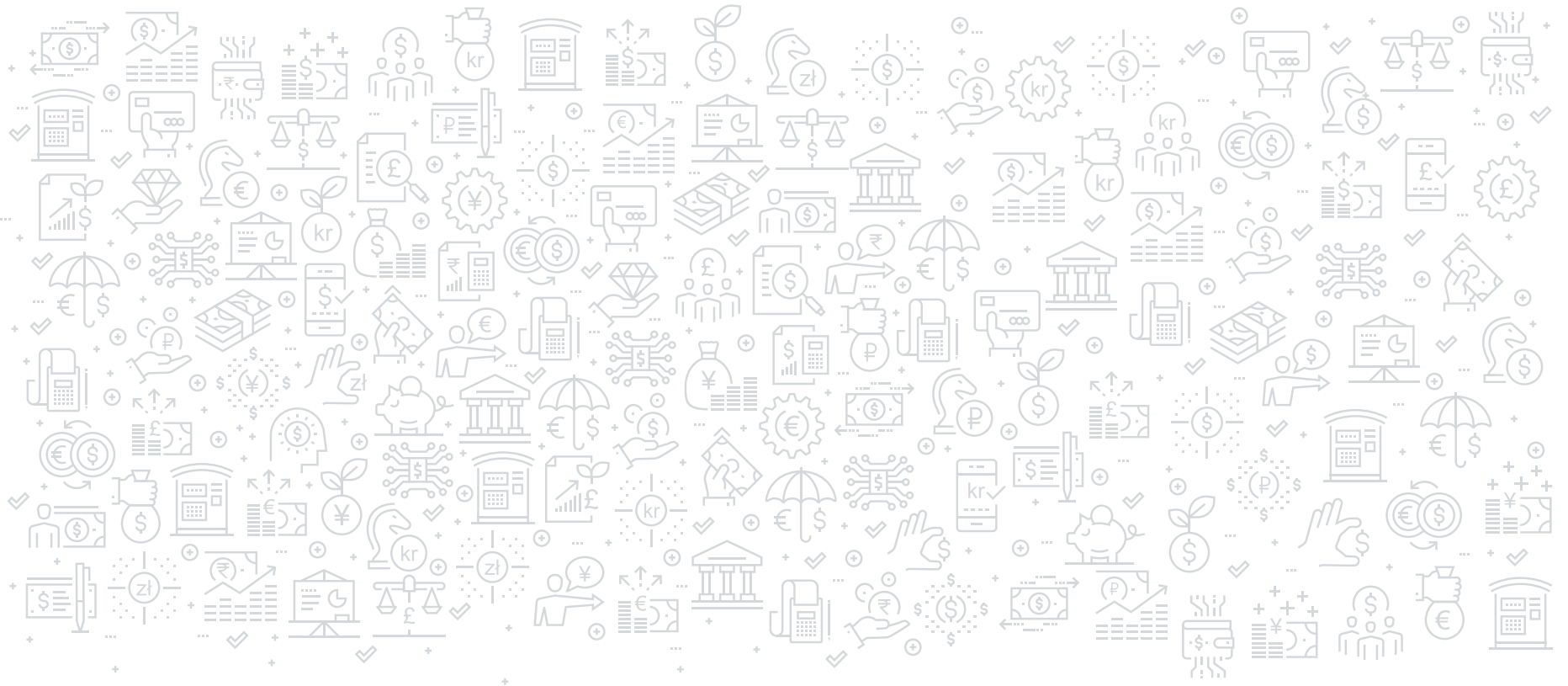
Treasury's Challenges in the Current Environment

We are well aware that technology is always evolving, but so is treasury itself, although thankfully not at the same breakneck pace. The economy, the regulatory environment, new age cohorts, management's expectations, and many more factors are all slowly transforming treasury's challenges and responsibilities. Meanwhile, new innovations appear that allow technology vendors to meet the new needs.

Geopolitical Tensions and Economic Stress

The world has been in a state of sustained turmoil since 2020, although the reasons for it continue to progress. COVID-19's direct effects have abated in most parts of the world, but its aftershocks, coupled with the Russia-Ukraine war and other factors, have brought chain reactions of ongoing chaos. This has led to supply chain difficulties, elevated inflation, interest rate hikes, bank instability, recession risks, currency fluctuations, market volatility, fraud, and more.

Depending on a company's industry, size, and geographic location and reach, different elements of this volatility and strain may have more or less impact, but all companies are feeling the shifts and struggling with various elements of volatility. This has led to sustained pressure on treasury. When treasury staff are spending all their time slogging through manual, error-prone processes, they cannot properly support their companies with the rapid, thoughtful, data-driven analysis needed for navigating the current environment. The combined complexity and shifting risk landscape of recent years have driven the treasury industry to rely more heavily on digital levers. Technological tools offer treasury departments the margin they need, especially in turbulent times, to focus on strategic and advisory tasks. As the industry – and, in fact, the world as a whole – moves forward in technological adoption, this raises overall expectations.

Meanwhile, the volatility of the economic and geopolitical environment of late has raised the urgency of many of the other usual technology drivers, such as management's expectations, staffing expectations and workload, efficiency, scalability, and visibility.
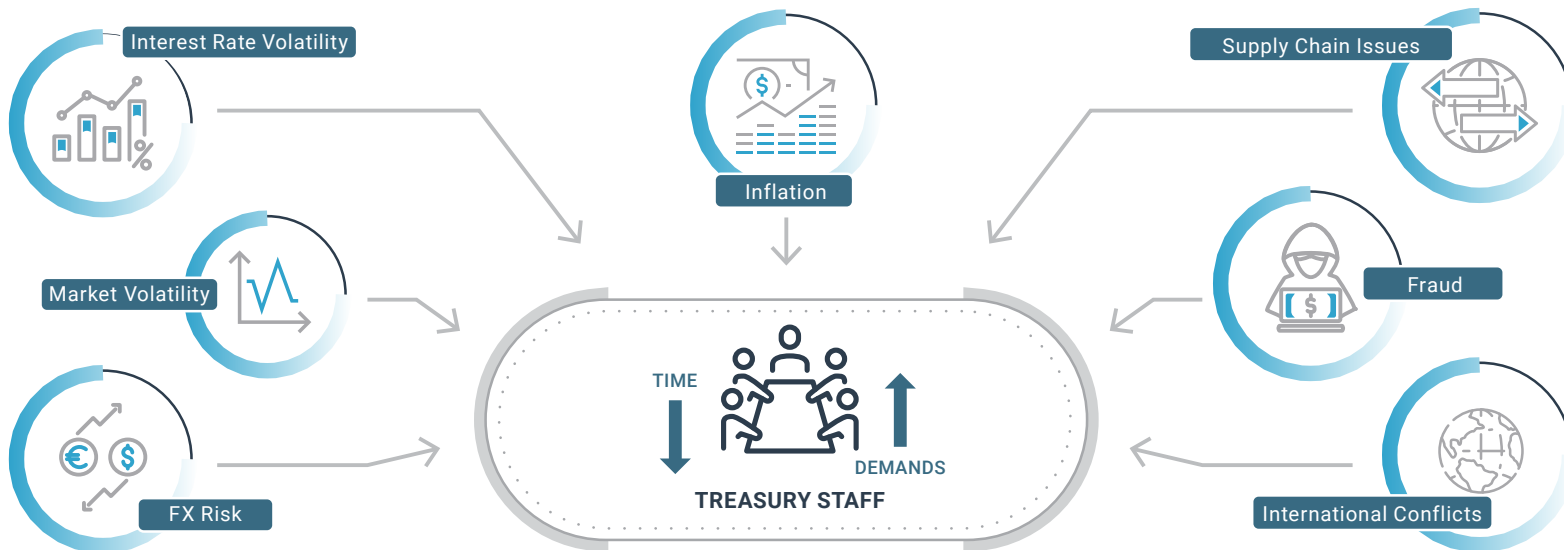
Efficiency, Scalability, and Flexibility

Accuracy in treasury processes cannot be compromised, as working and strategizing based on faulty information can be devastating to the entire company. At the same time, treasury needs its operational processes to consume little enough time that staff can focus on the advisory and strategic side. As the center cross-hair of speed and accuracy, efficiency is achieved when processes accurately accomplish their goals with the least possible use of resources (including time).

This matters to treasury not only with its own processes, but also with other departments whose operations impact liquidity, such as those in the cash conversion cycle. Here, efficiency is a primary means of reducing unnecessary costs and increasing control over liquidity. Efficient AP processes, for example, produce flexibility and control over liquidity by allowing the company the option of taking early payment discounts when they wish, whereas inefficient processes in this area take too long to allow for early payment.

By reducing wasted time and other resources and opening up more options, efficiency provides companies with flexibility and scalability. It gives staff the margin and leverage to handle sudden surges in complexity or intensity of data. Efficiency, scalability, and flexibility are each important even in times of relative calm, but economic upheaval and rapid changes make them vital. Many companies are needing to adjust their supply chains and are struggling

against a changing demand and supply landscape. More than ever, treasury needs margin, timely, accurate data to work with, and every option open instead of closed off due to inefficiency.

The need for efficiency – and the need for the scalability and flexibility that efficiency makes possible – is a strong driver for digital adoption. Manual

processes are both slow and error-prone, making them doubly inefficient by comparison to digital processes. Machines cannot do everything well, but leveraging them for what they are good at can provide treasury staff with accurate, timely information to work with, give them the time to fully engage with their strategic tasks, and strengthen their control over liquidity by increasing efficiency in the cash conversion cycle.

Q. Are there currently any responsibilities that you don't have time to perform?
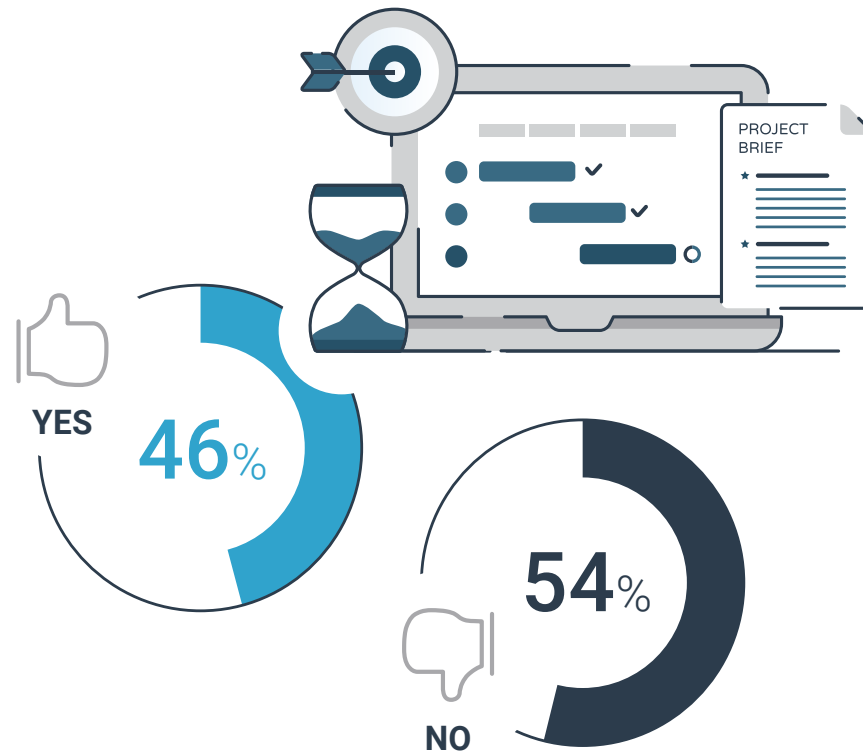

YES 46%

NO 54%

Figure 1

Big Data, Complexity, and Visibility

The sheer amounts of data produced and available today pose a challenge as well as an opportunity. Data must be stored and managed intentionally, but when properly harnessed, it can offer companies insights into market behavior, their own operations, and more. "Big data," as the massiveness of modern data has been dubbed, now means that every organization needs a robust data management strategy. Treasury should advocate for this in the company as a whole and should consider it in its own operations and technology use.

Why does data management matter? First, because the insights available through managing data well can offer modern companies a competitive advantage. This may involve using alternative data instead of traditional datasets that often "lag" too far behind in times of rapid change. During the pandemic, for example, some companies made creative use of data such as satellite images of parking lots to help them track consumer activity faster in a tumultuous and quickly changing environment.

Business intelligence (BI) tools are growing as well, using technology to harness a company's internal "exhaust" data for analysis as needed. Natural language processing (NLP) and artificial intelligence (AI) / machine learning (ML) tools are growing rapidly right now, with tools like ChatGPT bringing them into the public eye. These innovations dramatically increase the availability and ease of access to answers from

Q. What percentage of your bank accounts do you have VISIBILITY to within the following timeframes?
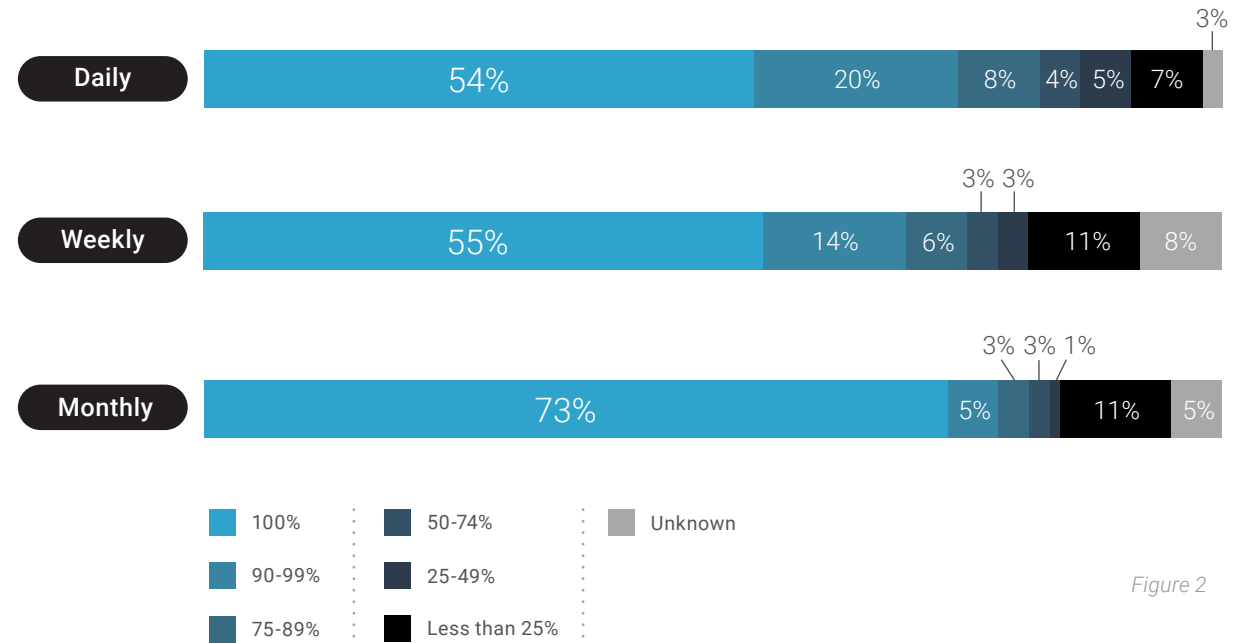
Figure 2

the data a company has stored. However, in order for any data tools to work fully, the organization must have a comprehensive, thoughtfully architected and implemented data management strategy.

Secondly, data management matters because of its impact on visibility. As an organization's banking structures, geographic spread, and many other factors become more complex, data grows exponentially, and visibility becomes harder to achieve. Visibility is not an area where treasury can compromise. It is vital for security, compliance, and operational excellence.

Proper, intentional data management and architecture become necessary at a certain point of complexity in order to maintain the needed visibility.

As treasury takes more of an interest in data and its management, it must also take more of an interest in the company's technology. Manual processes and many legacy digital processes both fail to support strong data management, making data strategy a driver of adoption for modern, integrative, high-processing technology.

Security and Controls

As the department responsible for protecting the company's most liquid assets and mitigating relevant risks, treasury has a duty to ensure that its organization is defending itself against fraud properly. This requires keeping abreast of the constant changes in the fraud landscape and the frequent updates in security standards.

Fraud and security operate in an ongoing feedback loop: as fraud becomes more frequent and more sophisticated, security and controls evolve to prevent current criminal methods more effectively; and as defenses improve, criminals find new ways of circumventing them. This feedback loop moves quickly and drives constant, rapid change in the threats companies need to be aware of and the security measures they need to have in place to avoid being an easy target.

COVID-19 accelerated the feedback loop by abruptly transitioning the corporate world to work from home (WFH). Manual processes had to be adjusted to function remotely, and temporary fixes and overall confusion opened the door for an onslaught of fraudulent activity. Driven by both the security issues and the logistical problems of manual processes in a remote environment, digital adoption in departments

such as AP took a leap forward. This pulled the industry standard for security up more rapidly than usual, meaning that those who failed to adopt secure digital processes are now finding themselves at the back of the pack, so to speak, which makes them easier targets for criminals.

While the return to office (RTO) has been occurring, it has manifested more as a largescale shift to hybrid rather than an actual return to five days a week in the office. With a hybrid schedule, staff are in the office some days, but spend other days working remotely, meaning that security still needs to account for remote access and digital payment processes.

Q. Please indicate your approximate work-from-home (WFH) schedule for the following time frames:

Pre-Pandemic

Never or rarely WFH
73%

Hybrid (1-4 days a week WFH)
16%

5 days a week WFH
8%

N/A
3%

2023

Hybrid (1-4 days a week WFH)
69%

5 days a week WFH
22%

Never or rarely WFH
8%

N/A
1%
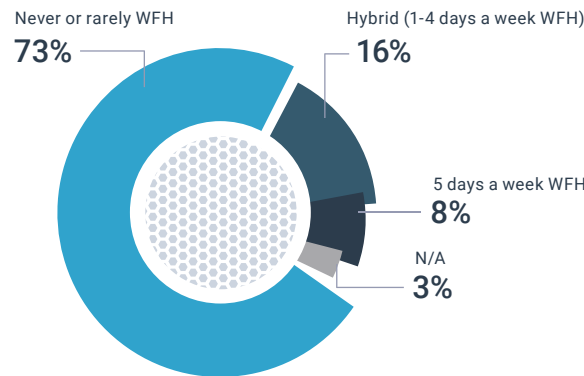
Figure 3

As of 2023, the hybrid work schedule (working 1-4 days a week from home and the rest of the time in the office) is the clear winner coming out of the shifts caused by the pandemic.

Technology strengthens security in several ways:

1. Reduced touchpoints: In payment processes, every touchpoint – or point where a human is involved in the process – is a vulnerability,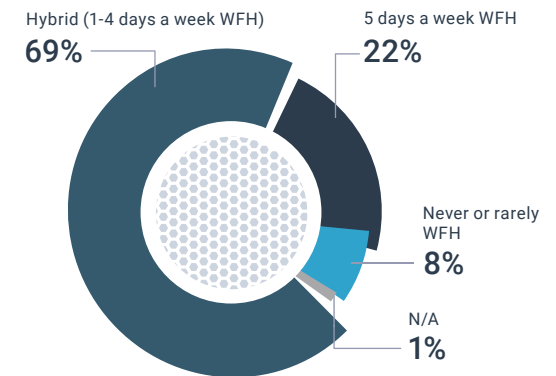 as it is a point where a criminal can potentially manipulate the payment. Technology allows for payment processes to be automated, reducing touchpoints and, therefore, reducing vulnerabilities.

2. Built-in controls: With manual processes, controls can be bypassed. Even if staff only bypass controls for innocent reasons (rushing to get something through on time, for example), this still opens up vulnerabilities in the organization. When the process is digital, however, the controls can be built into the solution's process such that the payment cannot continue without the proper steps.

3. Visibility and simplicity: You cannot protect what you cannot see, and with manual processes, visibility is often delayed, limited, and potentially inaccurate. Technology allows for more immediate visibility into bank accounts, transactions, payments, and more, which can help catch fraudulent activity early enough in the process that funds can be recovered or prevented from leaving. In addition, digital processes can simplify the defense. Consolidating scattered payment processes to run through one secure solution, for example, reduces vulnerabilities by narrowing what must be monitored and defended.

With an industry standard that has lurched forward into more digital processes and an ongoing partially remote work environment for most organizations, there is now increased urgency for companies to adopt technologies that help them defend their payment processes and data. According to a 2023 survey, more treasury professionals are expecting their companies to increase spending on security than ever before in the survey's eight-year history (Treasury Fraud & Controls Survey, 2023). Half of those expecting the increase in security spend attributed it to concern from management regarding the growing threat of fraud.

Q. We plan to spend more on treasury fraud prevention, detection and controls because:
(Select all that apply)

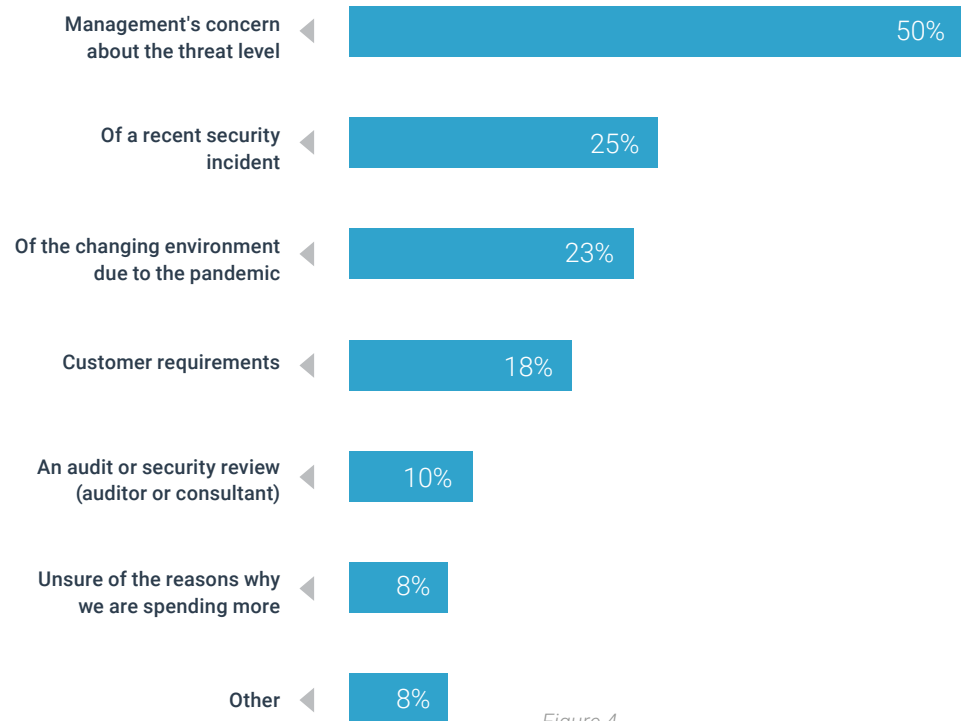| Reason	Percentage
Management's concern about the threat level	50%
Of a recent security incident	25%
Of the changing environment due to the pandemic	23%
Customer requirements	18%
An audit or security review (auditor or consultant)	10%
Unsure of the reasons why we are spending more	8%
Other	8%

Figure 4

Heavier Compliance Burdens

The regulations that treasury encounters are primarily aimed at mitigating issues such as fraud and past banking instability in the broader environments of economies and networks. These drivers are persistent. Much as we could wish fraud to simply disappear, we know it will likely continue to increase, and we cannot expect the banking industry to begin operating without oversight and regulation.

With such steady drivers, treasury expects their regulatory burden to keep growing for the foreseeable future. The regulations treasury must comply with vary depending on industry, size, and many other factors. While Know Your Customer (KYC) regulations are typically rated as a top compliance burden by far more treasury and finance practitioners than other regulations, others near the top of the list include PCI-DSS, GDPR, FBAR, and PSD2 (Treasury Perspectives Survey, 2021). A newcomer to the regulatory landscape, beneficial ownership information (BOI) reporting, is now adding to the burden and concern, although many companies are exempt. (To learn more about this new regulation via a white paper, podcast episode, or webinar, please visit https://strategictreasurer.com/boi/.)

Regulations drive technological adoption in multiple ways. Some of them have technical requirements, such as for secure data storage, that cannot be met without robust technology. Many of treasury's most burdensome regulations involve reporting on details that are painstaking to find with manual processes. The increased visibility and efficiency achievable through digital adoption makes it appealing to the compliance-burdened treasury department. Additionally, some solutions provide compliance-specific assistance. Whether a TMS module or a network that helps with KYC, these solutions can ease the burden of compliance.

Q. In the near future (1-2 years), I expect the following to be true of the regulatory environment:

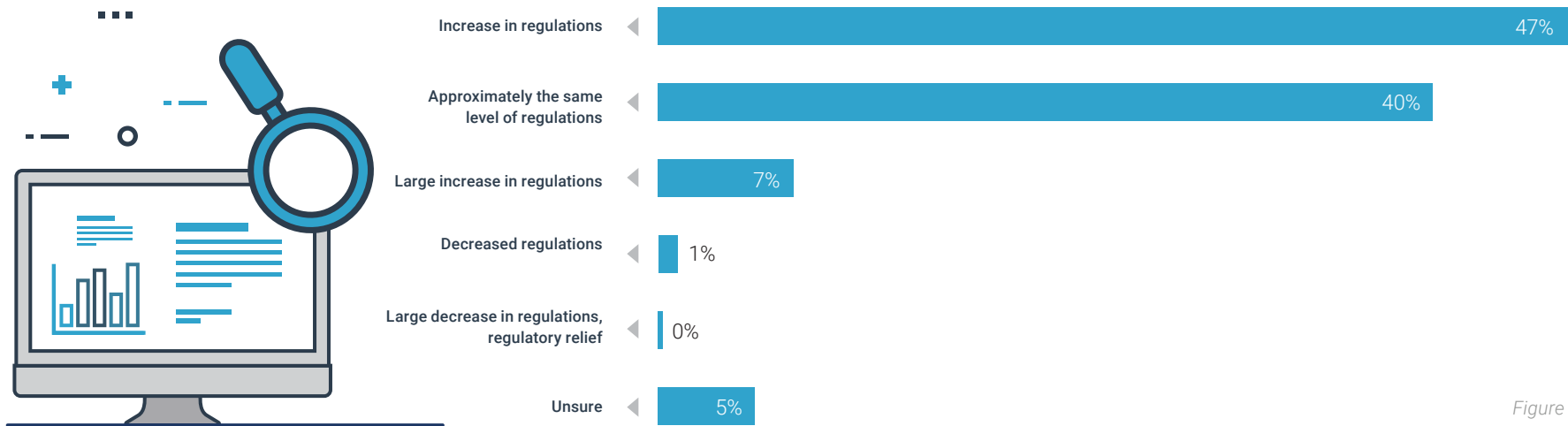|	
Increase in regulations	47%
Approximately the same level of regulations	40%
Large increase in regulations	7%
Decreased regulations	1%
Large decrease in regulations, regulatory relief	0%
Unsure	5%

Figure 5

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Slow Staffing Growth

Clearly, the demands on treasury are growing. Geopolitical and economic volatility are bringing the need for liquidity risk management into sharper relief. The compliance burden can only be expected to grow heavier. Treasury is increasingly being tapped to take responsibility for payment security and efficiency, and all of this is only becoming more difficult to achieve in the midst of constantly expanding complexity.

To manage all of this properly and meet the expectations of the C-suite, treasury needs either more and better tools or more staff. As far as staffing

goes, treasury tends to be a thin and slow-growing department. In many cases, staffing growth would have to be quite significant to meet the demand increases. This is not likely.

The most viable option for most treasury departments, then, is leveraging technology to automate processes and improve efficiency. It is also a highly effective option, allowing treasury to extend the reach of staff while improving accuracy, reining in costs, and tightening security.

Staffing concerns have begun driving technology adoption in another way as well, however. In addition

to needing leverage to meet demands with low staffing, treasury is now facing a situation where staff themselves are demanding better technology. The younger age cohorts who are coming up into the workforce now are accustomed to automation and efficient use of technology. They have little patience for processes that are unnecessarily manual. While some may perceive this as lazy, it may also be perceived as simply having high standards for efficiency. In an environment where many companies are concerned about hiring and retaining high-quality employees, leveraging modern technology effectively is becoming even more of a priority.

Q. How many employees do the following departments consist of?

Department	3 or fewer	4-6	7-10	11-25	>25	Unsure
Accounting	23%	13%	12%	15%	29%	8%
AP	36%	17%	13%	10%	15%	9%
AR	34%	16%	11%	9%	19%	11%
Treasury	52%	19%	8%	6%	10%	4%

Legend: ■ 3 or fewer ■ 4-6 ■ 7-10 ■ 11-25 ■ >25 ■ Unsure
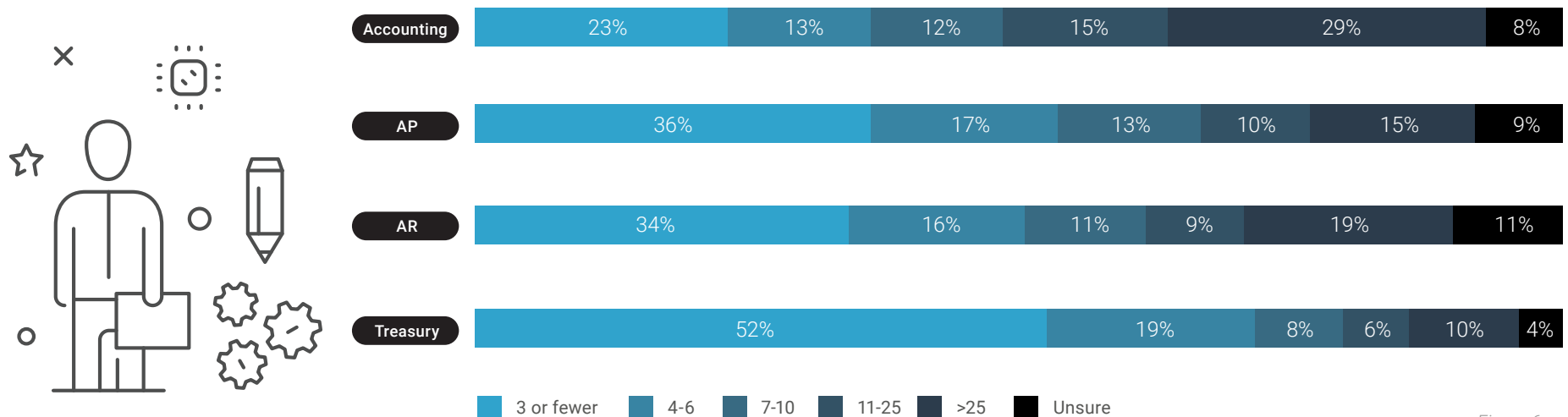
Figure 6

The Treasury Technology Landscape

Treasury's interest in technology spans both the solutions that are specifically designed to automate its own operations and those that help it achieve liquidity management, efficiency, and payment security across multiple areas of the company. While different treasury departments will find different solution types relevant to their organizational and departmental needs, there are a few categories of solutions that those in treasury should be aware of. This report covers four of these main categories.

Treasury Management Systems / Treasury and Risk Management Systems (TMS/TRMS)

A TMS serves as a central solution for treasury departments. These systems provide a robust platform for essential tasks like cash management, visibility, accounting, and forecasting with enhanced security, flexibility, and seamlessly integrated workflows. For treasury teams feeling held back by Excel, a TMS provides a more powerful and efficient option. For those that use multiple tools and need to share information across departments, a TMS can serve as a foundation for other tools to function and connect with other solutions.

Supply Chain Finance (SCF) and Cash Conversion Cycle (CCC) Solutions

While SCF and CCC solutions do not directly impact treasury operations, their impact on liquidity and working capital makes them an important category for treasury to consider. SCF solutions use digital platforms to create mutually beneficial outcomes for buyers and vendors. This can be achieved through leveraging the buyer's strong credit and third-party financing or by using the buyer's surplus capital. CCC solutions automate various stages of the cash conversion cycle, optimizing processes and increasing the efficiency and flexibility of cash management. As these solutions often affect multiple departments and impact working capital, the treasurer's leadership is crucial in identifying key challenges and implementing effective solutions.

Treasury Aggregators (TA)

TAs combine the functionalities of a data consolidator and a payment hub. These solutions are ideal for organizations with intricate payment flows or banking information. With robust capacity for aggregation and connectivity, TAs efficiently bring in, manage, and distribute banking information to relevant areas. They also establish connections and convert payment formats, enabling centralized, streamlined, and secure payment processes.

Enterprise Liquidity Management (ELM)

ELM systems represent a recent advancement in treasury technology, providing a comprehensive view of liquidity across the organization. These robust solutions encompass the core functionalities of a TMS but extend their reach significantly. In large corporations, data pertaining to liquidity is often scattered across different departments, making it challenging for treasury to track and strategize accurately. ELM systems integrate information from across the company, enabling treasury to view and manage liquidity comprehensively. On top of basic treasury and cash management tools, they cover aspects such as supply chain finance, payments, and foreign exchange, offering valuable insights for informed decision-making.

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The Foundations of Treasury Technology

Several foundational concepts deeply impact the progress of treasury technology. Understanding how each of these areas has developed and the current trajectories of their continuing development helps treasury professionals grasp the overall situation, why things are the way they are, and what to expect in the future.

Data

According to estimates, data doubles every two years, posing both a challenge and an opportunity. Big data offers valuable insights for informed decision-making, risk management, cash flow forecasting, and operational efficiency. Leveraging it properly can provide useful insights on operations, market behavior, trends, and more, but harnessing such complex and extensive data requires thoughtfully architected data management and advanced analytics tools.

Processing Power

The efficiency of computer processing power increases at an accelerated rate, outpacing the growth of data itself. With processing power doubling every 18 months, computers and systems are equipped to handle the ever-expanding volumes of data. This rapid progress in processing power enables treasury professionals to effectively manage and analyze data, facilitating enhanced decision-making, streamlined operations, and improved financial management. These rapid advancements in processing power also mean that previously state-of-the-art solutions are increasingly being rendered outdated compared to the average solutions available today.

Connectivity

Corporate treasury's connectivity options look very different today compared to half a century ago. After initially transitioning from traditional mail services to teletype machines, connectivity further advanced to host-to-host (H2H) connections and secure file transfer protocol (SFTP). Now, application programming interfaces (APIs) have emerged as a prominent connectivity solution. The introduction of Payment Services Directive 2 (PSD2) in Europe, mandating banks to enable customer data access through third-party providers, has played a crucial role in driving the widespread adoption of APIs.

Processing Power Growth vs. Data Growth Over Six Years

X PROCESSING SPEED   2x   4x   8x   16x

1.5 Years

X DATA   2x   4x   8x

2 Years
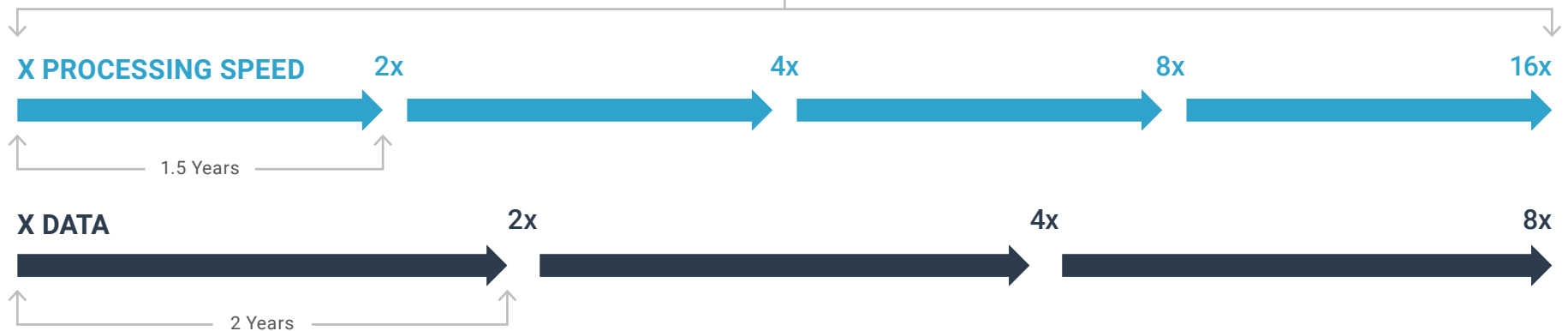
Hosting Models

Hosting models for treasury technology have also gone through multiple iterations in recent decades, particularly for TMSs.

◊   On-premises: Solutions were initially installed and hosted onsite. Although powerful for their time, the fact that these solutions were installed on client servers led to challenges with maintenance and backlogs of upgrades. On-premises solutions are perceived by most corporate treasury professionals as losing value over time, eventually becoming obsolete. While currently in use at many organizations, legacy on-premises solutions will need replacement at some point, and few companies are implementing new on-premises solutions today.

◊   Application Service Provider (ASP): This model emerged as an attempt to address the issues with on-premises solutions. It involved hosting the solution with a third party responsible for maintenance. While this model reduced the maintenance burden on clients and offered some improvements in the upgrade process, upgrades were still not enforced, and solutions built on this model still faced obsoletion.

◊   Software-as-a-Service (SaaS): SaaS solutions are cloud-hosted, multi-tenant platforms. They are maintained and upgraded by the vendor, and since clients pay for SaaS-based solutions on a subscription basis, the vender has both the ability and the incentive to properly maintain and add value to the system. As a result, SaaS solutions are

seen by many treasury professionals as actually increasing in value over time rather than losing value or simply holding stable.

Democratization of Technology

As technology progresses, processing power and sophistication both become more available for lower costs. Early treasury systems were a reasonable purchase only for very large organizations that desperately needed that level of power and sophistication and that could afford the cost and had the resources to maintain it on their own servers. Now, comparably powerful TMSs are affordable enough for companies under $500M in revenue. This trend, which we call the democratization of technology, is expected to continue indefinitely, with solutions constantly offering increasing leverage for less and less cost.

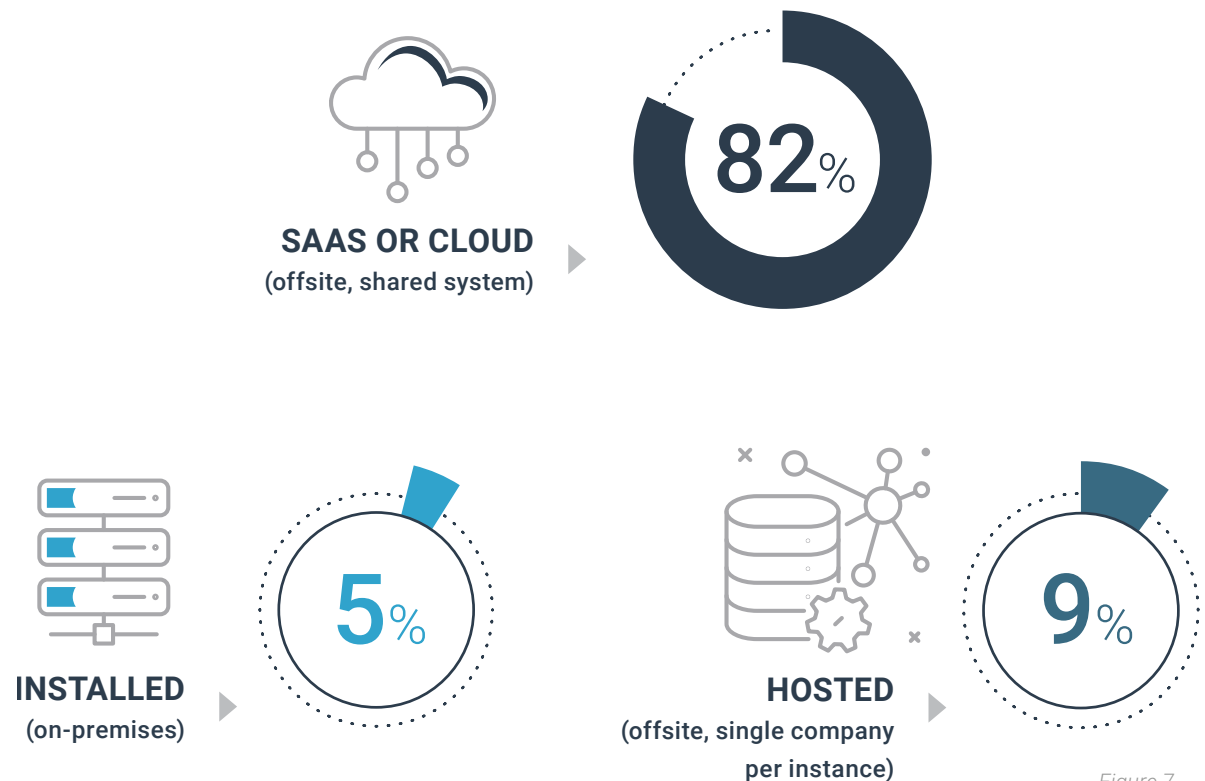Q. The TMS/TRMS platform type you use or plan to use is or is expected to be:

SAAS OR CLOUD
(offsite, shared system)   **82%**

INSTALLED
(on-premises)   **5%**

HOSTED
(offsite, single company per instance)   **9%**

Figure 7

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The Future of Treasury Technology

The headlines and advertisements constantly remind us that technology is advancing, but not all the buzzwords currently matter much for treasury professionals. Which innovations are important? What does treasury need to understand about them? Where are the trajectories of technological development currently pointing? The following sections cover the main emerging technologies and trends that matter for treasury as of 2023.

Platform-as-a-Service

Platform-as-a-Service (PaaS) is a cloud computing model that provides a platform or framework for developers to build, deploy, and manage applications. PaaS providers – which include Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform, and others – host and maintain a complete development environment, including hardware, operating system, development tools, database management systems, and runtime environments, allowing developers to focus on application development and functionality rather than the underlying infrastructure. PaaS offers benefits such as scalability, flexibility, ease of deployment, and cost efficiency, as developers can leverage pre-configured platforms and services without the need to invest in and manage complex infrastructure themselves.

What does this mean for treasury? First, the short timeframes needed for development and the smooth upgrade process benefit treasury, providing them with added value in their system on an ongoing basis. In addition, since vendors' server space is not an issue with PaaS, these solutions are hyper-scalable, meaning that they can accommodate the often varying needs of treasury efficiently. For example, tasks such as end-of-month hedging reporting may necessitate significantly higher computational power compared to the same treasury department's regular requirements throughout the rest of the month. Normally, such treasury departments would have to pay for the maximum power capacity for the entire month, even though it was only necessary for a couple of days. With PaaS, however, vendors can scale the allocated power up and down based on the client's needs, enabling treasury to pay for lower capacity most of the month, while easily scaling up when needed for specific days.

There are several other concepts and terms related to PaaS that treasury professionals need to be aware of. These interconnected areas of innovation are growing quickly and are having ongoing impacts on treasury technology.

◊ Cloud-Native: Many solutions today have migrated in recent years from a non-cloud environment to the cloud. In contrast, cloud-native solutions did not migrate to the cloud but were developed from the outset to take full advantage of cloud computing capabilities. Since PaaS offers a cloud-based development environment, it aligns with the cloud-native approach.

◊ Microservices: Cloud-native solutions often employ microservices, where the application is composed of small pieces of functionality that can be developed, deployed, and scaled independently. This allows for flexibility and agility in managing the application components, making it possible to upgrade one piece of functionality without impacting others or interrupting the user's overall experience.

◊ Low-Code/No-Code: The "low-code/no-code" approach to software involves the use of pre-written pieces of code that can be combined into a fully functional application by users with little-to-no coding knowledge. This opens up possibilities for rapid development and highly customizable treasury software.

◊ Embedded Functionality: PaaS offerings are frequently embedded into other solutions. For example, a treasury department may use PaaS-based TMS software that is embedded in their ERP solution. This integrative, open approach reduces connectivity redundancy and other issues and streamlines coordination between departments.

Artificial Intelligence (AI) and Machine Learning (ML)

AI and ML have been making headlines in 2023, and for good reason, as they are expanding the list of tasks computers can adequately perform. AI systems aim to mimic human cognitive abilities, learn from experience, and adapt to new information or situations. ML is a subset of AI that focuses on the development of algorithms and statistical models that enable computers to learn from large datasets and make predictions or decisions without being explicitly programmed. ML is a fundamental component of many AI applications, enabling systems to automatically analyze data, recognize patterns, and make informed decisions or predictions.

AI and ML have seen use in treasury technology for a few years now, with AI-enabled security features allowing some solutions to detect suspicious activity,

while others leverage AI to predict which suppliers will be most likely to take a discounted early payment option on which days, and so on. Now, as chatbots, deepfakes, and many other uses and misuses of AI appear, treasury must consider how else the innovations can help them and what they need to be aware of.

Recent strides in natural language processing (NLP) and natural language search are already impacting many professions through their use in applications such as ChatGPT, and they are likely to see use in treasury as well. NLP can enable robust, self-service data analytics tools, for example, that could be very useful in treasury.

Business Intelligence

Business intelligence (BI) tools are a major component of an organization's ability to harness

big data effectively. They collect and transform data from various sources, creating interactive reports and visualizations in user-friendly interfaces for non-technical users to explore data, identify trends, and make informed, strategic plans. A notable use of AI, ML, and NLP, BI tools make robust data analysis far more readily accessible to treasury and many other departments.

As the corporate world increasingly recognizes the importance of leveraging data properly, having a well-considered architecture for data management is becoming an ever more vital part of excellence and competitiveness. This architecture impacts treasury technology, as robust data management requires an integrative, open architecture to streamline the flow of data to the BI tools. Considering how solutions interact with and pass on data is already important in treasury, and it will only grow in importance over time.

Q. Which of the following technologies are you using/interested in using in treasury?

Application Program Interface (APIs)
37% | 35% | 14% | 14%

Artificial Intelligence (AI) or Predictive Analytics
14% | 28% | 31% | 28%

Blockchain/Distributed Ledger Technology
2% | 18% | 24% | 56%

Legend:
- Currently using or implementing
- Will use within two years
- Will use within 5 years
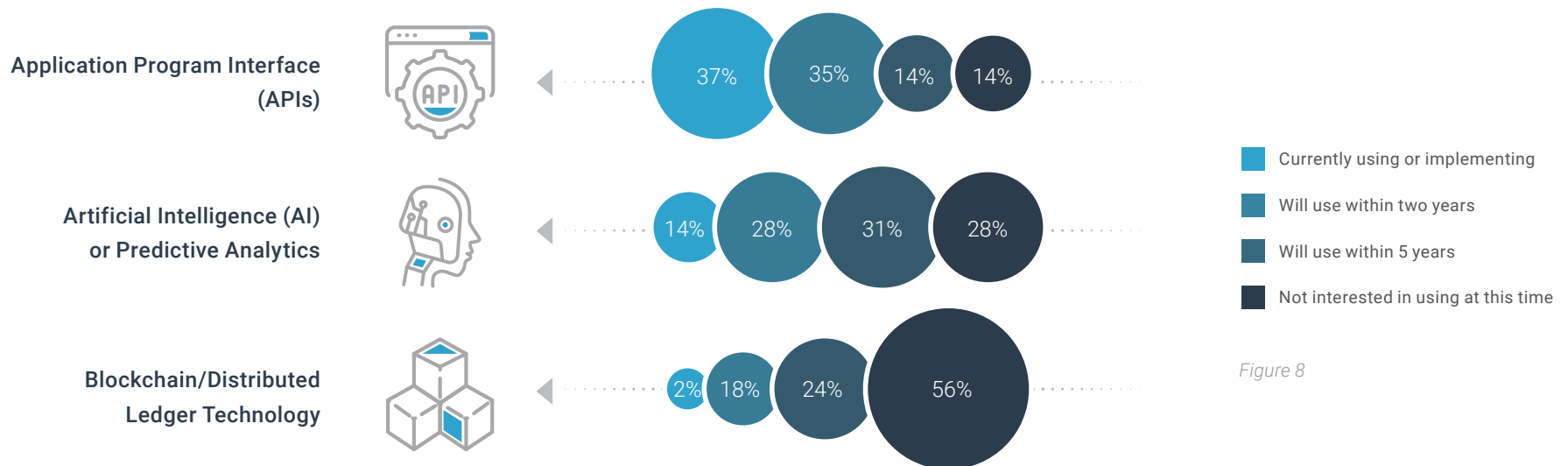- Not interested in using at this time

Figure 8

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Networks

While not as much of a buzzword as AI or APIs, networks have become an important component of the digital world and of technological plans, and their importance continues to grow. What makes them valuable? Participants and functionality. It doesn't matter what a network can do if it has no participants, but it also doesn't matter how many participants it has if it has no functionality. In reality, however, participants and functionality tend to positively reinforce each other, as more members join functional networks. For treasury, networks have three main uses:

▸ **Information:** Networks – especially payment networks such as Swift, EBICS, Zengin, and others – play a crucial role in providing treasury departments with timely and accurate financial information. By connecting with banks and financial institutions, networks enable efficient transmission of critical data such as account balances, transactions, and payment instructions, allowing treasury professionals to maintain real-time visibility and make informed decisions regarding cash management, liquidity, and financial risk management.

▸ **Outsourcing:** Many networks are adding outsourced services for data management, compliance, and more. On the data side, this includes tasks such as handling payee information. On the compliance side, some networks are launching KYC assistance to help streamline the process between banks and corporates.

▸ **Security:** Networks can be leveraged to prevent fraud by validating and cross-checking payee information and changes. The network can verify whether requested changes to payment information match changes on the vendor's other customers on the network. It can also confirm whether other customers have reported similar changes as potentially fraudulent.

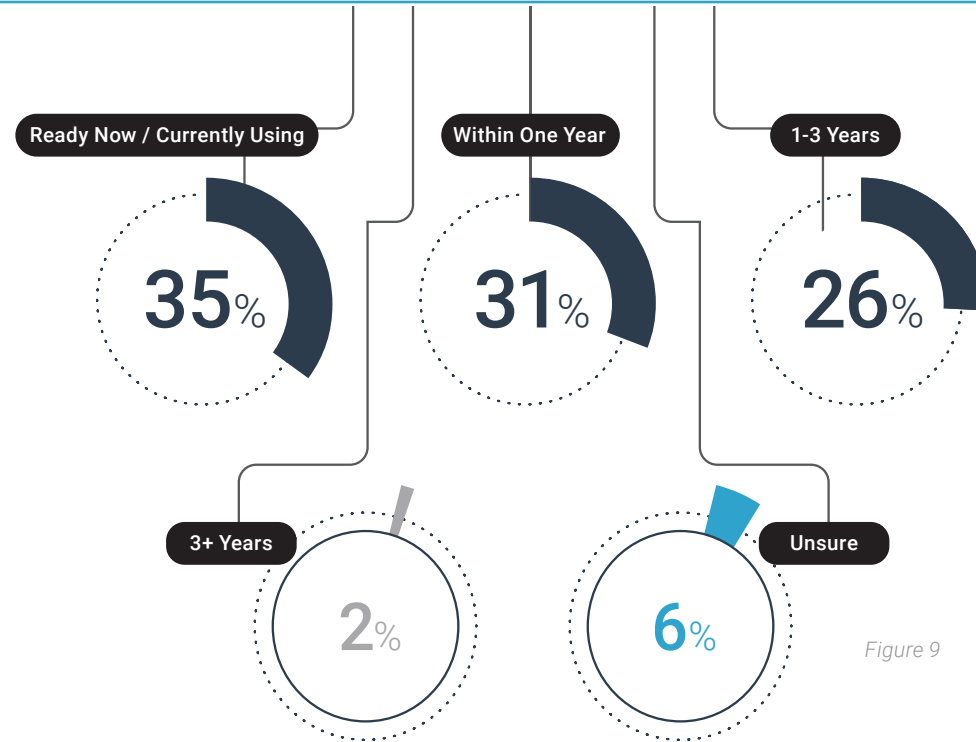Q. How quickly are you prepared to deploy faster payment capabilities?

Ready Now / Currently Using — 35%
Within One Year — 31%
1-3 Years — 26%
3+ Years — 2%
Unsure — 6%

Figure 9

From Faster to Real Time

Expectations for timing in treasury are changing as technology increases the speed at which various processes can run. The long-standing excitement around "faster payments" is steadily transitioning into an excitement around real-time payments, and the capacity for speed in data and visibility is creating an expectation for faster and real time for those areas as well. As technology continues to increase speed, expectations rise, further driving technological development in an ongoing cycle that is likely to continue until all treasury processes are real time if they can be.

Application Programming Interfaces (APIs)

APIs are sets of rules and protocols that allow different software applications to communicate and interact with each other. They enable seamless integration and data exchange between systems, allowing users to access functionalities of other applications at the click of a button. In the consumer space, APIs enable mobile apps such as Uber to allow customers to see where their ride is and pay all from the same app. In the corporate treasury space, APIs allow treasury technology users to access bank data at the click of a button and power more efficient integration between internal systems.

APIs are not a new innovation, but their use has skyrocketed in recent years. In finance, the European regulation PSD2, which requires that banks provide a secure way for clients to use their banking data in third-party applications, has driven substantial development and adoption worldwide.

This move to allow broader integration and access in banking is called "open banking." A similar movement is taking place within the context of treasury. "Open treasury" is also making use of APIs to facilitate integration, in this case integration between internal systems such as TMSs, ERP systems, and more. A vendor's solution sets often offer multiple APIs, each serving a specific routine or functionality. "API libraries" streamline the organization of these API calls, simplifying connectivity and reducing the complexity of integrating with external parties. By promoting seamless cooperation between different solutions, API libraries encourage innovation and foster an environment of openness within the treasury industry.
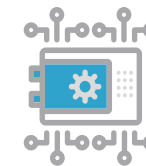
Blockchain and Distributed Ledger Technology (DLT)

DLT (distributed ledger technology) is a decentralized digital system that records and verifies transactions across multiple network participants, enhancing transparency and security. Blockchain is a specific type of DLT that creates a chain of blocks containing transactional data, ensuring immutability and enabling peer-to-peer transactions without the need for a trusted third party to verify. While blockchain and DLT have not seen massive adoption in treasury technology, they have been found effective for some specific use cases. Treasury should be aware of DLT and blockchain and of some of these use cases, but should understand that relatively little growth is expected for these technologies in treasury.

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General Principles for Obtaining Your Solution

We hope that reading this report will help clarify whether certain types of treasury technology could be a worthwhile investment for your organization. However, regardless of what type of technology you consider, the decision to pursue obtaining a solution is just the beginning of the process. From gaining funding to staying on budget for your implementation, there are a number of challenges to be navigated before your company can reap the benefits of your new solution. Understanding those challenges ahead of time and having a well-considered game plan can help you reach your goals efficiently while building a strong track record with your company's management.

solve your current issues as intended, but since modern solutions typically last for decades, your thinking and planning should not stop with your current problems.

Obtaining a solution can be divided into three major steps: the business case, selection, and implementation. Throughout all three of these steps, there is likely to be pressure to focus on short-term goals. Failing to take a step back and consider the long-term implications can undermine your project's ultimate success. Maintaining a steady focus on the long-term goals from the business case to go-live will help you avoid many pitfalls and set your department and entire organization up for success. This mindset forms the foundation of many of the specific steps below. Aim to make it the foundation of your project as well and revisit the concept often to ensure the focus doesn't narrow too much as you try to solve each detailed issue that arises.

A Future-Focused Mindset

The decision to obtain a solution is typically prompted by current problems. Your solution should certainly

Developing a Realistic and Comprehensive Roadmap

BUSINESS CASE

Strategic case
⌄
Stakeholder buy-in

SELECTION

Strategic partner
⌄
Short list

IMPLEMENTATION

Realistic approach
⌄
Phases & banded timeframes

| Research & Analysis | Internal Discussion | System Mapping | Future Planning | System Upkeep/Optimization |

The Business Case

Having determined that a treasury technology solution would be worthwhile for your company, your first task is to convince your organization to fund it.

The Financial Case: ROI.

The financial case is important, and explaining the expected return on investment (ROI) of your project is expected. However, avoid the trap of expecting ROI alone to win funding. Many projects are typically proposed for funding every year, and each project has an ROI to back it. Your ROI should be there to show that your particular plan is a good way of addressing the issue, but you also need a strategic case to demonstrate that the issue matters in the first place.

The Strategic Case.

Your project may be a clear help to your department, but what will it do for the organization at large? How will it help achieve overarching company goals? The answers to these questions form the basis of your strategic case. Show how your project will further the company's mission, and you will have much greater success in obtaining funding.

Gaining Stakeholder Buy-In.

Depending on the type of treasury technology, other groups outside of treasury, such as accounting or AP, may be impacted by your project. Whether your solution will integrate with theirs, will reduce the amount of manual work they need to do to get you certain information, or will be a solution they need to use as well, they may have concerns and interests caught up in your project. Treasury should proactively seek to identify any of these key stakeholders, understand their concerns and needs, communicate clearly with them about what the solution might mean for them, and adapt the project plan as needed to make it a win for all stakeholders. With their perspective heard and a clear idea of how the project could help them, the key stakeholders can become allies in helping you gain funding.

Selection

The abundance of choices available for many solution types comes as both an advantage and a challenge. On the one hand, it means that whatever your specific needs, there is likely a solution built for it. On the other hand, it means that the selection process can be somewhat overwhelming. The following tactics can help you find the best vendor and solution for your company in a streamlined manner.

Aiming for the Right Target.

While we call solution providers "vendors," the best vendors are those who approach the relationship less with the mindset of a vendor and more with the mindset of a strategic partner. The vendor mindset sees the client relationship as purely transactional, and the provider has little interest in the client's ongoing success. A strategic partner mindset, however, involves the provider looking for ways to support the client. A strategic partner is invested in developing their solutions over time to help meet the client's evolving needs. Take your organization's future plans and expectations into account and consider which provider can best be a strategic partner to you, supporting your growth over time.

Focus on the Short List.

When partnering with a company whose solution will be handling your company's financial data and supporting your daily operations for years, robust due diligence is necessary. Identifying the best solution involves diving deep – but it does not require diving deep on every single option. First, make a short list. This requires having defined business requirements that specify what your company will need out of its solution. Once you have this, you can use it to weed out any products and providers that don't fit without needing to research them in extensive detail. When you have it narrowed down to a short list, you can focus and perform your more thorough due diligence and demos to identify the most appropriate fit.

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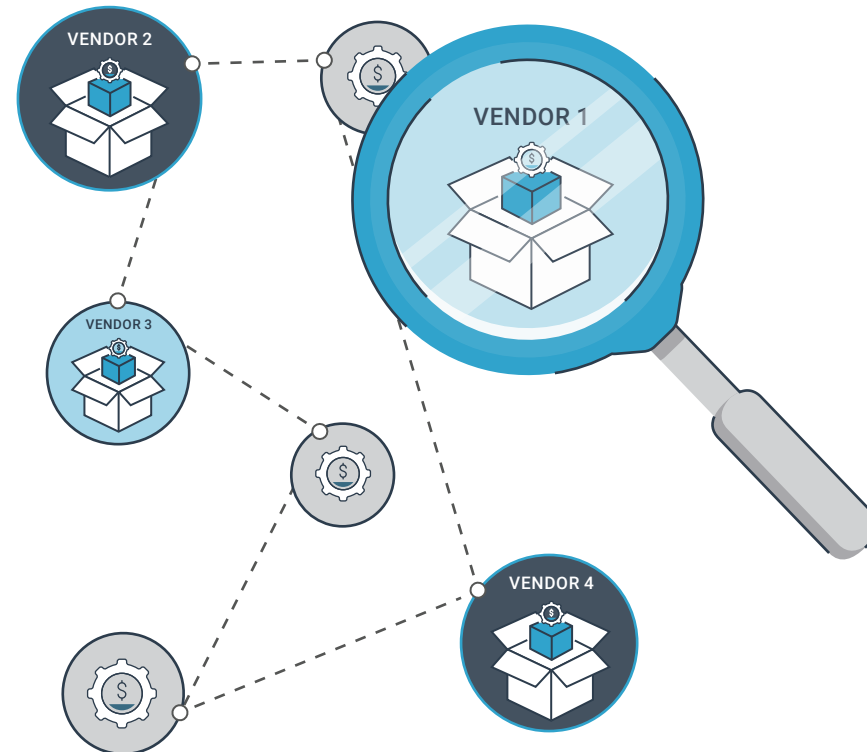
Implementation

Having obtained your funding and chosen your solution, the final hurdle remains: implementation. This process is often seen as a minefield of potential problems, with many implementation projects running over the allotted time and budget. However, following leading practices can help you avoid these pitfalls, run your implementation smoothly, and achieve a fully functional solution on time.
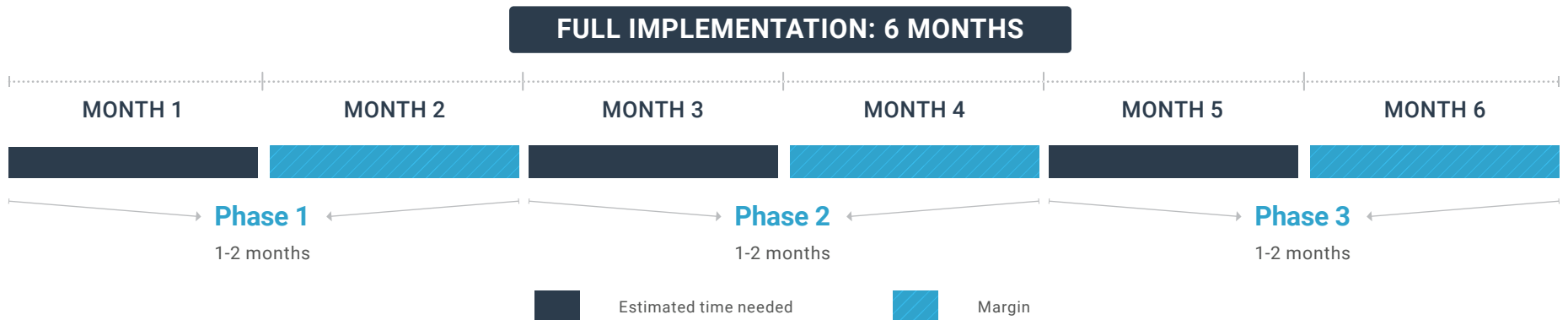
Approaching the Project Realistically.

Everyone wants the implementation to go quickly and cost little. Many involved in the process can be tempted to brute force an "aggressive" timeframe or push through with too little assistance. However, approaching the project unrealistically will ultimately backfire. Some tasks can be sped up, but others cannot. Some things can be done off the side of the treasurer's desk, but others cannot. An unrealistic approach almost guarantees that the project will not go according to plan, which increases the likelihood of delays, errors, rework, and abandoned functionality. Consult with the vendor, other key stakeholders, IT, and outside experts as needed to establish what resources will be needed, how long each portion of the project will take, and who will be available to help at each point in the process. Throughout planning and executing the project, maintain a realistic approach, as this drastically raises the odds of your implementation resulting in success with the least possible long-term time and cost.

Phases and Banded Timeframes.

One way of being realistic in planning your implementation is to break it into phases and introduce banded timeframes into the schedule. These banded timeframes include margin for each phase, which allows the project to remain on track if and when unexpected delays crop up. Breaking the project into phases also allows for better focus on each component. At the end of each phase (if not before), test the components that phase put in place to ensure all is working as expected. Testing early and often reduces unpleasant surprises and rework at the end of your implementation by allowing you to identify and fix issues before building on top of them. When planning your phases, make sure you consider which items are on the critical path, and put phases in a logical order.

Implementation Phases with Banded Timeframes

FULL IMPLEMENTATION: 6 MONTHS

MONTH 1	MONTH 2	MONTH 3	MONTH 4	MONTH 5	MONTH 6

Phase 1
1-2 months

Phase 2
1-2 months

Phase 3
1-2 months

◼ Estimated time needed   ◨ Margin

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Treasury Management Systems

Defining the TMS/TRMS

The treasury management system (TMS) and treasury & risk management system (TRMS) are solutions designed specifically to streamline the treasury department's daily tasks. They function as a central platform for treasury, helping integrate other internal systems while also offering robust functionality for tasks such as cash positioning, visibility, cash management, forecasting, and accounting.

However, the range of functionality is wide. Some TMS offerings cover only the basic treasury tasks listed above, while others offer advanced functionality in one or more areas. While a TMS with highly advanced functionality across multiple liquidity-related areas would also qualify as an ELM solution, many TMSs "specialize" in a single area of advanced functionality. As a result, there are TMSs available to suit a broad variety of needs. While the first TMSs were built for massive multi-national corporations that had the on-site servers to house them and the resources to maintain them, modern TMS offerings now serve everything from the massive company with sophisticated needs to the fairly small company just outgrowing Excel, with options for companies with specific areas of high intensity as well.

While all TMSs assist with risk management, some have more extensive capabilities in this area. These are often referred to as treasury & risk management systems. For our purposes in this report, however, we will refer to both types as TMSs.

In addition to assisting with various treasury tasks, a TMS provides an integrative central platform that ties treasury's digital ecosystem together. By offering robust integration capabilities, core treasury functionalities, and comprehensive data management, a TMS can serve as the central component that brings various tools together, enabling seamless connectivity, fostering open treasury practices, and facilitating efficient internal data management.

Hosting Models

TMS hosting models have seen clear progression in recent decades. Early solutions were all installed on premises, and these solutions still hold some of the market share, although few new implementations are installed now. Eventually, ASP options challenged the monopoly of on-premises solutions, but they never gained a majority of the market share. SaaS solutions, while initially viewed with some suspicion, have now become dominant in the TMS space for new purchases.

This shift is partly attributable to the lower burden on the client's IT infrastructure with SaaS, but another factor is the perception of value over time. While the predominant view of installed solutions is that they decrease in value over time, and the most common view of ASP solutions is that they are stable in value, most treasury and finance professionals see SaaS solutions as actually increasing in value over time.
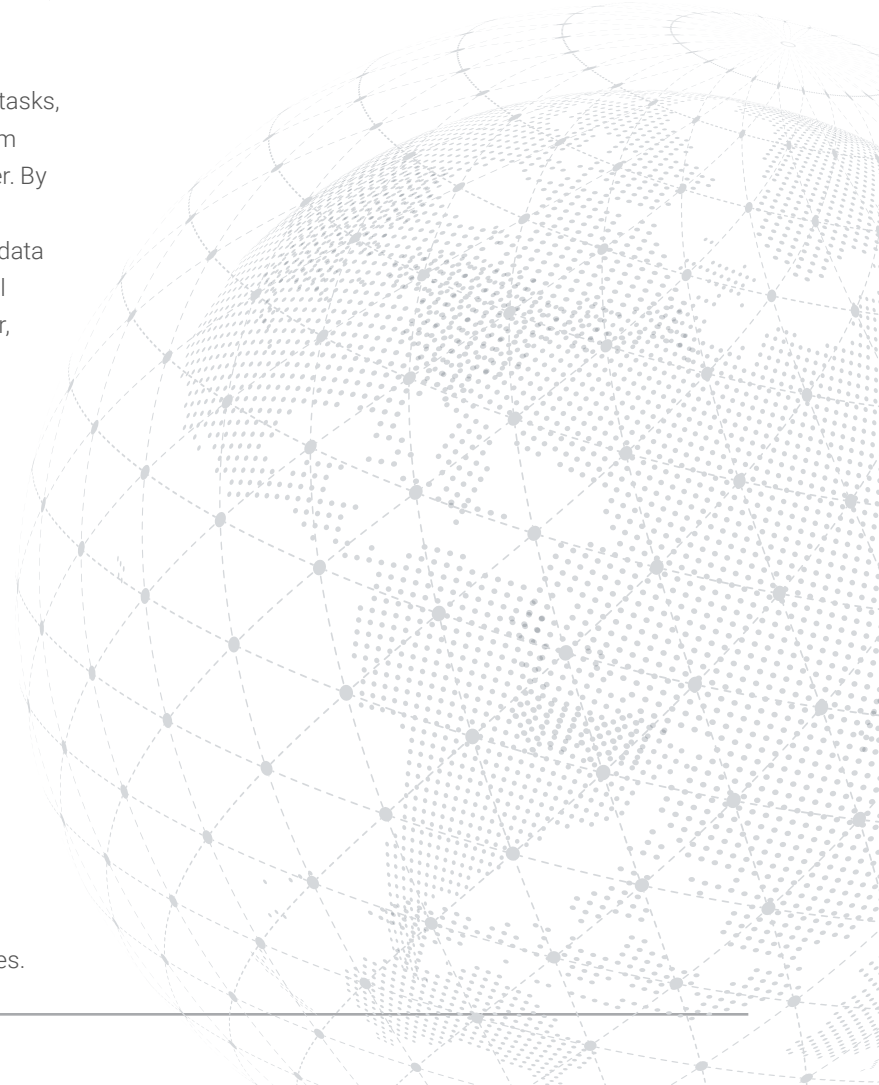
The ability to upgrade the system substantially over the years supports value growth, and the subscription payment model incentivizes it, as vendors only continue to receive payments by satisfying their customers with solid and improving functionality.

Adoption Rates

In 2023, over half (53%) of treasury departments used a TMS, with 16% planning to begin using one within two years. Thanks to strong democratization in the TMS space, the expected growth in the next two years is especially high among small companies (20% among companies with revenue under $500 million). The

current use rate in this category is much smaller, at just 30% in 2023, as companies of this size were typically unable to afford and support a TMS until more recent offerings began providing base TMS functionality at more affordable prices.

Q. For a TMS/TRMS by type of platform, how do you view the projected value proposition?

SaaS/Cloud
50%
28%
22%
0%

Hosted
38%
33%
17%
12%

Installed
50%
29%
12%
9%

Legend:
- Decreasing in value over time
- Stable value over time
- Increasing value over time
- Unsure or no perspective

TMS-Figure 1

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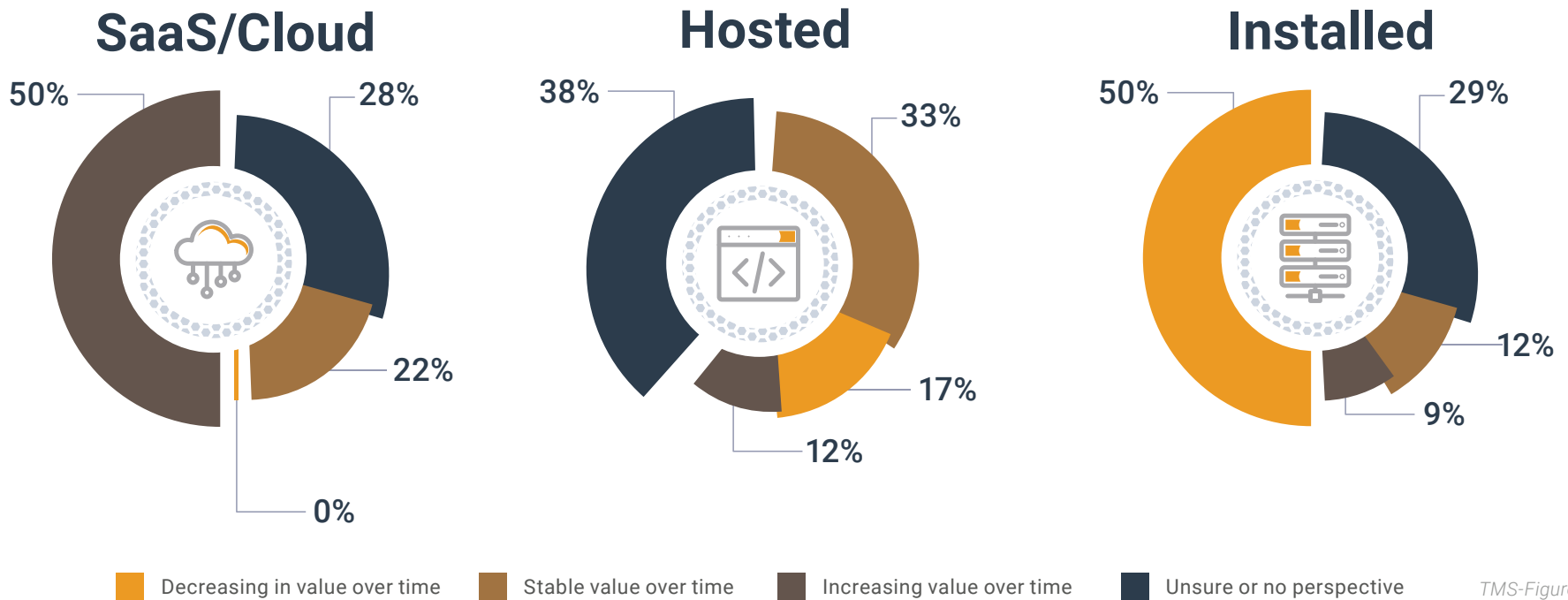
The Problems a TMS Solves

Efficiency for Overwhelmed Treasury Departments

We've discussed the rising demands on treasury and the fact that most treasury departments are anything but large. As companies grow more complex, treasury staff may reach a point where they are simply overwhelmed and unable to perform all their tasks without compromising accuracy, quality, or another task that needs their time. At this point, automating or streamlining many of their daily tasks through a TMS often becomes the wisest choice.

As the TMS speeds and simplifies many of the more repetitive tasks, staff are freed up for more strategic work. TMSs also offer staff access to timely, accurate data, allowing treasury to work faster and better in its advisory function.

Efficiency becomes more vital the more complex the company's financial and banking situation becomes. Acquired companies, added banks and accounts, geographic expansion, and many other factors that contribute to complexity all make a TMS's efficiency

benefits (one of the solution's main purposes) more and more important.

A Single Source of Truth for Data and Analytics

Organizational data functions in an ecosystem. The same data used by treasury may be needed and used in accounting and other departments as well. Meanwhile, treasury may need data that only AP has. If any of these departments are siloed, inefficient, or use tools that integrate poorly with one another, problems crop up. These problems may be the unnecessary cost and hassle of repurchased data, or there may be version control issues, poor BI tool integration, bottlenecked processes where one department is waiting on another to manually send information, and so on.

With rapidly growing data and a known need for analytics, treasury cannot ignore the need to facilitate good data management with their own technological choices. This may not be a pressing issue at some smaller companies, but for many companies, it is vital, and its importance is growing for all.

TMSs typically have strong integrative capabilities. As a central treasury dashboard that facilitates smooth data flow with other treasury tools, other departments, and any BI tools the company has in use, a TMS supports the "single source of truth" approach to data management. In this model, the most current and accurate data can always be accessed by all areas that need it from a single source.

Straight-Through Processing (STP)

In addition to supporting data management, strong integrative capabilities can also support STP. STP is the automation of financial processes to the point that they progress "straight through" the company's front (trading), middle (settlement/confirmation), and back (accounting/reporting) offices with no manual handoffs.

These offices are plagued by poor integration and manual processes at many companies, and since they all need much of the same information, this poor integration hampers efficient operations. The TMS's strong integration supports STP, helping financial processes and data flow seamlessly for stable, efficient workflows.

External Connectivity

Internal integration is not the only connectivity treasury needs. Banks, networks, market data providers, FX portals, and other external sources all have information that treasury departments use for their daily operations. The more sources there are, the less feasible it is to continue accessing them and downloading the information manually.

TMSs have solved this problem in different ways over the years. Until recently, SFTP connections were the main solution, and many modern TMSs still have SFTP connections built in for common sources such as Bloomberg and Reuters. APIs, however, are largely supplanting SFTP in connecting the TMS to banks and many other sources, as they allow for more flexible connectivity even when multiple sources are involved.

Security and Control

All areas of an organization have a responsibility to guard the sensitive data they work with. With treasury's access to the company's financial data and their ability to make payments, security and controls are vital. The TMS can help in five main ways:

01

BUILT-IN CONTROLS

Controls are only useful if they are used, and whether for malicious or innocent reasons, employees frequently bypass manual controls. A TMS can have controls built into the system, preventing payments or processes from proceeding unless the appropriate steps are taken first.

02

REDUCING TOUCHPOINTS

In addition to being a point of inefficiency, every manual touchpoint is a vulnerability. By reducing manual touchpoints, a TMS can significantly reduce the opportunities for a bad actor to insert themselves into the process.

03

NARROWING THE FRONT

Wars are easier to win when you aren't fighting on multiple fronts. This applies to fraud as well. Centralizing treasury's data and payment processes in one secure environment makes them far easier to protect.

04

VISIBILITY

Fraud cannot be detected and stopped if you cannot see what is happening. The timely visibility to bank accounts and activity that a TMS provides helps treasury detect fraudulent activity in time to do something about it.

05

SCALABILITY

Rapid scaling is sometimes necessary, but attempting to do so manually can result in compromised operational security. The TMS's efficiency adds to security by providing staff margin and flexible functionality and processing power, allowing them to scale up or down safely.

Managing Economic Volatility

Recent years have been tumultuous, and treasury's advisory function is arguably more vital than ever. To perform that function adequately, especially in times of volatility, treasury staff need timely, accurate information, and they need time to analyze, consider, and discuss that information. A TMS provides the margin and efficiency to accomplish this. Treasury cannot always know what the next disruptive event will be, but they can prepare for it by ensuring that they have tools and processes in place that will allow them to handle it.

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Do You Need a TMS?

01 Elevated Interest Rates and Fluctuating Inflation

Inflation and the interest rate hikes aimed at taming it have created a challenging and constantly fluctuating environment. While this environment is impacting everyone, from corporates to consumers, some industries have been harder hit than others. For some, the continuing viability of entire lines of business may be coming into question due to changes in prices, the cost of borrowing, or consumer behavior. The more inflation and interest rates impact your company, the more it might be wise to give your treasury department increased analytical power and margin by leveraging a TMS.

02 Global Conflicts

From war between Russia and Ukraine to threats of conflict elsewhere, organizations are having to cope with an intimidating and highly uncertain global situation. Each development in the conflicts has chain reactions that can impact supply chains, operations, availability of materials, and more. For some companies, these realities and threats are relatively minor issues, while for others, they pose a significant challenge that requires careful risk management and analysis. In the latter case, using a TMS to strengthen your treasury operations may become more important.

03 Uneven Economic Performance and Recession in Certain Regions

The multitude of factors complicating the economy are also creating different situations in different regions. In addition to the international conflicts, local policies surrounding interest rates and other issues are creating unique challenges (some more severe than others) in each country and region. Some regions have reached recession, while others may still avoid it. This can impact companies with headquarters, offices, operations, and supply chains in various regions. If the combined status of your headquarter country and other countries that impact your operations is straining your company or making it too difficult for treasury to assess the situation, a TMS may be able to help you manage the confusion more effectively.

04 Elevated Payment Concerns

While treasurers are now able to reap many benefits from modern technology, criminals are unfortunately finding efficient ways of leveraging it as well. Payment fraud is an ongoing and elevated concern for many companies, and the recent surge in AI availability is adding to the problem. However, technology can also be part of the solution for companies highly concerned about payment fraud, as a TMS strengthens the treasury department's security and improves the visibility that allows treasury to monitor for payment fraud elsewhere.

Emerging Technologies Impacting the TMS

How do AI/ML, APIs, and other innovations specifically impact the TMS? The following are the emerging technologies most relevant to the TMS, with a discussion of how they are currently impacting and may later impact the usefulness of these solutions.

AI/ML

AI and ML have been a popular topic in 2023, but their application within the TMS is not entirely new. While they have seen promising and growing use in TMSs for several tasks, there are two most notable use cases: cash forecasting and anomaly detection.

Cash forecasting is an area that treasury professionals consistently report spending much of their time on, and yet many also report that the time they do spend on it is insufficient. Once made, the forecasts are also often inaccurate. Some vendors have been finding good success in applying machine learning to the task of forecasting. With adequate historical data, these applications are proving accurate and efficient at predicting cashflow. While ML-powered forecasting is fairly new and not built into all TMSs, it is likely to become more widespread.
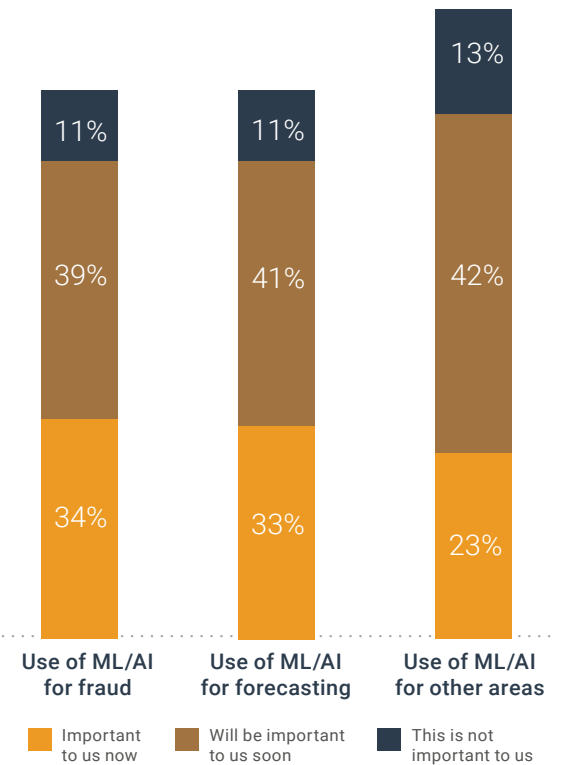
Anomaly detection is another area where AI and ML have proven highly useful. Fraudulent activity tends to break the normal pattern of system usage, such as an unusually large transaction being initiated after normal working hours, or an unusual number of files being accessed in a short amount of time. AI and ML excel at pattern recognition and, therefore, at recognizing when activities fall outside the normal range. The TMS can then flag the suspicious activity and, in some cases, hold payments until they are released by an analyst.

Data: BI Tools and Dashboarding

The adoption of BI tools is being driven by a natural stick and carrot approach: the stick is the need for some kind of tool to help manage the ever-growing masses of data, while the carrot is the advantages of enhanced analytical capabilities applied to that data. BI tools are vital to most robust data management strategies, but they can do very little if they are not given proper access to the data. TMSs' integrative capabilities allow data to flow to BI tools, and some TMS vendors are exploring offering BI tools and dashboarding options themselves.

Q. When it comes to machine learning (ML) and artificial intelligence (AI), what is important to your organization in product development? *(Unsure responses are not shown)*

	Use of ML/AI for fraud	Use of ML/AI for forecasting	Use of ML/AI for other areas
This is not important to us	11%	11%	13%
Will be important to us soon	39%	41%	42%
Important to us now	34%	33%	23%

Important to us now | Will be important to us soon | This is not important to us

TMS-Figure 2

APIs

With PSD2 promoting open banking, API use has seen globally increased adoption for bank connectivity. SFTP has become a minor part of the connectivity in modern TMS offerings, while APIs are enabling flexible connectivity to more banks and other external sources than was previously feasible.

APIs are also enhancing and changing internal connectivity, allowing for increasingly seamless integration with other solutions and tools in the technology stack. When selecting a TMS, treasury must keep in mind that the robust integration enabled by APIs has the potential to revolutionize how internal ecosystems work and how data flows. Different vendors take different approaches with their APIs and API libraries. Investigate and factor in your company's current ecosystem and integrative trajectory before choosing a solution.
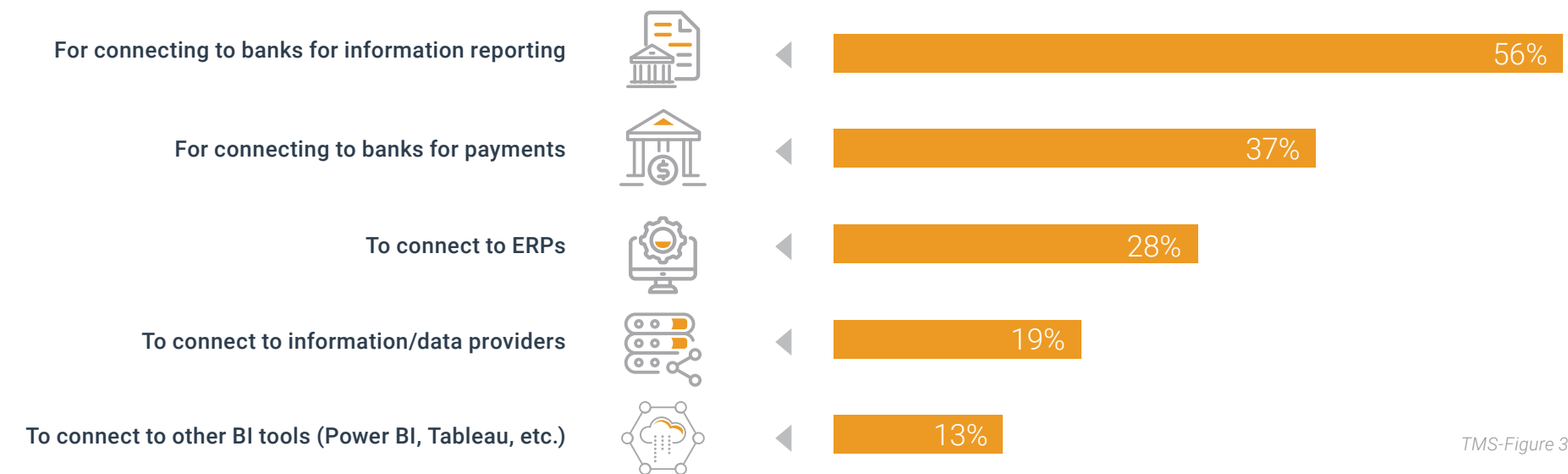
Cloud-Native or Miniaturization

Another area of innovation with potential to change how solutions are developed is the move to the cloud and the attendant "miniaturization." Using smaller and smaller components of code is allowing developers to build functionality piece by piece, sliding each layer in and out as needed without disrupting the function of the rest. This leads to development speeds and levels of scalability and flexibility that were unachievable with previous models.

While many vendors offer modern and highly effective solutions that are not cloud-native and do not use microservices, and these solutions are likely to continue to serve treasury well for some time, it seems likely that the industry will continue to progress in this smaller and more cloud-native direction over the years. With many advantages that point to long-term viability and adaptable relevance to the client's needs, these innovations should be carefully considered by those seeking a TMS.

Q. Through our TMS/TRMS vendor, we use APIs:
(Select all that apply. Only top choices shown.)

Category	Percentage
For connecting to banks for information reporting	56%
For connecting to banks for payments	37%
To connect to ERPs	28%
To connect to information/data providers	19%
To connect to other BI tools (Power BI, Tableau, etc.)	13%

TMS-Figure 3

Selecting and Implementing a TMS

The following leading practices for selection and implementation are intended to augment the points on selection and implementation in the Overview section and address some TMS-specific considerations.

Selection

The stakes are high when selecting a TMS. As the core treasury system your team expects to use for its daily tasks for decades, the product you choose will inevitably have a significant impact on your department's long-term success. To ensure this impact is positive, do extensive research both on the product and on your own company's plans and anticipated future needs. Talk to your IT department about the current and planned ecosystem of the organization and how different types of TMS offerings would fit into it. Keep in mind the innovations discussed above and their potential trajectories.

Be cautious, as well, in narrowing your scope. Many treasurers are likely familiar with a small handful of TMS providers, and you may be tempted to go into the selection process with assumptions and biases. These assumptions and biases might blind you to a lesser-known provider or solution that ideally suits your specific needs or to a lack of alignment between your needs and a certain provider you're biased towards.

Consider all your options before narrowing it down to your short list. Once you have that short list, be quite thorough with your due diligence, roadmap discussions, and demos, and consider the solutions in light of where the TMS landscape overall seems to be heading.

Implementation

Implementing a sophisticated solution that needs to integrate with multiple internal tools and to connect to multiple external sources is not a simple task. The high stakes are not over when the selection ends. A poorly implemented TMS is likely to result in underperformance and underuse, preventing you from meeting your ROI, making it more difficult to gain buy-in the next time you need a project funded, and making your staff's daily tasks more frustrating than they needed to be.

Fortunately, it doesn't need to go that way. If you approach your project with care and a realistic mindset and follow leading practices such as the following and those in the Overview section, you can avoid the pitfalls and navigate your project to a successful finish.

1. **Margin:** The recommended method of breaking your project into phases with banded timeframes is particularly vital for a TMS project. There will be several different elements to set up, each with its own complexities. The phased approach allows you to test each one before moving on, and the banded timeframes provide margin you are likely to need as you move through such an extensive project. Some things cannot be sped up beyond a certain point no matter how many resources you throw at them, so be sure to plan adequate time and margin for the inevitable unexpected issues.

2. **The Right Resources at the Right Times:** Assuming you are following the recommended phased approach for implementation, the phased plan you lay out will allow you to see when different types of resources will be most needed. You can then check on when resources will be available. Plan this out carefully, as you may find that even if you have sufficient coverage for the project as a whole, a certain phase of it will need more of a certain resource than will be available at that time. Work with your vendor, your IT department, and (if needed) a third party to ensure that each phase is properly covered.

3. **Be Open to New Processes:** Your old processes may not work well with your new TMS. Don't try to make them. As attached as we all become to the processes we're accustomed to, reimagining your workflows and choosing processes that are efficient and that work well with your new system will serve you far better in the long run.

Treasury Aggregators

Defining the Treasury Aggregator

Treasury aggregators (TAs) serve treasury departments with complex connectivity needs by providing information consolidation and payment hub functionality. Put simply, they pull data into the company and send payments out.

On the information consolidation side, TAs connect to sources and consolidate the data they pull from those sources. This largely means pulling in bank statements, both summary and detailed, and translating the information into formats that can be used in internal systems such as a TMS, ERP, reconciliation platform, etc. Connectivity methods vary in TAs and may include SFTP, APIs, and networks.

For payment hub functionality, TAs are able to receive payment files from other internal platforms and originate the payments, and payment requests can also be entered and managed directly from the TA. Again through connectivity methods such as SFTP, APIs, and networks, the TA formats and delivers payment files to banks. Validation and confirmation serve to raise the security level.

Data In

AGGREGATOR

Payments Out

Differentiating the TA

The TA is one of the more difficult treasury technology types to differentiate from other solutions, as its functionality does overlap that of several others, including payment hubs, payment factories, data consolidators, and TMSs. However, what makes the TA fairly unique is its combination of capabilities. Payment hubs, payment factories, and data consolidators each handle either the payments functionality or the data consolidation functionality. A TA must, by definition, handle both.

Depending on the particular offering, some TMSs overlap more thoroughly with TAs, with some even qualifying as TAs by our definition. However, these offerings are rare, as the category of the TMS does not require the intense connectivity, data consolidation, payment validation, and compliance capabilities that are necessary for a TA. In addition, the TMS's focus is more on analyzing and applying the data that the TA is simply focused on bringing in. Most companies with enough complexity to need a TA would not find most TMS offerings sufficient by themselves, and many companies use a TA and TMS together.

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TAs: Simplicity for the Complex Treasury Department

Bank and Bank Account Complexity

One of the core areas of complexity that TAs are designed to address is that of banks and accounts. A couple of banks and a few accounts are typically not overwhelming for treasury, but even moderate organizational growth can lead to outsized jumps in the numbers of banks and accounts. As their banking structure grows and becomes more complicated, treasury staff using manual processes end up spending more time than they can afford logging into portals, collecting statements, and transferring and managing data in spreadsheets.

At this point, achieving basic cash management and reporting in a timely manner becomes difficult, hampering visibility, and there is little time left for strategic tasks. Rushed manual work lends itself to errors, creating more delays and bottlenecks, and poor visibility impedes fraud detection and good decision-making.

Alleviating this issue by automating the data collection and consolidation process is one of the TA's main purposes. With the ability to build out connections to virtually any bank, TAs pull in and format bank data rapidly, allowing staff to move forward with accurate, timely data for strong analysis and decision-making and preventing fraudulent bank account activity from going unnoticed for too long.

Payment Complexity Calculator

	PAYMENT ORIGINATION AREAS	PAYMENT SYSTEMS	PAYMENT TYPES	PAYMENT FORMATS	PAYMENT BANKS	PAYMENT CURRENCIES	COUNTRIES	COMPLEXITY DIRECTION	
9		>20		>31	>20	>30	>40		
8	>20	16-20	>20	21-30	16-20	26-30	31-40		
7	16-20	11-15	16-20	16-20	11-15	21-25	21-30		
6	11-15	9-10	11-15	11-15	9-10	16-20	16-20		
5	9-10	7-8	9-10	9-10	7-8	11-15	11-15		
4	7-8	5-6	7-8	6-8	5-6	6-10	6-10	Increasing Rapidly	x 1.5
3	5-6	**3-4**	5-6	4-5	**3-4**	3-5	3-5	**Increasing**	**x 1.2**
2	**3-4**	2	3-4	**2-3**	2	**2**	**2**	Remaining Constant	x 1
1	1-2	1	**1-2**	1	1	1	1	Decreasing	x 0.75

FINAL SCORE RANGES

HYPER COMPLEX	**51 +**
HIGHLY COMPLEX	**37 - 50**
COMPLEX	**22 - 36**
MODERATE	**15 - 21**
SIMPLE	**7 - 14**

Sample Raw Total	15
With Factor Applied	18

Data Aggregation Complexity Calculator

	SOURCES OF DATA (BANKS)	SOURCES OF DATA (EXTERNAL INFORMATION)	SOURCES OF DATA (INTERNAL)	FORMATS OF DATA	RECEIPT / DELIVERY ENDPOINTS	TRANSFORMATIONS REQUIRED (INTERNAL)	COMPLEXITY DIRECTION	
8	>20	>10	>20	>20		>20		
7	16-20	9-10	16-20	16-20		16-20		
6	11-15	7-8	11-15	**11-15**	>25	11-15		
5	9-10	5-6	**9-10**	9-10	16-25	9-10		
4	7-8	4	7-8	7-8	**11-15**	**7-8**	**Increasing Rapidly**	**x 1.5**
3	**5-6**	3	5-6	5-6	6-10	5-6	Increasing	x 1.2
2	3-4	**2**	3-4	3-4	3-5	3-4	Remaining Constant	x 1
1	1-2	1	1-2	1-2	1-2	1-2	Decreasing	x 0.75

FINAL SCORE RANGES

HYPER COMPLEX	**43 +**
HIGHLY COMPLEX	**31 - 42**
COMPLEX	**19 - 30**
MODERATE	**13 - 18**
SIMPLE	**6 - 12**

Sample Raw Total	24
With Factor Applied	36

Calculate Your Complexity: Two primary elements determine your need for a treasury aggregator: the complexity of your payments and the complexity of your banking information structure. To determine each, use the calculators above. The lefthand column numbered 1-9 is your score for each of the following columns (3-4 Payment Origination Areas = score of 2; 3-4 Payment Systems = score of 3; etc.). Your "Complexity Direction" should be multiplied by the sum of your score for the other columns, yielding your final result. The bolded selections for each column show a sample score, with the corresponding sample results shown below the final complexity ranges for each calculator.

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VENDOR

Payments: Types, Formats, and Intensity

FIXED FORMATS

0000000000

DELIMITED

000,000,000.00

EXTENSIBLE

(pMT AMT) 0,000.00 (pMT AMT/)

Payment innovations, from FedNow to XML, come with many benefits, such as speed and enriched data. That said, they can sometimes lead to increased complexity. The old is typically phased out far more slowly than the new is phased in, meaning that many companies find themselves trying to support a multiplying set of payment types and formats. In addition to innovation and the passage of time, organizational growth may also require adoption of new types and formats, as well as increasing the organization's overall payments intensity.

With high volumes of payments, multiple types, and multiple formats, a solution that specializes in managing that complexity can become needful. TAs maintain fluency in both old and new formats, translating payment data as needed, and help treasury manage high volumes of payments, taking the situation from untenable to fairly simple for staff.

Security

Due diligence during the selection process is vital to ensure a particular TA is up to standards, but these solutions are typically highly secure, using SOC certified data centers, data encryption, and secure access methods. As such, they are a secure way of narrowing the front in your company's war against fraud. For the complex companies that find themselves considering TAs in the first place, that front often desperately needs to be narrowed – oftentimes, more than they realize.

Companies that perform a formal inventory of payment processes often find 50-100% more than they had initially believed existed. Numerous payment processes are difficult to properly protect even if treasury knows about them. Corralling those payment processes into a single, secure system such as a TA narrows the front and simplifies the defense, boosting clarity about exactly what payments are being made.

On the data side, each bank account is also a point of exposure, and yet 18% of treasury groups in 2021 had discovered active bank accounts within the previous two years that had not previously been accounted for. TAs improve visibility into bank accounts and their activity, allowing for far better watch to be kept on whether anything suspicious is occurring.

Q. **Within the past two years have any active bank accounts been discovered that were previously unaccounted for by treasury?**

YES **18**%

72%

10%

NO

UNSURE
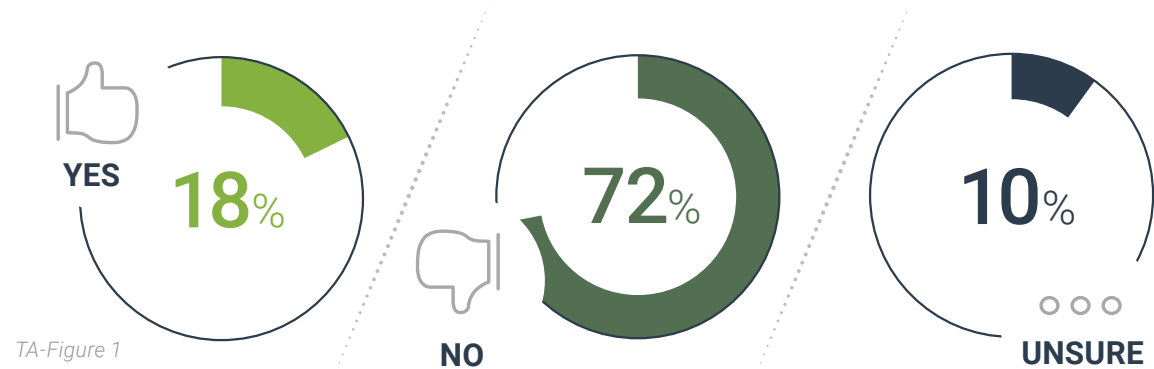
TA-Figure 1

Compliance

In an environment of ever-increasing regulations, TAs can offer valuable assistance with some of the requirements causing headaches for corporations. A TA may help your company meet the technical requirements for standards such as P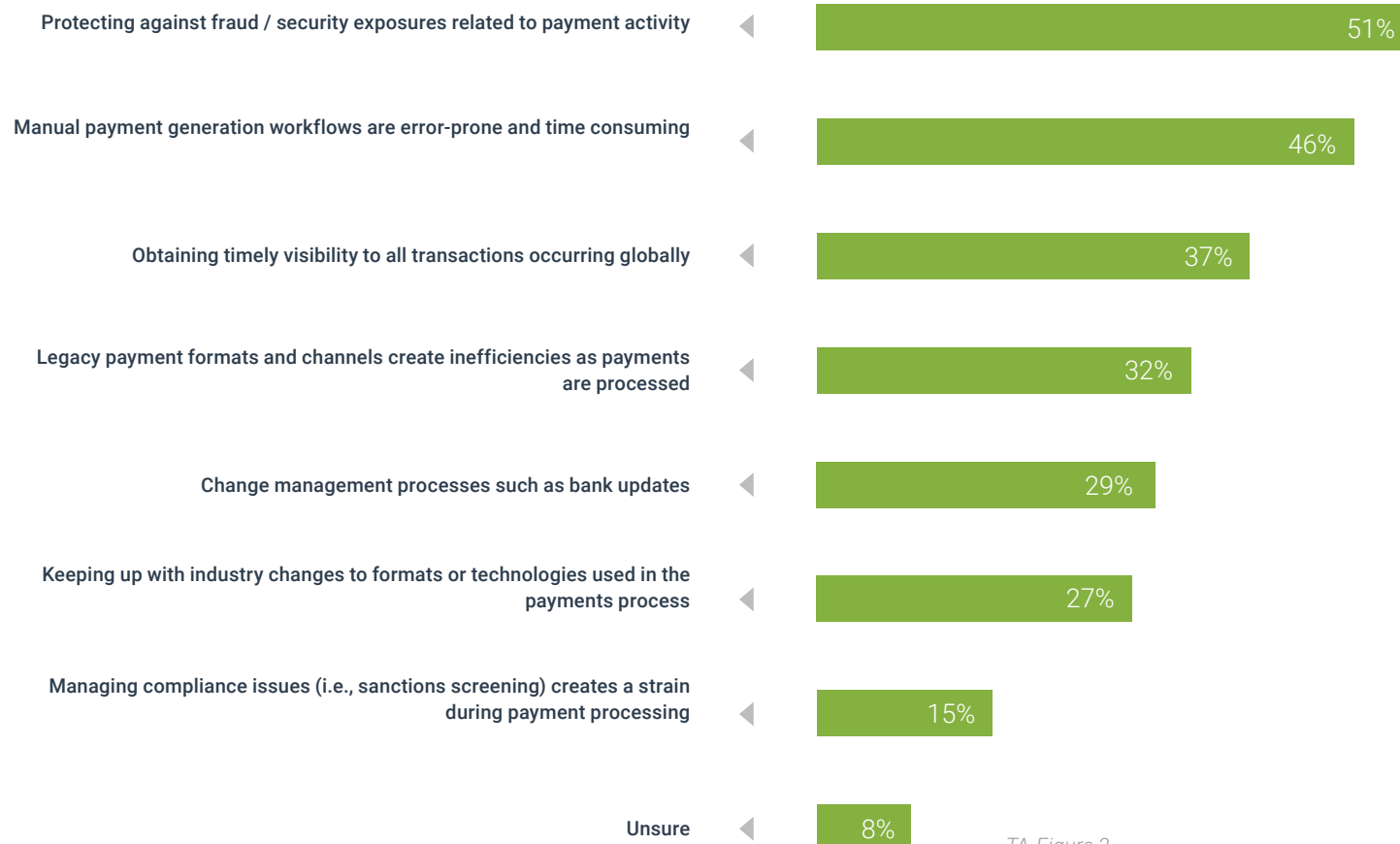CI-DSS or Nacha's rules and guidelines, and some offerings provide assistance with bank account and signer tracking to support FBAR requirements.

TAs also typically screen payments for potential sanctions violations, minimizing the chances of a fine with minimal hassle to treasury staff. Many corporations still leave sanction screening to their banks, but OFAC and similar regulatory entities have shifted toward holding corporations responsible for their own violations rather than stopping at the banks. Corporations have seen fines up to $100mm for negligence in sanctions monitoring in the past decade.

Q. **Please select up to the top 3 challenges treasury experiences regarding their B2B payments:**

(Not all choices included)

Protecting against fraud / security exposures related to payment activity — 51%

Manual payment generation workflows are error-prone and time consuming — 46%

Obtaining timely visibility to all transactions occurring globally — 37%

Legacy payment formats and channels create inefficiencies as payments are processed — 32%

Change management processes such as bank updates — 29%

Keeping up with industry changes to formats or technologies used in the payments process — 27%

Managing compliance issues (i.e., sanctions screening) creates a strain during payment processing — 15%

Unsure — 8%

TA-Figure 2

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Global Expansion

Expanding into a new region brings nearly exponential growth in complexity, with companies facing new payment rails, formats, currencies, regulations, and networks, as well as new banks and accounts. For treasury and other departments involved in payments and financial data, this can quickly become overwhelming without the right tools.

TAs specialize in handling these types of complexities and managing the extensive connectivity and translation needs that arise in global companies. If a small regional bank uses a proprietary format the TA does not already have, the aggregator will typically build out a connection. Standard regional formats, however, and some proprietary ones, are usually built into the TA.

Visibility and Cash Positioning

By automating bank data consolidation, eliminating the manual effort and time needed to download and handle bank data, TAs support treasury's need for timely visibility and cash positioning. Their internal connectivity capabilities also support other departments' and tools' needs for bank data. While frequently used in conjunction with a TMS, most TAs offer basic reporting for visibility and cash positioning.

Efficiency

Not every task can be automated well, and not every area for automation makes the same amount of difference to departmental efficiency and staff time. Aggregating bank data and managing outbound payments are among the tasks that take a massive amount of time with manual processes if any significant complexity is present, but they are also tasks that automate well. For treasury departments facing complexity and time crunches due to manual processes, a TA should be considered.

Do You Need a TA?

01 Expansion or Acquisition

Treasury must be able to support its organization's growth. Especially when that growth is significant and rapid, as in the case of an acquisition or an expansion into a new region, supporting it can place an immense burden on treasury. In cases like these, a TA's ability to reduce the complexity of handling payments and bank data can empower treasury to support organizational growth safely and efficiently.

02 Payment Security

With the ongoing and rising threat of fraud, securing payments is always vital. For companies struggling with vulnerabilities and complex payment processes that are difficult to defend, centralizing payments through a TA should be considered.

03 Payment Compliance

Sanction screening and other payments regulations are a hassle. If your company is struggling to meet necessary regulations, consider whether a TA would help bring the organization up to standards and potentially avoid a fine.

04 Format Changes and Sunsetting

As new payment formats are introduced and adopted and others sunset, companies must adjust. For those highly impacted by the difficulty of trying to manage these format changes manually, a TA may be a good option.

05 Solving Problems Repeatedly

Having multiple payment streams can sometimes mean having to fix the same problem or make the same change multiple times. This can happen, for example, when a back-end system is changed. Centralizing payments through a TA can mitigate this issue, allowing you to solve the issue just once.

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Emerging Technologies Impacting the TA

Technology's rapid march forces all solution types to adjust, whether by embracing new innovations or redefining themselves to remain competitive in the face of new challenges or new competition. The innovations impacting the TA are varied, ranging from some that are adding value to TAs to some that could be perceived as competition, while other innovations are simply changing the entire landscape and making the distinctions between solutions slightly less clear.

Faster, Better Payments

With FedNow finally in play in the US and many other modern payments rails around the world offering speed and enriched data, tools that make it easier to leverage these payment types are only increasing in utility. The complexity added by supporting these new payment rails is one driver of TA use, but another driver is the fact that these new payment types often come with significant advantages, whether in their speed, enriched data, or visibility. Having a tool that allows you to leverage them far more easily, then, both reduces a burden and opens the door for greater opportunities.
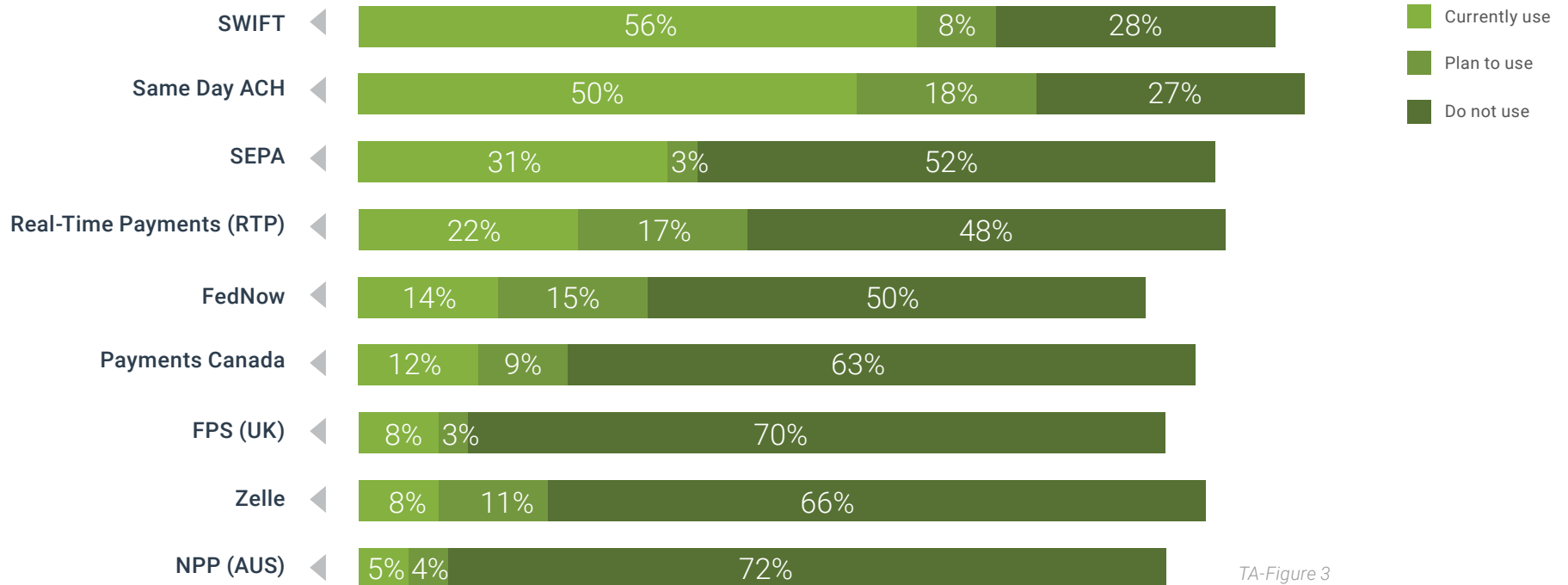
APIs

Despite being another highly popular way of connecting to banks, APIs have surprisingly little influence on TAs. At high levels of complexity, where TAs are most useful, APIs are often less cost-effective, as they tend to result in companies paying for data multiple times. While APIs excel at what they are good at, they lack the robust set of functionality and the affordability of a TA for complex companies.

Q. **Which real-time payment types are you using?**
  (N/A not included)

	Currently use	Plan to use	Do not use
SWIFT	56%	8%	28%
Same Day ACH	50%	18%	27%
SEPA	31%	3%	52%
Real-Time Payments (RTP)	22%	17%	48%
FedNow	14%	15%	50%
Payments Canada	12%	9%	63%
FPS (UK)	8%	3%	70%
Zelle	8%	11%	66%
NPP (AUS)	5%	4%	72%

TA-Figure 3

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Data Management

With the high priority companies are beginning to place on data strategy, tools that support robust data management, including TAs, are becoming increasingly desirable. As noted in an earlier section, BI tools are highly useful for harnessing the masses of data companies produce, but they can do nothing if they don't receive the data. TAs help ensure that they do.

Networks

As networks expand their functionality and reach, TAs' usefulness as a way of leveraging those networks also expands. Swift's new platform for messages, which seeks to increase visibility and reduce information loss, is just one example of the innovations being made in networks that TAs can help treasury leverage.

Blurred Lines as Capabilities Expand

As cloud-native, microservices, PaaS, APIs, and embedded functionality grow more prominent, they are beginning to blur the lines between solutions. The rapid development and the ability to plug separate pieces of functionality together cleanly allow vendors to easily offer solutions that overlap multiple technology categories or that integrate so smoothly that it's becoming harder to say where each solution's functionality begins and ends. The TA is still a highly relevant solution type, but as some solutions' functionality expands in multiple directions at once, distinguishing the TA category clearly in some cases is slowly becoming more difficult.

Implementing a TA

The specific practices advised for implementing a TA mostly relate to the heavy connectivity and integrations that must be set up and the effects this may have on the implementation process.

External Integrations: Banks

Once in place, a TA's bank connections can save treasury a great deal of time. Getting them all set up, however, may take a while, and ample time should be allowed. From identifying the right contact for each bank to complying with KYC requirements, there are many areas where delays can manifest.

Bank onboarding is also one of the areas where speed can only be increased so much by adding more resources. Sometimes, a bank holiday occurs, and a connection simply cannot be tested until afterward no matter how many internal staff you have waiting to make it happen. Plan plenty of margin for this process, but also plan out contact information, critical path items, and other details as much as possible ahead of time to avoid the delays that can be foreseen.

Internal Integrations

The TA's many internal integrations also require careful planning and careful execution. How many of these integrations there are and what all they entail will be unique to each organization, but certain steps will be universally advisable:

1. **Consult Your IT Department:** Planning out the internal integrations will require early and ongoing assistance from those who know your organization's ecosystem best: IT. Consult them on your project early in the process, keep them in the loop as it progresses, and heed their advice throughout.

2. **Test Early and Often:** The earlier you run careful tests on your integrations, the sooner you can identify any problems. The earlier in the process you identify problems, the easier they will be to fix. To avoid rework and other headaches, test each connection carefully as soon as it is online, and do not procrastinate on fixing any issues.

Training Staff

Training your staff on the new TA system must be done at the proper time. Such connectivity-heavy implementations may take some time, so if employees are trained at the very beginning of the project, they may have forgotten much of what they learned by the time they go live using the system. On the other hand, training after they have already begun using the system is also a pitfall, as it can lead to the development of poor habits. Strike the middle ground and train staff shortly before you begin using the system.

Supply Chain Finance and Cash Conversion Cycle Solutions

Some solutions count as treasury technology because they help treasury with its daily tasks. Others are treasury technology because they impact or help manage organizational liquidity. This latter group includes supply chain finance and cash conversion cycle solutions, a broad grouping of tools that infuse efficiency into the cash conversion cycle and improve working capital and liquidity management.

Definitions:
The Terms and Goals

Certain terms are defined differently by various groups, leading to frequent confusion in organizational conversations. Several of those terms are relevant to the solution types discussed in this section, so we will begin by defining our terms and noting what treasury's goals are in these areas.

Working Capital
Treasury uses the term "working capital" to refer to the cash available for the running of the business. This use may also be called "net adjusted working capital" (NAWC) and is notably distinct from accounting's more traditional concept of working capital as the

organization's ability to meet current obligations. Since they aim at measuring different things, these two concepts of working capital are also calculated differently:

> *Traditional working capital (used by accounting):* **Working capital = current assets − current liabilities**
>
> *Net adjusted working capital (used by treasury):* **Working capital = AR + inventory − AP**

The treasury definition of working capital is what we will be focusing on in this report, and when most treasurers speak of "optimizing working capital," they are using the NAWC definition. However, it is important to note that the traditional definition is not inferior. It very effectively serves an important purpose – ensuring the company can meet obligations – and is easy to calculate just from numbers found on the balance sheet. Keep the differences in mind in conversations with accounting and other groups in your company, but for our purposes in this report, you may assume the treasury definition from here on.

Since working capital makes up a significant portion of most organizations' liquidity, managing it appropriately is a priority for treasury. This appropriate management, however, will not look the same at all companies, and even within the same company, different needs and factors must be managed as time passes.

Optimized working capital is neither minimized nor maximized, as excess working capital ultimately leads to lower organizational value, while a scarcity of working capital puts a strain on liquidity. To strike the right balance and calibrate working capital properly over time, treasury needs ways of controlling the wide spread of factors that impact working capital. The solutions within this section, while varied, all offer some of that control through efficiency and flexibility.

Cash Conversion Cycle
The cash conversion cycle (CCC) is the amount of time a company takes to convert resources to cashflows. This is typically calculated by adding days sales outstanding (DSO) to days inventory outstanding (DIO) and subtracting days payables outstanding (DPO). The formula, DSO + DIO − DPO, tracks the time it takes from investing cash into inventory to being able to reinvest the cash from its sales into the cycle again. This measurement is used to determine whether processes involved in working capital are efficient.

Given that the CCC is composed of a multitude of departments and processes, each of which impacts working capital and has its own concerns to consider, minimizing and maximizing are once again poor goals in comparison to optimization. Efficiency is a primary concern with the CCC, but it is vital to keep in mind that efficiency is not simply about minimizing time, but

about optimizing processes so that they accomplish their goals properly without wasting time. This efficiency leads to flexibility, as it makes it possible to choose when things take place and scale up and down as needed.

Supply Chain Finance

Supply chain finance (SCF) is another term with more than one definition. For our purposes, we will be using the Euro Banking Association's definition: "The use of financial instruments, practices, and technologies to optimize the management of the working capital and liquidity tied up in supply chain processes for collaborating business partners." This fairly broad definition encompasses many methods and programs, some of the most common of which will be discussed later in this section.

Cash Conversion Cycle Solutions

The cash conversion cycle, with its multitude of processes, is a complex area to optimize. The solutions that help automate the CCC are numerous and varied, including any technology that increases the efficiency and accuracy of any part of the cycle. These solutions may have a narrow focus on just one process, or they may streamline a number of processes and the transitions between them.

With each area in the cycle having its own concerns and goals, the CCC is particularly prone to competing key performance indicators (KPIs) and inefficient processes. Since each process in the CCC impacts the overall time the cycle takes and ultimately impacts

working capital, inefficiency anywhere in the CCC is a matter of concern to treasury.

Despite standing outside the CCC and having little direct involvement in the processes that form it, treasury is ideally suited to spearhead CCC automation efforts. This is because treasury's goal – proper liquidity and working capital management – is the appropriate focus for CCC automation, and treasury's outside perspective allows it to help the departments involved work through competing KPIs and reach common goals. This requires careful listening on treasury's part to make sure it understands each area's concerns and priorities. The following overview may serve as a starting point in grasping the different departments and priorities involved.

Cash Conversion Cycle: Automation Opportunities
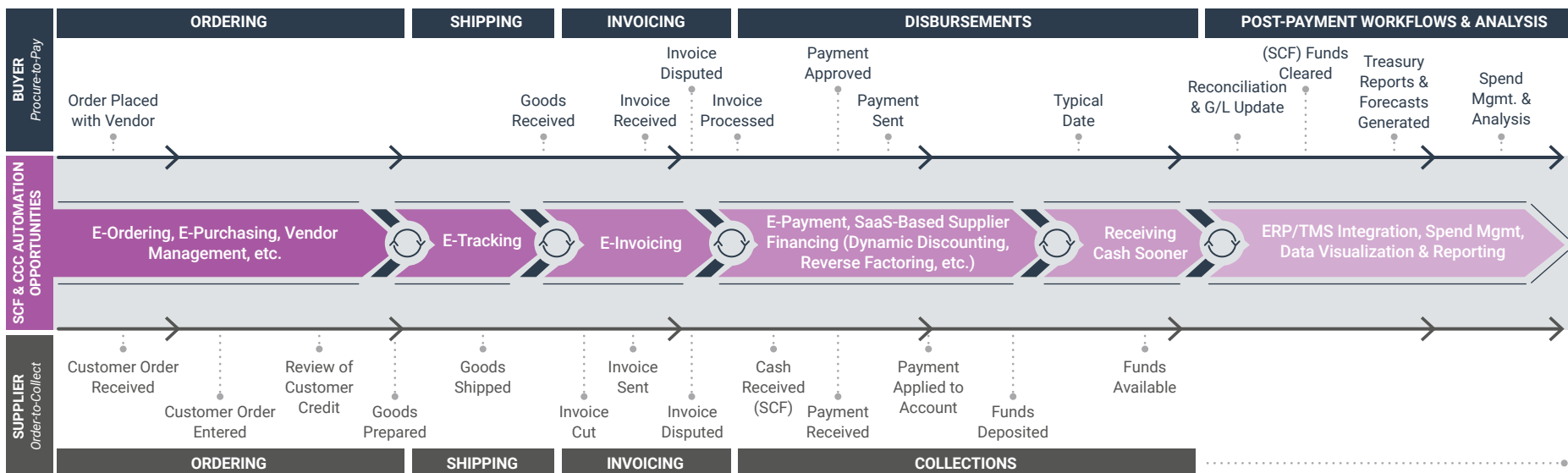
Challenges Across the Cycle

While the CCC differs somewhat depending on industry, size, and so on, the following areas are frequently involved:

Procure-to-Pay

The procure-to-pay process encompasses obtaining and paying for inventory, with two main areas involved.

Procurement: This department has multiple concerns to balance. Cost is a priority, but diversification of suppliers, quality of inventory, and the overall stability of the supply chain must be taken into consideration as well.

Accounts Payable (AP): Typically lightly staffed like treasury, the AP department focuses on DPO and controls. Opportunities for discounts through early payment must be balanced with keeping DPO above the minimum levels, as the organization generally wants to hold onto cash for as long as possible.

Inventory

Typically composed of just one department, inventory sits at the heart of the CCC and yet is quite distinct from all the other areas. It endeavors to maintain adequate inventory without investing space and cash in maintaining unnecessary amounts. Recent years have seen an abrupt change in trajectory in how this is managed, moving from the once growing "just-in-time" ideal to a more "just-in-case" approach in response to supply chain disruptions.

Most of the solutions discussed in this section have relatively little direct impact on inventory, but inventory does have a significant impact on liquidity. As a result, this department needs to be involved in the conversation regarding any initiatives for working capital and the CCC.

Order-to-Collect

The final stage of the cycle, the order-to-collect process, covers the sale of inventory and receipt of payment. Several different departments are involved.

Credit: Those that issue credit are primarily focused on minimizing losses that could be incurred by over-extension of credit. They sometimes have insufficient incentive to avoid under-extension of credit, but this is also important, as needlessly refusing to issue credit can result in the company losing valuable sales.

Sales: On the other end of the spectrum, sales is focused on maximizing sales or the capacity to sell, and incentives can be lacking to balance this against potential over-extension of credit and other issues that degrade operations, revenue, or relationships.

Fulfillment: Appropriate delivery of orders in a timely manner is the one main concern of the fulfillment department.

Invoicing or Billing: Accuracy and speed are both priorities for this department, where errors and delays can both be costly for the organization. Automation can be particularly effective in this area.

Collection and Credit Application: Relieving AR and maintaining DSO in accordance with promised terms are the priorities of this department.

Procure-to-Pay Automation

All areas of the CCC are prone to inefficiency, and procure-to-pay is no exception. Most solutions in this area help increase efficiency, but there is significant variation in where and how they do this. They may be industry specific or not, standalone or integrated into another solution (e.g., an ERP or SCF solution), outsourced or internally managed, interdepartmental or department specific. Some of the most common procure-to-pay automation tools include the following:
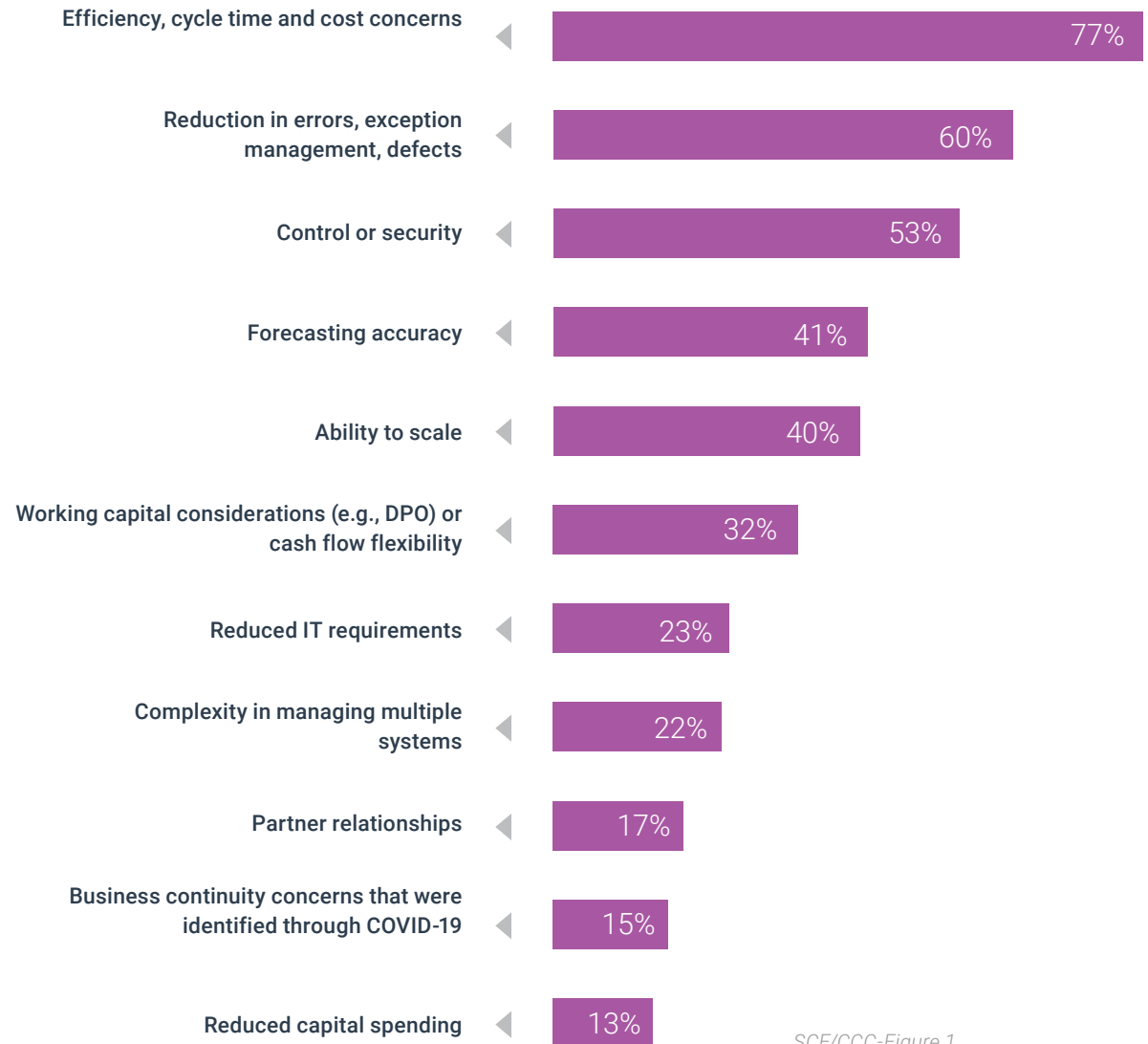
> Procurement platforms
> Vendor management
> Compliance management
> Receiving goods and services
> Receiving invoices
> Payment tools (AP)

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AP has proven a particularly good candidate for automation, with companies that implement it often seeing significant improvements in speed, error rates, and security. While reaching fully electronic processes in AP was already a goal for many companies, the operational flexibility and security features AP automation solutions offer became more vital during the abrupt shift to remote work in 2020, prompting a jump forward in adoption.

How does this help with liquidity and working capital? By infusing more efficiency into the payment process, automation opens up more options to the company with regard to payments. For example, manual processes for payment approval may take so long that payments are always late or just barely on time when they are finally approved. Not only are late payments detrimental to supplier relationships, but they also preclude the possibility of benefitting from early payment discounts. While early payment is not always the best option, being able to take early payment discounts when helpful is highly beneficial to liquidity. Similarly, any other tools that automate and streamline the procure-to-pay process allow for more control and flexibility in managing working capital.

Q. **What would drive you or drove you to more AP automation?**
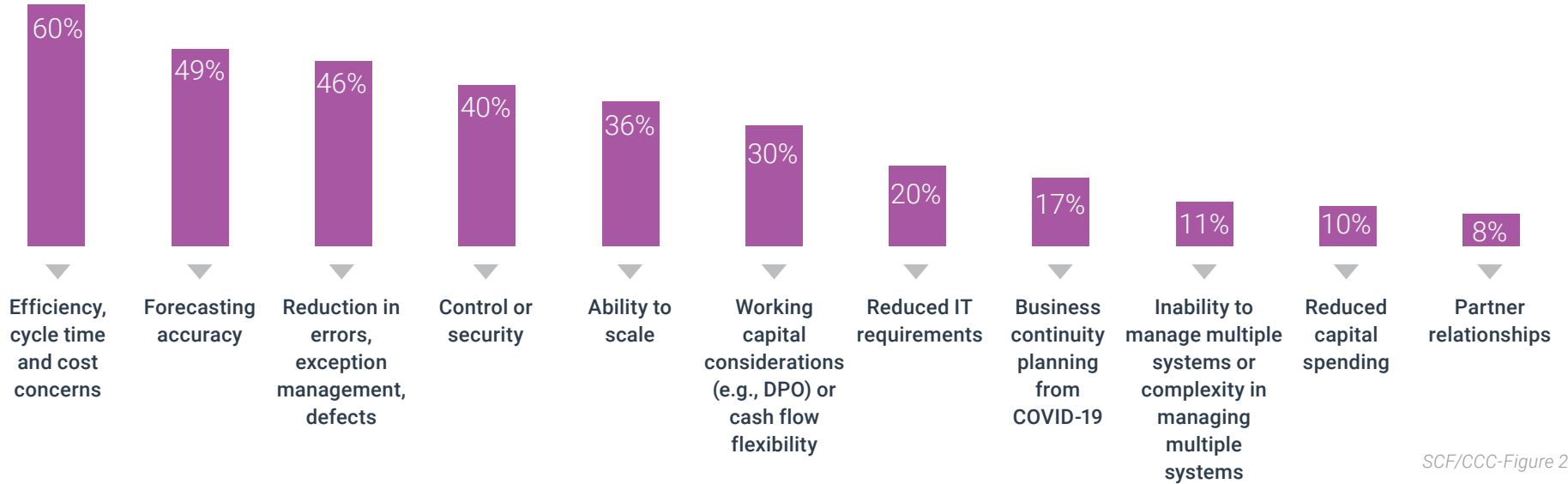*(Select all that apply)*

Driver	%
Efficiency, cycle time and cost concerns	77%
Reduction in errors, exception management, defects	60%
Control or security	53%
Forecasting accuracy	41%
Ability to scale	40%
Working capital considerations (e.g., DPO) or cash flow flexibility	32%
Reduced IT requirements	23%
Complexity in managing multiple systems	22%
Partner relationships	17%
Business continuity concerns that were identified through COVID-19	15%
Reduced capital spending	13%

SCF/CCC-Figure 1

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Q. What would drive you or drove you to more AR automation?
(Select all that apply)

Category	%
Efficiency, cycle time and cost concerns	60%
Forecasting accuracy	49%
Reduction in errors, exception management, defects	46%
Control or security	40%
Ability to scale	36%
Working capital considerations (e.g., DPO) or cash flow flexibility	30%
Reduced IT requirements	20%
Business continuity planning from COVID-19	17%
Inability to manage multiple systems or complexity in managing multiple systems	11%
Reduced capital spending	10%
Partner relationships	8%

SCF/CCC-Figure 2

Order-to-Collect Automation

A wide range of tools are available to automate part or all of the order-to-collect process. Some of the areas that may be automated include the following:

> Credit rating and scoring
> Shipping, fulfillment, and/or invoicing
> Cash application
> Collection

AR departments are a major focus for moving to electronic processes for many companies, with AR automation allowing companies to better control working capital and to speed their ability to convert receivables to cash. It can also facilitate better customer relationships and reduce costs.

Any part of the order-to-collect process, however, still has the potential to trap cash, cost more, and damage relationships through inefficiency. Invoicing is a prime example of this, with manual invoices both slow and error prone. Those errors lead to highly manual correction processes, leading to even more delays. Automating invoicing, like automating other parts of the order-to-collect process, can improve accuracy and speed significantly, opening up more flexibility for working capital management.

Accelerated Adoption

While moving to electronic processes for both AR and AP was a goal before 2020, the abrupt move to remote work made the shift a necessity for many. This jolted the industry standard of automation forward in

these areas. Although organizations should remain aware of their own needs and should be thoughtful in approaching any technological adoption, it is important to note that the industry norms have escalated, and automation in these areas could impact competitive advantage.

Innovations Impacting CCC Automation Solutions

As automation becomes more the norm throughout the CCC, new technologies are advancing what can be done with automation, with AI/ML and networks most relevant.

AI/ML

AI's popularity has received a boost in the past year due to tools such as ChatGPT. Its application in the CCC has already been effective in streamlining tasks such as forecasting, collection, cash application, payment security, and fraud detection. As AI continues to become more advanced and widespread, its impact in this area can only be expected to increase.

Networks

Especially in the area of payments, many solutions can tap into networks that offer extended functionality. These networks may help with security by validating payees and assisting with vendor management, as well as with compliance, payment tracking, and finding suppliers. As networks continue to expand their functionality and their participation, the advantages of solutions that can leverage them will also grow.

Supply Chain Finance Solutions

Rather than automating the internal processes of the CCC, SCF solutions digitally facilitate alternative ways for buyers to support their suppliers while also supporting their own liquidity. This often occurs through breaking the lockstep of traditional payment terms or by streamlining the early payment discount process.

Limitations of Traditional Payment Terms

With traditional payment terms, suppliers and buyers transact in lockstep, and their options are limited. In economically stable times, when the parties involved are less likely to be tight on liquidity at the same time, this may be adequate, although not ideal. Even then, the supplier would like to have their liquidity sooner, while the buyer wants to hold onto their cash longer.

Economically stable times have been scarce recently, however, and during unstable times when both parties need to bolster their liquidity, traditional terms can be highly problematic. The lockstep creates a win-lose scenario, where only one party at a time can get the liquidity they both need. Pulling too hard on a supplier's liquidity can lead to them deciding to end the relationship or putting them in a position that is not viable for them. In the end, losing a supplier is typically a bad outcome for the buyer as well, turning the win-lose scenario into a lose-lose scenario.

While many supply chains have partially recovered from the disruption of COVID, geopolitical conflicts are now stirring up more issues. For corporations whose supply chains are a matter of concern, supply chain finance can help strengthen suppliers while also supporting the buyer's liquidity needs, creating stability in times of turbulence.

Q. Please indicate your organization's use of the following to secure working capital from or provide working capital to trading partners.

Legend: Currently Use | Plan to use | No plans to use | Unsure

Category	Currently Use	Plan to use	No plans to use	Unsure
Receivables	48%	4%	33%	15%
Payables: extending payment terms	47%	10%	27%	16%
Payables: dynamic discounting	20%	13%	40%	27%
Payables: supply chain financing	18%	14%	46%	22%
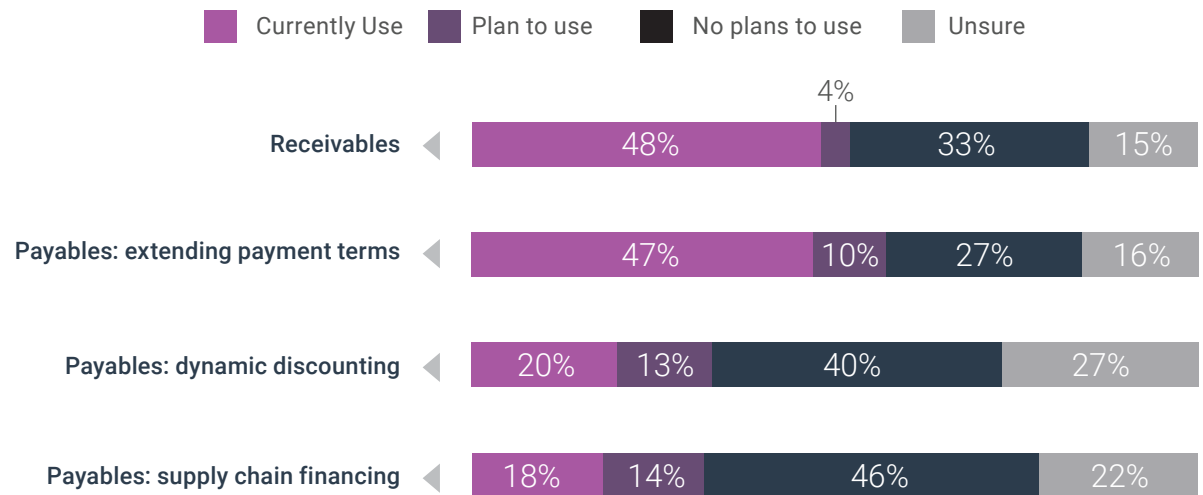
SCF/CCC-Figure 3

SCF Models and Techniques

While all SCF methods support supply chain resilience and liquidity, some are bank-led, some are supplier-led, and some are buyer-led. Regardless of which party "leads" or initiates the program, it typically has benefits for all participants. This report will focus on buyer-led approaches. One method covered on the following pages involves leveraging the buyer's superior credit to achieve this, while the other uses a buyer's excess liquidity. A third approach is a hybrid, which allows buyers to switch between leveraging their credit and their liquidity as needed.

Reverse Factoring

Reverse factoring leverages the buyer's credit to fund the supplier via third-party financing. This allows the buyer to hold onto their own cash beyond traditional payment terms while enabling early payment for their suppliers.

As suppliers are typically smaller organizations than their buyers, it is difficult for them to maintain as high of credit. Using reverse factoring, the buyer can use their superior credit to obtain financing for the supplier at a lower cost.

After the supplier submits an invoice and the buyer approves it, the buyer can log into the SCF platform and notify the third party. The third party can then pay the supplier early for a discount, and the buyer can pay the bank later at a negotiated time. This breaks the lockstep of traditional payment terms, allowing for a win-win.

Dynamic Discounting

Discounts for early payment are a traditional way of seeking a win-win for buyers and suppliers, with terms like 2/10 net 30 allowing earlier liquidity relief for suppliers in exchange for a discount. However, the rigidity of these discount options means the parties still have only limited options available. The buyer has no more incentive to pay on day 1 than on day 10, and

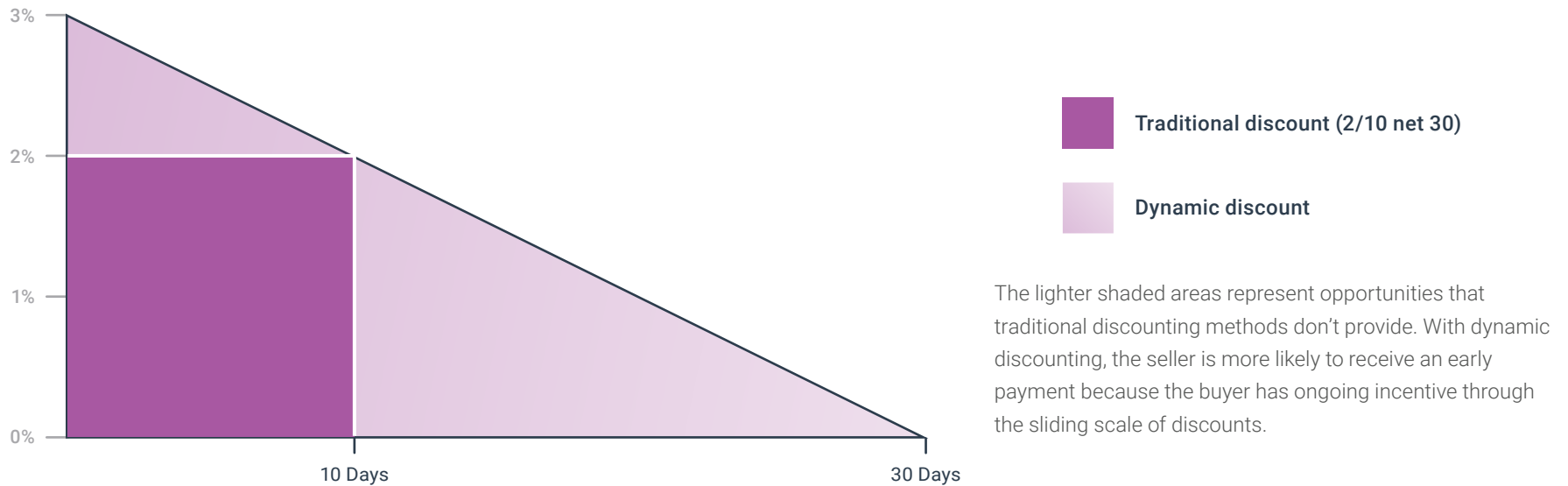if they cannot pay until day 11, it is then in their best interests to keep the cash until day 30.

An SCF platform that offers dynamic discounting provides a sliding scale of discounts that allows each party to decide what their liquidity is worth to them at any given point in the term period. Dynamic discounting SCF solutions allow suppliers to set the sliding scale. The buyer can then log in and see the full range of options that would be favorable for the supplier and pick the one that is most favorable for them as well. For example, the buyer might take a 1.9% discount to pay on day 11, even though they would usually have no incentive to pay on day 11 under regular 2/10 terms.

While reverse factoring is powered by the buyer's superior credit and a third party, dynamic discounting leverages the buyer's excess liquidity without involving a third party. Terms remain in lockstep, but the lockstep is streamlined and synchronized to help both buyer and supplier find a win-win.
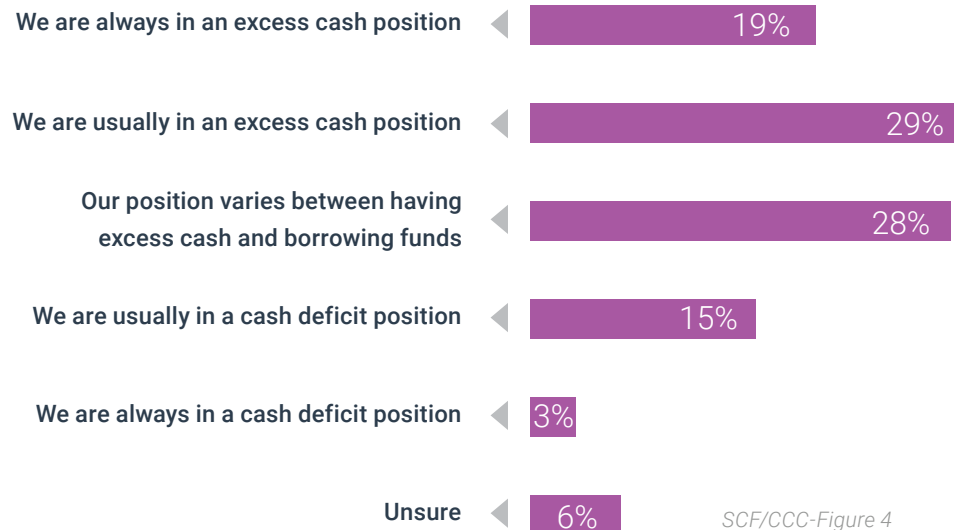
Reverse Factoring

Dynamic Discounting

Traditional discount (2/10 net 30)

Dynamic discount

The lighter shaded areas represent opportunities that traditional discounting methods don't provide. With dynamic discounting, the seller is more likely to receive an early payment because the buyer has ongoing incentive through the sliding scale of discounts.

Hybrid SCF

Reverse factoring is useful for buyers whose capital is in deficit, while dynamic discounting works well when the buyer is in an excess capital position. However, many companies report fluctuating from one position to the other, meaning that both methods could help them at different times.

This is the concept behind hybrid SCF solutions, which offer both options. Regardless of the buyer's liquidity status, it can continue to support its supply chain's liquidity through win-win scenarios, toggling from leveraging its own excess capital to leveraging its own credit and a third party as needed.

Q. Please indicate your most common working capital position.

We are always in an excess cash position	19%
We are usually in an excess cash position	29%
Our position varies between having excess cash and borrowing funds	28%
We are usually in a cash deficit position	15%
We are always in a cash deficit position	3%
Unsure	6%

SCF/CCC-Figure 4

Who Needs SCF?

01 Working Capital Optimization

Treasury's primary interest in SCF is as a working capital initiative. If you have already taken other steps to optimize your working capital, but it remains an issue, SCF programs may be a good next step to offer you more control and flexibility to optimize working capital.

02 Low Supplier Credit

If vital suppliers are struggling due to liquidity strains and low credit, SCF could be an ideal solution, allowing your company to leverage either its own credit or its own excess capital to strengthen the supply chain.

03 Elevated Interest Rates

After rapid rate hikes, US interest rates hit their highest levels in years in 2023. High borrowing costs hit suppliers especially hard, and this environment coming immediately after the supply chain disruptions of COVID puts some suppliers at particular risk. If your supply chain is struggling, SCF programs can allow you to support vulnerable suppliers effectively without straining your own liquidity.

04 Diversifying Capital Access

SCF not only provides added control and flexibility for your liquidity, but it also provides a different way of diversifying your organization's access to capital beyond borrowing from your bank in a high interest rate environment.

05 Net Liquidity Fluctuation

With many organizations fluctuating from a capital deficit to a capital excess, hybrid SCF solutions can be quite helpful. Whichever position the buyer finds itself in, it still has a way of supporting the supply chain while accommodating its own needs.

The Future of SCF

Many factors – some of which fluctuate, while others have a clear, ongoing trajectory – influence the usefulness of SCF. Some increase its power, while others create a more pronounced need for it.

Interest Rates

Typically, the higher the interest rates, the more important SCF becomes, as high rates make it even more difficult for suppliers to obtain funding. After many years of low rates, the US is now facing higher costs of borrowing, making alternative forms of financing like SCF more attractive. The progression of rates over coming years will continue to impact SCF adoption.

Compliance

Banks offering their own SCF solutions list KYC, one of treasury's most time-consuming compliance issues, as a significant challenge for their programs. While fintechs offering SCF are also subject to KYC, they are typically able to manage it with less overhead, reducing the challenge to adoption.

While KYC can prove a roadblock to SCF, other regulatory issues drive SCF adoption. For example, poor documentation can make cross-border disputes and regional compliance problems particularly difficult to resolve. Since many SCF programs improve visibility, and some have document management capabilities, they can prove very helpful for companies struggling with these types of compliance issues.

Networks

Network functionality is an integral part of SCF solutions, allowing them to connect with suppliers and financiers. Improvements in network functionality among SCF solution vendors will add to the value available to SCF users.

Q. Please indicate your level of concern the following will or may impact global economic and operational risks:
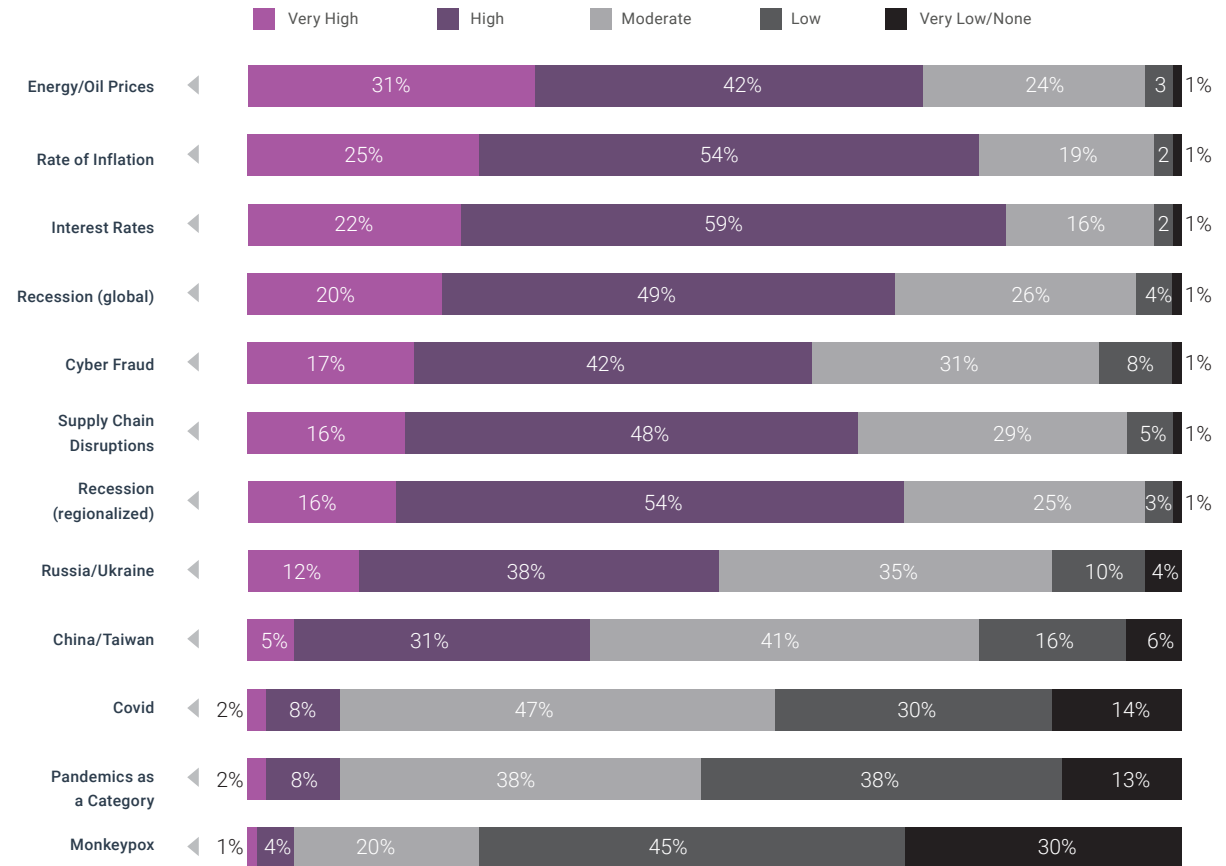
SCF/CCC-Figure 5

Emerging Technology

- **Artificial Intelligence:** AI has been used for some time in SCF solutions, but that use continues to scale up. AI's primary use case in SCF is to analyze historical transaction data, current rates, and industry vertical averages for DPO and DSO in order to calculate which suppliers are most likely to accept which terms. This allows for optimization of discount terms and payment strategies.

- **Blockchain/Distributed Ledger Technology:** As noted in the "Compliance" paragraphs above, cross-border disputes are particularly problematic due to the lack of transparency and documentation. Distributed ledgers are a primary means SCF solutions use to solve this issue, allowing transparency into the progression of transactions and adding efficiency to documentation processes. This makes it far easier to avoid confusion and resolve any disputes quickly. While blockchain has not seen rapid growth in its adoption in treasury in general, its use in this specific case has proven highly effective.

SCF: Selection and Implementation

Perform Due Diligence

Companies taking on a supply chain finance solution must be aware that they are partnering with another company that they will be relying on for capital. As with any other counterparty that impacts your liquidity, due diligence is vital here.

Due diligence must go beyond simply hearing that the company's stated business model is acceptable. It requires investigating the reality behind the stated practices. With SCF, it is particularly important to confirm that the provider is sufficiently diversified in its lending.
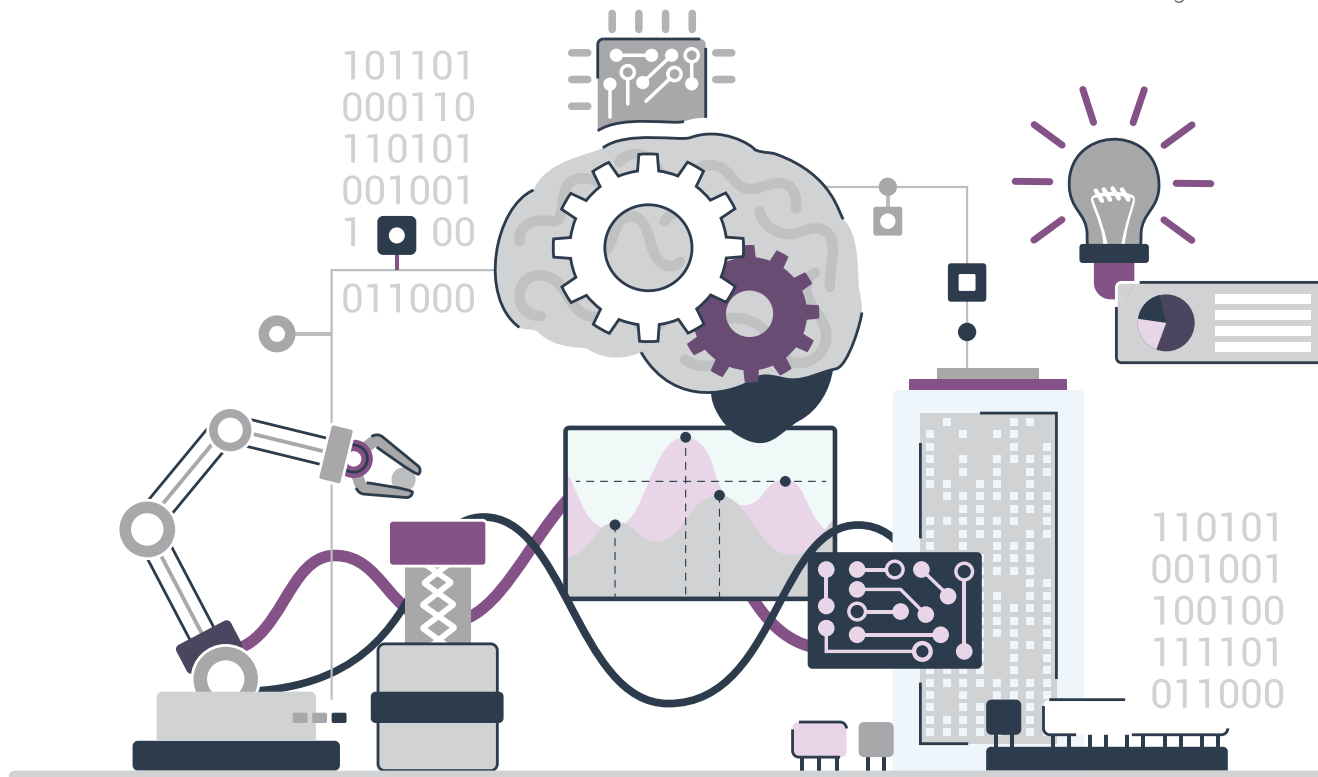
Maximizing Supplier Participation

The success of an SCF program hinges on the participation of suppliers. The types of SCF discussed in this report are buyer-led. While these solutions hold significant benefits for suppliers, that is often not immediately clear to them. Roadblocks that may seem small to the buyer may be enough to discourage many suppliers from participating, reducing the overall success of the program. To maximize participation, communication and minimizing cost and inconvenience to the supplier are key.

1. **Communicate:** Onboarding to a buyer-led SCF program may initially appear to suppliers as red tape they are being asked to go through solely for the buyer's benefit. However, these programs also offer the supplier earlier payment options and are designed to support their liquidity as well. Discuss this with your suppliers in detail, communicating exactly how it will benefit them, and ensure that the departments in most frequent contact with suppliers (typically procurement and AP) can and will communicate clearly with them on this topic as well.

2. **Minimize Cost and Inconvenience:** In addition to making the incentive clear, buyers should be intentional in avoiding and removing roadblocks that could discourage supplier participation. Consider that many of your suppliers may have fewer resources available, and fees and red tape that might seem small to your company could be significant to some of them. Keep the cost, convenience, training, and support for supplier onboarding and use in mind as you select an SCF solution. If there are fees for suppliers for onboarding, use, or training, covering these fees on their behalf may be well worth it for the increase in participation.

Q. Corporate Buyers: Rank these factors from 1-5 according to how they impact the success of SCF.

(Only the percentages of rankings 1-3 displayed)
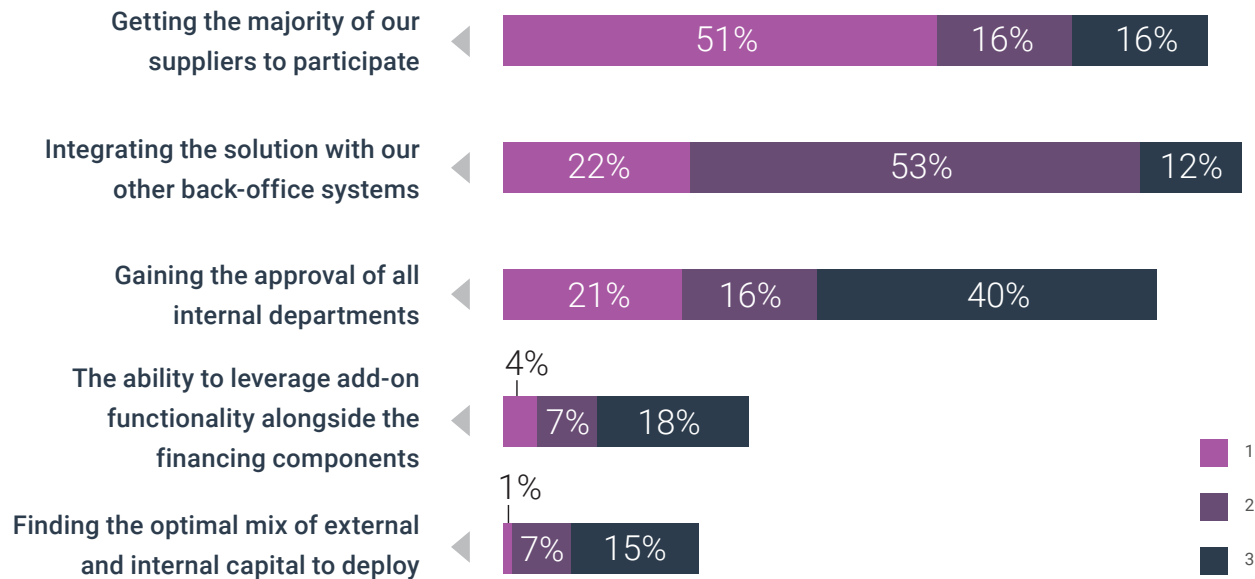
SCF/CCC-Figure 6

Working Capital Initiatives: Leading Practices

Every excellent organization intentionally seeks to optimize its working capital, but this is no simple task that treasury can undertake by itself. There are many moving parts involved in working capital, and addressing it effectively typically requires a concerted effort and careful orchestration. The following leading practices provide a framework for successfully approaching working capital initiatives.

The Working Capital Council

Orchestrating working capital initiatives effectively requires bringing together all the disparate areas involved in it to gather input and discuss options. This is the purpose of the working capital council, and any company interested in optimizing working capital should form one if they have not yet done so.

Treasury typically leads these councils, but representatives should be included from each area that would impact or be impacted by working capital initiatives. This will vary from company to company, but

it will usually include accounting, AR, AP, procurement, legal, tax, and more. The council meets monthly or quarterly to discuss key metrics, objectives, the status of projects, and strategies for moving forward. All other leading practices mentioned in the following paragraphs are intended to be carried out by the working capital council.

Q. Does your organization place heavy emphasis on working capital optimization and associated operations (inventory, receivables, payables)?

Yes **58%** No **42%**
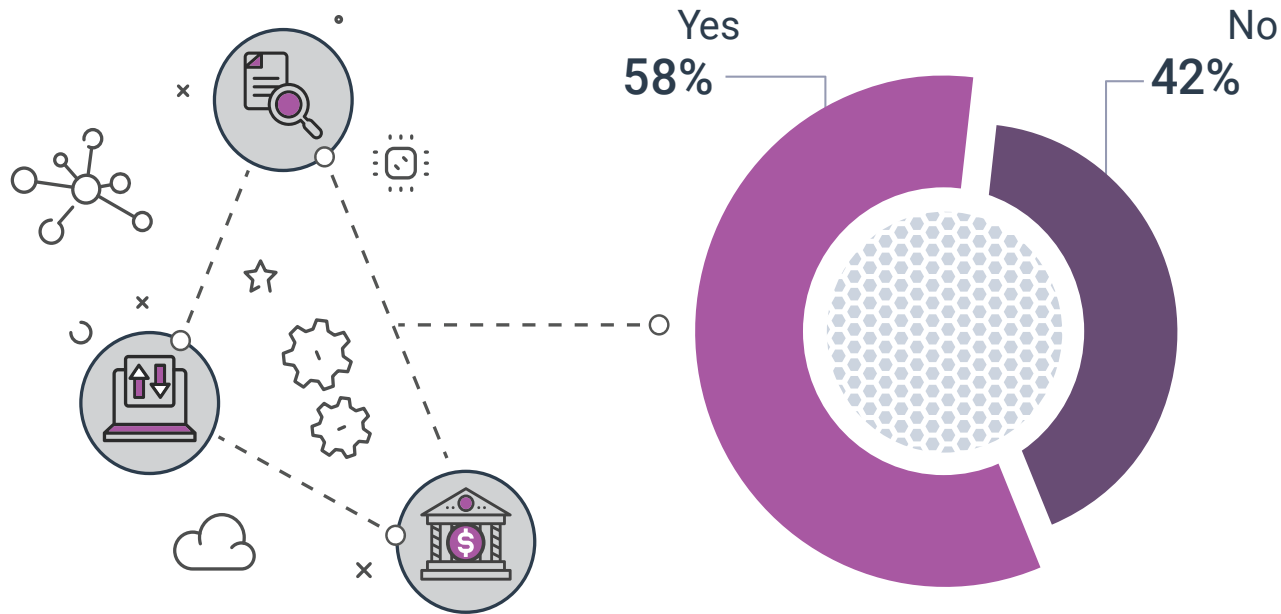
SCF/CCC-Figure 7

Eliminating Competing KPIs

Competing KPIs plague the departments involved in the cash conversion cycle. No matter how unintentional, these KPIs lead to inefficiency, poor interdepartmental relationships, and suboptimal working capital. Before delving directly into working capital initiatives, the working capital council must first work together to eliminate competing KPIs.

Treasury, as the leader of this process, must take several steps:

> Understand. Competing KPIs derive from the unique goals and concerns of each department. The first step is to ensure that each perspective is heard and understood. Treasury's role here is to listen carefully and help areas that may be quite different from each other understand each other's concerns and understand the importance of those concerns.

> Ensure all voices are heard. Some perspectives that are relevant to working capital may inevitably be absent from the council. This may include external partners such as suppliers and customers, or there may occasionally be internal groups that are impacted but not represented. Treasury must understand and communicate these absent voices' perspectives to the council.

> Communicate the need. Competing KPIs do not just inconvenience everyone else. The inefficiencies and suboptimal overall goals impact the entire organization, ultimately including the department the competing KPIs were originally intended to support. Treasury must help each participant in the council understand and remember that these KPIs ultimately hurt them, too, and must be changed.

A Single Set of KPIs

Having identified and eliminated competing KPIs, the working capital council must then create a new set of KPIs that all parties can agree on. These KPIs must support both departmental and overarching organizational goals without interfering with one another. In addition to the overall KPIs, specific objectives for working capital projects can also be established.

Monitor and Fine-Tune

As the economic environment shifts and as other internal factors change (acquisitions, seasonal sales fluctuations, etc.), working capital needs will change as well. Any initiatives you begin will need to be monitored and adjusted from time to time. The council should continue meeting monthly or quarterly to assess what's working, what isn't, what's changing, and how initiatives should be recalibrated for optimal working capital.

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Enterprise Liquidity Management

Introduction to ELM

As liquidity is foundational across the organization, stewarding it well requires a broad view. The factors that impact it are spread throughout the entire company. The larger and more complex a company becomes, the more difficult it is for treasury to keep an accurate, comprehensive view of the liquidity it needs to manage.

Meanwhile, treasury's role has shifted over time, as each crisis emphasizes the importance of liquidity risk management. C-suites are now expecting treasurers to advise them more rapidly and more thoroughly, especially in the midst of disruption, when getting a full grasp on the situation can be hardest.

Fortunately, technological advances are coinciding with this rise in expectations, offering treasurers the leverage they need to keep track of complex liquidity. Vendors are now building more open and integrative solutions, either by expanding their own ecosystem of offerings or by enabling easier integration with others. The expansive systems that result are enterprise liquidity management (ELM) platforms, which provide a comprehensive view of liquidity across the organization along with other extensive functionality.

Survey data shows that, especially among large companies, there are several different solution types that treasury and finance are currently using or planning to use (see ELM-Figure 1). These solutions range from a TMS to hedging, investment, and procure-to-pay platforms. While treasury and finance teams at these large organizations have extensive and
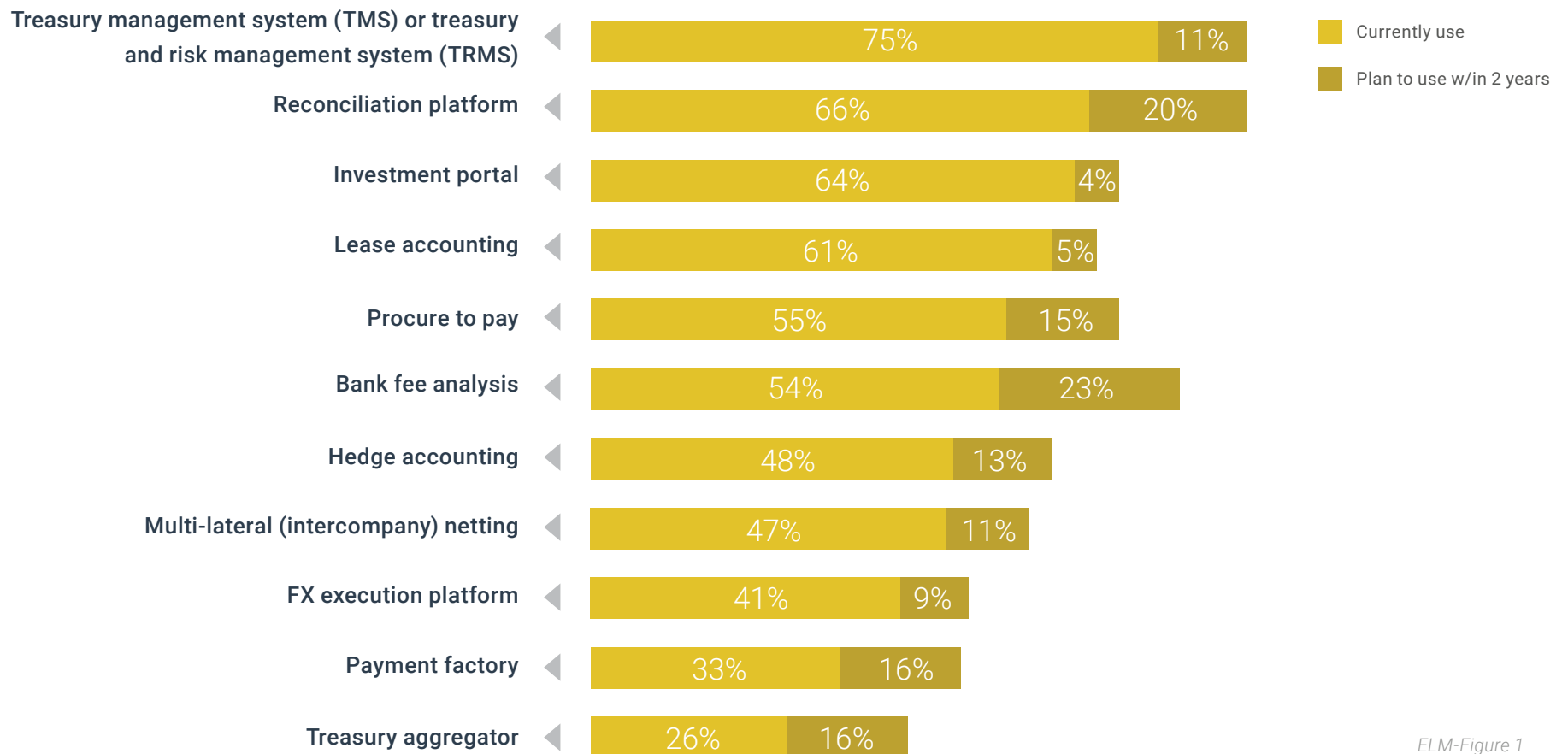
varied functionality needs, having so many separate solutions can be problematic. If they cannot integrate smoothly, treasury ends up lacking timely visibility and having to deal with more complexity and manual work instead of less.

ELM systems seek to offer a more cohesive platform from which organizations can use the functionality they need with full, rapid visibility to the varied factors that impact liquidity across the company. For functionality an ELM platform does not include, it will typically seek to offer integration with the solutions that do provide it.

ELM is a fairly new solution type, growing out of expansions and combinations of multiple functionalities, including those discussed elsewhere in this report. As a recent area of innovation, ELM still has significant room to grow.

Q. Do you currently use or plan to use the following?

(Not all answer choices displayed.)

Treasury management system (TMS) or treasury and risk management system (TRMS) — Currently use: 75%, Plan to use w/in 2 years: 11%

Reconciliation platform — 66%, 20%

Investment portal — 64%, 4%

Lease accounting — 61%, 5%

Procure to pay — 55%, 15%

Bank fee analysis — 54%, 23%

Hedge accounting — 48%, 13%

Multi-lateral (intercompany) netting — 47%, 11%

FX execution platform — 41%, 9%

Payment factory — 33%, 16%

Treasury aggregator — 26%, 16%

Legend:
- Currently use
- Plan to use w/in 2 years

ELM-Figure 1

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Defining ELM

ELM must be distinguished both from less enterprise-wide solutions, such as a TMS, and from less specifically liquidity-focused solutions, such as an ERP system.

There are several solution types that aim to provide more centralized visibility and functionality for dealing with information that is typically spread across the company. However, none of these other enterprise solutions adequately address liquidity.

Enterprise resource planning (ERP) systems are the most familiar enterprise solutions for treasurers. They aim to solve the need to manage resources and business activities across multiple departments. These resources range from cash and payroll to raw materials and involve accounting, procurement, materials and production, supply chains, HR, and more. ERP systems have more overlap with ELM than other enterprise solutions, as they do have some relevance to liquidity, and treasury may use and need to integrate their solutions with the ERP. However, ERP platforms lack much of the functionality that treasury needs for liquidity management, such as banking, cash positioning, forecasting, and risk management.

Other enterprise solutions tend to be more niche. For example, enterprise commodity risk management (ECRM) solutions specialize in managing factors impacting commodity risk for commodity intensive organizations. Enterprise trading solutions (ETS) are similarly niche, supporting the entire trade process for companies with intensity in trading.
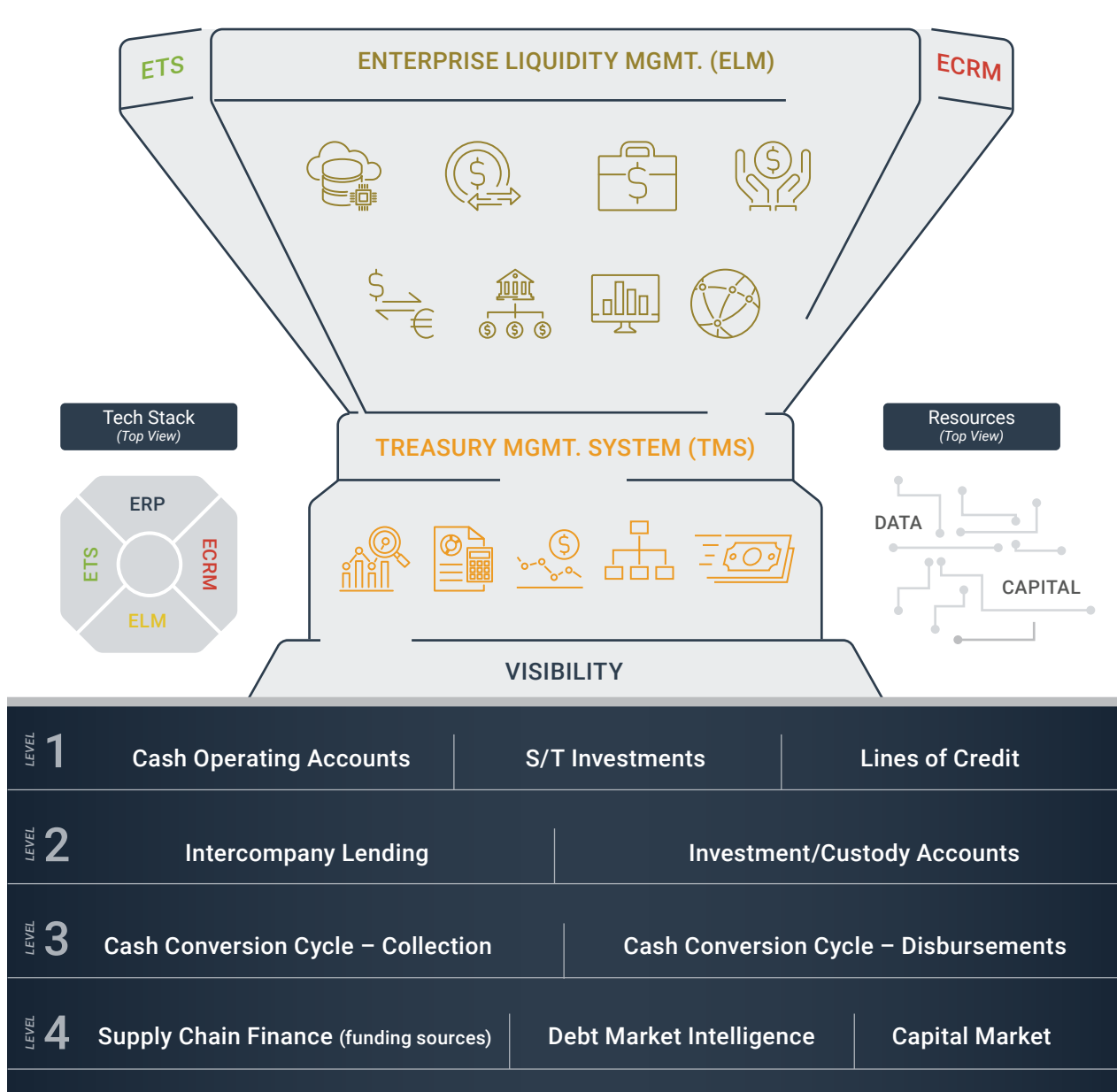
ELM solutions are far less niche. Companies in every industry have liquidity to manage. The need for ELM is determined, instead, by the level of complexity. A TMS is often sufficient for moderately complex companies, but at a certain point, the factors impacting liquidity become too numerous and scattered for treasury to quickly and accurately manage it without additional technological leverage. This leverage may come in the form of multiple open systems that integrate smoothly with each other, or it may come in the form of a monolithic ELM system. Keep in mind, however, that treasury is not the only party who would use an ELM system, as needs from areas such as receivables, payables, and the office of the CFO would be supported as well.

Areas of Commonality and Distinction

ELM has many areas of overlap with TMSs, as well as some areas of overlap with other solutions and tools. This can be confusing, especially since some TMS offerings specialize in advanced functionality in addition to their base functionality. Where does TMS end and ELM begin?

Our view is that a single area of advanced functionality makes for a specialized TMS, not an ELM offering. Recent years have seen some TMS providers expand their functionality in several directions, however, encompassing the capabilities not only of a TMS, but also of TAs, FX tools, advanced forecasting tools, and more. Once a solution expands to the point of offering a comprehensive view of liquidity across the enterprise, it becomes something distinct from a TMS.

Treasury Technology Stack

ETS

ENTERPRISE LIQUIDITY MGMT. (ELM)

ECRM

Tech Stack *(Top View)*

TREASURY MGMT. SYSTEM (TMS)

Resources *(Top View)*

ERP

ETS

ECRM

ELM

DATA

CAPITAL

VISIBILITY

LEVEL 1	Cash Operating Accounts	S/T Investments	Lines of Credit
LEVEL 2	Intercompany Lending	Investment/Custody Accounts	
LEVEL 3	Cash Conversion Cycle – Collection	Cash Conversion Cycle – Disbursements	
LEVEL 4	Supply Chain Finance (funding sources)	Debt Market Intelligence	Capital Market

Enterprise Liquidity Management (ELM)

- Technology Use
- Forecasting: Advanced
- Capital Access & Working Capital Mgmt.
- Visibility & Payment Support (Treasury Aggregator)
- Foreign Exchange (FX)
- Banking Structure, Investment Execution
- Advanced Accounting
- Global Support & Network Effect

Treasury Management System (TMS)

- Cash Positioning/Forecasting
- Accounting
- Debt & S/T Investment
- Bank Account Mgmt.
- Treasury Payments

ELM Functionality

The functionality shared between TMS and ELM offerings tends to address core treasury tasks. This includes:

› Cash positioning and forecasting
› Accounting
› Debt and short-term investments
› Bank account management
› Treasury payments

From this foundation, however, ELM expands into more advanced functionality or tools that reach outside of the scope of the TMS:

▶ **Capital access and working capital management:** The SCF and CCC solutions section of this report discussed how working capital forms a significant portion of most organizations' liquidity. AP, AR, and all the other departments whose operations impact working capital sit outside of treasury, often making it difficult for treasury to gain a complete picture of the current capital situation. From SCF to AP and AR automation, ELM systems offer functionality that addresses these areas. This increases efficiency and flexibility in working capital management while also meaning that treasury can get a far more complete picture of their liquidity from their ELM dashboard,

with the effects of SCF programs and more automatically incorporated.

▶ **Foreign exchange (FX):** ELM systems' FX functionality provides operational tools to help manage FX while also creating better visibility into how it impacts liquidity. This improves data accuracy and allows for better strategy both around FX itself and around liquidity as a whole.

▶ **Visibility and payment support (treasury aggregator functionality):** ELM platforms typically include TA functionality as well, pulling in banking data in the necessary formats and processing outbound payments securely.
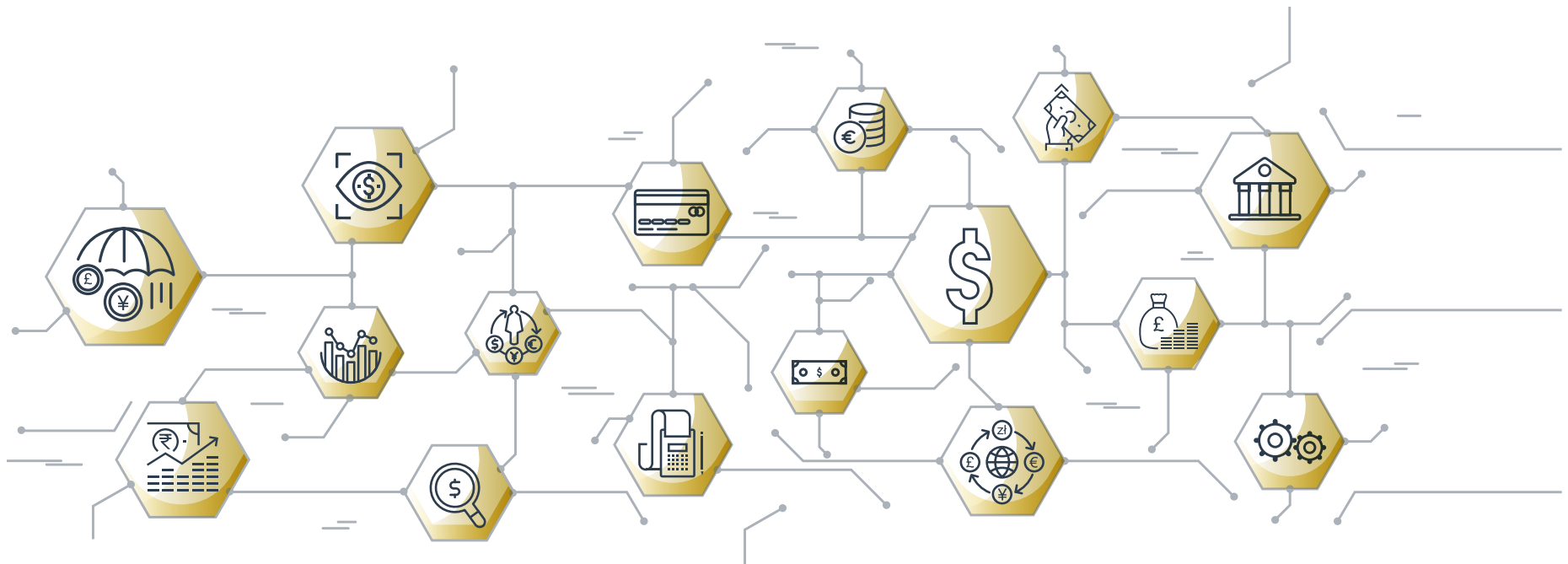
▸ **Advanced forecasting:** Complex organizations need accurate, timely forecasts, but when their liquidity is intricately impacted by numerous areas, all with their own complexities, corralling and quickly analyzing the necessary data to form a forecast becomes extremely difficult. ELM systems are sufficiently integrated with the areas impacting liquidity to access the data necessary for forecasting without significant manual work, and their advanced forecasting functionality allows them to create more accurate forecasts even with highly complex data.

▸ **Advanced accounting:** Accounting requirements also increase as organizations become more complex, making more advanced accounting functionality desirable in ELM systems.

▸ **Banking structure, investment execution:** Basic bank account management and short-term debt and investment functionalities are sometimes available in TMSs, but ELM offerings tend to offer more advanced capabilities to allow for robust management of complex banking structures and investment execution.

Other features of ELM systems typically include the following:

Newer technology:

In order to handle the high levels of power and integration required, ELM systems typically leverage fairly modern technology. They are cloud-based and often cloud-native and PaaS, supporting rapid development and interoperability.

Network effect and global support:

Many of the vendors developing ELM solutions have also recognized the value of networks and are working on expanding and adding functionality to their communities and ecosystems. Networks may also provide communities that can add to the global, follow-the-sun support typically available for such large-scale solutions.

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Open Treasury: ELM and the Future of Treasury Technology

With so much reliance on integration between tools and areas of functionality that have traditionally been standalone solutions, ELM is deeply connected to open treasury and the innovations supporting it. The move to the cloud and the development of PaaS and cloud-native have opened the door for more rapid development, efficiency, customizability, and seamless integration.

These innovations are allowing solutions to bleed over into functionality traditionally covered by other solutions, which is resulting in blurred lines between solution categories. It has also conveniently intersected treasury's growing need for enterprise-wide liquidity management, giving rise to ELM systems. It is still difficult to say what this innovation may lead to and how the ELM category will progress, but the need for more comprehensive solutions seems likely to remain and, if anything, increase.

Treasury's view is growing broader, with "end-to-end" views of processes expanding to include not only internal steps, but also the steps involving external partners (e.g., vendors and customers). As companies recognize the need to look at processes more comprehensively, they also recognize the need for tools and visibility that expand just as comprehensively. In meeting this need, vendors have multiple options. They can achieve openness and comprehensive visibility by expanding their own solution's functi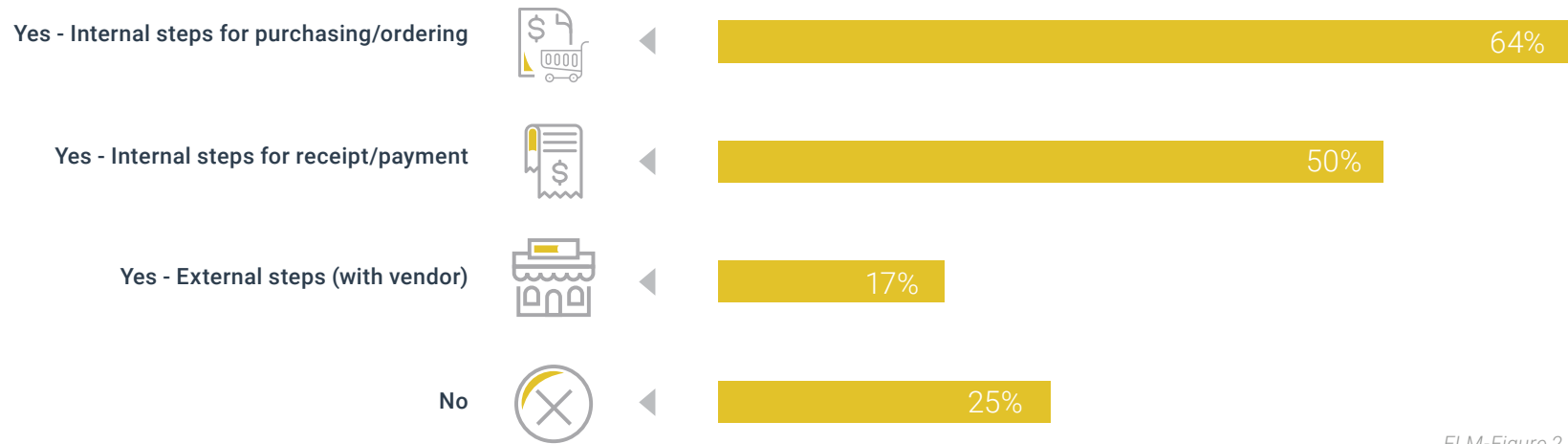onality into adjacent spaces, creating more monolithic ELM systems. Alternatively, they can rely heavily on API integrations and embedded functionality, resulting in a dashboard that lets you leverage other solutions as seamlessly as if they were all in one monolithic system. Any way a vendor chooses to accomplish it, their solution counts as ELM if it provides effective, comprehensive liquidity management functionality.

Treasury should not only keep in mind the growing need for comprehensive visibility and open treasury, but should also be mindful of the shifts taking place in technology and the different ways of achieving open treasury currently available. As ELM and all treasury technology continue to grow and evolve, with innovations continuing to lead to new ways of meeting the shifting needs, treasurers must keep an ear to the ground and consider how their treasury tech ecosystem may need to change over time.

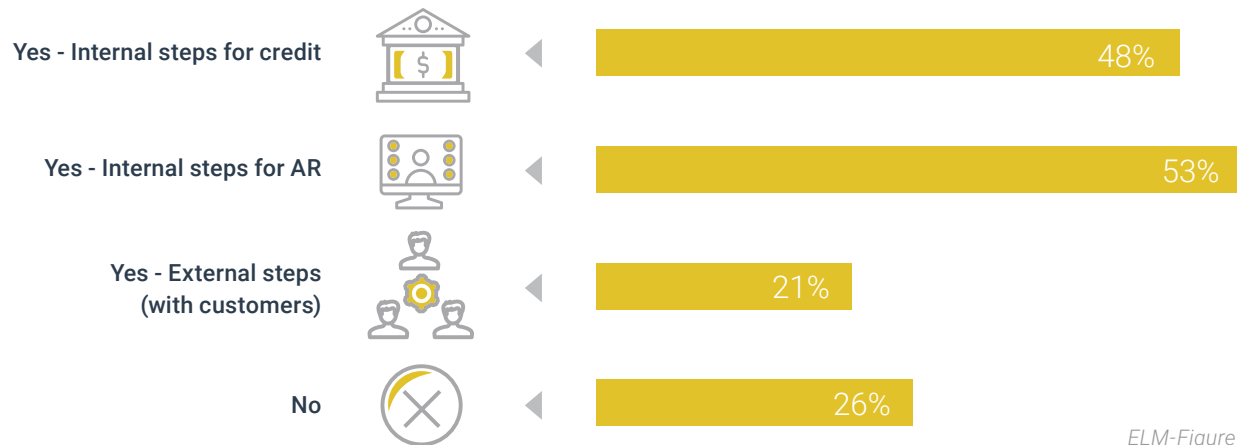**Q. Do you have an end-to-end view of your accounts payable processes?**
(Select all that apply)

Yes - Internal steps for purchasing/ordering — 64%

Yes - Internal steps for receipt/payment — 50%

Yes - External steps (with vendor) — 17%

No — 25%

ELM-Figure 2

Q. Do you have an end-to-end view of your accounts receivable processes?
(Select all that apply)

Yes - Internal steps for credit — 48%

Yes - Internal steps for AR — 53%

Yes - External steps (with customers) — 21%

No — 26%

ELM-Figure 3

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✔ Bank Connectivity

✔ Financial Messaging

✔ Validation & Conversion Services with hundreds of formats available

✔ Compliance, Sanctions & Fraud Management

✔ ERP & TMS Integration

Founded:
1910

Headquartered:
Zurich, Switzerland

Ownership:
Privately Held

CEO:
Andreas Lutz

Top Statistics

Fides' payment platform processes over $6 trillion every year.

Fides provides seamless integration with any TMS and ERP provider globally.

Fides connects clients to more than 13,000 banks worldwide, with over 3,000 direct connections.

Active Fides clients span 200 countries and territories.

Market Position

Fides offers a highly scalable multibanking platform for all sorts of financial messaging. Our unique hybrid service model enables connectivity to any bank, TMS or ERP, through any channel.

Fides operates on a global scale, with operations in Europe and the US, as well as development centers located in various European countries.

Fides serves more than 4,000 corporate customers globally.

News & Happenings

Global Growth.

Fides helps more than 4,000 of the largest global organizations, and has built out a massive partner network to best serve our customers today and into the future. In addition to banking, TMS and ERP partners, our ecosystem also includes Money Market providers, FX platform providers, and more.

Global Business Awards for Multibanking Excellence.

✔ Fides has received the TMI Innovation & Excellence Award for Best Bank Connectivity Solution for the past three consecutive years.

✔ Fides has received the Global Finance World's Best Treasury & Cash Management Systems & Services award for Best Cross-Border Payments Solution for two consecutive years.

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Payments & Messaging

Fides facilitates seamless global payments and financial messaging, ensuring smooth execution of outbound transactions from any platform. We are experts in transforming instructions into bank-compatible formats and transmitting files to the relevant institutions for execution. With Fides, you get a single outbound payments channel across your global landscape, eliminating the need for multiple internal platforms to connect with individual banks. Simply connect with Fides to transmit payments and receive comprehensive reports. We manage $6 trillion in annual payment volume, placing us in the highest tier of corporate-to-bank payment service providers.
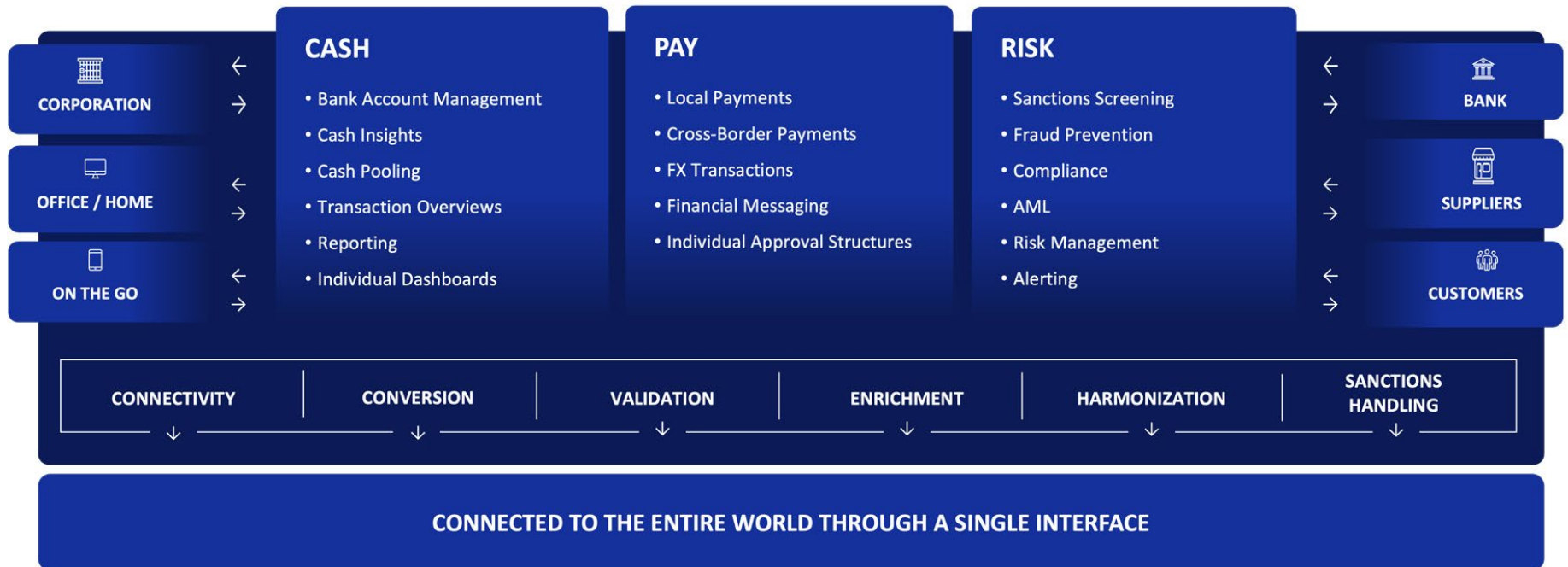
Cash & Liquidity Management

Using a single source for all bank communications makes it easy to gain visibility into global cash positions, increase forecast accuracy, and leverage cash pooling to manage funds across all your subsidiaries. Fides empowers your enterprise to efficiently handle diverse currencies, banks, countries, systems, and reporting standards, so you can reap the benefits of worldwide transaction transparency. Our user-friendly, drill-down dashboards enable granular or summary-level exploration, and reports can be effortlessly generated and shared via CSV, PDF, or other formats. Plus, all bank statements and reports are transmitted back to the originating systems, ensuring seamless integration with any ERP or TMS to provide straight-through processing and enable further analytics.

The One-Stop Shop for Visibility and Flexibility

Fides serves as the source of truth for managing global banks, accounts, and all underlying or associated data

CORPORATION	**CASH**	**PAY**	**RISK**	BANK
OFFICE / HOME	• Bank Account Management • Cash Insights • Cash Pooling • Transaction Overviews • Reporting • Individual Dashboards	• Local Payments • Cross-Border Payments • FX Transactions • Financial Messaging • Individual Approval Structures	• Sanctions Screening • Fraud Prevention • Compliance • AML • Risk Management • Alerting	SUPPLIERS
ON THE GO				CUSTOMERS

CONNECTIVITY	CONVERSION	VALIDATION	ENRICHMENT	HARMONIZATION	SANCTIONS HANDLING

CONNECTED TO THE ENTIRE WORLD THROUGH A SINGLE INTERFACE

Connectivity

Fides offers a comprehensive range of connectivity options. We connect to more than 13,000 banks globally, with 3,000 direct bank connections, eliminating days or even months of implementation time. Fides is also a certified SWIFT Service Bureau, compliant with the latest SIP version, and also uniquely acts as a Hybrid Service Bureau, making it easy to use SWIFT in conjunction with other channels, such as EBICs, host-to-host connections, or APIs. Fides' exclusive connectivity model, in combination with our very own transaction-forwarding SWIFT access, closes any gaps in your banks' SCORE readiness and can reduce SWIFT costs, the cost of maintaining individual connections, and implementation time. With Fides, you'll never lose connectivity due to a TMS or ERP change. The connectivity Fides provides goes beyond banks: Fides integrates with any TMS or ERP system. Not only does this make it easy to get the analytics you need, it also gives you flexibility and portability. If you choose to change TMS or ERP vendors in future, you will not lose any of your bank connections or have to rebuild them from scratch. During a migration, Fides can run connections to your banks in parallel, ensuring business continuity.

Sanctions Screening

Fides offers a robust, banking-level sanctions screening solution to ensure your enterprise meets financial compliance mandates, from regional to international. To minimize risk, we verify all transactions against all relevant sanctions and watchlists, including OFAC, UN, and EU — as well as any additional lists you may choose to add — before they are submitted to your banks. The Fides platform enables efficient global payment screening, while our validation services ensure account information such as balances, transaction data, and posting text from banking partners around the world is correct and verified as well as screened against sanctions lists. We keep you up to date on any flagged activity, and have a dedicated team to manage any compliance cases that may arise.

Fraud Prevention & Security

Security and compliance are a high priority for Fides. We protect your financial assets with a comprehensive suite of workflows, tools, and cutting-edge technologies to prevent and detect both internal and external payment and system fraud. Our platform is fortified with robust security measures, including multifactor authentication (MFA) as well as IP safe-listing and block-listing protocols. For enhanced security, all user actions within the platform are continually monitored and can be audited at any time. Any suspicious activity triggers alerts for further investigation.

Fides Multibanking Suite: Your Gateway to Seamless Financial Excellence

We believe that managing your finances should be effortless, efficient, and empowering. That's why we provide all our clients with the Fides Multibanking Suite – the ultimate gateway to all Fides services.

Imagine having all your financial needs in one centralized platform, accessible at your fingertips. With the Fides Multibanking Suite, you can effortlessly connect, monitor, and control your accounts across multiple banks and financial institutions. Say goodbye to the hassle of logging into different portals; we've streamlined everything for you.

⇌ Fides

Your one-stop shop for financial empowerment and organizational growth.

Works Cited

▷ Overview

» Figure 1, Page 3: *2023 Strategic Treasurer and TD Bank – Treasury Perspectives Survey*

» Figure 2, Page 4: *2023 Strategic Treasurer and Bottomline Technologies – Treasury Fraud & Controls Survey*

» Figure 3, Page 5: *2023 Strategic Treasurer Return to Office Survey*

» Figure 4, Page 6: *2023 Strategic Treasurer and Bottomline Technologies – Treasury Fraud & Controls Survey*

» Figure 5, Page 7: *2023 Strategic Treasurer and TD Bank – Treasury Perspectives Survey*

» Figure 6, Page 8: *2023 Strategic Treasurer and TD Bank – Treasury Perspectives Survey*

» Figure 7, Page 11: *2023 Strategic Treasurer and TIS – Treasury Technology Survey*

» Figure 8, Page 13: *2023 Strategic Treasurer and TD Bank – Treasury Perspectives Survey*

» Figure 9, Page 14: *2023 Strategic Treasurer and TD Bank – Treasury Perspectives Survey*

▷ Treasury Management Systems

» TMS-Figure 1, Page 21: *2023 Strategic Treasurer and TIS – Treasury Technology Survey*

» TMS-Figure 2, Page 25: *2023 Strategic Treasurer and TIS – Treasury Technology Survey*

» TMS-Figure 3, Page 26: *2021 Strategic Treasurer and GTreasury – Treasury Technology Survey*

▷ Treasury Aggregators

» TA-Figure 1, Page 30: *2021 Strategic Treasurer and GTreasury – Cash Forecasting & Visibility Survey*

» TA-Figure 2, Page 31: *2022 Strategic Treasurer and Bottomline Technologies – B2B Payments Survey*

» TA-Figure 3, Page 34: *2023 Strategic Treasurer and TIS – Treasury Technology Survey*

▷ Supply Chain Finance & Cash Conversion Cycle Solutions

» SCF/CCC-Figure 1, Page 39: *2022 Strategic Treasurer and Deluxe – Modernizing AP/AR Processing Survey*

» SCF/CCC-Figure 2, Page 40: *2022 Strategic Treasurer and Deluxe – Modernizing AP/AR Processing Survey*

» SCF/CCC-Figure 3, Page 41: *2023 Strategic Treasurer and Allspring Global – Liquidity Risk Survey*

» SCF/CCC-Figure 4, Page 43: *2023 Strategic Treasurer and TD Bank – Treasury Perspectives Survey*

» SCF/CCC-Figure 5, Page 45: *2023 Strategic Treasurer and TD Bank – Treasury Perspectives Survey*

» SCF/CCC-Figure 6, Page 47: *2019 Strategic Treasurer and Kyriba – Supply Chain Finance Survey*

» SCF/CCC-Figure 7, Page 48: *2023 Strategic Treasurer and TD Bank – Treasury Perspectives Survey*

▷ Enterprise Liquidity Management

» ELM-Figure 1, Page 51: *2023 Strategic Treasurer and TIS – Treasury Technology Survey*

» ELM-Figure 2, Page 57: *2022 Strategic Treasurer and Deluxe – Modernizing AP/AR Processing Survey*

» ELM-Figure 3, Page 57: *2022 Strategic Treasurer and Deluxe – Modernizing AP/AR Processing Survey*

Strategic Treasurer Market Research

As part of our ongoing market research, Strategic Treasurer conducts 12+ industry surveys on a variety of topics ranging from cash management and payments to fraud and compliance. These surveys are collectively completed by thousands of corporate, banking, non-profit, government, and higher education respondents. Below is a sampling of our current research initiatives.
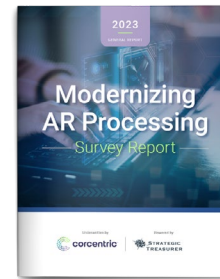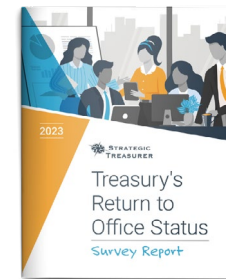
Treasury Fraud and Controls

Treasury Perspectives
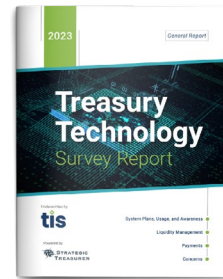
Treasury Technology

Modernizing AR Processing

Treasury's Return to Office Status

CORPORATE BANKING
Probes the perspectives and plans of bankers, with questions ranging from essential lines of business to expected growth, innovation challenges, fintech partnerships, and plans to build, buy, and use technology.

TREASURY COMPLIANCE
Captures the macro and micro elements of the compliance landscape that are impacting treasury, identifies how new regulatory developments are being accounted for, and gains insight into the various technologies and strategies leveraged by organizations for managing compliance on an ongoing basis.

LIQUIDITY RISK
Analyzes organizations' short-term investment and risk management strategies to uncover trends related to how firms are optimizing their liquid assets and identifying and mitigating associated risks.

SUPPLY CHAIN FINANCE
Evaluates the use of SCF technology within the corporate environment, as well as the strategies and technologies put in place by firms to manage vendor relationships, streamline cash conversion cycles, and optimize working capital.

CASH FORECASTING & VISIBILITY
Studies the operational and technological components deployed by organizations for maintaining visibility to cash positions and forecasting cash flows.

HIGHER EDUCATION
Focuses specifically on understanding the unique challenges and operations of financial personnel within the realm of higher education and how their experiences compare to those of their peers in the corporate environment.

→ **Custom research commissions available upon request**

To learn more about our market research, visit our website:

strategictreasurer.com/surveys