tis

Understanding APIs In Treasury

Questions Answered Inside:

> What are APIs and why are they relevant in treasury?

> How are APIs being applied today to drive treasury automation?

> Which treasury functions are most impacted by APIs?

Learn more at tis.biz »

About this Resource

For over a decade, TIS has spearheaded a variety of industry surveys and market research initiatives. These studies have helped us collect thousands of data points regarding the practice of treasury management and the use of treasury technology. Over time, this data and research helps us understand how new trends and technologies are impacting treasury's operations. Ultimately, these insights enable TIS to continually improve our software suite and provide educational resources that help treasury groups navigate today's complex payments, cash management, and financial technology landscape.

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01. Introducing APIs In Finance

WHAT ARE APIs & HOW DO THEY WORK?

Although Application Programming Interfaces (APIs) were first created in 2000, these process-based programming codes are only just beginning to reach their full potential within today's digitalized financial ecosystem.

In the simplest of terms, APIs are programs that sit between various cloud applications and define how these applications can interact with each other. APIs are typically developed by cloud software providers. As a result, they can support strong integrations between a corporate's back-office and the solutions used by their business partners, vendors, and banks. Ultimately, these API integrations enable a company's various financial platforms to interact with each other and share data without repetitive human commands.

In order to properly function, APIs require sets of parameters to define which platforms they can connect to and the data sets they can interact with. For instance, APIs that are used to automate back-office payment workflows must "know" which software systems to collect payment data from (ERPs, TMSs, AP systems, etc.), as well as which data fields to access (currency amounts, bank addresses, account numbers, etc.). As you can guess or may even know from experience, for organizations using multiple payment solutions and formats, developing the right API codes to sync all of these systems together can be tricky.

While perfecting the API logic behind complex financial integrations has taken time, there has been significant progress achieved over the past decade. Today, APIs are providing real-time control over numerous cross-platform functions. Now, as businesses increasingly transition to cloud solutions and digital work environments, the use of APIs within treasury and finance is growing exponentially.

BENEFITS FOR TREASURY

Back-Office Automation
APIs enable an organization's various treasury and financial software products to share data and process information in an automated fashion.

3rd Party Integration
APIs can connect a company's back-office systems with 3rd party solutions used by their banks, partners, and vendors.

Customizable Commands
APIs can be configured to perform an endless variety of financial reporting and process execution functions in the areas of payments, cash management, and security.

Global Consistency
Collaboration between Fintechs has helped standardize global API logic and drive even greater cross-platform automation between financial systems.

Real-Time Connectivity
As API technology becomes more mature, an increasing number of cross-platform functions and routines are being automated, which leads to greater real-time connectivity for treasury teams.

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Although Fintech solutions have come a long way in a relatively short space of time, there is still tremendous upside for APIs and other programming applications to improve the industry. From greater payments automation to better fraud protection, the bottom line is that once all your company's financial systems are integrated with one another, every stakeholder in the company wins. They all win, because at the touch of a button, real-time access to financial data and automation is available in the platform of their choice.

STEVEN BATISTE

Chief Technology Officer, TIS

Steven Batiste is a world-class developer, programmer, and data scientist with over 35 years of experience in his fields. Having started at age eight by developing video games, Steven moved to Los Angeles and founded two companies focused on data science for the entertainment and medical industries. After more than a decade of innovation in these fields, Steven transitioned to financial software and is now helping TIS deliver the next wave of innovation in B2B payment processing, cash management, and financial security.

# 01. How are Financial APIs Developed & Released?

Because APIs are essentially data-driven computer applications and programming scripts, before you can develop an API, you must have an online data-hosting service to accommodate it. Typically, APIs are "hosted" in the cloud using services such as Amazon's AWS or Microsoft's Azure products. Today, these servers provide the foundation on which most APIs and Fintech cloud products are built upon.

Once the API development process begins, computer programmers will use applications like Java, Node, and Python to write code-based scripts, as showcased below on the left-half of the screen. As these scripts are created, programmers will collaborate closely with financial professionals and experts who act as industry consultants. Since few programmers have real-world experience in financial roles, the oversight provided by these industry experts simply ensures that the API functionalities being created will have practical use cases.

Ultimately, the API code and scripts that are developed by these programmers and their industry guides will form the functions that dictate how various pieces of financial data can be manipulated by users. Some API scripts may be developed to aggregate all a company's payments data together, and other APIs will determine how this data can be processed or exported. In the end, all these scripts are packaged together to form cloud-based API products that are implemented and leveraged by corporates and businesses.

As these cloud products are released, corporate users will never need to interact with the underlying API scripts. They simply use the front-end interfaces and dashboards that the APIs are populating behind-the-scenes. In this way, any practitioner can benefit from the functionality that finance and treasury APIs provide, without having to acquire any technical knowledge of how the programs are developed or managed on the back-end.

HOW DOES THE "BACK-END" OF AN API COMPARE TO THE "FRONT-END"?

Developers create APIs using code-based programs.

Users interact with APIs via front-end dashboards.
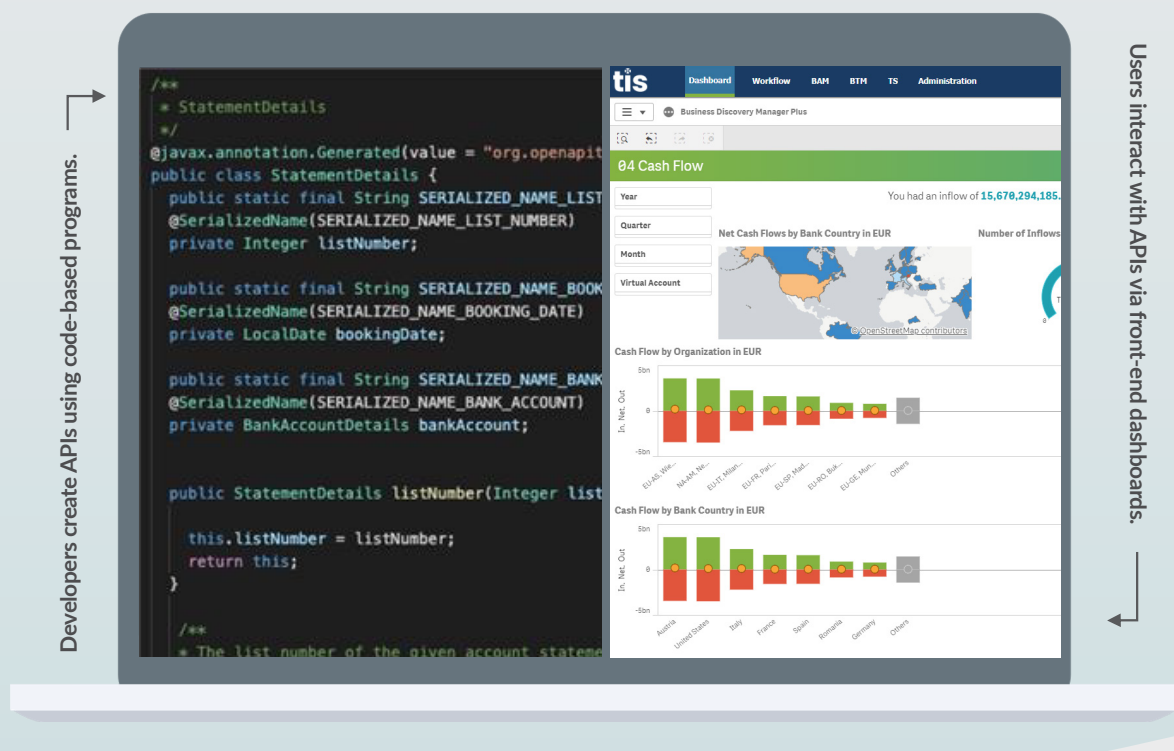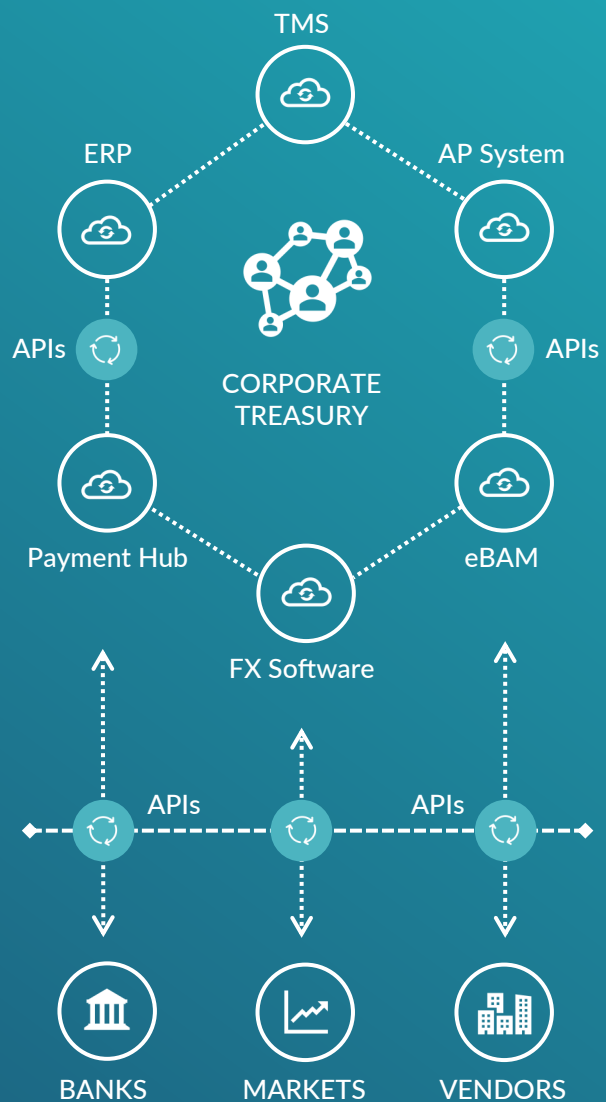
02.   The Cloud + API Effect

APIs ENABLE GLOBALLY CONNECTED NETWORKS OF CLOUD SOLUTIONS

While APIs are proving an innovative addition to the treasury and finance landscape, their benefits depend heavily on the industry's continued adoption of modern cloud technology. This is because API development has advanced so rapidly in the last decade that many older or "legacy" financial platforms, particularly those that are still hosted on-premise or via local servers, cannot support the newest programming standards.

However, data from early 2020[1] (pre-pandemic) shows that nearly 60% of corporate treasury groups are already leveraging cloud-based financial software, and nearly 40% are using treasury APIs. These usage levels are expected to grow rapidly over the next few years, and it is already becoming commonplace for treasury groups to leverage a variety of different cloud platforms at once. As long as each platform is API-enabled, integrations can quickly be established to connect it with other cloud solutions in the corporate's technology stack.

Although new API standards are being developed regularly, upgrades can be downloaded to existing cloud solutions through online patches that do not require complex installations or system downtime. In most cases, these upgrades are provided as a standard feature by software vendors as they release new product versions.

Ultimately, APIs are enabling much greater cross-platform integration capabilities for corporates. As a result, corporate back-offices increasingly resemble webs of interconnected technology solutions and data sets. With modern APIs, both external and internal platforms can connect with each other, and data can flow seamlessly between any system within the network.
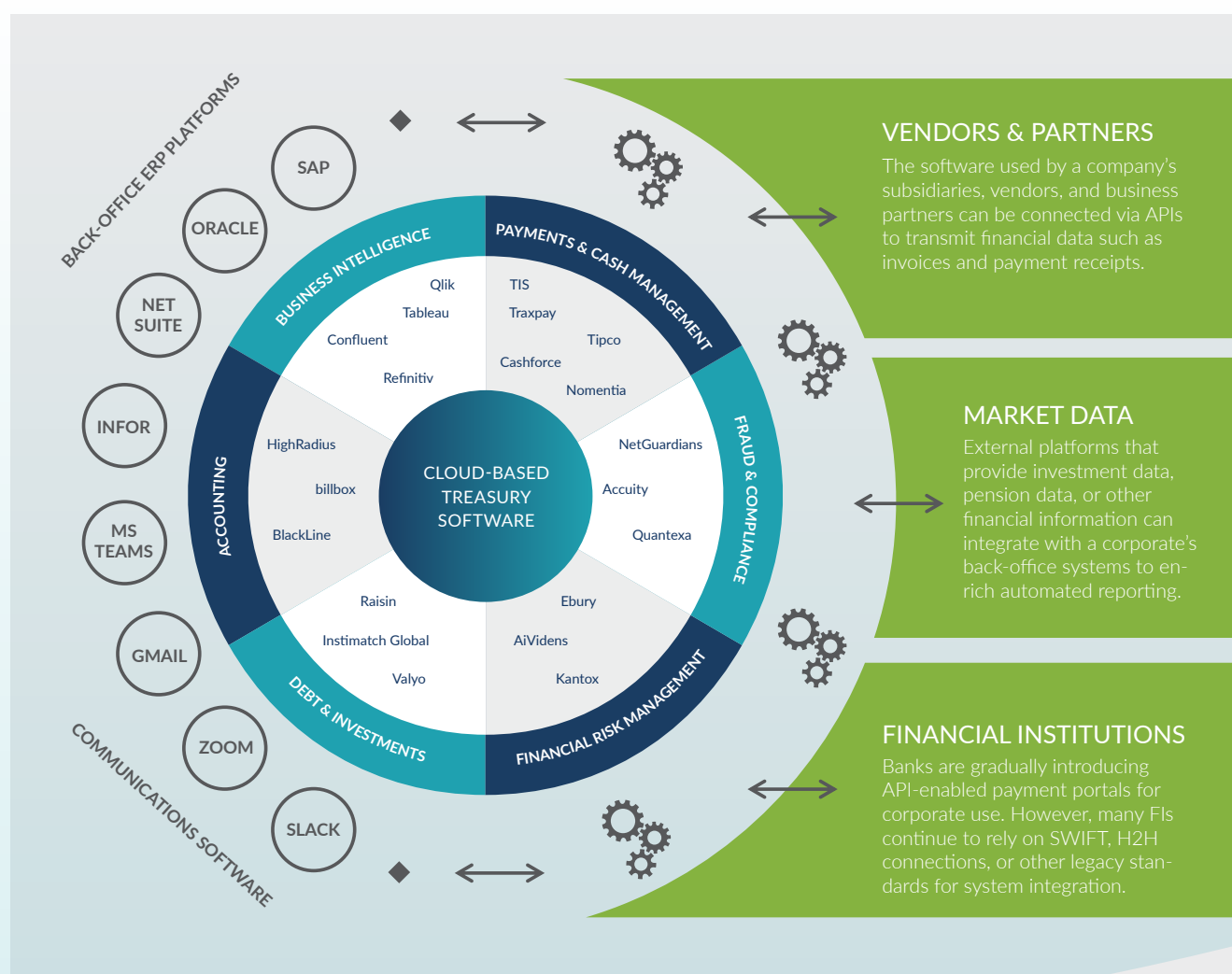
[1] 2020 Strategic Treasurer & TD Bank Treasury Perspectives Survey

TMS

ERP

AP System

APIs

CORPORATE TREASURY

APIs

Payment Hub

eBAM

FX Software

APIs

APIs

BANKS

MARKETS

VENDORS

02. How the Cloud + APIs Enable a Best-of-Breed Approach to Technology

Given the robust nature of today's APIs, the integration capabilities now available to corporates can establish connectivity across virtually any combination of cloud solutions, including everything from global ERPs and TMSs to simple communication platforms like Slack, Zoom, and Gmail. Today, all the leading cloud solutions on the market use APIs, and most vendors work hard to ensure their solution's APIs are compatible with other systems. This means that by being intentional with how their APIs are deployed, organizations can automate almost any function, from sharing documents and reports to transmitting payment data and developing cash forecasts.

As a result of modern API integrations, treasury groups are able to leverage numerous back-office solutions alongside one another without being impeded by siloed data or segmented workflows. This is a reality that has only recently become feasible for many companies, and it is resulting in a widespread movement towards "best-of-breed" technology architectures. The core benefit of this best-of-breed approach, compared to adopting an "all-in-one" solution, is that specialized software products can be utilized to perform niche functions, such as payments management or FX trading, without creating a gap in how the underlying data is collected or analyzed.

VENDORS & PARTNERS
The software used by a company's subsidiaries, vendors, and business partners can be connected via APIs to transmit financial data such as invoices and payment receipts.

MARKET DATA
External platforms that provide investment data, pension data, or other financial information can integrate with a corporate's back-office systems to enrich automated reporting.

FINANCIAL INSTITUTIONS
Banks are gradually introducing API-enabled payment portals for corporate use. However, many FIs continue to rely on SWIFT, H2H connections, or other legacy standards for system integration.

03. APIs in Action: Three Current Applications for Treasury

PAYMENTS AUTOMATION, FRAUD PREVENTION, & CASH FORECASTING

Because thousands of financial APIs have been developed over the past decade, treasury groups have an almost endless variety of integrations at their disposal. In 2021, a treasury group that has intentionally adopted an API-enabled technology stack could use dozens or even hundreds of different APIs at once. These APIs may be functioning apart from one another to perform entirely different functions, or work together as part of a larger process to complete more complex tasks. For example, APIs may be used to quickly export account data from bank portals to an ERP or TMS, transmit payment files between two back-office software platforms, or enhance treasury's financial security procedures by automating fraud prevention and detection functions. For more insight to how these API-enabled processes work today, we analyze three treasury API use cases in the following pages.

1

CROSS-PLATFORM PAYMENTS AUTOMATION

APIs can connect a company's various ERPs, TMSs, and AP or HR systems with a centralized payment hub that manages connectivity to all the company's banks on their behalf. Users can initiate payments in the platform of their choice and have their transfers delivered via API to the payment hub. The provider then forwards the transactions to the appropriate banks for payment.

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2

MULTIFACTOR FRAUD PREVENTION

Security APIs help automate the multifactor authentication process for users as they log onto corporate financial software. They also help monitor user activity within each software application to identify suspicious or fraudulent activity. For instance, an API can generate an email or text alert every time a payment over $25,000 is initiated, or any time a login request is generated from a "suspicious" location or device.

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GLOBAL CASH FORECASTING

To optimize cash flow and other types of financial forecasts, treasury must aggregate data from a variety of different sources. These sources may include their banks, accounting systems, investment platforms, and different legal entities. Using APIs to connect these sources with a central forecasting solution enables treasury to quickly and accurately develop optimized financial forecasts.

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03. How APIs Provide Cross-Platform Payments Automation for Treasury

For payments, APIs are commonly deployed to manage cross-platform transaction workflows and data transmission. With many large international companies using multiple ERPs, TMSs, and AP or HR systems to create payment files, using a centralized payment hub to manage bank connectivity for all these solutions can be an effective way of maintaining global control. However, in order to properly integrate all of these systems, payment APIs will require a set of standardized parameters to define exactly how payments data should be captured and formatted. For instance, how will an API process an international wire for $3,000,000 compared to a domestic ACH or SEPA payment? Because the

workflows and data fields related to executing these two payments are different, the API parameters must clearly define how each payment scenario and the underlying data should be handled. These parameters must include which fields should be pulled and which other systems should be involved in the transaction. Because of the often-minor differences in how certain payments are handled, corporates must work closely with their Fintech providers to identify and map the required workflow for every type of payment they utilize. This is the only way APIs will effectively automate company payment workflows without the need for human intervention.

1 **DEFINE THE REQUIRED DATA FIELDS**
Payment APIs must be programmed to pull unique data fields (currencies, names, account numbers, etc.) for each specific payment format a company uses.

WHAT FIELDS MUST BE DEFINED?
- Bank names and addresses
- Recipient names and addresses
- Payment amounts and formats
- Bank account and routing numbers
- Custom remittance fields

2 **MAP THE SYSTEM WORKFLOWS**
Payment APIs must integrate with a variety of back-office systems in order to manage the full scope of a firm's payment initiation and file transfer requests.

COMMONLY INTEGRATED SYSTEMS
- ERP – For Finance & Accounting
- TMS – For Treasury
- Pension System – For Legal & HR
- Vendor Platforms – For AP & AR
- Payment Hub – For Bank Connectivity

3 **ASSIGN USER AUTHORIZATION**
To protect API programs from fraudulent takeovers, only specific users are granted access to the functionality within each cloud platform the API connects to.

MANAGING API USER ACCESS
- Because API functionality is accessed directly through a corporate's cloud platforms, each individual user and solution in a company's network represents an API access point.

4 **TEST, REFINE, & OPTIMIZE**
As new solutions or payment types are added to corporate workflows over time, the API must be updated to account for these additional formatting options.

03. How APIs Enable Multifactor Fraud Prevention for Treasury

When it comes to payment security, a variety of different APIs have been developed to automate workflows for multifactor authentication (MFA). APIs are also used for monitoring user actions within financial software to help identify suspicious or fraudulent activity. For instance, APIs can be configured to send a one-time text or email passcode to users as they log onto their payment or treasury platform. In this case, the API is programmed to recognize the unique credentials of a user as they submit their login request and transmit a custom code to their mobile device or email address as a final layer of authentication.

Outside of MFA workflows, APIs can also be programmed to monitor financial systems for suspicious activity. By clearly defining the user actions that are classified as "suspicious", such as a user initiating a login request from an unknown IP address or device, APIs can automate the process of detecting fraudulent behavior. In these cases, APIs can be programmed to automatically suspend activity from suspicious users or accounts and send automated alerts to system admins warning them of potentially fraudulent activity. More about these types of security APIs are highlighted below.

SMS PASSCODE AUTHENTICATION

As a form of multifactor authentication, an API can prompt a one-time security code to be delivered via text to a user in order to confirm their identity at login.

SINGLE SIGN-ON USER ACCES (SAML)

SAML APIs enable users to automatically login to all of their software platforms after their identity has been confirmed on one of them. This helps to reduce the risk of stolen credentials.

B2B TRANSACTION ALERTS

APIs can trigger automated email alerts to system Admins anytime payments (e.g.) over a certain dollar amount are initiated.

BIOMETRIC IDENTIFICATION

Biometric APIs scan and transmit personally identifiable data, such as a user's fingerprint, to confirm their identity during login.

USER ACTIVITY MONITORING

Custom security APIs can trigger alerts when a user logs into a system outside of normal working hours, from an unregistered device, or from a suspicious geographic location.

IP SAFE-LISTING

To prevent unregistered devices from accessing company software, a safe-listing API can block unverified IP addresses from submitting login requests to the platform.
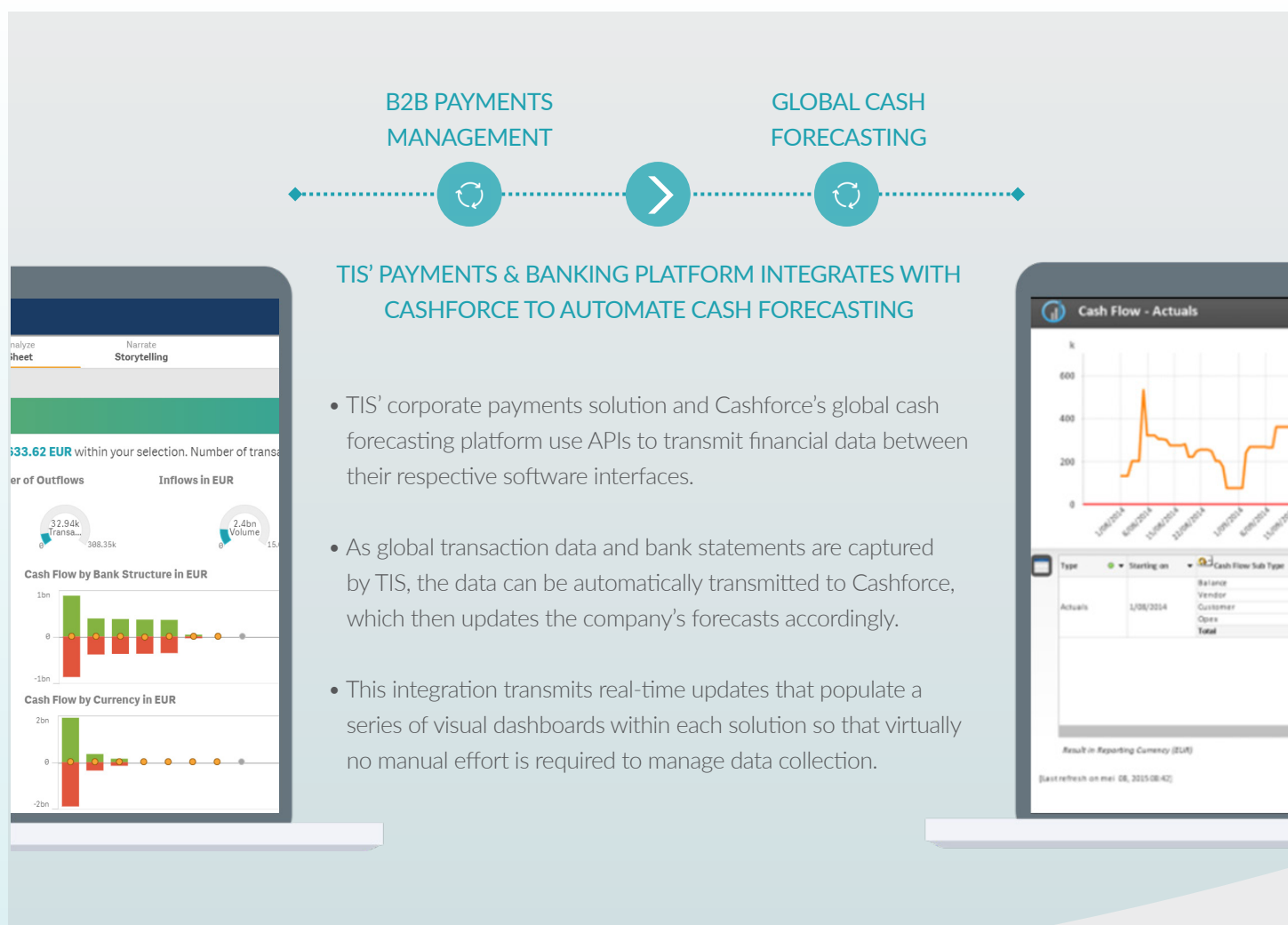
03. How APIs Support Global Cash Forecasting for Treasury

With cash forecasting, the APIs that treasury uses to automate data collection must be able to pull financial data from a variety of back-office and external systems. To avoid inaccuracies, the API must know exactly which data to pull (bank statements, invoices, etc.), how often to pull this data (hourly, daily, weekly, etc.), and from which systems to pull data (ERP, TMS, payment hubs, bank portals, etc.).

Although the APIs tasked with pulling and aggregating this financial data are key for ensuring both accurate and optimal forecasts, there are other APIs involved in the forecasting process as well. For instance, after forecasts have been developed, an API may pull data from the completed forecast and compare it with historical data to compare trends and identify gaps or variances. APIs may also be configured to transmit forecasting data back to ERPs and TMSs for additional analysis by other departments and internal groups.

Because Fintech providers have spent years developing APIs to support forecasting, the solutions available today can automatically populate treasury's software interfaces with an array of financial data without requiring any human commands. This is the level of integration that exists today between TIS' cloud-based B2B payments solution and Cashforce's global forecasting platform. We explore this integration further in the below graphic.

B2B PAYMENTS MANAGEMENT → GLOBAL CASH FORECASTING

TIS' PAYMENTS & BANKING PLATFORM INTEGRATES WITH CASHFORCE TO AUTOMATE CASH FORECASTING

- TIS' corporate payments solution and Cashforce's global cash forecasting platform use APIs to transmit financial data between their respective software interfaces.

- As global transaction data and bank statements are captured by TIS, the data can be automatically transmitted to Cashforce, which then updates the company's forecasts accordingly.

- This integration transmits real-time updates that populate a series of visual dashboards within each solution so that virtually no manual effort is required to manage data collection.

## 04. APIs Become the Backbone of Treasury's Digital Work Environment

Having just entered a new decade of treasury technology innovation, it's clear that APIs will play a crucial role.

Given the sudden emergence and sustained impact of the 2020 pandemic, the entire financial industry has been set on a much faster trajectory of technology adoption than was previously anticipated. With remote work quickly becoming mainstream for all types of corporate personnel, executives are prioritizing the adoption of cloud-based solutions to connect their global workforces. And as more cloud solutions are implemented, APIs are being increasingly relied upon to synchronize all these systems and unify the underlying data. The early results of this new-age technology boom have been very promising, and as evidenced by the below graphic, the number of globally registered APIs in use across today's software environment continues to grow at an exponential rate. This growth rate, coupled with many companies' admittances that remote work has in many ways boosted productivity, is testament to the advantages they provide.

But despite this transformational growth, there are still technology gaps that limit the use of APIs within certain financial sectors. Even today, corporates with a multinational banking landscape are often confined to using a combination of H2H connections, SWIFT services, and disparate banking portals to manage connectivity. Ultimately, a lack of API standardization at the bank level has complicated the integrations that corporates can achieve with their FIs. This remains a critical issue today.

Although these gaps in API connectivity will need to be addressed before true, end-to-end automation can be achieved, data and experience indicate that the industry is progressing favorably. Within the past few years, banks have begun collaborating closely with software providers and each other to improve their APIs. Fintechs and 3rd party vendors continue to upgrade their programs as well, and as this trajectory continues, APIs look set to become the core backbone of treasury's digital work environment.

SINCE 2006, THE NUMBER OF GLOBALLY REGISTERED API PROGRAMS HAS GROWN FROM 1 TO 30,000+*
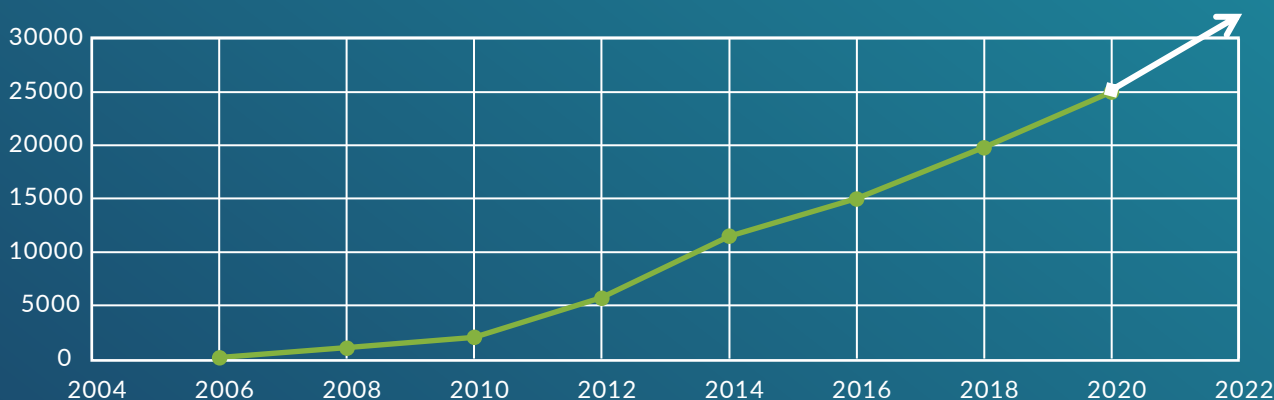
*Source: Programmable Web Online API Directory

About TIS

TIS is reimagining the world of enterprise payments through a cloud-based platform uniquely designed to help global organizations optimize outbound payments. Corporations, banks and business vendors leverage TIS to transform how they connect global accounts, collaborate on payment processes, execute outbound payments, analyze cash flow and compliance data, and improve critical outbound payment functions. The TIS corporate payments technology platform helps businesses improve operational efficiency, lower risk, manage liquidity, gain strategic advantage – and ultimately achieve enterprise payment optimization.

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