White Paper

APIs in Securities Services

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PREFACE

The securities servicing space is undergoing a transformation from an operationally focused industry to one oriented around technology, data, and integrated workflows. Underpinning this push is continued pressure on margins and fees as well as a need to pursue growth beyond the core by providing an additional set of services.

Application Program Interfaces, or APIs, are one technology that promises to support this transformation by:

- ***Accelerating data exchange:*** Participants from across the securities servicing value chain are increasingly demanding flexibility and real-time access to their data held by custodians, exchanges, centralized securities depositories, and others. APIs can catalyze the transition from a 'push' to a 'pull' regime which supports access to data on an 'as-needed' basis. In turn, this transition can then support increased rates of straight-thru-processing, increased adoption of Robotic Process Automation (RPA), and other efficiency gains.
- ***Improving inter-firm integration:*** Removing manual touch-points in data and instruction handling between firms is a significant source of value unlock. APIs can enable deeper integration of firms' systems, improving efficiency and unlocking opportunities for additional service offerings.
- ***Ensuring interoperability with tech of the future:*** The path forward on core processing infrastructure remains unclear. Should new technologies, such as distributed ledger, be broadly adopted, APIs could play a meaningful part of the target-state solution as well as provide a bridge from existing systems to the systems of the future.

APIs are not the exclusive focus for most executives in the securities servicing industry. Distributed ledger, cloud-based data solution, robotic process automation, and others are garnering the attention of executives in their pursuit of margin improvement and revenue growth. We have chosen to explore APIs specifically as the maturity of the technology, combined with the myriad use cases being explored today, suggest their adoption has great potential across the industry.

BCG and SWIFT have joined forces in exploring APIs in securities services. Our perspective is built upon discussions with industry executives, experience with API pilot programs with industry participants, and applying learnings from API use in other industries.

EXECUTIVE SUMMARY

Application Program Interfaces, or APIs, have emerged as a key technology underpinning digital transformation programs across the corporate world. While previously only the domain of technology firms, APIs are increasingly mainstream tools and becoming strategically essential for companies in all industries. APIs promise to increase the efficiency of interaction between firms while also facilitating the birth of new business models and promoting sources of revenue.

The securities servicing industry has been relatively slow to adopt APIs, despite the fact that innovations in payments systems and 'open banking' have brought about considerable use of the technology in other areas of financial services. However, green shoots are observable in securities servicing, as industry participants recognize that APIs have the potential to deliver value in 4 key dimensions:

- *Efficiency / cost savings:* replacement or improvement of inefficient manual processes and reduction of reconciliations
- *Real-time visibility:* improvement of the visibility of settlement status, liquidity management and intraday risk
- *Value-add services*: such as customized reporting and data enrichment
- *Aggregation / benchmarks*: improvement of operational performance and adherence to service level agreements

While overall penetration of API technology in securities servicing remains low, custodians have led the industry in launching pilots with their clients. Pressure to reduce service costs and increase efficiency has encouraged custodians to experiment with APIs to communicate with their clients. The focus thus far has been on asset managers, which historically have been more resistant to adopt industrialized, scaled solutions (e.g. SWIFT connectivity).

One of the key barriers to more widespread adoption of APIs in securities servicing is concern over lack of standards. In a recent survey of asset managers, ~70% indicated that they were 'somewhat or very concerned' about API interoperability when considering implementing an API solution with their custodian or broker-dealer. Lack of interoperability could diminish the efficiencies achievable by migrating to an API solution. This makes potential adopters cautious.

Any API solution also has to meet strict security and resiliency standards to be considered a viable alternative to existing means of communication. While APIs can deliver

improvements in security and resilience by replacing a manual process with one that is automated, this is not viewed as a differentiator in itself but rather merely as an opening bid.

In our view, the most effective way to overcome the obstacles of interoperability, security and identity management, among others is to mutualize components of API solutions. The introduction of common components of API infrastructure would benefit the industry as it would reduce aggregate investment required to implement API solutions, thus freeing resources for other business priorities. It would also facilitate adoption by enabling network effects in a system that might otherwise be frustrated by proliferation of point-to-point solutions.

The securities servicing industry has many features that make it highly suitable for adoption of APIs. These include the need for highly complex and dynamic communication between participants, burgeoning data-based service offerings, strict security requirements, and enduring pockets of highly inefficient processes. Deploying technology like APIs promises to greatly increase efficiency and improve service offerings. The characteristics of the securities servicing also suggest that mutualizing API infrastructure to ease adoption and unlock collective value is the way forward.

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BASIS OF PERSPECTIVE

BCG and SWIFT have conducted an extensive assessment of the potential use of APIs in securities servicing. This includes establishing a baseline threshold for the use of APIs in the industry today, as well as developing a perspective on the likely future development of API-based solutions. Our conclusions are based on interviews with business, operations, and technology executives from industry incumbents such as custodian banks, asset managers, broker-dealers, and centralized securities depositories, a survey of ~100 asset managers, and our own experience with API technology from other industries including banking, data, analytics and technology companies, and others.

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THE CASE FOR ADOPTING APIS IS STRONG, AND IS ROOTED IN IMPROVED EFFICIENCY AND SERVICE

API technology is well suited to aid the securities servicing industry, given the open architecture possibilities, familiarity with it amongst developers, and existing use in banking communications.

APIs are a well understood technology that is supported by a highly active community of developers. The benefits of this are manifold, but importantly provide for a virtuous cycle of innovation to help drive continuous improvement in capabilities as well as a talent pool to implement API solutions at securities servicers.

In addition, the flexibility offered by APIs can both ease implementation and allow for customization as products evolve and client demands change. More fundamentally, APIs enable communication that is more akin to a genuine conversation in that data is transmitted as and when it is called for, and the amount of data transmitted is only what is requested.

Finally, API technology has proliferated across nearly all sectors of financial services, including personal banking, commercial banking, wealth and asset management, insurance, capital markets, and more (see exhibit 1). Consequently the talent and core capabilities required to deliver API solutions are already in place and need only to be extended to the securities servicing industry.

Exhibit 1: Open banking strategies and products (APIs) are proliferating across all sectors in financial services
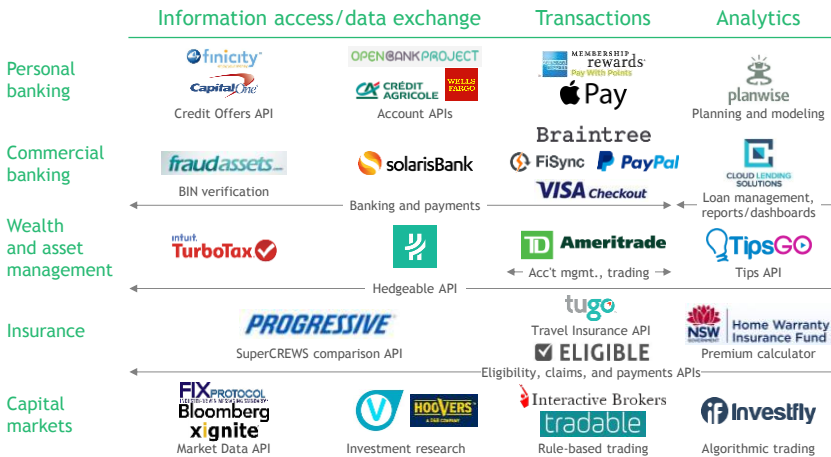
Source: Company websites; ProgrammableWeb; BCG research and analysis

Characteristics & trends in the securities servicing make API adoption attractive:

I. *Increasing levels of firm-to-firm integration and complexity of information exchange requirements between industry participants*
   - The frequency of interaction and volume of data exchanged between participants in the post-trade industry is high and increasing.
   - The expansion of functions passed from the buy-side to custodian and asset servicing providers is increasing, resulting in highly integrated operating models.
   - APIs are well suited to meet the complex data exchange requirements between the buy-side and custodian banks, and can enable more seamless integration between servicer and client systems regardless of the underlying technology infrastructure.

II. *Growth in alternative assets and resulting proliferation of complex asset types*
   - Innovation in asset design has produced increasingly complex requirements in post trade. For example, when a new type of derivative instrument is introduced, new data fields have to be created and exchanged between an asset manager and custodian to facilitate clearing and settlement. As the pace of innovation increases, the need for a solution that is sufficiently flexible to handle such changes without introducing manual processes is critical.
   - API solutions can also support requisite levels of flexibility while maintaining high levels of straight through processing

III. *Fee compression through the post-trade value chain and persistence of pockets of inefficiency*
   - There continues to be fee pressure in the post-trade world, driven by the rise of passive investment vehicles and the continued reduction of fees paid by investors. This

trend has affected all post-trade players, and has resulted in renewed efforts to find efficiencies and cost savings
- Pockets of inefficiency still exist in post-trade, particularly in areas that are sub- scale or where changing requirements hinder investment in robust, automated processes. For example, some asset managers and custodians remain reliant on electronic faxes and phone calls for many of their inter-firm communications.
- APIs lower the barrier to adoption as investment required for implementation is low compared with existing post-trade solutions.

IV.   Burgeoning data and service offerings from custodians
- Custodian banks are exploring ways to expand their position in the market, and are increasingly looking to provide services such as data management, analytics and insight, portfolio risk analytics, and others. StateStreet's acquisition of Charles River Development is perhaps the most visible recent manifestation of this trend.
- These new business models will entail engagement with different units in the existing client base (e.g. front-office), and will require more ways of interfacing than currently in use. APIs can support firms as they grow the scope of services that they look to provide.

APIs have the potential to deliver value to the securities servicing industry in 4 key ways:

I.   Efficiency / cost savings
- Current levels of automation and straight-through-processing (STP) in inter-firm communication vary considerably by activity type and asset class. For example, while equity clearing and settlement enjoy high levels of processing efficiency today, complex instruments such as syndicated loans often rely on fax and phone calls for settlement and confirmation. This is often the result of the need for dynamic data exchange and also continuous product innovation, which make investment in automated solutions with existing messaging technology challenging. The flexibility of API solutions makes automation of these communications possible, improving efficiency and reducing the need for oversight teams to handle breaks and exceptions.
- The need to provide customized reporting for clients remains a source of frustration, and materially contributes to costs at many securities servicing providers today. APIs can make client data available in a flexible way, enabling reporting solutions that are easy to both implement and modify.

II.   Real time visibility
- A key feature of API-based solutions is provision of information on an as-needed basis. Rather than clients being a passive recipient of outputs from batch processes, with an API they have an ability to call up specific information at the precise moment it is required.
- This 'real time visibility' is valuable in settlement, whereby clients can get relevant information throughout the day. This enables clients to better manage intra-day risk, improve cash and collateral management, and better execute value-added programs such as securities lending.

III. ***Value-added services***
- Securities servicers continue to expand their product offering, reflecting the demand from clients for new services. These include enriched data (such as inclusion of trading volume statistics in equity transactions), and data and analytics services.
- Beyond making such data-based offerings easier, APIs can also enable new processes in areas such as NAV distribution, transaction screening, KYC utilities and other services that rely on the integration of operating models across players in the securities servicing industry.

IV. ***Aggregation & benchmarks***
- Should a common API infrastructure be used to support adoption of the technology in the market, there will be an opportunity for delivery of additional value services, such as development of benchmark indices built by aggregation of data.
- Operational benchmarks can track adherence to SLAs, track breaks and failed settlements, and help servicers identify where they are outperforming and underperforming peers.

Exhibit 2: APIs deliver value to securities servicing ecosystem in four key ways

Efficiency / Cost
- Reduction in oversight teams needed to handle breaks and exceptions
- Reduction in requests for customized reports
- Increase in STP rates for setups that are currently not SWIFT enabled

Real-time visibility
- Improved visibility into settlement status, intraday risk compared to EOD batch processes
- Improved cash / collateral management
- Ability to lend out settled securities earlier

Value-add services
- Ability to enrich exchanges with trade specific data (e.g., daily volume share, corporate actions) or other proprietary data (e.g., SWIFT payment data)
- Expedited means of accessing / developing customized reports & analytics on data held at counterparty

Aggregation / Benchmarks
- Visibility into operational benchmarks (e.g., # of breaks, timeliness of NAV) and peer adherence to potential SLAs
- Visibility into business benchmarks (e.g., Custodian or BD volume by asset class, fund performance)

Sample use cases that illustrate the power of APIs in post-trade:

Improving timeliness of NAV calculation & distribution

- Challenge:
  - Data required for NAV calculation is batch-processed by fund accountants at different cut off points until the end-of-day, often through manual processes.
  - Once calculated, the NAV is then distributed to consumers on a batch basis, with limited or no information about status of price evolution offered to consumers.
- Solution & benefit:
  - Fund accountants replace batch-processing of NAV input data with API calls to improve accuracy, speed of data collection, and consequently accelerate NAV calculation.
  - Consumers (e.g. asset managers) can call for status updates and NAV from fund accountant via API calls.
  - An operating model that can support intra-day NAV evolution and ultimately make 'real time' NAV available to clients.

Real time status of settlement instruction

- Challenge:
  - Current status reporting mechanisms are not suited to industry needs. Exception monitoring should be fast, automated, and simple.
  - Instead, high volumes of status messages with low data quality can overwhelm systems without effectively prioritizing exceptions which require immediate attention. .
- Solution:
  - Provide access to settlement status through API calls that will increase flexibility and reduce notification latency.
  - In cases of exceptions, data fed back can be customized based on the type of exception encountered, thus improving transparency of the information sent back to consumer.

Ad-hoc consumption of securities positions across custodians and depositories

- Challenge:
  - Intraday communication of holdings is often manual, especially when a position in a specific asset is needed on an ad-hoc basis.
  - Having access to securities positions across multiple accounts is essential to sell-side firms when receiving an allegement (missing trade match).
- Solution:
  - Provide account holders the ability to request security positions through APIs across multiple accounts held at different account servicers.
  - Reduce batch processing for custodians and depositories, and improve the efficiency of middle, back, and front office operations for buy-side and sell-side firms.

Normalizing complex asset classes information

- Challenge:
    - Asset classes such as syndicated loans or derivative contracts have complex and dynamic requirements regarding the exchange of deal information.
    - Multiple types of data and also data providers result in fragmented processes to collect, normalize, and process data. Procedures lack standardization and are difficult to automate.
    - Revolving credit facilities call for real-time access to data for borrowers, lenders and agents.
- Solution:
    - A collaborative and open source modelling tool and methodology to create flexible but standardized API contracts.
    - A central API gateway can give access to all parties using a single authentication mechanism, can validate or flag deviations of specific SLAs or track transactions based on unique data (ISINs, CUSIPs).

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API ADOPTION IN SECURITIES SERVICING LAGS OTHER PARTS OF FINANCIAL SERVICES

APIs are not a new technology in financial services. In fact, 75% of the top 50 banks have launched an API platform, and 25% have launched a customer-facing apps. APIs are used extensively in retail banking, commercial banking, wealth and asset management, insurance, and capital markets. APIs support information and data exchange, transactions, and analytics delivery.

Regulation has provided one of the catalysts for the proliferation of APIs in other areas of financial services. For example, the European Union's Payment Servicers Directive 2 (PSD2) has pushed banks to support API technology. However, there has been no similar catalyzing event in the securities servicing business. This, combined with the fact that traditional messaging solutions continue to serve large portions of the industry adequately, accounts for the relatively slow adoption of API solutions among securities servicers.
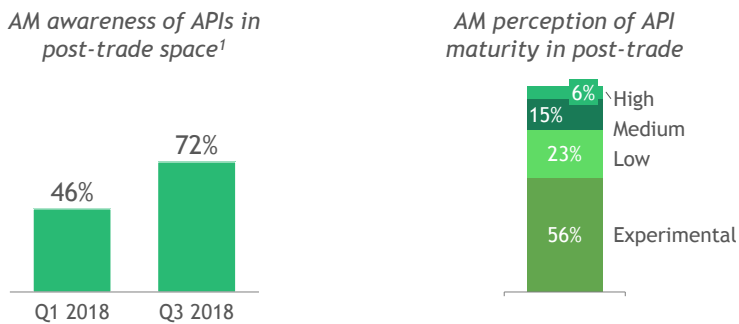
In contrast, there is rapidly growing interest in APIs in the post-trade space. In two surveys of asset managers conducted in Q1 2018 and then in Q3 2018, we found awareness of APIs grew from ~46% of respondents to ~72%. There are more pilot schemes and use cases than before, particularly between asset managers / asset owners and their custodian banks. It is in this corridor that we see the lowest levels of post-trade STP and automation today, and as post-trade adoption is driven by commercial rather than regulatory pressures, it is perhaps not surprising that API solutions have gained the most ground here.

But there are other worries that have restrained broader adoption of APIs. In particular, there is concern in the securities servicing industry about the possibility of proliferation of different API standards. The difficulties presented by handling multiple labels and attributes for data elements, JSON definitions, and others would undercut any gains in efficiency that APIs would deliver. Consequently, many players have adopted a 'wait and see' approach and have delayed investment until there is more clarity in these areas.

In addition, there is little consistency in the readiness of players in the post-trade world to adopt APIs. Asset managers vary widely in terms of both their technical sophistication and openness to engaging with vendors via API solutions. Some 56% of survey respondents perceive maturity of post-trade APIs to be "experimental" while just 21% say it is "high" or "medium". In addition, many custodians that we spoke to are focused on

improving their internal technology and data architecture before they can offer services via APIs.

Exhibit 3: Increasing awareness of APIs in post-trade space, though perceptions of maturity still vary widely

AM awareness of APIs in post-trade space[1]

AM perception of API maturity in post-trade

46%   72%

Q1 2018   Q3 2018

6% High
15% Medium
23% Low
56% Experimental

Source: BCG survey of Asset Managers (N = 99, 2018); 1. Q1 2018 estimate based on interviews with asset managers

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CALLS TO ACTION TO ACCELERATE API ADOPTION IN THE SECURITIES POST TRADE INDUSTRY

APIs have the potential to drive efficiency and open new business models in the securities servicing industry. However, uncertainty regarding existing solutions, lack of clarity about likely development, and uneven levels of technological readiness among key players has resulted in slow adoption. We have four calls to action to the industry that can accelerate adoption of APIs in securities servicing:

I. *Mutualize common API infrastructure*
   - Many components of API solutions do not offer a competitive advantage to any one market participant. Foundational pieces of any API solution such as identity management, authentication, security, and management of network connectivity should not be the focus of individual firms. Rather, they should focus on what APIs enable – new products and services, improved client service, and efficiency gains realized by converting manual processes to automated ones.
   - Mutualizing the API infrastructure has the added benefit of increasing scale while reducing individual costs.

II. *Curate API standards to support interoperability while maintaining flexibility inherent to API technology*
   - APIs are inherently flexible. This feature makes APIs suitable for handling complex asset classes, bringing new services to the market speedily, and providing customized client solutions.
   - Proliferation of multiple standards (or rather, lack of any one overarching standard) threatens to diminish the efficiency gains that APIs can deliver. Consumers of APIs want to use a single API standard to engage with multiple providers.
   - Harmonization of modeling APIs can strike the balance between flexibility and speed of development while also ensuring interoperability of APIs

III. *Support networked APIs rather than point-to-point solutions*
   - Firms stand to benefit from networked APIs. For example, a single call to check the status of settlement from a broker-dealer can be routed to multiple custodians simultaneously. A networked solution will also support convergence of both data definitions and other characteristics of API contracts, resulting in net benefit to the entire securities servicing post-trade market.

IV. *Meet strict security and resiliency standards*
   - Security and resiliency remain top of mind for securities servicing industry participants. As such for any API solution to gain traction, it will need to meet a high bar in protecting data transmitted via the API and have high levels of resiliency. This is table stakes for any solution in this industry to gain traction.

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CONCLUSION

While APIs have become popular in payments, information services, capital markets, and other industries, their adoption has been relatively slow in securities servicing. Viewed solely from the perspective of benefits that APIs can deliver, this is surprising. Benefits are manifold, ranging from improvements in efficiency and productivity to setting the stage for diversification of revenue by launching new businesses focused on data and analytics.

Low adoption of APIs in securities servicing is in part explained by the lack of a transformative event like PSD2 in the payments world. Differing levels of familiarity with APIs and uncertainty over how the technology will be deployed have prompted some players to take a 'wait and see' approach, further slowing adoption of APIs.

However, the industry may be near a tipping point. Asset managers are increasingly aware of and interested in using APIs to connect with their service providers. We observe green shoots in events such as pilots and initial commercial offerings delivered by custodians to their clients.

By mutualizing foundational API infrastructure, aligning an approach to set standards, and pursuing networked rather than point-to-point solutions, the securities servicing industry stands to unlock significant collective value generated by greater use of APIs.