



What Banks Need From Their Technology Stack

TO SUPPORT CONSUMER FINANCIAL HEALTH

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EXECUTIVE SUMMARY

The need to support consumer financial health has never been greater. The precariousness of household finances in the U.S. has been pushed to the forefront by the economic fallout from the pandemic. Financial institutions will play a role in their customers' recovery; but to do so effectively, they will need to better understand the financial health challenges of their customers and offer tools to help them build resilience.

Digital finance tools—new online and mobile apps that help consumers forecast their account balances, pay down their debts, build cash cushions for emergencies, and meet other savings goals—are showing they can build households' ability to weather financial catastrophes. Ideally, these would be widely available as features of bank checking accounts; but these innovations have come largely from direct-to-consumer fintechs and challenger banks, rather than from established banks and credit unions. The prevailing “free checking” model may be partly to blame: it limits returns institutions can earn on

new features customers might want with their accounts. Instead of value-pricing for account features or add-ons, the model relies on debit card interchange and back-end fees such as overdraft.

But banks' reliance on their legacy technology “stacks” and the vendors that provide them also act as barriers to innovation. All but the largest depository institutions depend on third-party core processing platforms, related software, and digital banking providers — their technology stack — to enable them to understand their customers' financial needs through data analytics and to deliver

financial tools that help customers meet those needs. These “core platforms” are provided by a small number of vendors whose systems rest on architecture and technology from the 1970s and 80s and who have been slow to innovate or to collaborate with the fintechs or developers that have been the leading innovators in the financial health field.

To better understand the banking technology infrastructure and its role in supporting the analytics and tools that institutions need to support financial health, we conducted over three dozen interviews with CIOs at small and mid-sized institutions, consumer app developers, core processing platform suppliers, consumer fintechs, and other banking technology observers. These stakeholders generously provided insights as to why banks’ and credit unions’ key technology vendors have been slow to adopt or support fintech-led consumer-facing financial health tools. Both technical constraints imposed by the age and complexity of legacy core banking and key ancillary systems, as well as vendors’ long-standing business models, play a role.

Institutions seeking to make financial health central to their business strategies as well as consumer app developers both express frustration. The banks lament the high costs and risks of converting to new, more open platforms that may promise ways to expand their consumer offerings. Prospective in-house or third-party developers of consumer-facing solutions point variously to high API licensing fees, charges to the banks themselves to access

their own data within the core, and high revenue-sharing conditions as barriers to integration.

Financial health products and analytics depend on customer financial data.

For example, a product that predicts when a consumer has enough excess funds to put aside a portion for savings requires access to historical and current transactional account inflows and outflows. Fintechs that provide consumer financial tools have accessed this information through data aggregators, who provide it in standardized data categories and formats. But financial institutions have had a harder time accessing and using their own customers’ financial data because their banking technology vendors have historically limited institutions’ data access and their ability to integrate third-party offerings.

This situation is changing. Competition — from new core platform providers based on more modern software design and from workarounds to direct integration for institutions served by incumbent platforms — has begun to lower the barriers. **Three promising pathways to access critical customer data and new consumer-facing services are emerging:**

1 Middleware

Middleware serves as an intermediary between the core processor platform, or another critical source of banking data, and the application using the data. Middleware that can facilitate financial health product offerings is pre-integrated with popular core

processor systems, lowering the cost of custom integrations and providing financial institutions and developers with easier access to needed data.

2 Data Aggregation

Through data aggregators, which often access consumer data in the same manner as a consumer — using a digital banking log-in — product developers and innovators have access to needed data without integration, or even permission, from the banking platform. The additional data cleaning and enhancements provided by data aggregators, along with the ease of use, has prompted some financial institutions to use data aggregators to power personal financial management apps or internal analytics. There are near-term costs to financial institutions, from unquantified risks in data security to the pennies paid each time data is accessed through their outsourced digital banking services. But by streamlining new product development and providing data from all the institutions a consumer might have relationships with, data aggregators continue to facilitate innovation.

3 Open APIs

Recognizing the demand for greater access to critical financial data, core processing platforms are increasingly offering reliable, secure access through APIs (application programming interfaces). “Open APIs” indicate that a platform is encouraging third-party integration, in contrast to incumbent providers’ historical approach of driving financial

institutions to purchase more “native” services and solutions from them. This evolution is promising and, depending on data-call pricing, could increase the number and range of digital services that financial institutions offer their customers.

The smallest institutions (i.e., those under \$500 million in assets) will remain heavily dependent on their core platform providers’ “native” digital banking services for financial health-related tools, since they lack the staffing bandwidth and technical capability to manage multiple vendors. But the emerging data pathways provide other financial institutions and product solution developers with more opportunities to test and implement ways to support consumer financial health.

The COVID-19 crisis is leading growing numbers of financial institutions to make customers’ financial health central to their organizational missions. All but the largest will rely on others to build and support solutions that integrate easily with their core processing and digital banking platforms. **By giving institutions greater access to their own data and options for solution integration, banking technology providers can better support their clients in offering products and services that consumers will come to expect.**

Core platform providers, digital banking services, and all participants in the tech stack can either facilitate financial institutions’ efforts to foster financial health, or lose customers to the competitors who will.

In a competitive market, improving consumer financial health can differentiate financial institutions and build loyal customers.

INTRODUCTION

There are over 10,000 depository institutions serving consumers in the United States. These banks and credit unions vie to hold onto the customers they have and attract new depositors and borrowers. But between financial institutions, neobanks, and fintech apps, consumers have an increasing number of options to meet their day-to-day needs for banking and payment services. In this competitive market, more financial institutions are including customer financial health in their retail banking strategies by understanding their customers' financial health needs and offering products and services that meet those needs. Customers who believe that their financial institution cares about their financial health are three times more likely to recommend it to friends and family and five times more likely to buy additional products and services from it.¹

Unfortunately, only 32% of Americans were financially healthy as of early 2020² — a percentage that is likely to decrease as the economic impact of the COVID-19 pandemic plays out. Stay-at-home orders demonstrated the importance of digital banking and tools that enable consumers to transact and plan remotely. As financial institutions seek to support their

customers' changing circumstances and meet their financial goals, banks and credit unions need banking technology that allows them to offer well-designed financial products affordably and flexibly. Yet at most financial institutions, the ability to analyze customer needs or to offer digital solutions that advance customers' financial health depends on third-party technology that is not yet up to the task.

¹ Analysis conducted by the Financial Health Network using survey responses to the U.S. Financial Health Pulse (2019).

² Analysis conducted by the Financial Health Network using survey responses to the U.S. Financial Health Pulse (2020).

In this report, we explore the technology and vendor challenges that small and mid-sized banks and credit unions face in delivering market-leading financial health tools, and we identify emerging pathways around those barriers. Along with secondary research, we draw from interviews with roughly three dozen banking professionals from financial institutions and banking technology providers, including leading core processing platforms and digital banking services, fintech and third-party product vendors, and bank technology consultants. Heads of technology, innovation, and operations at banks and credit unions, ranging in size from

\$12 million in assets to over \$12 billion, also shared their experiences with technology procurement and integration. (To promote candor, we promised anonymity, so only those who agreed to be identified are quoted or otherwise acknowledged.) We heard that financial institutions are heavily dependent on their vendors for financial health tools, while the leading incumbent banking technology vendors are waiting for others to build tools that they can acquire. All the while, fintech apps and neobanks are appealing directly to consumers with banking services that support consumer financial health.



STATE OF THE ART

Most financial institutions are lagging behind fintechs in finhealth product offerings, despite having the data to understand customer needs.

Most banks and credit unions are lagging behind fintechs and some mega-banks in offering digital tools for building financial health. Non-bank innovators such as Digit, Qapital, and Acorns, for example, have each attracted millions of users, filling product gaps left by users' primary financial institutions. Financial health products rely on information about the consumer — specifically data from the deposit accounts where consumers deposit their pay and manage

their daily spending — to facilitate positive financial behaviors. Depository institutions large and small, which host these primary transaction accounts, should be well positioned to offer such products. But that hasn't been the case. Financial institutions cite serious obstacles in tapping their information systems as a reason for being slow to develop or integrate new services that could help customers better plan, save, and regulate their own spending and borrowing.

Financial health solutions rely on customer data to make complex financial management easy.

Financial health products — or solutions that help consumers to better spend, save, borrow, and plan — evolved from personal financial management (PFM) services, which enable a consumer to track investments, balances, and spending transactions and to establish spending budgets. Financial health products focus more on informing or automating the day-to-day decisions consumers must make to effectively manage their financial lives. Accordingly, some have labeled these new action-oriented services “PFM 2.0.” Financial health products rely on being able to access various pieces of balance and transaction data about consumers' accounts. They can range

from simple balance alerts to AI-enhanced forecasting tools and decision rules. The following are examples of solutions offered by fintechs and a few large banks.³

Balance forecasting tools, such as Erica from Bank of America, use information about consumers' recent transaction and deposit histories to identify recurring expenses and automatic debits that post to consumers' accounts and predictable times, yielding a “safe-to-spend” number that can be significantly less than the available balance a consumer sees when they check their balance online. They can also use an account's recent deposit history to predict when

³ These examples are the four “retrinnovations” identified in a recent [Financial Health Network paper](#) identifying financial health solutions that restore personal financial habits and practices from the era of paper banking and checking.

funds from a consumer's next direct deposit will become available to fund payments, helping a consumer to avoid overspending or risking overdrafts.

Savings apps such as Digit help consumers increase savings by automatically transferring funds from a checking account in small amounts when the funds won't be missed. These solutions build algorithms based on deposit and transaction history, as well as a consumer's most recent transactions, to make automated savings withdrawals when withdrawing won't cause the consumer to fall short of meeting their recurring financial obligations. They are helping consumers to save for certain large-ticket purchases without having to borrow, and to build "rainy day" funds that can be used in an emergency.

Earmarking tools, such as those offered by Mvelopes, EarnUp, and several of the new virtual challenger banks, replicate the paper envelopes that households once used when operating on a cash basis. These tools segregate income into separate buckets to assure that recurring bills get paid (and may even pay the bills automatically) so that households can meet their most important obligations. These solutions enable consumers to create a layer of virtual sub-accounts to separate funds they have set aside for upcoming obligations from the portion of their deposits that are still safe to use for discretionary expenditures.

Debt management and credit-building tools help consumers pay down their credit card balances or student loans by establishing installment plans and helping borrowers stick to them. By reducing credit line utilization, these apps can help free up more credit for emergencies and improve credit scores.

A separate set of services that support consumer financial health enable a financial institution to assemble and analyze data about its customers and their various accounts and transactions. These **data analytics** are part of the institution's internal capability to understand its customers'

needs and identify trends, challenges, and potential solutions that inform its product, servicing, and marketing strategies. For example:

Customer segmentation and marketing can enable institutions to use their customer data to identify different customer segments with different financial needs. For example, deposit patterns can be used to differentiate customers who have volatile incomes from those who have stable ones and recommend the right savings tool. As another example, customers' bill payment information can help identify customers with high credit card or student loan balances who might benefit from debt management services or consolidation loans.

Cash flow underwriting can be used to extend credit to customers who do not qualify using traditional credit scoring. By analyzing bank account inflows and outflows, financial institutions can estimate future funds available for repayment and extend the appropriate amount of credit for individuals with minimal credit history.

Financial coaching and similar financial health advisory services rely heavily on a consumer's financial data. Sessions usually begin with helping the consumer assemble information about their assets, debts, income, and expenses so that, together, client and coach can assess the overall financial situation and plan, budget, and save appropriately for the future. The information-gathering process can be slow and cumbersome, especially if it relies on collecting paper statements or cancelled checks. But data aggregation and analysis tools can automate and accelerate this process, helping coach and client get to the work of goal-setting and establishing a financial plan more quickly.

Financial institutions' ability to develop and deliver digital financial health services and to marshal their customers' data to support financial health strategies depends heavily on the basic banking technologies — the technology stack that banks and credit unions depend on to operate.

STATE OF THE STACK

Customer data is spread among many systems.

Financial institutions generate a wealth of data, but it is siloed in various systems that are hard to integrate and that are updated at different frequencies. Fintechs that offer apps directly to consumers have avoided the need to integrate with their customers' banks' systems by relying on data aggregators such as Plaid, Yodlee, Finicity, and MX, who, in turn, have accessed much of the necessary financial data through the banks' digital banking web pages. Access to "scraped" data obtained through the aggregators is one factor that has enabled fintechs to develop and deliver innovative digital services more quickly than the institutions that actually host the data.

Core banking systems or "core platforms" are most central to the operations of banks and credit unions and form the base of every bank's "technology stack." They maintain information about an account holder's balances and update them following various deposit and debit transactions. The "core" is the system of record used to send monthly account statements to customers, maintain an institution's chart of accounts, generate financial statements, and produce various reports that regulators use to monitor institutional safety and soundness. But a variety of subsystems are also needed to connect the core banking platforms to the various payment networks (check, ACH, signature, and PIN debit) and to various interfaces that staff and consumers use to obtain account information and initiate transactions (teller, ATM, online, and mobile banking). These subsystems operate in different timeframes (e.g., real-time vs. batch) and often house different or more timely information than that housed in the core

platforms, which is still largely updated only daily through batch processing.

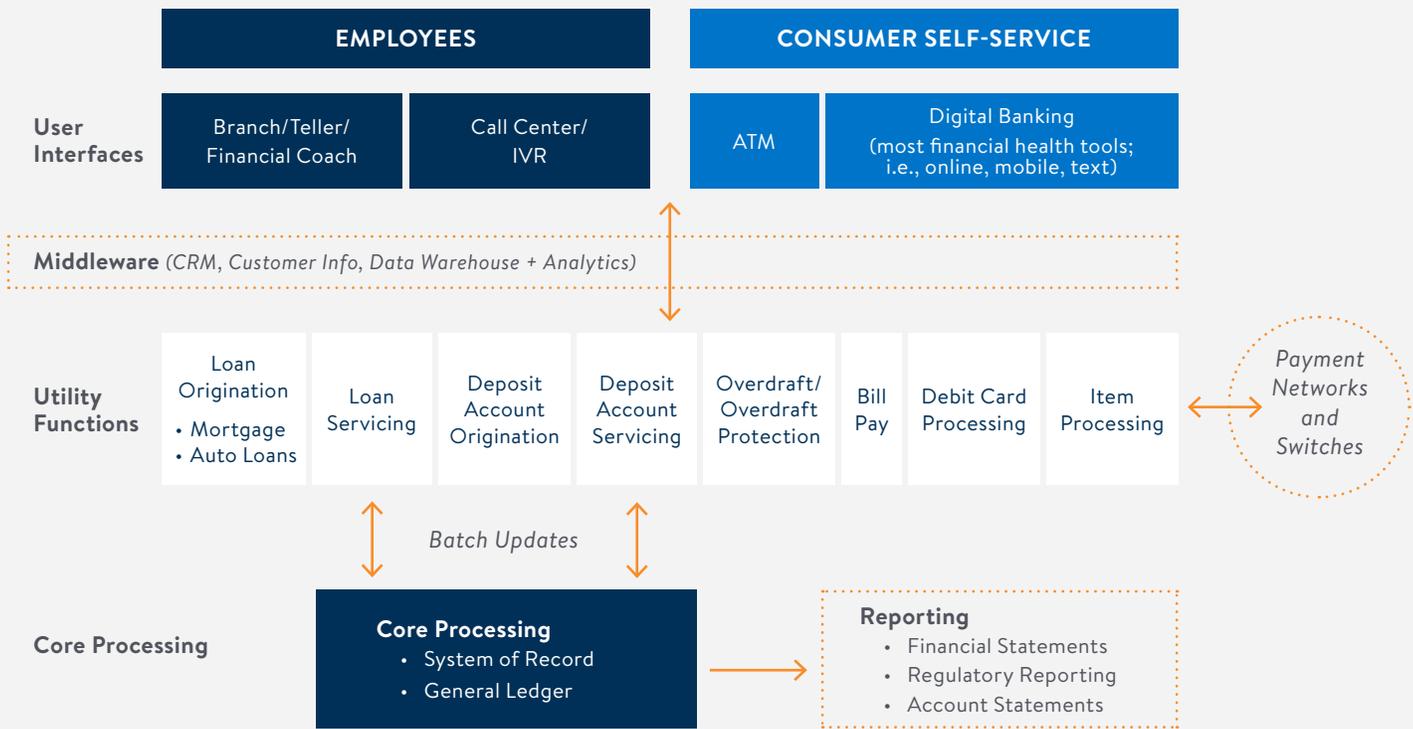
For example, when consumers look up their available balances via mobile banking apps, the digital banking system:

- a) queries the core system's balance from the previous end-of-day batch operations
- b) checks the debit card processing systems to reduce the available balance by the amounts of transactions the bank has authorized but that have not yet been presented from the merchants' banks
- c) may query item processing systems to adjust available balances for check and ACH transactions that have been presented during that day but have not yet been processed

In short, even the simple act of providing consumers with their current available balances involves querying multiple systems that operate in different time frames, have differing data formats, and may even be supplied by different vendors.



SIMPLIFIED TECHNOLOGY STACK OF FINANCIAL INSTITUTIONS SERVING CONSUMERS



Some of the most useful apps for fostering consumer financial health rely on digital interfaces for both assembling information about a consumer’s bank accounts and recent transactions and for prompting alerts or automating decisions about them (for example, prompting the consumer to transfer funds to avoid overdrafting their account). Thus, they often rely on an ability to tap data about a

consumer’s accounts and transactions that is cached in separate subsystems.

Integrating or interfacing with both the core accounting systems and key subsystems across the stack is the most important functionality for supporting financial health apps. In fact, the more sophisticated the solutions, the more data sources – and the greater number of interfaces – they generally rely on.

The smaller the financial institution, the more reliant on the core processing platform vendor for all banking technology.

All financial institutions rely on vendors to supply key technologies, but small institutions rely on them the most. The 9,000-plus banks and credit unions with assets under \$1 billion tend to rent the core accounting systems and related subsystems on which they operate from a single provider under long-term contracts. Three national core processing platform vendors dominate this market segment, with over 70% market share among financial institutions.⁴ Because of fixed setup costs, institutions receive the most favorable pricing terms when they enter long term contracts with these vendors. When the contracts are up for renewal, the costs and risks of converting from one platform to another are high (even to a platform offered by the same vendor). Thus, most institutions renew contracts with their established vendors for five or more years at a time.⁵

Most small institutions also use the digital banking solutions supplied by their core platform provider. These institutions have little influence over which new functionalities get added to these solutions, and the platforms generally wait to add features or offerings until larger institutions have proven them out and they become “must-haves” for their smaller clients. Yet, despite not having to make their own investments in new digital offerings or maintaining a costly bench of internal IT talent

as compared with larger institutions, small banks and credit unions actually direct a proportionally higher amount of their operational costs toward procuring information technology. All of these factors greatly constrain their ability to cover integration costs or contract with new vendors who might offer add-on services, including financial health products and services.

Mid-sized institutions have somewhat more flexibility. They can choose specialized vendors, often referred to as “best-of-breed,” that provide non-native digital banking systems that are already integrated with their core processing platforms and ancillary systems and that may offer a greater number and sophistication of services to consumers. As they get larger still (above \$10 billion in assets, which accounts for just 150 depository institutions), they may have the internal capability to develop some of their own consumer-facing applications, use middleware that can deliver data from the core and other subsystems to new applications, or may populate “data lakes”⁶ for conducting customer analytics and marketing programs. Only the very largest banks develop and host major portions of their underlying enterprise systems and generally build their digital banking services themselves.

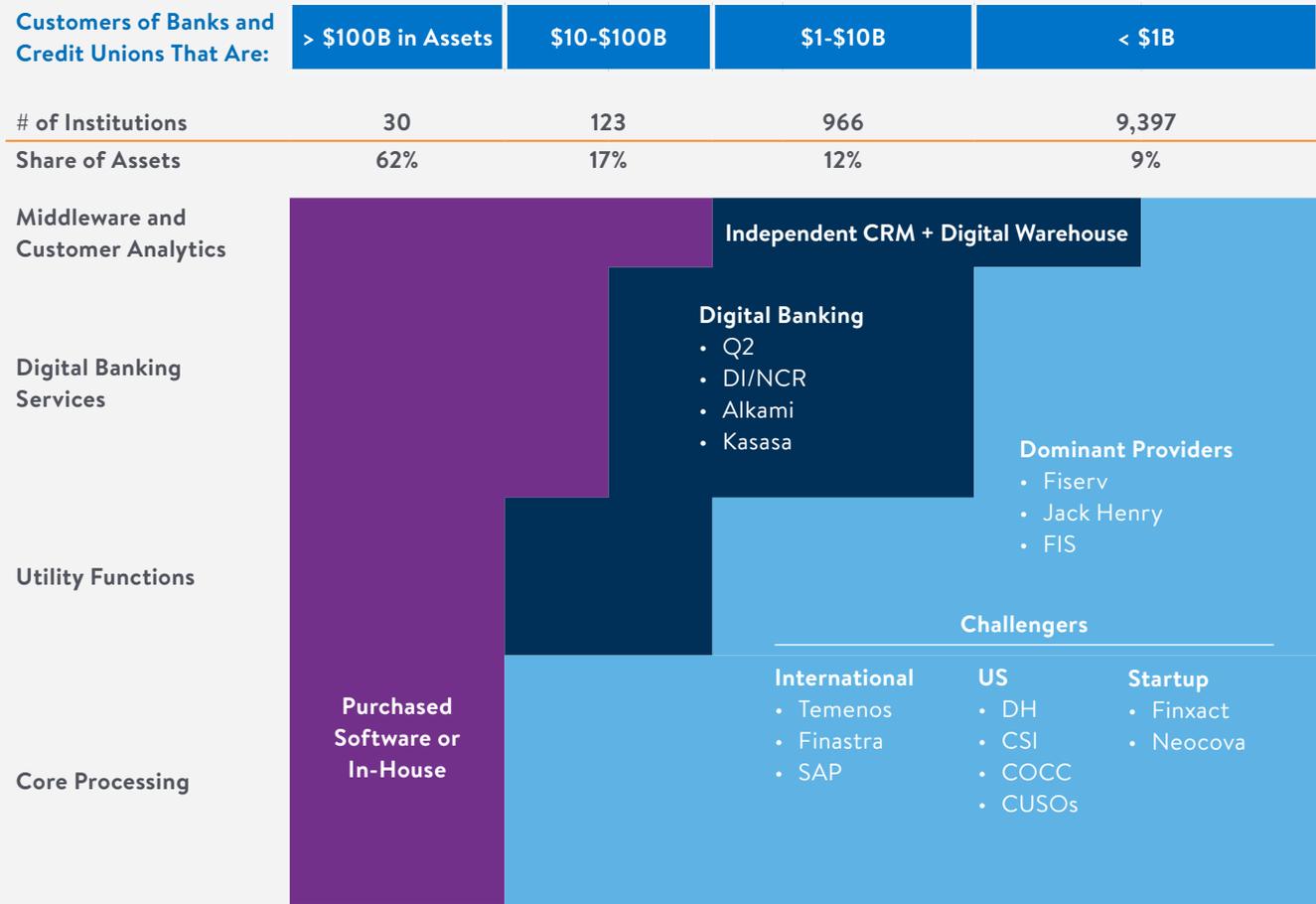
Only the very largest banks develop and host major portions of their underlying enterprise systems and generally build their digital banking services themselves.

⁴ FedFis 2019, viewed on 5/7/20 at <https://www.lendacademy.com/can-new-technology-providers-upend-the-core-banking-market/>.

⁵ One consulting firm interviewed for this paper estimates the average length of relationship that credit unions (the vast majority of which are quite small) maintain with their core platform provider – including both original contract terms and subsequent renewals – is 27 years.

⁶ A data lake is a repository of data that may be unstructured, allowing for more flexibility in the future uses and analytics, than a structured data warehouse.

SIMPLIFIED MARKET STRUCTURE OF CONSUMER BANKING INFRASTRUCTURE PROVISION



Analytics and the State of the Stack

Similar tiering exists in how banks and credit unions construct data warehouses or data lakes that permit them to segment their customers by spending, earning, and other behavioral characteristics, identify key life events from transactional data, implement target marketing and cross-selling programs, and increasingly assess and track their customers' financial health. For customer data analytics, the levels of integration with banking systems and real-time data needed to power many financial health tools are not as necessary and can be supported by batch uploads of data via "flat files." Most core platforms offer report-writing tool

kits that institutions with small IT departments have the expertise to use. The smallest institutions are generally limited to a menu of standard reports from their core platform provider and may not have the ability to generate their own custom reports. These tools are also limited to the customer data housed on the core processing platform, which may be only a fraction of the information needed.

The largest banks have massive national databases encompassing internally generated and externally purchased data on both their existing and prospective customers. Mid-sized institutions can build custom data warehouses or choose

from a number of off-the shelf software to license or purchase as a service. The smallest institutions can use “native” data warehousing services offered by their core platform vendor, but many do not because of the cost or a lack of internal technical skills required to obtain useful analyses and reports. One CIO of a mid-sized credit union

estimates that half of institutions with assets under \$1 billion do not have data warehouses or the ability to generate custom analytical reports (extracted from their core systems) that would enable them to identify direct deposit customers who had lost income as a result of the COVID-19 pandemic.

STATE OF THE MARKET

Platform technology's historic business models can inhibit solutions.

For all but the largest institutions, offering consumer-facing applications that foster their customers' financial health means relying on their core processing provider or specialized digital banking service provider to introduce them. But the prevailing business models of platform providers — and, to a lesser extent, of digital banking providers — has been to limit their investments in consumer-facing innovations while at the same time making it hard for third-party developers to achieve the level of integration needed to offer their applications.

The core processing platform providers have generally avoided making unproven or risky investments in new products. The combined internal spending on new product and technology development by the three largest platform providers amounted to less than any one of the three largest U.S. banks.⁷ Acquisitions of established companies, some of which may have more advanced technologies or new service offerings, have presented a lower-risk way to retain

existing customers who might otherwise defect for more modern offerings of competitors, while also expanding the companies' user base. And when the acquisitions have involved new consumer-facing functionality, the platform and digital banking providers have generally targeted services that promise immediate “revenue enhancements” that enable the providers to justify incremental licensing fees or to negotiate a significant share of the incremental revenue.

When it comes to newer consumer-facing digital solutions, the incumbent platform providers have erected barriers to integration by third-party developers who could compete with their “native” digital banking applications. A product developer could face high charges for access to APIs, delays in developing or sharing API specifications, high hourly charges for the platform providers' own developer staff to support banks who want custom integrations, or rent-extracting revenue-sharing agreements with developers.

⁷ From banking technology consulting firm interview, based on public filings.

Financial institutions are seeing customers increasingly use independent apps rather than their internal offerings, putting their relationships with customers at risk.

One app developer shared a telling anecdote: It had a promising mobile app named “Shake & Bank” that enabled consumers to view their bank balances simply by shaking their smartphones, long before the quick balance concept was on the market. Beta testing showed extremely high customer adoption and use. In order to offer it widely to multiple banks, the developer recognized it would need to obtain very basic integration with one or more of the core platforms that hosted the available balance data. But the first platform provider it approached quoted a price for integration of \$10,000 per bank, despite the fact that only a one-time integration would be needed to make this limited-purpose app available to the hundreds of institutions using one of its platforms.

Given this understanding of prevailing business models, platform providers appear unlikely to offer services that foster financial health until there are clear indications that large numbers of their clients demand them and are willing to pay for them. Meanwhile, financial institutions are seeing customers increasingly use independent apps rather than their internal offerings, putting their relationships with customers at risk. Under pressure to respond, **financial institutions and solution developers are pursuing alternative pathways to access the customer financial data needed to power financial health solutions and bolster their data analysis capabilities.**

A Broader View of the Banking Technology Stack

Beyond the financial health lens, our interviewees included a number of industry veterans who view the “stranglehold” that the dominant core platform providers have on all but the largest financial institutions as an existential problem for the banking industry. They pointed to the recent core processing task force organized by the American Bankers Association and its investment in a challenger core platform as indicative of how important it is to increase provider competition. At issue are institutions’ high cost structures, inability to adapt rapidly to changes in market conditions and customer needs, and the difficulty of accessing the data needed to analyze their businesses or develop their own product innovations.

Some observers we spoke with view prudential regulators such as the Office of the Comptroller of the Currency, Federal Reserve, National Credit Union Administration, and Federal Deposit Insurance Corporation as having reinforced the dominant players’ market position by making it harder for banks that wish to use challenger platforms to obtain charters or pass exams relating to their vendor management policies. This is not surprising, given the inherent conservatism that goes with these regulators’ responsibilities to assure the safety and soundness of the banking system and their limited ability to assess the benefits and risks associated with use of new technologies. But regulators are beginning to recognize that technological stagnation may bring greater risk.

HOW BANKS WILL GET WHAT THEY NEED

To stay competitive, financial institutions will work with vendors that allow for data sharing and third-party integration.

Financial institutions, fintechs, and developers have a number of emerging or newly widening avenues available for accessing the data needed to adopt and power new consumer solutions and internal analytics. Middleware providers, the evolving data aggregator ecosystem, and open APIs are each opening alternative data pathways from established system architectures, while upending established business models that have impeded innovation by keeping tech stacks closed.

The competing market players clearing these pathways — and the business models they are relying on — are rapidly evolving. But the increased competition and new data pathways are positive developments for regional, mid-sized and even some smaller financial institutions — reducing the upfront time frames and investment while also lowering the ongoing vendor costs of introducing new digital service offerings or expanding their analytic capabilities.

1 MIDDLEWARE: BRIDGING LEGACY TECHNOLOGY AND NEW SOLUTIONS

A number of larger institutions that develop their own digital banking services and internal user systems have developed “middleware” layers designed to quickly extract and store data from their legacy systems and send transaction instructions to those systems. Middleware is designed to make it easy for new solutions to plug in, bypassing the need for custom integrations to the core systems for each new app or data warehouse, which lowers the cost and logistics barriers involved in launching new financial health products or building new data analytics capabilities.

Several middleware vendors have pre-integrated with the predominant core banking platforms and ancillary systems that mid-sized and smaller institutions use. Their integration layer is available to third-party solution developers, removing the need for developers to invest in their own integration to the core banking platforms and enabling financial institutions to adopt those solutions without investing in (or paying platform providers for) their own custom integrations.

2 THE EVOLVING DATA AGGREGATOR WORK AROUND

Direct-to-consumer financial health solution providers, such as Digit, Qapital, and EarnUp, have gotten around the need to integrate with their customers’ banks by using data aggregators such as Yodlee, Plaid, MX, and Finicity to obtain the data they need to power their apps. Using a data aggregator pathway involves minimal upfront cost and it is fast, if not fully reliable (data aggregation’s ability to obtain timely and accurate data can vary by aggregator, institution, digital banking service provider, or core platform). Aggregation has enabled fintechs to introduce, test, and continually improve solutions that consumers can use without having to switch their bank or credit union.

Aggregators evolved in the early days of digital banking, enabling personal financial management services such as Mint to collect, organize, and present information from a consumer’s accounts at multiple institutions. Consumers provide their usernames and passwords, enabling aggregators to log into their personal banking sites and extract their information via

“screen scraping.” Even institutions that wanted to provide PFM services to their own customers have relied on data aggregation to pull in data from their customers’ accounts, including the ones they host themselves, thereby avoiding the need for direct integration with their own systems.

As uses for data aggregation have grown, aggregators have come under industry and regulatory pressure to improve the accuracy, timeliness, and security of the data they transport.⁸ Banks from which the data is obtained, in turn, rely on data aggregators to protect the data from breaches and minimize unauthorized uses, for which banks are liable. Both of these developments are leading aggregators and the largest banks to establish direct contracts that will replace screen scraping with more secure and direct data interfaces (APIs) and replace exposure of consumers’ login credentials with bank-issued tokens.⁹

Screen scraping by aggregators continues to be the predominant means by which fintechs obtain customer data from mid-sized and small institutions that rely primarily on platform providers to provide their digital banking services. This method can be costly to the banks (and beneficial to the platform providers), as they often pay for their platform provider on a per-customer login or per-page refresh basis, whether it is the actual customer or a fintech’s aggregator that is logging in. Understandably, but unfortunately, this has soured the community banking and credit union industries on aggregators and even on the fintechs that use the aggregators. Recently, some of the leading core platform providers have joined the Financial Data Exchange, the consortium of companies that is addressing security concerns raised by data-sharing and developing standards for establishing direct connections between aggregators and banks’ core systems.

3 CORE PLATFORMS’ RESPONSE: STREAMLINING THIRD-PARTY INTEGRATIONS

As middleware providers and data aggregators have opened up pathways for accessing bank-hosted data, incumbent core processing platforms are facing new direct competitors who are using ease of integration and data access as selling points. Start-ups such as Finxact and Neocova, as well as established international players like Temenos and Finastra, are seeking to break into the U.S. market. They are differentiating themselves by offering API access more readily and with little to no up-front cost. Instead, they charge on a per “data call” basis, which makes the challengers not just product-agnostic when it comes to consumer-facing solutions or internal analytical apps, but incented to facilitate new product integration and data use.

In response, incumbent platform providers have signaled a new level of flexibility and openness to third-party integration. Some are offering “open APIs” and “integration toolkits” on a licensing basis that promise to ease integration for their financial institution customers and third-party developers. And some, such as Fiserv’s DNA platform, have opened “app stores” that allow



⁸ The Financial Health Network supports consumers’ ability to access their financial data housed at their banks and other financial institutions and to share it with fintech and other solution providers of their choosing. Data aggregators play a critical role in this data-sharing ecosystem and have become subject to regulatory scrutiny. Banks and credit unions have come under regulatory pressure to provide consumers with access to their account data and the ability to share it, first with the passage of the Dodd-Frank Act and the Consumer Financial Protection Act (Section 1033) and supported more recently by the Department of the Treasury’s July 2018 Report to the President: “A Financial System That Creates Economic Opportunities: Nonbank Financials, Fintech, and Innovation.”

⁹ An industry consortium, the Financial Data Exchange, has proposed a general framework for use of APIs in sharing data directly or through aggregators at <https://financialdataexchange.org/FDX/News/Announcements/financial-data-exchange-releases-first-major-update-to-fdx-api-makes-fourth-version.aspx>.

third-party developers who have invested in building an integrated product to offer the product to other institutions using that platform.

It is unclear how technology providers' business and revenue models will evolve to adjust to the new openness or how they will affect institutions' economics of offering new consumer-facing solutions. Until now, the incumbent platform providers have relied on a business model that favors product bundling, offering steeper discounts to platform users that also use them for auxiliary systems and digital banking services. Challenger core processing platforms that may not have a full suite of offerings are likely to offer more favorable base pricing for their platforms, but charge for each "data call" made by applications developed within the institution or offered by third parties. This approach maximizes revenue as institutions expand their data-using applications, regardless of who develops them. Per-data-call pricing also provides a revenue model for how core platform providers can offer integrated data delivery to data aggregators, replacing per-log-in revenue they might have enjoyed when aggregators obtain data via screen scraping.

likely be better positioned to white label their products for financial institutions.

Among all of the institutions that rely on vendors to provide their core banking platforms, the roughly 2,000 banks and credit unions with assets over \$500 million will benefit most from open APIs and middleware, as they are most likely to have the internal IT staff capable of managing multiple vendors or if they are larger (over \$5 billion) creating and integrating their own customer-facing solutions. Depending on how data aggregators' negotiations with core platform providers proceed (and any resulting improvements in data timeliness and quality), even smaller institutions may find themselves with newly available solutions to offer their customers, particularly as some of the more established direct-to-consumer fintechs explore white labeling partnerships with the platform providers.

Over the longer term, and in an environment where financial institutions find it easier to develop their own customer-facing solutions and have a growing menu of third-party solutions available at greatly reduced up-front integration costs, more experimentation and market testing will

Pathways to consumer data will create more options for financial institutions to offer financial health solutions.

The emergence of competing pathways for accessing data in the core systems, and platform providers' responses, give financial institutions new options for offering customer-facing solutions more quickly and less expensively. Likewise, third-party app developers have new avenues through which they can enable institutions to offer their products to the institutions' customers. Even independent fintechs that have relied on data aggregators to reach consumers directly will

result. As institutions learn which solutions their customers find most useful — and what they are willing to pay for on a subscription basis — core platform providers will have an opportunity to license or acquire some of them to expand their businesses. Such a development would provide new opportunities for the smallest financial institutions who rely most on the core platform providers' bundled digital banking services.

EVOLVING DATA ACCESS PATHWAYS AND IMPLICATIONS FOR MARKET PARTICIPANTS

	OPEN APIs	MIDDLEWARE	AGGREGATION
Technical Advantages	Eliminates need for custom integration	A single integration with multiple subsystems Supports multiple solutions and ongoing development	No integrations required Data standardization and categorization included
Technical Disadvantages	May need different APIs for different solutions	Solution developers must rely on third-party middleware developers to connect with the smallest institutions	Data integrity and stability may vary by aggregator and digital banking provider
Pricing and Cost Considerations	Fluid pricing and revenue models that vary by platform, including: <ul style="list-style-type: none"> Per-API license Per-data-call Revenue share (e.g., via “app stores”) 	High initial costs (for internally developed middleware layer), but lower solution development and back-end costs	Lowest initial development costs Per-consumer-account-per-month pricing for developers Additional costs imposed by digital banking service per-logout may be most costly for FIs that rely on third-party digital banking services
Implications for Solution Developers	Most direct and stable pathway for third-party developers Solution developers still face weak bargaining position vis-a-vis platform providers Digital banking specialists already rely on APIs, but may need to negotiate new ones for new services	Provides greatest flexibility for internal development groups of larger banks that can afford to build their own middleware Third-party middleware offers immediate product integrations, but number of addressable platforms may be limited	Already used by fintechs who may seek to white label services for institutions Fastest pathway for third-party developers seeking to deliver new digital solutions through institutions, but may be most costly for their customers in the long run
Implications for Different-Sized Institutions	<p>Institutions around \$5 billion and above have the most number of new options available for building new digital solutions internally or licensing solutions from third-party developers. They are best able to make use of open APIs directly.</p> <p>Smaller institutions (\$500 million - \$5 billion) will have new solution options available for their customers from third-party developers. These providers will be increasingly able to deliver services through retail institutions by using middleware, data aggregators, or open APIs.</p> <p>The smallest institutions (under \$500 million) will continue to rely most heavily on core platform providers’ “native” digital banking services for finhealth solutions.</p>		

Increased data availability allows for financial health data analytics and customer insights.

The new openness should also help many financial institutions expand their analytic capabilities. Because they don't require the same level of timeliness, institutions building their own data warehouses or data lakes to perform customer analytics do not need to wait for the new openness to expand their analytical capabilities. But smaller institutions that don't have the internal staff expertise needed to build and maintain these centralized utilities may benefit from more packaged solutions that deliver more specific types of analyses and answer more targeted questions about customers' financial conditions.

For example:

- Who among our customers has a thin credit file, but might qualify for a loan based on their earning, saving, and spending behavior?
- Who has been most immediately affected by the COVID-19 crisis or will soon be affected by the expiration of unemployment benefits?
- Who among our customers is financially healthy, coping, or struggling?

Likewise, there is a market among institutions that offer coaching and advising for tools that can help financial coaches assemble crucial income and spending data on their customers, resulting in more productive coaching sessions.

HOW TO ADVANCE CONSUMER FINANCIAL HEALTH

Each player has a role in advancing consumer financial health:

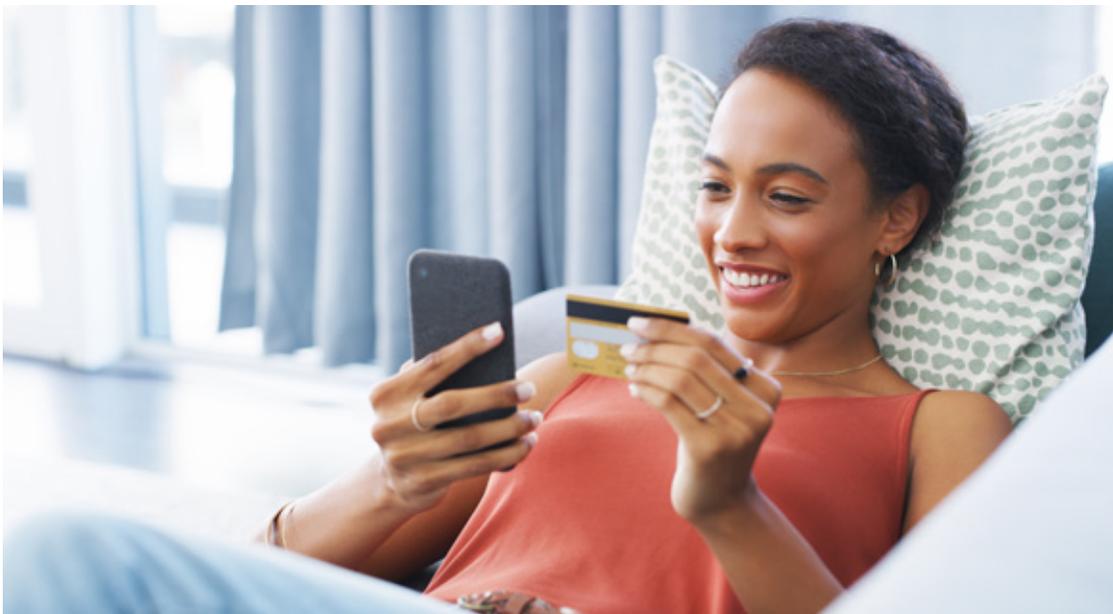
PLAYER	ROLE
Smallest Institutions (Under \$500 Million)	Adopt finhealth solutions and data analysis capabilities as they become available Consider referral partnerships with finhealth solutions
Smaller Institutions (\$500 Million - \$5 Billion)	Offer finhealth solutions in partnership with third-party developers
Institutions Around \$5 - \$10 Billion	Build new digital solutions internally or license solutions from third-party developers
Core Processing Platform Providers	Lower barriers to integration with the platform to allow for data sharing with finhealth solutions Include consumer financial health data analytics reports as a standard offering in reporting platforms
Consumer-Facing Product Developers	Work with digital banking vendors and other platforms to distribute solutions to financial institutions
Marketing and Data Analytics Platform Providers	Develop consumer data analytics to understand customer financial need

Conclusion

Banks and credit unions need access to their customers' financial data, analytics platforms to generate customer insights, and flexibility to innovate and experiment with new financial health products and solutions.

With emerging pathways for data availability and third-party product integrations, financial institutions have imperfect options. Financial institutions and their vendors need to move quickly to break down barriers to innovation and integration. The largest banks are starting to offer financial health tools and fintechs are already disrupting the consumer

relationship, demonstrating consumers' willingness to adopt and pay for well-designed solutions that can help them manage their daily finances and improve their financial health. Banking technology vendors must assist their financial institution customers in innovating to meet the needs of consumers, or both will face a shrinking number of customers.





The Financial Health Network is the leading authority on financial health. We are a trusted resource for business leaders, policymakers, and innovators united in a mission to improve the financial health of their customers, employees, and communities. Through research, advisory services, measurement tools, and opportunities for cross-sector collaboration, we advance awareness, understanding, and proven best practices in support of improved financial health for all.

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