

Hitachi Research Institute Report

Redefining Banks through Digital Transformation

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“Banking is necessary, but banks are not.” This prediction Bill Gates presented in 1994 is now starting to become a reality. Third parties including FinTech companies, platform players (e.g., GAFA), distributors (e.g., E-commerce) and app developers are advancing into banking services, and the digital transformation (hereinafter DX), which represents a discontinuous change in financial services using digital technologies such as the internet, smartphones, the cloud and AI, is marching ahead. Hence, it is becoming increasingly unnecessary for banks to be the primary providers of banking.

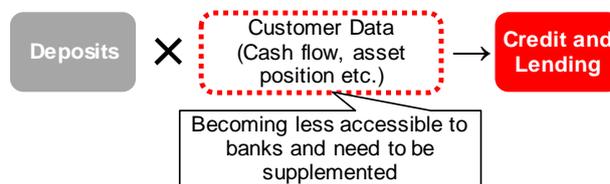
This paper discusses “The decrease in customer data accessible to banks” that threatens the meaning of banks in Chapter 1, “Leveraging open APIs to maintain and expand customer data” in Chapter 2, “Expanding credit and lending using cross-industry customer data” in Chapter 3, and redefinition of banking and the role that banks should play in the future in light of all of the above in Chapter 4.

1. DX is Eroding the Value of Banks

1.1 Third party access to customer data is increasing

The banking that gives banks the reason for their existence can be summarized in “deposits × customer data → credit and lending.” In other words, banks make it possible to provide *credit and lending* to customers by multiplying the *deposits*, to which a high barrier to entry is set by laws and regulations, by the *data* that enables customer screening (hereinafter “customer data”). Such data includes customer (individuals and companies) attributes obtained from face-to-face customer services, and records of cash flow and asset data that can be accessed through their bank accounts (Figure 1).

Traditionally, customer data could only be accessed through bank accounts, allowing banks to enjoy their monopoly. However, we are now seeing the explosion of digital customer data that can be collected without accessing their bank accounts, such as SNS and information on purchases on E-commerce sites. Customer data that banks can directly obtain and access has been decreasing in relative terms, and the core role that banks have been playing in the credit and lending business is now shifting to third parties at the same time.



Source: Compiled by Hitachi Research Institute by referring to various materials

Figure 1: Illustration of banking that banks provide

Indeed, third parties have already made changes to the flow of financial services from “Customer – Bank” to “Customer – Third Party – Bank” by offering a wide range of financial services, including banking, on banks’ behalf. And some of the customer data (e.g., location, amount and time of payments) is being held by third parties, and this is forming a *black box* that is inaccessible to banks.

One example of customer data residing in third parties in the realm of financial services for individuals (retail) is Apple Pay/Apple Card, which is Apple’s mobile payments and payment management service using its own smartphones. In this service, the details of the history in every payment and remittance scene (e.g., location, amount and time of payments) including E-commerce, non-face-to-face payments, in-store payments and utility bill payments are collected in Apple’s payment management application as customer data. On the other hand, the customer data that banks can access through bank accounts is limited to the payment and remittance amount that Apple Pay (strictly, credit cards registered in Apple Pay) aggregates on a monthly basis. This, as a result, allows Apple, although being a third party, to run more sophisticated customer attribute analysis (profiling) than banks.

In the area of financial services for companies (wholesale), one example of customer data residing in third parties is the automated accounting services for small, medium and micro enterprises (SMMEs) offered by freee K.K. freee has made it possible to grasp and track the entire flow of corporate customers’ funds by aggregating funds data moving in and out of accounts SMMEs hold at multiple banks, whereas banks alone cannot see the flow of funds in other bank accounts.

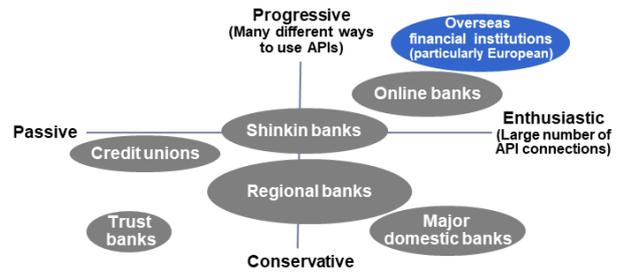
Third parties that provide automated accounting services like freee have an advantage over banks in profiling SMMEs and capturing information on their assessments.

As above, the dominance in customer screening, which has traditionally been performed by banks based on flow of funds information, including the deposit/withdrawal patterns they collected through bank accounts, is now shifting to third parties.

1.2 Collecting cross-industry customer data in order for banks to maintain their credit and lending business

With banks' competitiveness weakening relative to third parties in their credit and lending business, the strategy banks should adopt for their future is to build a cooperative relationship with third parties, not a hostile one. This means to expand the scope of customer data that banks collect from traditional flow of funds data to include information on customers' daily behavior and their attributes by working with other industries. In particular, one way for banks to work with third parties to obtain data from different industries is to make their APIs¹ publicly available (open APIs). Third parties can incorporate banking into their services by utilizing open APIs for banking that banks provide. Banks, on the other hand, can use the services third parties offer to increase contact points with customers and capture more granular customer data. For example, Sumitomo Mitsui Banking Corporation (SMBC) granted Amazon the right to view the account data of its individual customers via its open API, so that Amazon could embed a balance inquiry function into its smart speaker Echo (this service has now ceased). As banking services had become more familiar, individual customers of SMBC accessed its services more frequently, which believed to have allowed the bank to collect more detailed customer data, such as the number and time period of account balance inquiries.

Efforts to facilitate the wider use of open APIs have also been initiated from the legal and regulatory sides. The Japanese government made amendments to the Banking Law, which came into force in 2018, to make it mandatory for Japanese banks to allow external use of their APIs. However, providing write APIs², which effectively means sharing banking functions with external entities, poses a significant security risk and brings a huge cost burden for constructing and connecting to an API environment, including system updates. Therefore, only 30% of Japanese banks took up on sharing such APIs, with the majority remaining passive and conservative toward it (Figure 2).



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Figure 2: Illustration of trends in open API initiatives by type of bank

Note 1 Application Programming Interface. The terms that provide procedures and data formats for accessing and using the functions of and data managed by a computer program (software) from other external programs

Note 2 An API to rewrite data content. On the other hand, an API that does not rewrite the data content but only allows browsing is called a "read" API

2. European Banks eager for Open APIs for Cross-Industry Customer Data Collection

2.1 PSD2 and GDPR propel Open APIs

European banks are among the most enthusiastic and progressive players globally in providing banking functions and collecting cross-industry customer data using open APIs. The main reason why European banks are ahead of others in deploying and using open APIs is the two significant data regulations, PSD2³ and GDPR⁴, established by European regulators.

PSD2 is a regulation designed to facilitate collaboration between banks and third parties via open APIs. PSD2, which came into force in 2018, sets requirements for third parties that provide payment services in EU member states to ensure transparency in handling of their customer data, and rights and obligations for banks, including the rights to access information. For example, PSD2 requires banks to allow third parties with AISP (Account Information Service Provider) licenses to access funds flow information through their standardized APIs. This requirement to allow access to APIs enables third parties with AISP licenses to access customer account information at any bank within the EU through open APIs, provided customers agree to it. Accordingly, PSD2 serves as an *accelerator* that accelerates third parties indirectly engaging in banking.

Meanwhile, GDPR that was introduced in Europe in 2018 is a regulation on private data protection specifying “the right to be forgotten” as a deterrent against misuse of customer data by banks and third parties through unauthorized use of open APIs. The right to be forgotten is a regulation that provides customers with the right to request companies, to which they have given their data, to erase the data if they no longer wish their data to be used, while requiring the companies to satisfy the request unless there is any justifiable reason. GDPR serves as a *brake* to deter banks from using open APIs without regard to customers’ benefits and abusing customer data.

Note 3 Payment Service Directive 2. A directive for electric payment services. It requires EU financial institutions to make their payment infrastructure publicly available and give third parties access to their customers’ bank account data

Note 4 General Data Protection Regulation. A regulation intended to strengthen and integrate data protection for all EU individuals

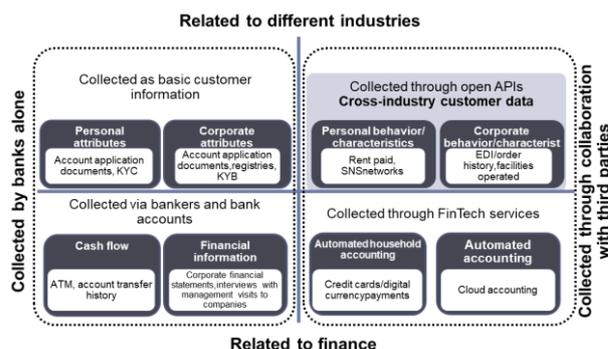
2.2 Spain’s BBVA promotes open APIs

Spain’s BBVA⁵ is the financial institution in Europe that has mastered the use of this *accelerator* and *brake* to provide third parties with banking functions through its open API, while collecting cross-industry customer data from the third parties at the same time. As symbolized by the comment by BBVA chairman Francisco Gonzalez in 2015 that “BBVA will be a software company in the future,” the bank has made eight types of banking functions publicly available on its API, and provides customer data it holds regarding its customers, accounts and credit cards, as well as settlement and other banking functions (Table 1). BBVA is also working with over 1,500 companies to develop services in the retail and wholesale areas, at the same time as collecting cross-industry customer data through third parties (Figure 3).

Table 1: BBVA’s Open API

Banking functions provided	Benefits to third parties
Customer information	Obtain name, date of birth, sex, email address, address, ID, phone number etc. with one click
Account information	Collect information on account type, status, balance, transaction history and payment in real time
Card information	Information on card transactions and ATM withdrawals
Payment	Make it possible to transfer money from BBVA accounts to accounts in and outside the country, making online payment options wider
Lending	Provide immediate pre-approved financing
Notification	Notify bank transactions in real time and provide tailor-made services
Corporate accounts (KYB)	Capture balances at predefined institutions and information on transaction history for each corporate customer, and can be integrated with ERP software
PayStats (regional information analysis)	“Regional information analysis function” leveraging the bank’s channels, including anonymized and aggregated data of millions of customers, can be used for market research (“as it is aggregated data, customers consent is not required)

Source: Compiled by Hitachi Research Institute by referring to Nomura Institute of Capital Markets Research (2016)

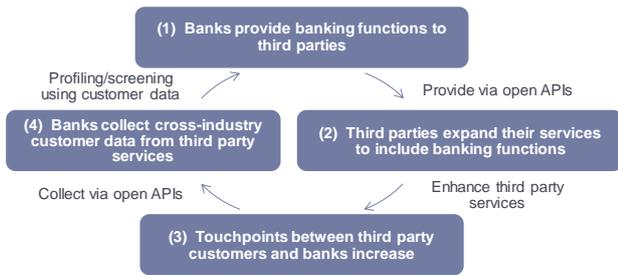


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Figure 3: Position of cross-industry customer data in customer data classification

In the retail business, BBVA aims to expand its contact points with individual customers, using the bank’s smartphone app as its main channel to offer its services. In particular, the bank makes its existing banking services, such as payments and lending, publicly available through its open API and provides them to third parties, including app developers, via hackathons⁶. Examples include Relocation Assistant, a real estate information app that enables individual customers to compare the age group, consumption behavior and types of businesses in the area of their current addresses and locations where they wish to live in the future, utilizing the bank’s open API PayStats that analyzes its customer marketing data. A question answer app Qkly is another example that informs users about congestion or time periods when congestion can be avoided at the Picasso Museum and other tourist destinations.

Moreover, BBVA provides its payment function (e.g., payment data for credit/debit cards issued by the bank), which is part of banking, to app developers and other third parties through its open API, so that they can incorporate it into their smartphone apps, in order to maintain contact with individual customers. The bank then collects cross-industry customer data, which BBVA was not able to reach in the past with its bank accounts alone, such as detailed behavior patterns of individual customers (e.g., real-time changes in customers’ demand for real estate from search results on its real estate app) through the channel delivering its services. With the provision of open APIs, banks have established a cycle where: (1) banks provide banking functions to third parties; (2) the third parties incorporate banking into their services and expand them; (3) contact points between third party customers and the banks increase; and (4) the banks collect cross-industry customer data from the third parties and utilize them (Figure 4).



Source: Compiled by Hitachi Research Institute by referring to various materials

Figure 4: Bank and third party collaboration using open APIs

BBVA leverages open APIs also in its wholesale business where it allows third parties to access its existing banking, while collecting cross-industry data relating to its corporate customers through third parties. For example, BBVA provides its lending function and KYB⁷ function to Wise, a platform for SMMEs, via its open API. In return, BBVA is able to capture and update the latest data on business activities of SMMEs that the bank could not access in the past due to the costs involved.

Note 5 Banco Bilbao Vizcaya Argentaria. A major financial institution with offices mainly in Spain and the southern United States, as well as in Latin American countries

Note 6 A term coined by the U.S. IT industry combining *hack*, which is used to refer to software engineering, and *marathon*, to mean an event for development where multiple teams of programmers and designers participate in programming throughout the given time frame of hours to days to compete with each other for ideas and outcomes

Note 7 Know Your Businesses. It refers to documents and procedures for identification required to verify customers when corporate users wish to start having financial services, such as opening of a corporate account

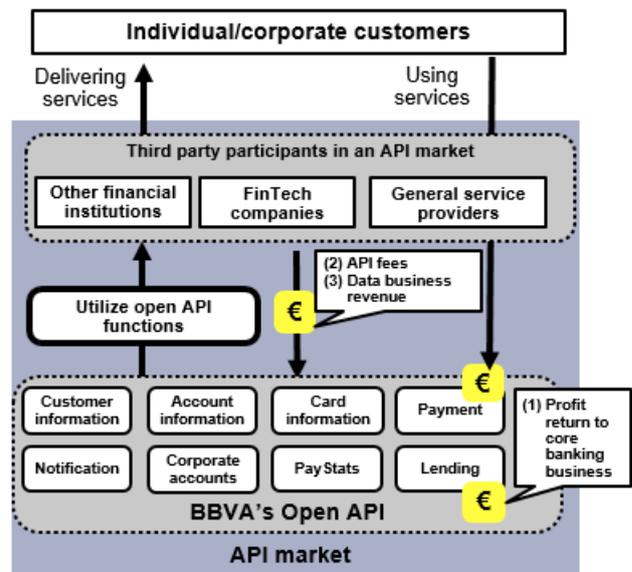
2.3 API market to accelerate customer data collection

The “API market” is expected to become a system that further prompts European banks to advocate open APIs. The API market is a platform where, similar to App Store provided by Apple, primarily banks launch and operate markets to make their APIs publicly available, and third parties that are registered and approved to participate in the markets can freely download the APIs from the markets. This allows banks to give more third parties access to their banking functions than when releasing their APIs bilaterally, and increase cross-industry customer data they collect from the third parties. That said, in order for banks to operate the API market as a sustainable system, they need to build a business model that satisfies all three actors of banks, third parties and customers, and to generate enough profit for themselves as entities that operate the market.

3. Expanding Credit and Lending using Cross-Industry Customer Data

3.1 The way to substantially monetize open APIs heavily depends on “increasing revenue streams of the core banking business”

Banks can generate the following three types of profit through their API markets on the basis that their customer bases would expand with collaboration with participating third parties: (1) interest income and fees from the core banking services (e.g., remittance fees when a third party procures a bank’s remittance function from the API market and its customers use such function); (2) fees for using banks’ open APIs; and (3) fees for banks to integrate and analyze customer data through open APIs (data business) (Figure 5). In practice, however, (2) API fee revenues and (3) data business often bring no profit to the banks because they are usually provided free of charge as an incentive to increase the number of participating third parties. As such, profit-making via the API market is highly dependent on (1) profit return to the core business (e.g., increases in remittance fees and interest income) thanks to the growing number of customers (Table 2). However, BBVA that opened its API market in May 2017 generated service income of 7.7 million euros in total, accounting only for 1/4 of net interest income⁸, suggesting that it is difficult to monetize the API market services alone. In order to sustainably operate the market, it is necessary to utilize cross-industry customer data collected to benefit credit and lending, which are the main revenue streams of the core banking services.



Source: Compiled by Hitachi Research Institute by referring to various materials

Figure 5: BBVA's API market business model

Table 2: BBVA's open API helps the bank to increase its revenue streams of the core business (2Q2017–3Q2019)

	BBVA
Revenue from remittance fees	5% increase
Number of users (via digital channels)	33% increase (approx. 10 million)
Digital channel sales ratio	Increased to 60% from 30%

Source: Compiled by Hitachi Research Institute by referring to BBVA's publications

Note 8 Figures are from "service income and other income" of BBVA in FY2019 acquired from Refinitiv's Eikon

3.2 Expanding Credit and Lending using Cross-Industry Customer Data

The cross-industry customer data that banks can collect through their API markets differ completely from the conventional customer attributes, and funds flow and financial data, including deposits and withdrawals, obtained from bank accounts in terms of both *quantity*, as in frequency of collection, and *quality*, as in accuracy of data (Figure 3). Therefore, banks can extend their credit and lending services to those beyond their customer base, from whom they traditionally have not been able to obtain sufficient collateral or guarantees, if they leverage detailed and extensive cross-industry customer data.

European banks, for example, have expanded their credit and lending business by cooperating with Experian and Credit Kudos who are third parties with AISP licenses and Europe's biggest credit information companies. Both third parties use open APIs to collect rent payment history of individual customers from CreditLadder, a UK-based provider of rent payment services, as cross-industry customer data. This means banks can capture not only rent payment histories of tenants that they usually get via their bank accounts, but also such rent-related data as "whether the payments are made on time," "whether those payments that are overdue have lenders consent," and "whether the tenants paid their rent for their previous properties they lived according to their terms," from tenants' multiple bank accounts and lenders' information via third party open APIs. Banks can acquire new credit scores on credit information and the credit worthiness of individuals developed by these third parties, and expand their customer base for their credit and lending business.

One example of banks utilizing cross-industry customer data, which is expected to become the biggest contributor to the expansion of credit and lending in their wholesale business, is commercial flow (placing/receiving orders and EDI⁹) data of SMMEs (Table 3). Banks can only capture simple cash balances if data that they can access is limited to the "past performance" of SMMEs, such as their flow of funds data (cash flow history). However, if banks are able to use EDI

data as detailed cross-industry customer data of SMMEs' activities, they should become able to estimate the "ability to respond to future risks" of SMMEs, including BCPs¹⁰ and resilience capability, based on their order cycles, and dependency on and location of their customers and suppliers.

In fact, it is becoming increasingly important for banks to visualize SMMEs' ability to address future risks, after the risk of supply chain disruptions was highlighted in natural disasters and pandemics, as in the case of the Great East Japan Earthquake in 2011, Typhoon Hagibis in 2019, and the current coronavirus outbreak in 2020. If a SMME has high disaster resilience capability, the chance of receiving a continuous cash inflow from it in the future is higher. This enables banks to extend their credit and lending to those SMMEs that were previously not considered banks' targets because they were new or without sufficient assets that could be used as collateral to support their creditworthiness.

Table 3: Examples of banks increasing income streams in their core banking business using EDI data for SMMEs

Targets	Ways to leverage cross-industry customer data (small and medium enterprise EDI data etc.)	Increasing income streams for core banking business
Resilience capability	<ul style="list-style-type: none"> Supply chain visualization is effective in understanding the actual state of a company Visualize the degree of concentration and diversity of specific customers and suppliers with data showing changes in their names and transaction amounts Changes in the proportion of recurring customers and newly developed customers 	Lower dependency on specific customers and suppliers is deemed to suggest better BCP capabilities, resulting in credit line expansion
	<ul style="list-style-type: none"> Visualize the degree of concentration of some customers and suppliers with data showing changes in their names and transaction amounts Use addresses of customers and suppliers who are highly depended on together with hazard map data 	Lower risk of a natural disaster occurring for specific customers and suppliers who are highly depended on is deemed to suggest better BCP capabilities, resulting in credit line expansion
Financial situation	<ul style="list-style-type: none"> Calculating financial forecasts from EDI data, and real-time estimation using figures in product costs and sales amounts that are highly correlated with financial information will be effective in the future 	Since expectations for orders are high in the fourth quarter according to the order cycle, explore the possibility of unsecured supply chain financing for working capital

Source: Compiled by Hitachi Research Institute by referring to various materials

Note 9 Electronic Data Interchange. A mechanism of E-commerce in which various types of transaction data including orders, shipments, invoicing and payments is exchanged between companies over communication lines

Note 10 Business Continuity Plan. A plan that a company prepares to describe strategies to ensure that its critical operations can continue and survive in the event of a crisis, such as terrorist attacks, disasters, system failures or scandals

4. Banks being redefined

The traditional banking had been "combining deposits and customer data to provide credit and lending ("banks" as referred to in the prediction by Bill Gates at the beginning). However, the function banks will provide in the future should be not to protect their traditional role of a financial intermediary (bank), but to: (1) give external access to their banking functions ("banking" as referred to in the prediction by Bill Gates) using open APIs; (2) collaborate with third party participants in their API markets; (3) capture, integrate and analyze cross-industry customer data that banks alone had not been able to access; (4) put in place new credit evaluation criteria including "ability to address future risks";

and (5) provide credit and lending to a wider range of customers, including startups with competitive business models and SMMEs whose businesses are deemed to be highly sustainable.

Meanwhile, third parties including FinTech companies like freee, and non-financial companies like Amazon and Apple can also leverage their own (cross-industry) customer data and collaborate with banks to offer digital services with embedded credit and lending functions, thereby further expanding their customer base. Accordingly, DX urges banks to redefine the functions they provide so that they can become business entities of “deposits × cross-industry customer data → expanding credit and lending.”

Traditionally, banks have been carrying out credit screening focusing on collectability, using customers’ funds flow (deposits and withdrawals) data and financial (assets) data that show their past performance, in accordance with Financial Services Agency (FSA) guidelines (Inspection Manual). This made it difficult for banks to add differentiation factors to the credit and lending services they provide, and limited the customers they could offer such services to those with the ability to repay under the guidelines.

However, since the FSA abolished a uniform evaluation for financial institutions based on the Inspection Manual at the end of 2019, it has now become increasingly necessary for each bank to set its own credit and lending evaluation criteria and enhance customer data that can serve as the basis for customers’ “ability to pay in the future.” To collect such customer data, banks are required to further advance the use of DX for their future.

As of May 2020, with the outbreak of coronavirus causing a rapid contraction in the economy, particularly private consumption, banks are swiftly extending interest-free and unsecured emergency lending to financially troubled SMMEs. On the other hand, banks providing credit and lending to all SMMEs without any screening may also create a moral hazard, and could potentially have a serious and adverse impact on the economy in the mid-to-long term. In these extraordinary circumstances, we believe it is important for banks to utilize cross-industry customer data to visualize the “ability to pay in the future” backed by such data and provide credit and lending, in order to balance prompt support for SMMEs with the avoidance of moral hazards.