Bank of Japan Review 2021-E-2

Digital Transformation of Japanese Banks

Financial System and Bank Examination Department

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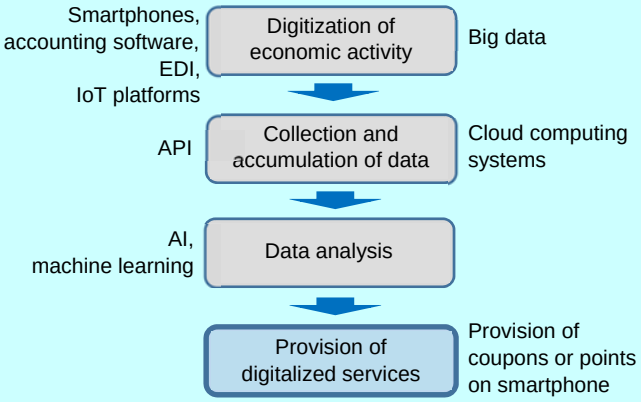
With the rapid development of digital technology over the past few years, an increasing number of companies and governments around the world have taken steps toward "digital transformation (DX)." DX refers to drastically rebuilding management and business processes by adopting digital technology, which leads to improved management efficiency and the provision of higher value-added services. DX first took place in the non-financial sector, but it has also been expanding rapidly in the financial sector. Furthermore, DX is gradually accelerating due to increased needs for virtual services owing to the spread of COVID-19. This paper summarizes the trends and implications of Japanese banks' DX.

Introduction

Over the past few years, digital technology has developed very rapidly. This development has incentivized a wide range of industries to adopt digital technology so as to drastically rebuild their management and business processes, leading to improved management efficiency and the provision of higher value-added services, which is known as "digital transformation (DX)."

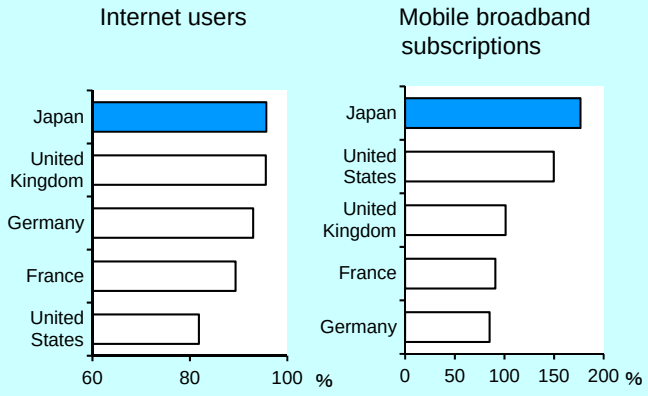
Many companies have been enhancing systematization, with the aim of improving their operational efficiency. However, recent developments are somewhat different. Rapid advancement in the "digitalization of society" has created an environment that enables not only improvement in the efficiency of current operations based on paper and manpower, but also the creation of innovative services and transformation of business models themselves. There are four notable developments supporting the recent digitalization of society, which has seen a remarkable change in the business environment: (1) widespread use of digital devices, particularly smartphones, which enables collection of data on economic activity; (2) widespread use of cloud technology, which decreases the cost of collecting and storing large amounts of data; (3) AI and other cutting-edge technologies, which improve the ability and efficiency of analyzing large amounts of data; and as a result; (4) highly customized services based on data analysis being provided through digital channels in a timely and extensive manner (Chart 1). In addition to technological advances, the widespread use of digital devices such as smartphones by individuals and corporations, which are the recipients of services, is also increasing the momentum towards further digitalization of society.

[Chart 1] Digitalization of Society



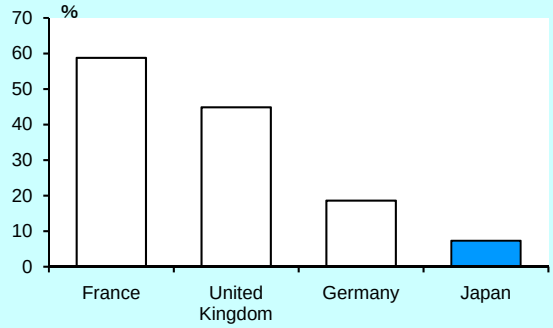
According to the *OECD Digital Economy Outlook 2020*, Japan's digital infrastructure availability (internet usage rate, mobile broadband penetration rate, internet speed, etc.) is considered to be at a generally high level in the world (Chart 2), and the same could be said about smartphone penetration. On the other hand, the utilization of online services, such as in national administrative procedures, lags behind other countries (Chart 3). "World Digital Competitive Ranking 2020" published by Institute for Management Development (IMD), a business school in Switzerland, shows that Japan faces a lack of capital and human resources in the digital field, insufficient flexibility in business transformation, and obstacles to regulatory frameworks compared to other countries (Chart 4). It is also worth pointing out that, although Japan has the technology

[Chart 2] Diffusion rates of digital services among G5 countries (2019)



Source: OECD

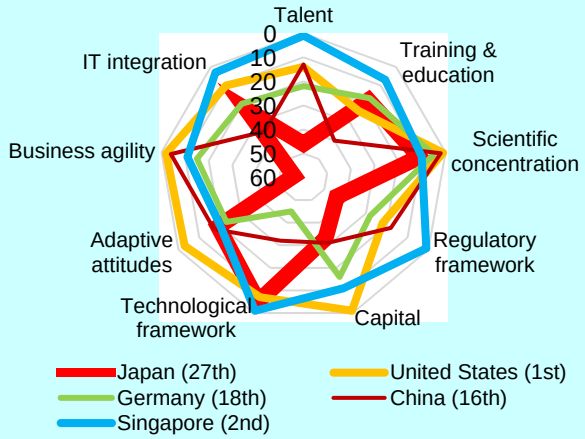
[Chart 3] Diffusion rates of online usage for administrative procedures (G5 countries, 2018)



Note: The diffusion rate for the United States is not available. The bar chart indicates the proportion of individuals using the internet for sending forms via public authorities' websites.

Source: OECD

[Chart 4] World Digital Competitiveness Ranking (2020)



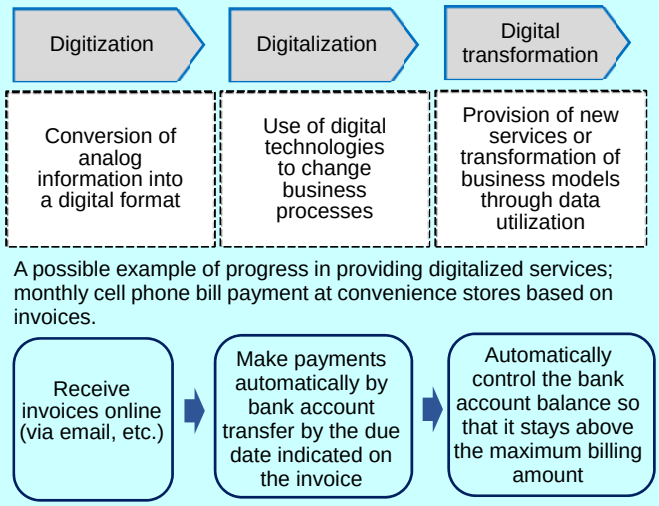
Note: The numbers in the graph are the rankings in the surveyed countries.

Source: IMD

and infrastructure to promote the digitalization of society, a lot of information is still collected in paper form and is not in the form of electronic data, which is a prerequisite for further digitalization. Under these circumstances, the government has announced the establishment of the Digital Agency in 2021 and its active commitment to further improving the digital environment in Japan.

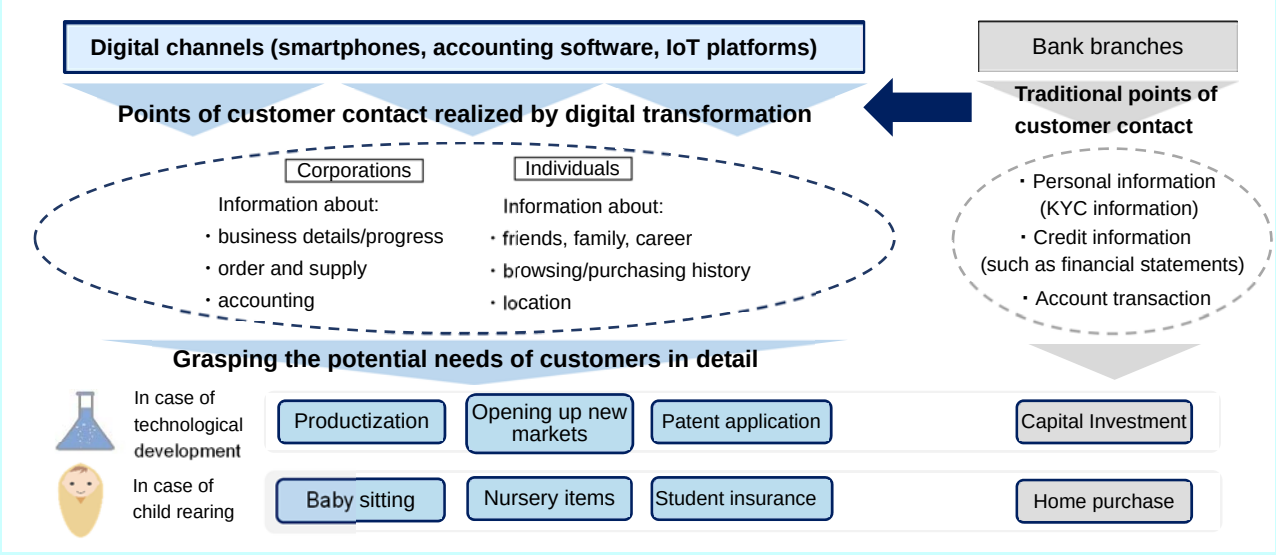
Today, we find various definitions of "digitalization." In this paper, we divide digitalization in three stages and define each stage as follows: "digitization," in which information in paper form is converted into electronic data (e.g., transition toward a paperless basis); "digitalization," in which business processes are digitalized (e.g., robotic process automation [RPA][1]); and "DX," in which an innovative service is created making use of data (Chart 5). Digitization and digitalization have conventionally been pursued by many companies to reduce costs by improving management and operational efficiency. DX, on the other hand, is a relatively new concept that aims to generate new revenue.

[Chart 5] Concept of digitalization



Daily contact with customers and improved user experience (UX) are often raised as important factors for achieving successful DX. It is believed that through highly frequent contact, service providers could capture not only actual needs but also potential needs of customers and could provide services that respond to each customer's precise needs in a timely manner through digital channels. Traditionally, banks have provided loans and other financial services to customers when they need a large amount of money; namely, when they carry out capital investment or when they purchase houses. When requested, banks use static data, such as customers' past financial information, to examine the creditworthiness of customers and make decisions. In contrast, after successful DX, banks can have daily interaction with customers via smartphones and can access customers' activity data in addition to

[Chart 6] DX in the banking sector



static data. This enables banks to understand not only their customers' actual needs but also potential needs, and to provide necessary services such as advice on patent applications, finding babysitters, etc., in a timely manner (Chart 6).

In this way, DX can significantly change businesses in many industries, but in this paper, we focus on DX of banks [2] and summarize recent trends and their implications for the financial system.

Business Environment Surrounding DX of Japanese Banks

In order to better understand the business environment surrounding Japanese banks' DX, let us look at the development of DX in the financial sector (financial DX) overseas. The development differs greatly between emerging and advanced countries.

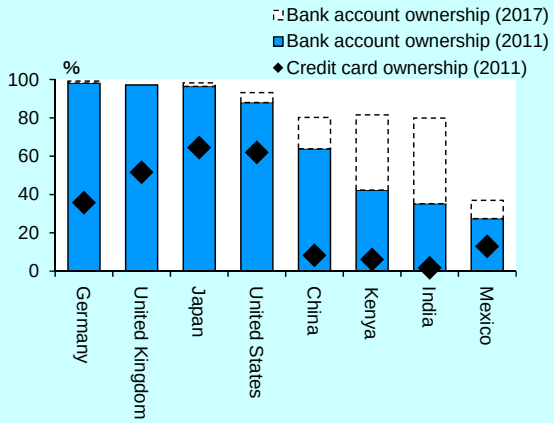
In emerging countries, BigTech entities have established innovative financial services on their own, without relying on existing financial systems, and have successfully gained a wide range of customers. Alibaba in China is a typical example. Through its numerous group companies, which each have a vast customer base, and its partner companies from a variety of industries, Alibaba accumulates a significant amount of data including traditional static data -- e.g., financial data such as individuals' financial asset information -- and daily behavioral data. Alibaba analyzes such data and develops highly customized financial and non-financial services for each customer and is expanding its revenue base.

On the other hand, in advanced countries, progress in DX is limited. Even the world's major financial institutions have not been fully successful in generating new profits by providing innovative services or by changing business models. Major financial institutions in the United States and Europe continue to invest in digital fields, but their main aim seems to remain in the re-construction of their legacy systems and improving management efficiency. Meanwhile, in Europe and the United States, FinTech entities created "challenger banks."[3] With their user-friendly interfaces and low fees, they have gained a certain number of customers. Others, such as Facebook's Diem (formerly Libra), are planning to issue private digital currencies and build payment infrastructure, or are in the microcredit business. However, a certain number of these companies are experiencing stagnant earnings, and some have discontinued the services within a few years from their commencement.

This difference between emerging and advanced countries is largely due to (i) differences in the maturity level of the financial infrastructure and (ii) the number of people who are considered "underbanked" or "unbanked," meaning they have insufficient or no access to financial services. In emerging countries, policy measures supported the rapid development of financial DX through a variety of means, including adequate financial regulations. Such support was widely accepted by society as it led to the enhancement of the countries' welfare.

The percentages of adults with a bank account and with a credit card, which is an efficient means of settlement, were high in advanced countries but low in emerging countries in 2011 (Chart 7). Subsequently, in some of these emerging countries, non-banks started to provide innovative settlement services, advancing financial DX, and the rate of bank account ownership rose, supported by strong governmental measures.[4]

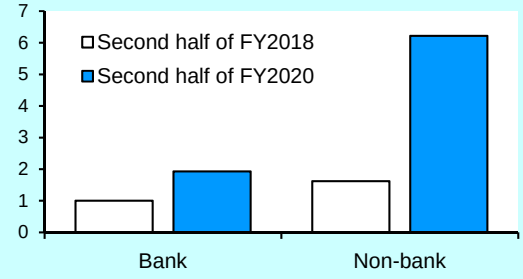
[Chart 7] Ownership rates of bank accounts and credit cards



Source: World Bank

In Japan, the rates of bank account and credit card ownership were already high in 2011, and together with an extensive bank branch network and ATM network, the user convenience of financial services was high enough. Additionally, a survey shows that people have greater trust in banks than they do in other entities when they decide with whom to share personal information. In sum, in Japan, as in Europe and the United States, it is not easy to come up with new revenue-generating services through DX -- i.e., to achieve positive DX results in the financial area -- unlike in emerging countries. Moreover, it may be more difficult for newcomers to gain a certain share in the market.

[Chart 8] Number of monthly active users of banking applications provided by banks and non-banks



Notes: 1. Indexing the number of monthly active users of banks in the second half of 2018 as 1.

2. The bar chart indicates the average of the top five applications in terms of monthly active users (excluding pre-installed applications) for both non-banks and banks. The number of monthly active users is the total of iOS and Google Play. The top five applications are extracted from the finance category in iOS/Google Play in Japan.

Source: App Annie

Nevertheless, "platformers" may have a competitive advantage over banks in the case they decide to provide or expand financial services. Platformers are non-banks that already have an overwhelming customer base, brand power, and daily interaction with customers through digital channels. In fact, the monthly active users of the top five non-bank applications, such as those provided by platformers, is roughly three times that of the top five bank applications (Chart 8). Since the outbreak of COVID-19, demand for digitalized or virtual financial services has been increasing among both the young and elderly. This may mean that the aforementioned advantage of the platformers could play a larger role in the near future.

Current Status of DX of Japanese Banks

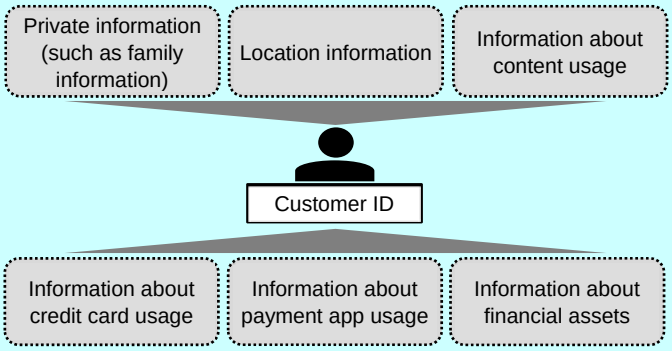
In Japan, banking services are already widely available to the public. Therefore, as in Europe and the United States, the main aim of digitalization in financial institutions' management is to improve their management efficiency, such as optimizing the efficiency of existing operations, rebuilding legacy systems, and restructuring branch and ATM networks. At the same time, there are also initiatives that utilize DX to provide innovative services and transform business models. The following provides the current status of Japanese banks' DX, especially on the creation of innovative services using data, and examines developments of non-banks as they are competing with banks by expanding their innovative financial services. We will look into services provided to three different groups of customers: (1) individuals, (2) small and medium-sized enterprises (SMEs), and (3) large enterprises.

(Services for individuals)

A number of FinTech entities and non-banks, such as platformers, are expanding their financial services for individuals, thanks to regulatory reforms that have established fund transfer services (*shikin idō gyō*) and electronic payment services (*denshi daikō gyō*). These entities started with providing payment services, but then developed a wide range of financial services and have already acquired a large number of customers. Typical examples are PayPay, LINE Pay, and d payment. Some entities, especially retailers, try to improve the efficiency of their customers' payment process, and thereby enhance their traditional business, whereas others seek to provide a wide range of new services by making use of a variety of customer data obtained through various financial and non-financial services. The latter are pursuing the business model of Alibaba.

When providing a wide range of services to individuals, it is crucial to manage the various data of each customer under a unique "ID." In order to provide services that meet a particular customer's needs, a large amount of broad data, both financial and non-financial as well as static and dynamic, need to be collected and analyzed. Since a single application cannot acquire such diversified data, it is essential to obtain data from several applications, and link such data to a customer using the customer's unique ID (Chart 9).

[Chart 9] Customer information management by user ID linkage



In fact, some non-banks have begun to collect data from non-financial and financial services, and by linking all the data using a unique ID, they analyze customers' behavior. One of the available services is "Smart Money Lending" provided by NTT docomo together with Shinsei Bank. This is a score-lending product that calculates users' credit score based on a variety of data obtained by NTT docomo, and uses the score in the loan screening process. This is an example of a financial service that utilizes non-financial data collected by a platformer. It is expected that such initiatives will expand in the future.

Against this background, banks started to work on improving customer experience. Resona Group and Sumitomo Mitsui Financial Group (SMFG) have improved the interface of their banking applications and expanded digitalized services, such as online banking, private digital currencies, and budgeting applications. However, due to legal restrictions, banks can only commit themselves to banking business. It is therefore not possible for them to establish a non-financial subsidiary and acquire non-financial data by themselves. Moreover, it is also difficult for banks to launch large-scale give-away campaigns through which some non-banks have successfully attracted many customers. Hence, banks seem to be struggling to successfully appeal to customers.

In this situation, some banks are trying to expand their services by collaborating with third-party platformers and tapping into the unbanked population in emerging countries. For example, MUFG Bank has formed a capital alliance with Grab, a Southeast Asian platformer whose core business is food delivery and ride-hailing. MUFG is now offering a lending service to Grab's drivers and merchants. This is a new attempt to provide banking services to unbanked people who have funding needs but have had difficulty obtaining bank loans. The reason that MUFG can provide loans to them is that, through the capital alliance, it can obtain new data, such as that on drivers' behavior and merchant sales information, and use the data to examine their creditworthiness.

Mizuho Financial Group, Shinsei Bank Group, SBI Sumishin Net Bank, and others are also focusing on BaaS (Banking as a Service). Under this scheme, banks provide non-bank entities with banking functions so that non-financial enterprises can offer financial services to customers as their own products. Banks do not provide services directly to the customers but act behind the scenes. So far, there have been some cases of cooperation between banks and non-bank entities, such as issuing regional gift certificates, deposit services, foreign currency trading, and housing loans. One such example is JAL NEOBANK, a service provided between SBI Sumishin Net Bank and Japan Airlines (JAL).

(Services for SMEs)

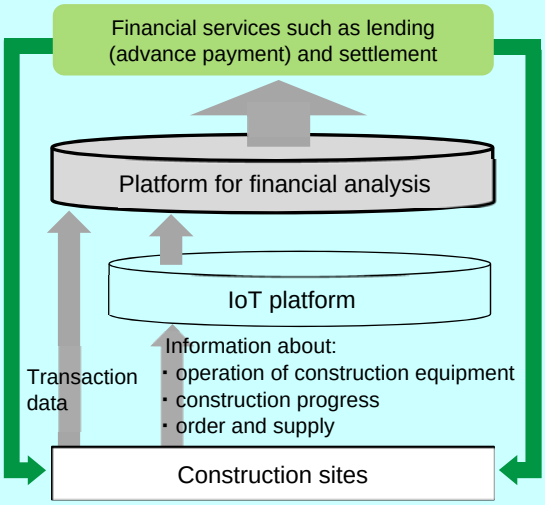
With the spread of cloud accounting software and other services for SMEs, a number of non-banks are offering financing services that use dynamic financial data, such as unaudited accounting information, inventory information, and sales information, all of which were not used for screening in the past.

Some of these services are provided in cooperation with banks, but there are also a number of services in which non-banks themselves act as lenders. However, some of them, including major entities, have withdrawn from the market within a few years. One of the reasons may be because loans to SMEs tend to be short-term and small in volume. It is not always possible to cover the high cost of verifying the identity of customers and the high cost of sales promotion. The latter is a unique problem facing non-bank lenders since they have a low market profile compared to banks. It may be possible to improve their profitability by expanding the scale of their loans, but it will require them to have a reasonable funding ability, which is not always easy to acquire, especially for emerging non-banks.

Banks are also using new data to develop new services that will support the financing needs of SMEs and improve their administrative efficiency.

For example, SMFG is working with Komatsu Ltd. By connecting Komatsu's existing data platform, which handles information on the operation of construction equipment, with SMFG's newly established financial analysis platform, SMFG provides loans to Komatsu's contractors and subcontractors in a timely manner to meet their funding needs (Chart 10).

[Chart 10] Platform for small and medium-sized enterprises



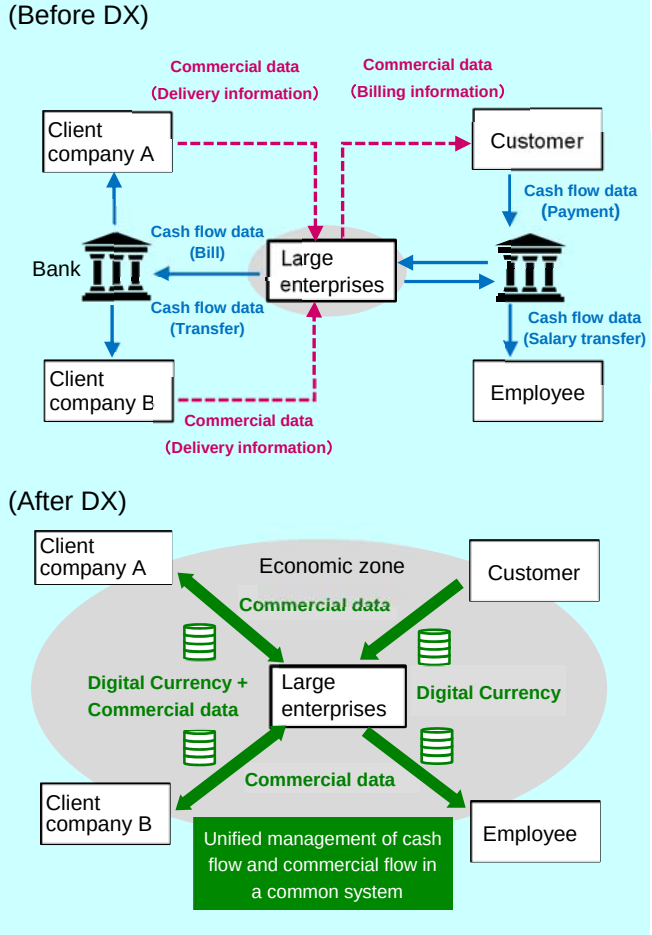
In addition, there are examples of banks considering to introduce measures to improve SME's business operations. Some SMEs use electronic data interchange (EDI) systems to place and receive orders. Banks are trying to construct a settlement platform and link it to an EDI system, so that companies can check their order (commercial data) and settlement (financial data) at the same time and automate the process of reconciliation. Such initiatives will not only increase the administrative efficiency of companies and stimulate corporate activities, but could also deepen business relationships between banks and SMEs, thereby leading banks to respond more flexibly to SMEs' future financial needs.

(Services for large enterprises)

There has been no significant attempt by non-banks to provide services for large enterprises. As large enterprises do not face many difficulties in funding, the financial services they outsource are large in scale, such as merger and acquisition (M&A) financing and bond issuance. Therefore, service providers need to have strong financial and sales capabilities, and the dominance of banks, especially major banks, in this area is established. FinTech entities, BigTech entities, and other platformers who managed to gain certain shares in the services for individuals and SMEs will find it difficult to take the place of banks in providing services for large enterprises.

This does not mean, however, that banks are the only players in financial DX for large enterprises. In the longer run, it may be possible for large enterprises to build their own payment platforms that could be used extensively by companies, including those in their supply chain, in order to improve administrative efficiency, reduce costs, and increase their financial efficiency. Those platforms could be B-to-B or B-to-B-to-C and big enterprises could develop new financial services, such as responding to the potential financing needs of companies or employees, on their platforms. For example, large enterprises could create their own means of payment for Mobility as a Service (MaaS),[5] which is considered as a form of DX for transportation. They could also consider issuing their own private digital currency and use it not only to pay wages to their employees but also to make payments in the supply chain (Chart 11). The discussion of liberating payroll is

[Chart 11] Blueprint of financial DX of large enterprises



still ongoing, but it could be a good opportunity for enterprises to reconsider their services.

Although these issues need to be thoroughly discussed from the perspective of stability and efficiency of the payment and settlement system as well as the financial system, if it becomes possible to exchange and share financial data and commercial data in association with each other, it will not only improve large enterprises' administrative efficiency but also lead to greater efficiency in the use of funds, which would be of great benefit to businesses.[6] Banks, too, could discover new business opportunities. At this moment, it is uncertain whether these possibilities will be realized and, if they are, how banks will be involved. However, it is possible that the role of banks will change dramatically.

Japanese Banks' DX and Financial System Stability

It is desirable for Japanese banks to make progress in DX from the standpoint of providing services with a high level of customer satisfaction and increasing the added value created by society as a whole as a result of revitalized corporate activity. At the same time, however, the following points need to be kept in mind to ensure financial system stability.

(Decline in profitability and risk-taking by banks)

As DX in the banking sector progresses, competition between banks and non-banks may intensify. While this could bring benefits to customers in the form of greater convenience and lower costs, it could lead to a decline in commission income and other revenues for banks. In particular, under the prolonged low interest rate environment, which makes it relatively easy to raise large amounts of long-term funds at low interest rates, the distinctive role of banks as financial intermediaries, a source of their competitive advantage, could be impaired. In this case, the competitive advantage of banks over non-banks, which are better at providing value-added services except for loans, will decline and banks' profitability is likely to decline. There is also a possibility that deposits could shift to non-banks in the future, and banks' customer base could shrink. Of course, it would be favorable if banks could maintain and expand their profits by providing new services via DX, but given that there are currently no groundbreaking success stories even in other advanced countries, it seems unlikely that this could be achieved in the short run. It is worth noting that, if intensifying competition with non-banks leads to a further decline in bank profits, in combination with other factors, it could lead to excessive risk-taking by banks, which could destabilize the financial system.

(Ensuring fair competitive environment)

It is important to ensure a level playing field between banks and non-banks in terms of regulations and other factors.

At present, discussions are underway so as to allow non-banks to expand their business; namely, the Payment Services Act will be revised to remove the upper limit of payment[7] and access to the Zengin System by non-banks[8] is also being considered.

As for banks on the other hand, although regulatory easing is gradually being promoted, there are still legal restrictions on non-financial business, and they are required to take stricter measures than non-banks. Such measures include the firewall regulation, which does not allow the sharing of customer information even within the same financial group. In this sense, the current discussion to reconsider the adequate scope of banking business, reflecting the changes in the environment surrounding banks, is a desirable action.

Given that the restriction on non-financial business for banks is designed to maintain financial system stability and protect depositors, it would be appropriate for new entrants, providing similar services to banks, to be subject to the same regulations as banks, provided that the necessary safety net framework is in place.
If banks were put under regulations that are stricter than necessary, there is a risk that, as stated before, a decline in banks' profitability would lead to excessive risk-taking, which may destabilize the financial system. Therefore, in order to maintain the stability and efficiency of the financial system, it is important to ensure a fair competitive environment.

On this basis, it would also be beneficial to consider what kind of regulations would encourage digital innovation.

(Customer identity verification and personal information protection)

With financial DX, virtual and digitalized services are the mainstream. It could become common for customers and service providers to not meet in person throughout the service period. In such a case, the possibility of identity theft could increase, so it will be more important for individual service providers to properly verify their customers' identity.

In Singapore, where DX is well advanced, the government is taking the lead in developing and promoting a digital ID scheme, called the NDI

(National Digital Identity), that could be used by the public and private sectors. It provides an infrastructure allowing people to identify themselves online and conduct transactions safely and easily. In Japan, if the government makes further progress in using the Social Security and Tax Number System or other similar initiatives as in Singapore, it could bring about enhanced security and lessen the administrative burden on private companies.

Additionally, service providers will receive and manage more information, so they will need to be more responsible for the privacy of customer information. It will be necessary for service providers to carefully determine what information to protect, how to use the information, and how to obtain appropriate approval from customers. Furthermore, as digitalization increases the risk of information leaks, such as by cyber-attacks, the establishment of robust cyber security will be crucial.

Conclusion

The advancement of DX in the banking sector is expected to expand financial services and stimulate economic activity through increased convenience and efficiency for customers. Under the strong leadership of their management, banks would be able to promote DX, while reforming their corporate cultures, hiring and training digital human resources, and proactively incorporating the benefits of innovation, such as rapidly advancing digital technologies. It is also important for banks and non-banks to complement and collaborate with each other by taking advantage of each other's strengths, thereby responding thoroughly to a wide range of financial needs, including potential ones. In addition, although not touched on in this paper, DX in areas such as securities and asset management is also very important from the perspective of improving financial intermediary functions and helping individuals to build their assets.

There is no clear answer for what kind of DX will be successful in the financial sector. For the time being, the priority for financial institutions would be to build a foundation for promoting DX through improving management efficiency by firmly proceeding with digitization and digitalization.

Based on the above, and from the perspective of ensuring the stability of the financial system, the Bank of Japan intends to encourage a variety of initiatives for financial DX and to contribute as much as possible to the development of the necessary environment.

[1] A software robot that automates business processes using a program that automatically processes information. It is said to be relatively easy to introduce this robot without profound programming knowledge.

[2] This paper mainly focuses on major banks. For more information on DX trends among regional financial institutions, see "Dejitaru jidai no chiiki kin'yū," Financial System Report Annex Series, March 2021 (available only in Japanese).

[3] Generally, they obtain a banking license and provide services, such as checking accounts, savings accounts, and mortgages, to individuals on a mobile application.

[4] In China, debit cards were already widely used in 2011, and there were few unbanked people. Alibaba's success stems from its development of services that reflect customer demand and were not previously available. Convenient payment methods and escrow services on e-commerce sites are typical examples.

[5] A service that improves user convenience by enabling users to search, make reservations, and pay for transportation using their smartphones or other devices when using multiple modes of transportation, such as trains, buses, and airplanes.

[6] For more information on the effects of linking, exchanging, and sharing commercial and financial data among companies, see, for example, Sugayama, Y. and Tamura, Y., "Fintekku de kasoku suru kigyō no shouryū, kessai jōhō no rikatuyō -- Yoshin kinō no anbandoringu --" Bank of Japan Review Series, no. 19-J-8, September 2019 (available only in Japanese).

[7] Currently, funds transfer service providers can send money up to one million yen. Under the amendments to the Act on Sales, etc. of Financial Instruments and the Payment Services Act promulgated in June 2020, a new category for remittance of larger amounts of funds (Type I Fund Transfer Businesses) and a new category for remittance of small amounts of funds (Type III Fund Transfer Businesses) will be established.

[8] Japanese Banks' Payment Clearing Network established a task force in May 2020 to study the next-generation payment clearing system. The task force examined the system so as to include funds transfer service providers' participation in the Zengin System, and published a report in December 2020.

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