

Fujitsu Future Insights Digital Transformation of Banking Services

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Banking Services in 2030



It's morning. Your personal AI agent tells you your schedule for the day. It gives you a rundown on how the day's news and events will impact your asset management portfolio, and it recommends stocks to buy. You tell your AI agent to purchase those stocks.

You go to work at a smart factory where data from sensors is used for realtime visualization of production and inventory management processes. People and robots are working together efficiently. Al predicts demand from a range of customer behavioral data and autonomously adjusts production. It makes predictions for working capital requirements based on the predicted production and, via an API, automatically obtains the required finance from financial institution partners. The finance officer is free to pursue the development of creative strategies rather than working to ensure the business has sufficient cash flow this month.





You are on an overseas holiday and walk into a souvenir store where you pick up a fashion accessory that you want to buy. The price is converted into your own currency and displayed on a wearable device that you have. You say "I'll take this please" and the phrase is automatically translated for the shop assistant. You pay for the item using the store's terminal to contact your bank and complete authentication using hand-palm and voice biometrics.

You are an entrepreneur with a business idea and product prototypes that you tell the world about via the net. Sponsors use virtual currencies to send you donations and investments in real time. With the initial capital quickly raised, you use Blockchain to enter into contracts with freelance engineers around the world. You share some of the virtual currency with them and start development without delay.



These scenarios show the potential new shape of banking services in the year 2030. However, each of the above scenes depicts some form of 'banking' rather than some form of 'bank'. The year 2030 is just over 10 years away, but by that time banking customers, even more so than now, may be using services without any conscious awareness of the physical bank behind them.

With the ever-advancing progress of technology, digitalization is rapidly changing people's daily lives and the way businesses function. Currently, anyone with a smartphone is able to shop on ecommerce sites globally, whenever they like and from wherever they want. With rapid advances in IoT and AI technologies, we are also seeing many new innovations such as autonomous vehicles. In such a digital society, banking services will be digitalized and become even more sophisticated.

We can see signs of this future in trends particularly at Amazon, the ecommerce platform accessible by customers all around the world. Payments can be made using the company's own points system, which can also be used to send money to friends. And when businesses open a store on Amazon, they can use the company's own finance services. In 2017, Amazon also opened Amazon Go, an unmanned grocery store without a single store assistant. Customers simply pick up the products they want and walk out of the store, with payment being made automatically. When providing these convenient ecosystem-based services, Amazon is effectively acting as the 'Bank of Amazon'.

In the digital society of the future, large digital platforms such as Google and Amazon, as well as companies in other industries such as retail and telecommunications, will likely provide banking services that have a high affinity with their own businesses and provide convenience for their customers. As the traditional providers of savings and loan services, banks on the other hand will employ digital technologies to improve the customer experience. They will also accelerate innovation in order to dramatically improve management speed and business efficiency. Additionally, with greater specialization into areas such as private banking and investment banking, and with provision of banking services to companies entering the banking sector from other industries, we may see further decentralization of banking functions. By 2030, it is possible that banks and other industries will collaborate to create an ecosystem where users can access reliable banking services anywhere and anytime they wish.

So how will digital technologies transform banking services in the future? This paper analyzes major potential trends and explores the strategic business opportunities that they offer. Fujitsu hopes that this information proves useful to help shape your strategy.

Digital Transformation of Banking Services

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Fujitsu Future Insights

Every year, Fujitsu publishes the Fujitsu Technology and Service Vision. This is the company's global vision for the future, looking at how businesses and society will use technologies to drive innovation. Fujitsu Future Insights looks at specific fields in order to provide a deeper analysis of challenges and the impact of technologies. It also offers suggestions for possible future scenarios and strategies related to those fields.

[Website]

Fujitsu Technology and Service Vision http://www.fujitsu.com/vision/

Fujitsu Future Insights http://www.fujitsu.com/global/vision/insights/wp1/

Chapter 1 Digital Transformation and the Banking Industry



Digital technologies are moving into the heart of everything we do. Digital transformation is rapidly changing the way we work and live. Digital transformation is the reinvention of business processes and business models, and the creation of new value, using the Internet of Things (IoT), Artificial Intelligence (AI), and other digital technologies.

Digital transformation is causing significant change to the structure of industries. From the typical vertically-integrated structure with large corporations at the top, industries are changing to a decentralized ecosystem-based structure with customers at the center. Digital technologies have the power to transcend traditional boundaries between different companies and industries. To create ecosystems that connect companies, partners and customers, and to co-create the value that users need. Fujitsu calls these types of ecosystems 'Digital Arenas' . Depending on the participants involved, Digital Arenas are not isolated. Multiple Digital Arenas will have the potential to develop into an autonomous and distributed

network to deliver greater value for people. We expect Financial services to also take on new forms in Digital Arenas, where they promise to provide even greater customer value.

According to Fujitsu's global survey*, two-thirds of traditional companies, which excludes online companies, have already begun their digital transformation journeys. Of those, finance companies are the most advanced when it comes to digitalization, with 90% of companies working toward digital transformation. Business leaders in the finance industry responded that about 30% of their projects had already achieved business outcomes. The survey further revealed that the companies with the more robust ecosystems had delivered the greater results. Companies in the finance industry prioritized business efficiency and growth almost equally as the reasons for undertaking digital transformation. The next most important driver of change was the threat of competition. This is probably due to innovative Fintech services and other similar trends that are significantly impacting the industry.

The essential functions provided by banks were first established at the end of the 17th century when the Bank of England was founded. This was the birth of our modern banking system and the core services have changed little since that time. Its main functions include acting as a financial intermediary between people who need funds and people who want to invest their funds, creating credit by using people's savings as capital for loans to grow the volume of money circulating in the market, and settling payments by moving funds cashlessly between parties separated by distance or unknown to each other. Banks have traditionally acted as an intermediary, assessing whether parties entering into transactions can be trusted or not. Another important value that banks provide is the collection and analysis of various types of information, together with assessment of the creditworthiness of parties and the risk of the transaction. In this sense, you could say that the banking industry has always been an information industry. It means that the industry has a high affinity with digital services.

Technology and other industry sectors creating new financial services

With the advance of digital transformation, many companies are actively moving from all directions into the banking business space. These include emerging technology companies and companies in other industries, such as retailers and telecommunications companies. These new entrants are replacing functions previously provided by banks, and are creating new value in the process.

Taobao is China's largest online marketplace. It is operated by

Alibaba, which owns Ant Financial, a Fintech affiliate operating a payments service for ecommerce sites. In addition to operating Alipay, the company's mobile payments platform with 500 million monthly users - mainly in China - Ant Financial has also developed the Zhima Credit (or Sesame Credit) personal credit scoring system. This system uses trading data from Alibaba, personal assets, academic background and other data. Zhima Credit data can be used when accessing financial services, including home loans, with a high score entitling the individual to preferential treatment and other rewards on Alibaba's services. Companies that operate ecommerce sites and collect personal transaction data are assessing creditworthiness themselves, rather than relying on banks. As a result they are creating new value.

Technology companies are using advanced technologies to eliminate inefficiencies from existing financial services, improve the customer experience, and create new types of financial services. The UK is the center of Fintech development in Europe. A steady stream of tech companies in the region are applying to open banks and are being granted licenses. Known as "challenger banks," these fledgling institutions are experiencing rapid growth due to their convenient financial service offerings; focusing mainly on smartphone-oriented digital channels that compete with ATMs and bricks-and-mortar traditional banks. During the 100-plus years from around 1900 to 2010, only one new banking license had been granted in the UK. Yet from 2010 to 2017, more than 10 licenses to operate new banks were granted, with apparently dozens



Digital journey (non-online companies*)

* Companies which do not provide product or service purely online.

more waiting in the wings.

As a result, a whole range of new entrants are starting to provide banking services directly to consumers, driving an emerging Digital Arena in finance. So what are the traditional banks up to?

Banks evolving into tech companies

"BBVA will be a software company in the future," predicted the chairman of Banco Bilbao Vizcaya Argentaria, S.A., a Spanish banking group that is one of the largest financial institutions in Europe, in 2015. This statement may leave some people wondering why a bank would want to become a software company. However, it is in fact recognition of the major changes required to counter the significant challenges brought on by many technology companies making inroads into the financial services sector. It means that as digital transformation continues, banks themselves must evolve to become technology companies that use software as a key source of differentiation. The most advanced banks are now transforming into tech companies, providing new banking services in the Digital Arena. One such company is Capital One, a major financial institution in the US, which acquired a startup that was developing internal systems for the bank, and has now begun offering IT solutions to other financial institutions. In October 2017, Deutsche Bank, a major financial institution in Germany, opened up the source code of software it provides to institutional investors, thereby publicly releasing 15,000 lines of development code. Deutsche Bank's intention in open sourcing the software was to scale the impact of its software in the market. In doing so, the bank aims to create the de facto standard within the banking industry.

In the digital era, banks are starting to transform their businesses into tech companies. They are ramping up efforts to provide new value to other players in the Digital Arena. We expect banks in various forms will increasingly co-create new values in the Digital Arena, with users able to enjoy a whole new range of banking services.

The borders of existing industries are becoming blurred and disappearing, and being replaced by emerging ecosystem Digital Arenas where enterprises co-create innovative value for their customers



Chapter 2 New Banking Services Created through Digital Transformation



Five mega trends of banking service

Digital accelerates the formation of a decentralized Digital Arena to provide users with innovative banking services. Participants could include technology companies, retailers, telecommunications firms and companies from other industries, as well as traditional banks. Fujitsu believes the following five trends will drive the transformation of future banking services.



Engagement Banking Providing services that are integrated with people's lives and businesses



Platform Banking Providing plug-and-play banking functions



Technology Banking Providing technology-based efficient services



Social Banking Creating new services without intermediaries



Inclusive Banking Helping maximize social value

Each of these trends is explained in more detail below.



Engagement Banking

Providing services that are integrated with people's lives and businesses

In a digital society, people are able to connect to networks to communicate and access services whenever or wherever they wish. In recent years, we have seen the increasing use of smart speaker devices that enable easy voice-controlled operation by anyone. According to the White Paper on Information and Communications in Japan, published by the Ministry of Internal Affairs and Communications (MIC), there are more than four billion smartphones in use globally, with 2.4 billion being used to access social media services. At the same time, enterprises are digitalizing their operations and strengthening collaboration with other companies.

The internet has enabled service providers to increase the diversity of touchpoints from which their users can connect. In the past, the only points of contact between banks and users were through physical channels, such as branches and ATMs. However, the internet and mobile banking have broadened these points of contact significantly. It is becoming more important to allow users to access the required financial services whenever and wherever they wish, through various non-bank services that they are familiar with.

For example, the Commonwealth Bank of Australia collaborated with a large real estate information company in Australia to develop a smartphone app that allows users to immediately check the price of properties for sale, access home loan simulations, and contact loan officers, just by taking a picture of a property for sale with a smartphone camera. The app enables users to complete the entire process of purchasing that home on their smartphone.

SAP, a major software vendor in Germany, is developing a B-to-B network called Ariba Commerce Cloud, which provides a cloud platform for corporate services offering electronic procurement, contracts management and electronic purchasing. In addition to procuring required materials from suppliers through reverse auctions on the network, users are able to source necessary funds from banks. In all cases, financial services are integrated into the services that people and enterprises use every day.



Platform Banking Providing plug-and-play banking functions

With the advent of engagement banking, SAP and similar companies from outside of the banking sector have started to provide front-end financial services. At the same time, new



Application of a housing loan by a smartphone



platform banking providers have appeared, offering back-end banking functions to these companies. Specifically, such banking functions include agency services for banking operations and related business processes that require banking licenses, as well as services for mutual authentication of parties to transactions.

New entrants to the financial services sector are specializing in front-end services. They are focusing their management resources on providing user-friendly services to meet the diverse needs of their customers and deliver exceptional customer experience. This is why new entrants prioritize flexibility and low-cost when procuring their banking services. To meet these needs, back-end service providers are developing banking functions on highly-scalable cloud infrastructure. They offer these services via APIs to the nonbanks. For these platform banking providers, their competitiveness depends on how flexible and affordable their banking services are, so consolidation in pursuit of scale is likely to happen. An open banking environment, where services from financial institutions, non-banks and other companies are connected via APIs, is essential for flexible service delivery. In January 2018, the European Union implemented the PSD2 (Revised Payment Service Directive), specifying that banks are obligated to connect data and services securely with Fintech companies and companies from other industries. In Japan as well, the revised Banking Act of 2017 obligates financial institutions to define basic policies for open APIs when connecting with Fintechs. The majority of financial institutions in Japan have now defined these basic policies. There is a tendency to consider the only beneficiaries of API connectivity as being the new entrants that offer front-end services to customers. However, this also enables banks to incorporate the services offered by nonbanks and Fintech companies into their own platforms and develop new businesses.

In 2007, Fidor Bank was founded in Germany as a completely digital bank, designed without branches and ATMs, enabling all transactions to be completed online. The bank offers its

banking platform to other industries wanting to provide new financial services. By using the Fidor Bank platform, companies from other industries can immediately start providing financial services without applying for banking licenses. With more than 50 Fintech companies connecting to the bank's platform through APIs, Fidor Bank is also creating an ecosystem for providing its own users with a wide range of financial services that meet their needs.

Technology Banking Providing technology-based efficient services

Along with the remarkable advances in computing technologies over recent years, AI technologies are enjoying rapid adoption in the real world. Although artificial general intelligence (AGI), if even possible, is still a long way off, some function-specific AI technologies, such as image recognition and natural language processing, are making rapid progress. These specialized technologies are expected to find practical application in a range of fields, including autonomous driving, manufacturing and medicine. Fujitsu has developed Human Centric AI Zinrai, which is already delivering business outcomes in collaborative projects with companies and research institutes across a number of fields.

Robotic Process Automation (RPA), which enables automation of routine tasks, and AI technologies, with even further advanced processing capabilities, are attracting interest for their ability to significantly transform conventional labor-intensive business processes in the financial sector. Citibank, a leading U.S. financial institution, estimated that AI and other technologies would replace some 30% of banking jobs over the next five years. In fact, Goldman Sachs, a leading investment bank in the US, has reduced the number of traders working at its headquarters from 600 to just 2, with the majority of trading work now being performed by computer programs. In Japan, the country's mega banks have announced plans to use AI and other cutting-edge technologies to reduce workloads over the next 10 years by the equivalent of 30,000 employees.

Al and robots will replace people in difficult and routine operations and repeatable activities, while people will focus on tasks that require rich communication skills, planning abilities and creativity. It is also expected that people will play a crucial





role to develop higher value-added services. Al can be used to enhance the capabilities of these people, so its role is to improve productivity through collaboration. For example, the credit analysis and optimal asset management portfolio generated by Al will allow, financial professionals to understand individual customers better and focus on customer interaction and delivering more personalized services. Wells Fargo, a leading U.S. financial institution, is planning to offer a new asset management service that combines an Al-based asset management with personal contact through financial advisors. The financial advisors will be able to better understand the customer's life plan and need for asset management. Al can then be applied to those ideas to achieve the optimum asset management solution for the customer.



Social Banking

Creating new services without intermediaries

Leveraging networks, digital technology breaks down the barriers between people, and provides spaces for people to connect directly, even when separated by distance. It also changes the economic activity, enabling peer-to-peer transactions without intermediaries. The sharing economy is attracting interest as a new form of economic activity that can directly connect a large number of service providers and users via a network. According to the MIC White Paper on Information and Communications in Japan, the size of this market is predicted to expand to around 35 trillion yen (320 billion US dollars) by 2025.

In 2009, a new distributed ledger technology emerged as a result of a paper published online by Satoshi Nakamoto. Blockchain attracted attention as a new core technology for data management and distribution. Since then, many organizations in the world are researching its technologies and implementing projects toward commercialization. For example, Fujitsu is collaborating with Japanese financial institutions through the development and field testing of Blockchain technologies that enable peer-to-peer remittances between personal bank accounts. Fujitsu has also developed a technology that safely inter-connects multiple blockchains to exchange various different values. This allows easy transfers between different virtual currencies.



A Blockchain-based virtual currency called Bitcoin was developed and, unlike conventional payment methods, payments can be made automatically without the services of a bank or other administrator. As Bitcoin includes incentives for participants in the payments network to maintain the system, payments can be conducted autonomously with no administrator.

For the sharing economy and other new economic activities to grow in the future, participants in a network need to trust each other, and must be assigned with credentials for transactions. Building a Blockchain-based system to automatically assign credentials has the potential to enable seamless and secure transactions with no intermediary. Autonomous transactions between network participants are expected to form a platform for the sharing economy.



Inclusive Banking

Helping maximize social value

As many as four billion people around the world are currently living on an annual income of US\$3,000 or less. People at this

level, occupying what is called the Base of Pyramid (BOP) stratum, live mainly in emerging countries in Asia, Africa, and Latin America. They are also people who have never used financial services. According to the World Bank, there are up to two billion people globally who have no access to formal financial services or who have no opportunity to use these services. Many of these people live a cash-based existence; they have no access to financial services such as obtaining a loan when they need it, and they live in circumstances that make it difficult to improve their standard of living. However, because the digital space enables people to expand their circle of activity, it holds promise as an opportunity for these economically challenged people to access financial services.

In recent times we have seen an enormous uptake of smartphones and other digital devices, with the majority of people worldwide being active online. As a consequence, massive amounts of personal data are being created and distributed day and night. The four GAFA corporations¹ have experienced rapid growth by collecting and analyzing this data, and use it as part of their business in areas such as marketing, product development and advertising. In other words, personal data being generated by every person has intrinsic value as an asset. With a strong awareness of the importance of protecting personal information, Europe has formulated a new General Data Protection Regulation (GDPR) that defines the rights to this personal data as belonging to the individual. In Japan as well, the public and private sectors are joining forces to spearhead discussions on personal data stores (PDS), where individuals can appropriately manage their own data and connect that data for use by new services. For example, Fujitsu and AEON Financial Service have conducted field testing for an Information Bank, where individuals administer and manage their personal data themselves, and earn rewards in the form of Blockchain-based intra-company virtual currency according to the volume of data shared. The financial services sector is also investigating ways of making effective use of personal data and providing returns to individuals. For instance, analysis of online personal networks and various behavioral data allows the capabilities and risk profile of individuals to be estimated. In the past, microfinancing services had to determine the strength of an individual's personal network and estimate their creditworthiness before they could extend loans to people with an insufficient credit rating. In the same way, if a person has grown their business through many personal connections online, it might be possible to estimate their creditworthiness from those activities and provide financing even to people with a low credit score. Analysis of personal data enables the appropriate assessment of an individual's capabilities and potential, which can greatly boost their chances of economic success.

Chapter 3 Transformation of the Banking Business

As described above, digitalization is driving real change in the banking sector. However, the question remains as to what challenges and opportunities for growth exist for traditional banks and for new entrants.

For traditional banks, this offers an important opportunity for

using digital technologies to transform the business model. It is likely that banking business models will specialize into one of three types. The first type is where companies evolve into 'better banks', able to leverage digital technologies to transform customer contact and business processes, and provide more convenient and efficient services coupled with a greater

customer experience. The second type of business model involves businesses specializing in the provision of back-end platform functions via APIs to new entrants who provide financial services. In addition to basic banking functions, these include digital services for authentication and data analysis, as well as banking transaction services that require a license. Finally, the third type of business model involves businesses evolving into front-end banks that leverage the trust they have built up with their customers. They use both digital channels and physical channels, including shop fronts, to deliver services closely aligned to their customers' needs, while procuring any required back-end functions from other banks. In pursuing either business model, it is crucial that banks identify their greatest area of strength, focus their management resources, and use digital technologies to transform their business model accordingly.

So what about the new companies entering the sector and offering banking services? The key to success for these new entrants is to combine their existing areas of business expertise with new banking services, and redefine the value that they provide to users. An example would be telecommunications and power companies that have their own customer base and detailed individual customer data. These firms have the opportunity to use that data to generate credit information, which can be leveraged to provide banking services. Large-scale retailers with extensive store networks and a high volume of visitors also have the opportunity to make effective use of both digital and physical channels to provide banking services that are finely tuned to each of their individual customers. Furthermore, purchasing data from those retail stores can be effectively used in developing banking services desired by customers. Flexible strategies are important for new entrants. They may focus on providing banking services to their particular niches, while procuring the required banking functions from banks specializing in back-end platforms.

To maximize business opportunities driven by digital transformation and exploit the big trends of banking services, companies must work on co-creation with trusted partners. In a Digital Arena, enterprises are connected beyond the borders of existing industries and create ecosystems for the co-creation of new value for customers. We expect traditional banks and new entrants alike to join forces in a Digital Arena to co-create new banking services for users. Fujitsu is focusing on developing and offering cutting-edge digital technologies, such as AI, IoT, security and Blockchain, as well as providing industry platforms for API-based financial services. In this way, we will continue to contribute to the co-creation of a new banking services Digital Arena.

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