A New Relationship between Financing and Technology in the FinTech Era

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Abstract

The progress and dissemination of ICT have brought about a significant shift in the banking systems. This paper reviews changes happened in the Japanese banking systems and discusses how the relationships have varied between banking systems and ICT. It then goes on to introduce a new relationship between financing and technology based on the changes in the roles of technology and of relationships with consumers.

Keywords

banking system, online, Internet, big data, business model, financial operations, bank API.

1. The Environment Surrounding Banking Systems

Internet dissemination and popularization of smartphones and tablets have made social media an integral part of the daily activities of people. As a result of this trend, the penetration of cloud computing has made it easy to use the computing power that formerly required large investments. Such an environment has highlighted the new kinds of services created by storing and analysing various kinds of information; including those of human behaviour and natural phenomena. In the following, by reviewing the history of the advancement of these services in always adopting the most readily available advanced technologies, we discuss the effects of this trend on the banking systems that used large-scale computers to form nationwide networks.

2. Changes in the Banking Systems

2.1 Applications of Online Technology

Japan's first online ordinary deposit service was started in 1965 at the Marunouchi Branch of The Mitsui Bank (currently Sumitomo Mitsui Banking Corp., or SMBC). Previous banking system operations were mainly conducted via offline centralized batch processing making use of punched cards and paper tape systems. Subsequent to the Mitsui Bank going online and following the increase in processing volumes backed by high economic growth and improvements in the performances of computers, the accounting, saving and lending operations of banks went online individually. The systematization of the banking operations of the initial period are referred to as the primary going online phase. The banking system in the latter half of the 1960s was called the "first online application." Subsequent to this, the "second online application" came in the late 1970s and the customer information management were systematized. The "third online application" started in the late 1980s in order to cope with the deregulation and globalization of the financial market.

The mainstream of networking in the 1960's and 1970's was performed using the private networks of each individual bank. Subsequently, in around 1980, the subscriber telephone network was opened to data communications, which led to the start of electronic banking

(EB) utilizing the public telephone network. Although the EB users were initially limited to enterprises, the Sumitomo Bank started the Sumitomo Telephone Service that was available from household telephone sets in 1980. In those days, some banks had already started telephone services for pushbutton phones that had a penetration rate at the time among people of below 10%. The Sumitomo telephone service was started for dial phones that had a much higher penetration rate. For this project, NEC developed a computer-controlled voice synthesis system that achieved the highest approval level worldwide.

In 1977, which was much earlier than the dissemination of telephone banking. Chairman Koji Kobayashi of NEC declared that C&C, which is the concept proposing the integration of the communication and computer technologies would lead to implementation of the C&C concept and that by "early in the 21st Century, it will be possible to talk and see between any persons, at any time, at any place", NEC continues to make advances in the technologies used in communications and computers as well as in their integration.

2.2 Application of the Internet

The main event of the latter 1990s was the advancement of the Internet. Linux was released in 1994, Windows and Java in 1995 and personal computers and mobile phones were spread widely in enterprises as well as in households. The banking operations that had gone online (computer processing capable) in 1980s became available on the Internet in the period from the late 1990s to the late 2000s. Subsequent to the Sumitomo Bank starting its Internet service in January 1997, the Asahi Bank (currently the Resona Bank) started a service in June of the same year, the Sanwa Bank (now the Bank of Tokyo Mitsubishi UFJ), the Sakura Bank (now the SMBC) and the Fuji Bank (now the Mizuho Bank) followed this trend. Some banks started only those services not having money flow, such as for balance inquiries. Services were then gradually expanded until the purchase of investment trusts and foreign deposit savings followed. Eventually it became possible to perform almost all transactions without visiting a bank branch office.

2.3 The Advent of Big Data and Other Technologies

As the progress of Internet applications and the use of mobile terminals have led to an explosive increase in generated data, the technologies required for processing such large amounts of data has also advanced. This has led to the launch of the big data technology in the late 2000s and the means of launching the big data technology has also advanced in the late 2010s. The Hadoop that attracted attention as a big data processing technology is originated from the Google File System (Map Reduced) made public by Google in 2003. It was started as an open source project of Apache in 2006. In the same year, one of the machine learning algorithms attracting attention as AI technology was named "Deep Learning".

Because of the bankruptcy of Leeman Brothers in the United States at the same period, skilled individuals from the financial domain changed their careers to become entrepreneurs. This trend led to the birth of a business model that alleviates user frustration by integrating technological and financial knowhow.

Also in this period, financial service companies intending to create business models that were previously not possible used new technologies to announce their debuts in California's Silicon Valley. In 2006, Lending Club was founded in the United States and became famous by making use of big data to develop individuals-oriented lending models that had previously been hard for the traditional financial institutions to handle efficiently.

The Square, Inc. was founded in 2009 and marketed a product that allows small retailers to accept credit card payments by simply attaching a dedicated terminal to their iPhones. In general, a store should pass a probation period by the credit card company, conclude an agreement with it and obtain a card payment terminal in order to handle credit card payments. Square, Inc. built a business model that allows retailers to start their card acceptance immediately by monitoring the payment procedure of the store using big data.

3. Banking Operations and Technologies - Differences between the Past and the Future

The age of online applications continued for about 40 years, from the late 1960s to the late 1990s.

The age of Internet applications lasted for about 10 years from the late 1990s to the late 2000s.

After the late 2000s and for about 10 years until the later 2010s was the age of the acceptance of new technologies such as the big data technology.

So far, we have briefly reviewed the changes in the financial operations and their systematizations. It should be noted of this history that among the effects of technology on financial operations, the changes begun in the late 2000s feature not only an acceleration in the pace of development but that they could also involve discontinuous leaps rather than smooth extensions of previous situations. This means that in Japan it will be necessary to review the relationships between the financial operations and technology.

3.1 Discontinuous Leap 1: Changes in the Role of Technology

In the applications of the online processing and the Internet to banking systems from the 1960s to the late 2000s, systematization has been studied by focusing on the financial operations conducted by humans. The main benefit of systematization in the period of online application was improved efficiency, while that in the period of Internet application was the convenience (ubiquitous value meaning whenever and wherever). In the period of the online and Internet applications, the process of vertical specialization was advanced, in which persons with a deep knowledge of banking operations defined the system requirements and a system integrator (SIer) was placed in charge of design and development.

However, the new relationship between technology and businesses that began in the late 2010's now differs from the previous relationship. The roles of the systematizations have changed significantly, from contributing to the efficiency and convenience of operations defined by a certain business model to enabling previously unavailable business model changes. The AI (which is an analysis technology that continues to advance via various data that will increase even further in the future) is not merely a substitution for the credit decision and analysis operations, but it has the potential to replace them with different processes. Meanwhile, the Blockchain technology (that enables digital asset management based on a reliance on systems) has the potential of replacing the reliance features that used to be provided by financial "institutions" to the users. In such an era in which the technology becomes the core of business models, it is necessary to advance further the vertical specification between the financial institutions and system integrators of the era of online and Internet applications. Moreover, it is required to create a new system of co-operation between those with an understanding of financial operations and those with an understanding of technology.

3.2 Discontinuous leap 2: Relationship changes between businesses and consumers - From B to C to C to B

Disseminated technologies have also brought changes in the relationships between businesses and individual consumers. With regard to the services that need advanced knowledge and information, such as the financial services, the information available for the service providers and that available for the users were previously unbalanced. In the selection of financial merchandise, the individuals as purchasers were highly dependent on the financial institutions who were the sellers. Even at present time, the information collected and analysed by the financial institutions still remains a high added value when they are delivered to individuals. On the other hand, the dissemination of technologies (Internet, mobiles and information) offered a means of accessing various information sources as well as wider options to the purchasers. So far, individual purchasers have been depending on a financial institution as a means of obtaining information on financial merchandise. However, it is expected that such a trend is going to decrease. In the future the banks are expected to disclose their APIs. In addition, in fields where it is difficult for a single bank to detect needs and propose solutions, new kinds of service providers that are able to propose solutions by cooperating with multiple banks may be increased. In order to make this possible, it is necessary to advance the security technology to cover both the banks and the new service providers. With regard to security that NEC has made, please refer to "Improvement of Financial Service Safety by Promoting Cyber Security Measures" (pp. 45-49) in this issue.

4. Example of a Project Aimed at the Age of New Technology-Financing Relationships

NEC founded "brees Corporation" (hereafter "brees"), a joint venture with SMBC in 2014. This is a collaboration of NEC and SMBC that has a detailed knowledge on financial operations and which aims at dealing with the varying needs of consumers by creating new businesses that offer bargains for both parties. It is based on the following understanding; a technology should be the core of the business models that solves various issues existing individual consumers' and entire society. Therefore, NEC tries to learn the financial operations and regulations via the activities at "brees" in order to enhance the strength of planning business models by leveraging the power of technology. Before the start of "brees", NEC had decided to incorporate the design thinking in cooperation with the NEC Design Center (in order to completely conform to the viewpoints of users). "Empowerment with empathy" used in the logo mark of "brees" shows its strong intention to follow the users viewpoints.

5. Conclusion

Today we live in an age in which the interaction of the various technologies developed since the late 2010's are bringing about an exponential increase in the development of new technologies. Future developments in technology will have the potential of exerting effects that were unpredictable in the context of previous experience in banking operations. The importance of being human-centric instead of being techno-centric is now being assessed in the context of various keywords that include, human-centric design and design thinking. We are required to free ourselves from the constraints of the past and to avoid technology-orientation by determining the role of technology through unlearning.

The idea of C&C that was declared about 40 years ago, in the second period of online applications to banking systems, has now almost been fulfilled. This was "early in the 21st Century, it would be possible to talk and see between any persons, at any time, at any place." In order to resolve the new issues facing technology and society after the C&C declaration, we must continue probing for innovative business relationships and for ideal relationships among the roles to be assumed by the projected supporting technologies.

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