

## Featured Articles I

# FinTech Accelerating with Growing Digitalization

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*OVERVIEW: With the IoT and other digital technology innovations being linked with EC and SNS, and in anticipation of regulatory reforms, there has been an expansion of digitalization that is stimulating the transformation of supply chains and business models by directly connecting individuals with companies. IT and financial systems have continued to advance while maintaining an inextricably close relationship to each other. The digitalization of financial flows using FinTech links capital providers and users directly, enabling low-cost fundraising, account settlement, and collections. By working with commercial flows and logistics, FinTech is enabling transactions that are smaller, higher-frequency, and more diversified. Constructing distributed financial platforms such as blockchains will become important.*

## INTRODUCTION

IN 2012, Silicon Valley entrepreneur, Janusz Bryzek, predicted that the number of sensor deliveries would exceed one trillion units annually by the beginning of 2020. With the spread of sensors into every aspect of society, things that never before existed as data have become digitalized and connected to networks, enabling finely-tuned data exchanges in realtime, with impacts on business value chains. Increasingly advanced analysis technologies such as artificial intelligence (AI) and simulations are enabling useful information to be extracted from massive amounts of obtained data, and are leading to service innovations.

Linking these types of digital technologies with communities and markets such as electronic commerce (EC) and social networking services (SNS) is anticipating regulatory reform by linking companies and individuals directly, and accelerating changes in supply chains and business models. In addition to expanding market participation by prosumers, service delivery innovations are advancing and seamlessly connecting the contract-payment-delivery series of transactions, enabling transactions to be completed in the digital environment.

Growth is currently centered around services aimed at individuals, such as car-sharing and homestay services, but in the finance sector, financial technology (FinTech) is creating financial flow innovations that enable new services that use digital technologies to link capital providers and users directly at low cost.

## FINTECH DRIVEN BY CLIENT NEEDS

Currently, in the world's financial systems, FinTech and innovations that combine digital technologies and EC are advancing in the three fields of investment, account settlement, and information.

Specifically, there are three growth areas: (1) investment by crowdfunding [peer-to-peer (P2P) finance] that matches lenders and borrowers directly, (2) rapid account settlement done by mobile payments made from mobile terminals, and (3) mass-customization of financial services using information on personal activity and personal characteristics such as settlement history, SNS, and biometric information.

### Growth of Crowdfunding in the Investment Field

In the investment field, crowdfunding has recently been gaining attention as a method of investment by using the Internet to link investors that have capital directly to borrowers that need capital. Crowdfunding's use as a fundraising method has expanded rapidly in the USA and elsewhere overseas, and the global fundraising volume for 2015 is estimated to be \$34.4 billion (based on research by Massolution), and is expected to continue having a high rate of growth in the future. Crowdfunding lets an individual or company use an SNS or similar service to appeal to the general public for project funding. Once the fundraising target is achieved, the project is executed (see Fig. 1).

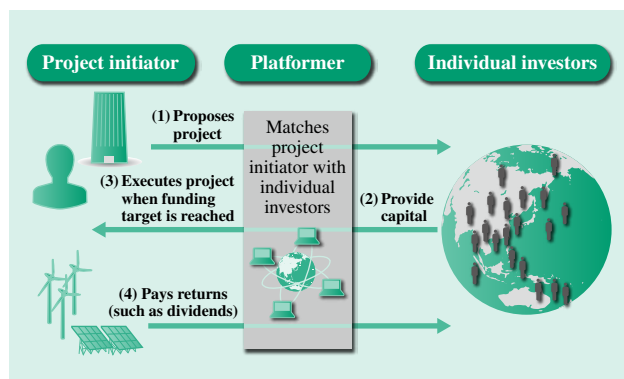


Fig. 1—Basic Scheme of Crowdfunding.

Crowdfunding works through an intermediary, known as a platformer, which directly matches a project initiator that is seeking funding with individual investors who will provide capital.

Crowdfunding uses an intermediary known as a platformer to match individual investors with those who need capital based on information about their characteristics. A 2- to 3-minute loan screening process is done via the Web to complete a loan or funding agreement.

Since there are many investors with different levels of risk tolerance, crowdfunding can offer various benefits such as the ability to raise funds for even small-scale risk ventures and, depending on matching, the ability to raise funds at a lower cost than the market interest rate. Crowdfunding also brings a wide range of financial products to the market. For example, some projects also offer non-monetary returns on investment by being primarily oriented toward corporate social responsibility (CSR) efforts such as low-cost sales of new products for investment, and reinvestment in the development of communities or developing countries.

Although the most users of crowdfunding as a fundraising method have so far been individuals and small- to medium-sized businesses, global companies have already started to use it also. Sony Corporation and Nissan Motor Co., Ltd. have used crowdfunding for developing new high-risk products such as smartwatches and electric vehicles, while the City of Memphis and the Coca-Cola Company have used it for highly community-oriented projects mainly designed to give back to the local area. When in-house R&D is underway for a cutting-edge project of unknown marketability, crowdfunding can provide an alternative to discontinuing development or selling out to a competitor. It provides a source of risk capital that can be used to gauge marketability and to continue development.

On the other hand, some financial institutions such as Banco Santander, S.A. and ABN AMRO Bank N.V. are also responding to the growth of crowdfunding by using it to finance projects in collaboration with individual investors. The use of crowdfunding by corporations should continue to grow in the future, along with the presence of financial institutions serving as lenders of last resort.

### Increasing Financial Disintermediation Enabled by New Account Settlement Methods

In the account settlement field, the provision of inexpensive mobile payment services centered around mobile phone service providers is expanding. These services work by having the user pay cash to the service provider, who then forwards the payment to the payee (prepaid method). This method eliminates credit risk, while letting users send money (settle accounts) from their mobile phone or smartphone without using a bank account. The commission is low and the procedure is simple.

The benefits of mobile payment services are low cost and immediacy. For example, the commission for sending (settling) \$100 from Japan to the USA using the USA's PayPal<sup>\*1</sup> service is less than 400 yen, instead of the 6 to 8 thousand yen charged by conventional payment methods, and payment takes only 2 or 3 seconds instead of the conventional 2 or 3 business days. And, in many cases, mobile payments can also be made just by specifying the payee's mobile phone number, email address, or SNS account, making the procedure simple.

The use of mobile payment services offering high speed, low cost, and universal availability is expanding mostly among emerging countries where mobile phone use is spreading, followed by the USA and other developed countries. For example, the number of PayPal and Alipay<sup>\*2</sup> accounts greatly exceeds the number of accounts held by major commercial banks. Some companies are trying to harness this rapid expansion of mobile payment services users by coordinating aspects of their own business with these services to change their business models or to improve their cash flows. Germany's BMW Group is developing a pay-per-use car rental service by linking mobile payment services to connected cars. The renter simply provides identification by touching a terminal built into the vehicle, and is then ready to begin their

\*1 PayPal is registered trademark or trademark of Pay Pal, Inc. in the United States and many other countries.

\*2 Alipay is a registered trademark of Alibaba Group Holding Limited.

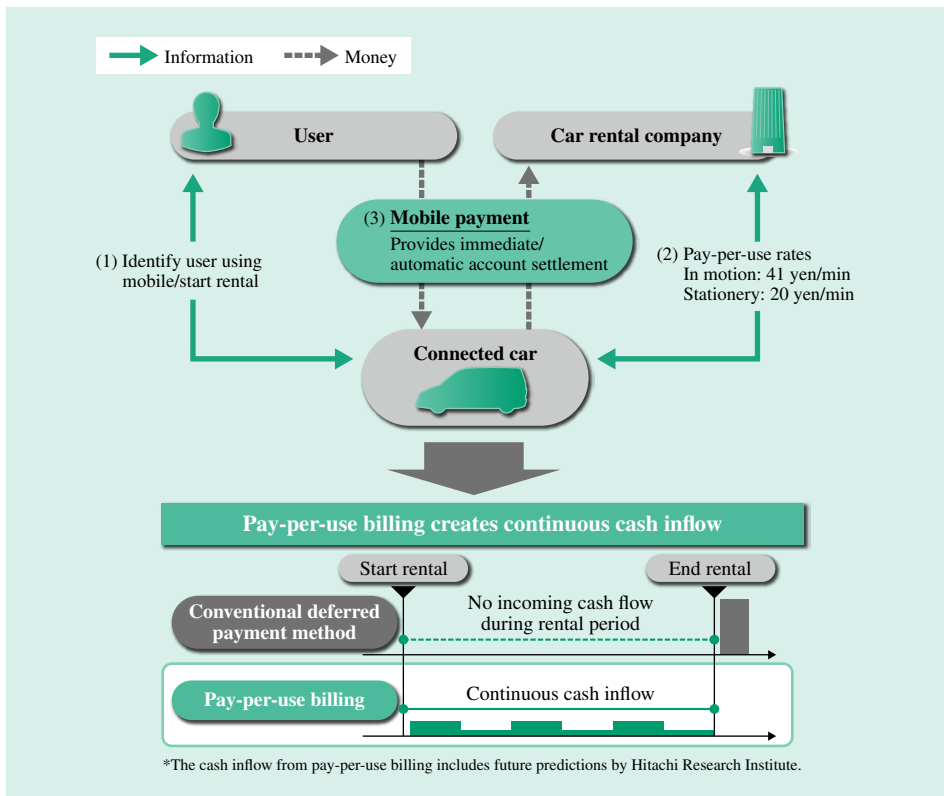


Fig. 2—BMW's Pay-per-use Car Rental Service. Pay-per-use services driven by mobile payments can improve the certainty of corporate capital recovery.

trip. Billing is done automatically according to the status of the vehicle, taking moving and stationary time into account. These types of pay-per-use services allow users to pay in proportion to the amount they use, and since charges are generated and settled whenever they are used, companies can expect continuous and immediate cash inflow (see Fig. 2).

Organizations in the USA, UK, the Kingdom of Sweden, and other Western countries have started working together by using a bank settlement system with messages written in Extensible Markup Language (XML) conforming to ISO 20022 (an international standard), and by creating real-time remittance services such as services for year-round, round-the-clock, immediate transfers between financial institutions. Standardization of inter-bank networks and other account settlement infrastructure and strategic work on financial infrastructure to enable linking with FinTech through function expansion and improvement will be important tasks for many countries, including Japan, in the years ahead.

### Mass Customization of Financial Services Leveraging User Information

With the expansion of transactions done via smartphone applications, EC, and SNS, work has started on improving financial service accessibility

through the use of authentication data such as biometric information, service usage history, and a wide range of other data on customer characteristics.

Examples of these efforts include work on automatic loan screening using mobile payment account settlement histories or household account book application information, and on proposals for financial products that are optimally tailored to individual customers by text mining of SNS profiles and online comments in order to analyze preferences.

Japan's financial institutions have started providing handy financial services with authentication using fingerprint, vein, iris, or facial biometric data. For example, AEON Bank, Ltd. is demonstration testing automated teller machines (ATMs) that authenticate users by fingerprint alone without the use of bank cards, while Resona Bank, Limited is letting customers open accounts using finger veins in place of the personal identification stamp (hanko) normally used in Japan.

This use of user characteristic information can be linked to real-time, dynamic information obtained from the Internet of Things (IoT) to improve the accessibility to financial services and to create the potential for financial service mass customization.

For example, in the field of car insurance services, information obtained from user interviews has been used to divide users into clusters and calculate risks.

But the use of micro-information such as driving preferences obtained from telematics is enabling insurers to provide flexible premium plans and policyholder incentives directly to users.

The use of the IoT should also help expand the market for loans secured by movable property such as inventory. Attaching sensors to products in stock or to warehouse equipment will enable conditions such as quality and quantity to be managed remotely and in realtime. By reducing the cost of operations such as collateral value estimation and periodic monitoring, this innovation will enable customers to obtain movable property financing tailored to their characteristics, something that has been difficult to obtain in the past.

Advanced wholesale financial services previously only available to professionals such as financial advisers are now increasingly being offered to individuals and small- to medium-sized businesses with relative convenience. Based on attribute information and management policies relating to the user's personal risk tolerance level, robo-advisory services use algorithms to automatically create portfolios of financial assets such as publicly traded mutual funds, and rebalance them in line with performance. Robo-advisory companies such as Wealthfront Inc. in the USA provide asset management services with low commissions. More precisely targeted management proposals will become possible in the years ahead by using log data such as the user's management performance and transaction history. In Japan, a growing volume of services is expected to be provided by the major financial institutions that manage the bulk of publicly-traded mutual funds, along with the country's emerging management startups.

## BACK-OFFICE INTEGRATION THAT IS IN DEMAND

Japan's Financial Services Agency is planning to complete a report on an open application programming interface (API) policy during fiscal 2016. The policy will be designed to enable smooth transactions between financial institutions and non-financial companies by setting standards for linking information related to financial flows such as personal authentication, account inquiries, and fund settlements. It is expected to enable connections to the IoT, SNS, EC, pay-per-use services, and public infrastructure from platforms such as smartphone apps. As digitalization accelerates in the years ahead, the types of user data handled and

the service business models connected will become increasingly diversified. There will be a demand for constructing financial infrastructure for completing the contract-payment-delivery process flow while dynamically linking with services that execute high-frequency transactions. Back offices will therefore need to have systems enabling secure and low-cost linking, integration, and management of information and transactions pertaining to increasingly complex commercial flows, financial flows, and service deliveries.

A blockchain is a method of recording and sharing data that prevents rewriting or falsification using encryption and distributed network technology. A blockchain functions as the electronic equivalent of an endorsement on a check, and (like Bitcoin\*<sup>3</sup> and other digital currencies) is gaining attention as a core technology for executing transactions on networks. A blockchain creates a list of records representing the history of transactions among users, which is stored in a location enabling it to be held or shared by each market participant. Blockchains are expected to enable lower transaction costs by eliminating the need for a large central management system, etc. Their use for contract execution will enable automatic linking of commercial flows, financial flows, and service deliveries.

The use of blockchains for contract execution is a concept known as smart contracts, which enable transactions to be executed securely by recording the execution conditions for the contract-payment-delivery process in the blockchain ledger, so that these conditions can be shared and mutually referenced by all of the systems related to commercial flows, financial flows, and deliveries. In addition to the business-to-business (B2B) field, the use of blockchains to integrate these three flows (commercial flows, financial flows, and service deliveries) will help create new markets such as end user-to-business (E2B) and even end user-to-end user (E2E) (see Fig. 3).

By working with commercial flows and service logistics, FinTech is enabling transactions that are smaller, higher-frequency, and more diversified. The importance of constructing distributed financial platforms such as blockchain technology is growing.

## CONCLUSIONS

As low interest rate policies become entrenched, centering around the developed countries, users and financial institutions are facing an increasingly severe

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\*3 Bitcoin is a registered trademark of bitFlyer, Inc.

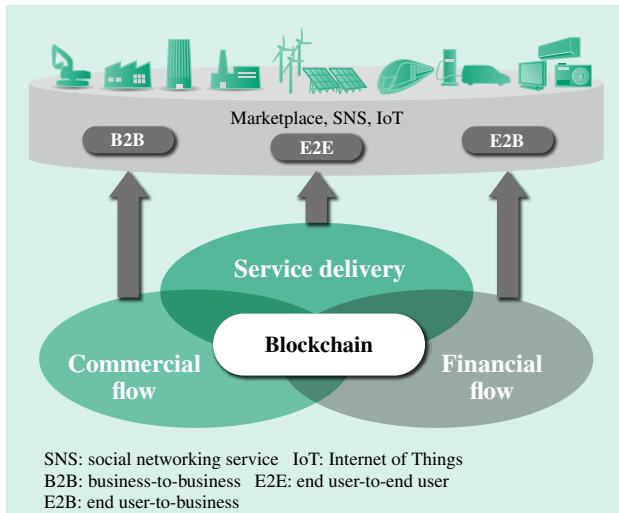


Fig. 3—End User-driven Business Model Approach. Blockchains accelerate the integration of commercial flows, financial flows, and service deliveries (three flows).

management environment. As a result, for financial institutions, the importance of working on FinTech as a way of innovating the delivery of financial services using digitalization is growing.

FinTech will encourage mass customization and diversification of financial services, and holds the potential to actively manage and reduce risk by providing incentives based on detailed information analysis and transaction performance data.

Hitachi Research Institute will continue to explore innovations in financial service business models, while looking at the latest trends in cutting-edge digital technologies, FinTech-related policies, and user needs.

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