An Overview of NEC's FinTech Strategy

FinTech - financial technology - is a recently coined neologism that describes innovative 21st century financial services made possible by the integration of financial services and technology. Over the past few years, advances in mobile computing and data processing have ignited an explosion in innovation, driving forward the evolution of FinTech at an ever-accelerating rate and shining a spotlight on the unprecedented new services being generated in this disruptive new sector. FinTech's ability to develop services that transcend conventional industry models has brought it attention precisely because of its potential to further accelerate social innovation.
This article discusses NEC's commitment to developing the advanced technology that we believe will provide the foundation for future FinTech innovation, as well as offering unprecedented social value.

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1. Introduction

FinTech is more than just a buzzword, it's the future of the financial sector. As audacious new startups are leveraging new technologies to innovate wave upon wave of disruptive new financial services that are sweeping away old ways of doing business and transforming the world we live in.

Yet, despite all this, FinTech is still in its infancy. Many of the advanced technologies expected to play a core role in FinTech, as well as the solutions that use those technologies, are still in the phase of validation and verification. In order to become the "one" in one-to-many relationships, all the enterprises involved are jockeying for position in an increasingly competitive race for supremacy.

This now includes not only the traditional financial institutions that have conventionally competed with one another, but also a wide range of businesses from non-financial fields, including both domestically and globally deployed companies.

Keeping up with the speed of innovation in such an environment demands a new approach. Rather than sticking to what might be called the principle of self-sufficiency, today's future-facing organizations need to build win-win relationships by forging alliances and cooperative agreements where each partner brings strengths to the table that can complement the other's deficiencies, creating efficiencies and driving innovation, while expanding the range of value they have to offer to society.

2. Advanced Technologies and Social Value at the Core of FinTech

NEC's FinTech development focuses on four areas: AI, blockchain, cyber security, and IoT - the Internet of Things -. We are also aiming to create new social values by using related solutions created by technological components that include robotics, rapid mobile app development, and biometrics.

The technological components of FinTech are summarized below. Full details are available in the corresponding articles in this special issue.

2.1 Advancement of Financial Services through the Application of AI

Let's take a look at artificial intelligence (AI) first. Rapid growth in digitized services has led to the accumulation of massive amounts of data by institutions in the financial industry. At the same time, the shift in customer contact from person-to-person to person-to-system has spurred a transition in how businesses understand customer needs and wants - knowledge which in the past was based largely on face-to-face communication - from human perception to high-speed data analysis using AI, which makes it possible to discover regularities that would pass unnoticed by humans.

At financial institutions, AI is widely used in the area of data analysis.

(1) One of the deep learning technologies, RAPID Machine Learning Technology enables high-precision operation with reduced risk when it is used for screening loan applicants.
(2) Capable of also showing the basis for prediction, Heterogeneous Mixture Learning Technology is now being studied as a potential tool for use in detection of fraudulent activities such as credit card fraud, insurance fraud, and illegal money transfer.
(3) Textual Entailment Technology makes matches based on the meaning of each sentence and is used for the improvement of service quality by analyzing comments from customers and feeding them back at high speed.

Also under development is AI technology that automates data preparation tasks before data analysis, saving a huge amount of labor.

2.2 Improving Communication with Customers by Combining Robots and AI

While AI is utilized in financial operations as described above, service robots are also showing remarkable progress. Robots have already been put into practical use in customer reception, security, and welfare. Supported by AI technology - most notably authentication technology - they are now able to communicate more effectively and more reliably with customers. Some of the practical applications are listed below:

(1) Combining robots with face recognition technology makes it possible to identify individuals and provide them with personalized recommendations
(2) Combining robots with image recognition technology makes it possible to provide a variety of information to customers by identifying objects and linking those objects with dynamic information related to those objects in the real world
(3) Combining robots with speaker verification technology makes it possible to identify individuals by voice alone - without making them aware of the identification procedure. Ideal in environments where camera sensitivity is poor, this allows customers to receive personalized treatment

Robots are also expected to achieve smoother communication by lowering the psychological hurdle for people. Precisely because robots are not human, people may feel less insecure. Moreover, the main functions and edge functions provided by the authentication technology are now being utilized with a view to reducing authentication time and helping robots achieve a level of communication equivalent to human communication.

2.3 Inter-company Collaboration Facilitated by Secure, Scalable Blockchain Technology

Thanks to its ability to facilitate secure, decentralized transactions, blockchain technology has become key to the development of financial services. Blockchain makes it possible to manage data without having central administrators by distributing it through low-cost servers, while using sophisticated encryption and storage methods to prevent data from being lost, stolen, or tampered with.

With a view to reducing system investment and operation costs by preventing data from being tampered with, financial institutions are also looking forward to functions that detect fraudulent activities.

Current blockchain platforms include Hyperledger Fabric and Ethereum, but none of these yet possesses a level of functionality that would make it suitable for commercialization.

NEC has taken on some of the problems that are holding back these platforms, including limited scalability and insufficient privacy protection, through the development of our own original blockchain technology called Satellite Chain.

Converting operations with multiple stakeholders into blockchain-based operations makes it possible to substantially improve and increase inter-company collaboration - not only between financial institutions, but between any type of business or organization. With enhanced cooperation, the possibilities for innovation become much greater.

To test the effectiveness of our approach and to uncover potential problems and limitations, NEC regularly runs validation experiments, while continuing with research and development aimed at finding solutions to any problems we discover.

2.4 Achievement of "Mobile First" Networking through AIP-driven High Speed Development

Today, as more and more financial systems take full advantage of state-of-the-art technology, the drive to offer innovative new technology-based financial services and to increase service sophistication and flexibility through inter-service collaboration is accelerating. To create these new services, API collaboration used in development of apps and service-providing devices is fast shifting to mobile devices.

NEC is working on building frameworks for rapid mobile app development while focusing on the following:

(1) Use of API-driven development approaches in the development framework while separating fast-evolving UIs and business logic in consideration of life cycles
(2) Provision of bridge functions between web apps and native apps by using development platforms dedicated to development of mobile apps
(3) Early achievement of highly value-added mobile apps while confirming operation of UIs on actual apps through utilization of APIs by using Real-time Development Designer, a rapid mobile app development tool

As for API components, NEC offers SDE Smart Device API, which maximizes functions peculiar to smart devices and achieves the following:

(1) Enhanced security
(2) OS-device collaboration
(3) Cloud collaboration
(4) UI enhancement

When it comes to services that will actually be available, NEC is planning to offer the following:

(1) FIDO biometric authentication
(2) API gateway
(3) Various back-up services

NEC will also provide new platforms in the SoE area that will integrate these frameworks, APIs, and services.

2.5 Developing Cyber-security Measures to Enhance Overall Security and Reliability in Financial Institutions

Cyber-attacks and crimes are on the rise worldwide. The damage that these attacks can cause and the huge costs associated with that damage mean that no business or organization can afford not to take these threats seriously. As critical infrastructure operators, financial institutions are systematically establishing robust cyber-security measures. Nonetheless, the risk of cyber-attacks continues to grow. In Japan, for example, the threat is increasing as we draw closer to the upcoming major international events.

The most prominent recent threats to financial institutions include:

(1) DDoS attacks using IoT devices
(2) Ransom demands using ransomware
(3) Illegal money transfer using malware

In its annual Strategic Directions and Priorities, the Japanese Financial Services Agency is demanding that financial institutions make efforts to further strengthen cyber-security while continuing to develop FinTech services.

As our commitment to financial institutions, NEC will deploy:

(1) Support for management and human resource training
(2) Support for cyber-security risk management and provision of technological solutions
(3) Information exchange with related organizations and establishment of information provision services
(4) Support for comprehensive cyber-security management

2.6 Towards the Achievement of Mobile Multimodal Authentication Using Biometrics

With cooperation between multiple stakeholders expected to increase, the FinTech services now being promoted for practical use by financial institutions require robust security at a level even higher than required in conventional financial systems.

One security measure that is receiving a lot of attention lately is biometric authentication which is being pushed as the most effective way to solve the security risk inherent in conventional ID/password authentication methods. What makes this feasible is the rapid shift to mobile devices equipped with a camera and fingerprint sensor as standard. As a world leader in biometric technology with related R&D and commercial activities stretching back more than four decades, NEC is ideally positioned to leverage this opportunity.

NEC is currently developing a multimodal authentication system that combines FIDO - new online authentication technology that applies biometric authentication technology to mobile devices - with biometric authentication engines that utilize our proprietary security technology and our formidable AI technology. Multimodal authentication is expected to see rapid implementation as an identification technology at financial institutions all over the world.

2.7 Secure, Reliable, Convenient Self-monitoring Solutions Using Wearable Devices

IoT is quickly expanding its reach from industrial and business applications in fields such as manufacturing and energy to consumer and household such as home security.

In the financial arena, the success of FinTech has spawned another insurgent technology known as InsurTech which, as the name suggests, integrates insurance and technology to innovate revolutionary new insurance products in areas such as life care and healthcare, as well as in autonomous driving systems.

Self-monitoring IoT solutions play a key role in the application of these new services and are typically deployed in the form of wearable devices that measure activity and physical condition. NEC is actively engaged in developing functions both for the devices themselves and for the IoT platforms with which they communicate.

It is important to point out that all of the technological components introduced in this paper - AI, blockchain, cyber-security, robotics, rapid mobile app development, and biometrics - will be incorporated in our IoT platforms.

NEC self-monitoring solutions are built on an IoT platform foundation and will offer the following benefits:

(1) Real-time capability: for optimal detection and notification of signs of risk as they occur
(2) Convenience: to minimize user discomfort and inconvenience in daily life
(3) Confidentiality: to ensure biometric data is protected and user privacy is not compromised

NEC will accelerate the development of these solutions to ensure that they will be in place as soon as possible so that people can take advantage of them to enjoy a safer and healthier life.

2.8 New Departments to Promote the FinTech Activities

To promote our FinTech-related activities, NEC launched the FinTech Business Development Office in April 2016. Since then, NEC has been pushing forward the development of new financial services focusing on solutions to various social tasks. Digitization of various industries and diversification of consumer needs have raised expectations for digital innovation of new and more convenient financial functions. NEC is committed to creating new services that will meet these expectations.

In April 2017 NEC established the Financial Digital Innovation Technology Development Office (FDIT), whose goal is to support the work of the FinTech Business Development Office by stepping up our efforts in the core technologies that compose FinTech. Focusing on the study and verification of advanced technology, the FDIT is responsible for research on technological and industrial trends, verification of technologies, problem detection and solutions, development of system models, demonstrative verification with clients, and information transmission. The FDIT will also collaborate with partners that provide complementary world-class technologies to ensure that we can promptly meet the ever-diversifying needs of our customers.

With these two new offices functioning as the wheels of both business creation and technology enhancement, we will further accelerate the expansion of our business in the new fields of the 21st century.

3. Focusing on the Future of FinTech

In the midst of the innovation of financial services represented by FinTech, NEC has no intention of chasing after others. Rather than merely following the evolution of FinTech, we will take the initiative to offer technological information ahead of everyone else.

NEC's vantage point goes beyond our proprietary technologies and solutions. While always being conscious of what is happening on a global scale, as a social value innovator we will continue to be committed to realizing a society that embodies the values of safety, security, efficiency, and equality. Through co-creation with our customers at financial institutions, as well as wide-ranging cooperation with external entities such as research institutions and startups, we are confident that we can contribute to the acceleration of innovation not only in the financial industry but also in society as a whole.

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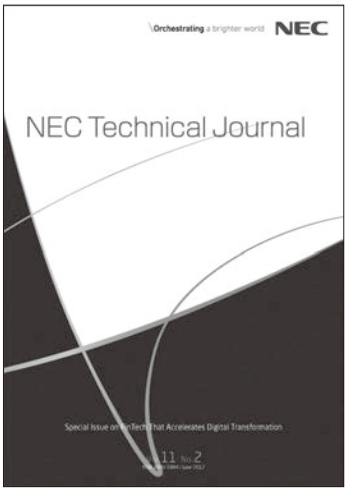

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June 2017

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