

IoT-driven Evolution and Business Innovation



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(concurrent post)

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A variety of initiatives have begun throughout society to research, develop, and provide solutions to social problems with an eye to Society 5.0*¹ (Super Smart Society). These initiatives seek to create and make use of innovative technologies making up a “fourth industrial revolution” based on the Internet of Things (IoT), big data, Artificial Intelligence (AI), and robotics. As described in its Medium-Term Strategy 2020 “Declaration beyond” announced in April 2017, NTT DOCOMO aims to merge networks and services and create new value by enhancing and evolving IoT, AI, and the fifth-generation mobile communications system (5G) scheduled for launch in 2020. In the IoT era when everything is connected, it is important that new added value be created from data obtained from the physical world while incorporating the evolution of technology. Such added value can mean dramatic increases in operational efficiency through cost reductions and effective use of resources or business creation through the provision of new services and value. However, a survey conducted in Japan revealed that only 12% of domestic companies had introduced IoT as of fiscal year 2016 and that the majority of those companies had done so with the aim of becoming more efficient through so called visualization. It can therefore be said that there is still much more room for growth in this area.

Under these circumstances, I’d like to introduce three NTT DOCOMO initiatives for promoting business innovation and creating a prosperous and enriching future through IoT.

(1) Value creation through construction of new platforms

There are three main approaches to doing this. The first gives birth to value through a mechanism that connects diverse enterprises and industries beyond their traditional boundaries and continues to enhance that value. For example, in the construction industry, NTT DOCOMO is working with Komatsu Ltd., SAP Japan Co., Ltd. and OPTiM Corporation to jointly plan and operate a new platform called LANDLOG. This platform will provide a centralized means of collecting, storing, and analyzing all sorts of data possessed by multiple construction firms with the aim of achieving safe and highly productive construction sites. These data may consist of site operating status, earth and materials status, on-site topography, etc. obtained from construction machinery, dump trucks, measurement equipment, drones, and personnel. The second approach is regional revitalization featuring a wide variety of use cases achieved through horizontal expansion. For example, NTT DOCOMO is conducting a trial together with Hakusan City, Ishikawa prefecture and Kanazawa Institute of Technology (KIT) on creating new lifestyles and fostering innovation with the aim of transforming rural areas (satoyama) into smart cities through collaboration among the industrial, academic, and public/private sectors. This trial is based at the KIT Hakusanroku Campus now under construction as part of the IoT Acceleration Lab, Regional Edition. The third approach is platform building on a global scale. In addition to our “docomo M2M platform” for Machine to Machine (M2M) applications, we have been expanding the coverage area of our embedded Subscriber Identity Module (eSIM) solution for globally expanding corporate users to enable more convenient use of IoT mechanisms. In June of 2017, for example, NTT DOCOMO and China Mobile announced their development of the

world's first multi-vendor eSIM system based on GSMA 3.1 in China, which has been expressing much interest in Japanese enterprises.

(2) Value creation through NTT DOCOMO's strengths and their evolution

The second initiative is to create new value by combining the data possessed by NTT DOCOMO with other data and AI technology given the company's role as a value creator through ongoing refinement and evolution of its core strengths. For example, in the area of next-generation mobility services, NTT DOCOMO has conducted a trial in Tokyo and Nagoya City on an "AI taxi" system that uses AI to predict customer demand by combining various types of data such as NTT DOCOMO population statistics and taxi operations data. We have also been conducting a trial since the end of last year on an AI-based bus operation system that enables efficient on-demand running of buses by using AI to support dispatching and routing. Furthermore, by combining the various types of value created by the above test systems, NTT DOCOMO has begun a trial on an autonomous bus service at Kyushu University. Finally, since April 2017, NTT DOCOMO has been offering vehicle-related firms "AI infotainment," a platform that personalizes car navigation systems with the application of AI in the area of vehicle-oriented services.

(3) Value creation through evolution of network technologies

The third initiative is to make various types of network preparations to support diverse market needs as the application of value-creating IoT

expands through the evolution of network technology and expectations of network capabilities diversify. For example, NTT DOCOMO has been holding a Low Power Wide Area (LPWA) technology trial with partner firms since April 2017 beginning with the testing of LoRa^{®*2} use cases. There are also plans to hold sequential trials on extended Discontinuous Reception (eDRX) known as cellular IoT as well as on LTE-M and NarrowBand IoT (NB-IoT) to assess market needs, technology maturity, and use cases. In this way, NTT DOCOMO plans to provide network technology evolving from LPWA to 5G as solution packages tailored to customer needs.

As I've described above, NTT DOCOMO is promoting business innovation through IoT from a variety of perspectives, but the main point here is that close interaction with R&D and co-creation with partners leads to the creation of new value. Going forward, we welcome the challenge of promoting IoT-driven evolution and business innovation in collaboration with a diversified group of partners.

*1 Society 5.0: A new economic society advocated by the government to enrich people's lives through maximum use of ICT as the next stage in world history following the hunter-gatherer society, agricultural society, industrial society, and information society.

*2 LoRa[®]: A radio system based on LPWA technology using frequency bands not requiring a radio station license (unlicensed radio spectrum). The LoRa Alliance, an industry association established in 2015 centered about Semtech, a leading semiconductor maker in the United States, proposes LoRa specifications and open standards for global use. LoRa is a registered trademark of Semtech Corporation.