

On the Publication of the 25th Anniversary Issue of NTT DOCOMO Technical Journal



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The inaugural issue of the NTT DOCOMO Technical Journal was launched in July 1993, the year following the establishment of NTT DOCOMO. This year marks its 25th anniversary as a technical public relations magazine providing a broad introduction to the latest research and development trends at NTT DOCOMO.

As one milestone in the history of the NTT DOCOMO Technical Journal, this 25th anniversary issue highlights technical innovation and business innovation as envisioned by NTT DOCOMO over the next 25 years. A separate volume looks back at the history of mobile communications services over a period of about 40 years as indicators of future progress. For that volume, we have extracted and compiled articles on epoch-making R&D from the NTT DOCOMO Technical Journal and from Nippon Telegraph and Telephone Public Corporation and NTT technology-development materials (Electrical Communications Laboratories Technical Journal).

Mobile communications services began on December 3, 1979 with the launch of the world's first mobile communications system (first generation) based on a cellular system by Nippon Telegraph and Telephone Public Corporation (forerunner to NTT). For the roughly 40 years since then, NTT DOCOMO has fostered much technical innovation and contributed greatly to the development and transformation of the mobile market in both quantitative and qualitative terms.

Technically speaking, a new generation of technology has arisen about every ten years to meet the demands of the market. The 1980s broke ground with the first generation of a mobile communications system based on analog technology, but the 1990s saw the coming of a second-generation system based on digital technology to satisfy the skyrocketing demand for telephones and lay a foundation for mobile data communications. This was followed by a third-generation system in the 2000s supporting the expansion of mobile multimedia and packet communications, and today, in the 2010s, by a fourth-generation system providing further gains in high-speed, broadband communications based on the LTE system.

Viewing this history from a service perspective, it can be said that our lives have been transformed about every 20 years. In the 20-year period of the first-generation and second-generation mobile communications systems starting in 1979, the telephone that had so far been “fixed” in our homes and offices developed into a business tool that could be used anywhere by anyone. In this period, the first car phones were viewed as a status symbol used by very few people, but the appearance of the “mova” series of mobile phones small enough to fit into a breast pocket marked a radical transition to a business tool that businesspersons could use both inside and outside the office. This development had a great effect on the business environment. Then, in the 20-year period of the third-generation and fourth-generation systems starting in 2000 and continuing to the present, the mobile

phone underwent another transformation from a business tool to a “lifestyle tool” indispensable to our daily lives. The i-mode service launched in 1999 gave birth to a world in which e-mail and various types of content and services could be accessed from the palm of one’s hand. It made the mobile phone into an essential tool for living that could be used not only by businesspersons but also by anyone from children to adults anytime and anywhere.

The smartphone helped to further expand and accelerate that world. It also transformed the business model of the telecom market from vertical integration driven by carriers to horizontal integration centered on content.

We can see from this review of the past 40 years that technical revolutions occur in 10-year cycles while changes in social value having a significant impact on society occur in nearly 20-year cycles. If we believe, as the saying goes, that history repeats itself, surely 2020 will be a year that gives birth to great change from both a technical and social-value perspective.

Today, NTT DOCOMO is focusing its energy on the research and development of the 5th-generation mobile communications system (5G) with an eye to 2020. Technical studies are now in progress with the aim of making 5G into a system that can satisfy three key requirements: “high-speed and high-capacity” mobile communications, “low-latency” for use in remote control and other applications, and “massive device connectivity” for achieving the Internet of Things (IoT).

However, 5G is not limited to progress in mobile system performance. Working with a wide variety of industry partners, we can expect 5G to transform the social infrastructure by making business more efficient, creating new business opportunities, and solving social problems. Indeed, we can expect 5G to trigger the launch of the Fourth Industrial Revolution.

That is to say, we can expect 5G to play a role not only in advancing communications technology but also in supporting IoT, creating new user devices, providing new services using big data and AI, and finding solutions to social problems. These business cases will be achieved not by the conventional carrier-centered vertical-integration business model but rather by the Business to Business to X (B2B2X) business model that promotes co-creation with business partners in an open



manner. At present, NTT DOCOMO is exploring the creation of new business models together with diverse partners through a variety of means including 5G trial sites and a 5G open partner program. As of the end of July 2018, co-creation activities had already begun with more than 1,600 partner companies.

Today, mobile communications is not simply a telecom infrastructure—it is also a tool essential to daily life that each and every one of us cannot do without. At the same time, it looks to become a social infrastructure that drives the Fourth Industrial Revolution. To achieve this and make further progress, co-creation through open innovation with diverse industries and people including readers of the NTT DOCOMO Technical Journal will be essential.

In the inaugural issue, then president Koji Oboshi had the following words to say about the publication of the NTT DOCOMO Technical Journal: “This magazine will serve to introduce the R&D activities of NTT DOCOMO and some of its key accomplishments and to provide its readers with a reference to voice their comments and opinions. In this way, we ourselves will be able to improve our mobile communications technologies and services.”

As a forum for open and vigorous exchange of information with readers, we will work to enhance the NTT DOCOMO Technical Journal toward the next quarter-century. We look forward to a wide variety of opinions from our readers.