Aiming for 2020 and Beyond

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"The new of today, the norm of tomorrow" is NTT DOCOMO's brand slogan. It declares that NTT DOCOMO will continue to create Smart Innovations. These innovations, including services, are original and may be difficult to approach at first, but all users will use them fluently in their everyday lives when they become aware of them. NTT DOCOMO's R&D activities are carried out not just for the sake of self-satisfactorily refining technologies. They have the critical mission of realizing Smart Innovations by presenting value and benefits whose allure customers can feel. NTT DOCOMO R&D's medium- to long-term plan for 2020 and beyond sets forth two worldviews as customer values: (1) liberating customers from all stresses in communication and (2) breaking down barriers that stand in the way of Smart Life. Here I present a vision of 2020 and beyond that depicts these values and technologies to realize them.

(1) Stresses in communication are inconveniences experienced daily in communication, such as slow service, inability to connect, and complicated and annoying mobile phone operations. We are therefore implementing our unflagging wireless strategy of "improving LTE-Advanced and realizing 5G by 2020," even as we continue to increase communication data capacity at an explosive annualized rate of more than 150 percent. This will create an environment in which so-called "packet congestion" is eliminated and smooth communication is possible. To reduce connection problems due to temporary spikes in network traffic during phenomena such as events and natural disasters, we are creating networks that connect easily. This is achieved by virtualizing networks so communication processing resources can be flexibly allocated to regions experiencing concentrated traffic. Furthermore, we are creating friendly User eXperience (UX) that are customized according to the proficiency level of users, such as first-time users and the elderly who need time to operate their smartphones, even if they are used to

them. This will enable users to effortlessly use smartphones before they know it. Technological innovations such as 5G, virtualization, and UX improvement will liberate users from the stresses of communication.

(2) The barriers that stand in the way of Smart Life are inconveniences in daily life, including the inability to find the information you want, difficulty in understanding one another due to foreign languages, and illness as a result of living habits. NTT DOCOMO is therefore offering the ultimate personal agent that presents accurate information needed by our customers at the optimal times. This personal agent analyzes vast amounts of big data, such as each person's situation, trends, and socially accepted ideas. Also, increases in foreign visitors to Japan and the global expansion of Japanese companies will expand opportunities in mutual understanding with foreigners even more compared with today. However, the language barrier cannot be easily torn down. NTT DOCOMO is working on automatic translation technology that seeks to remove the language barrier by gathering voluminous dialogue corpora and analyzing them with big data technologies to provide accurate and high-speed multilingual translation. Furthermore, avoiding illnesses and leading healthy lives is the dream of humankind. By creating data of individual life habits using wearable devices and combining them with genomic information for big data analysis, individual-specific advice for preventing illnesses can be provided to maintain and improve health. We are working to tear down barriers standing in the way of Smart Life by refining big data analytic technologies adapted to supported markets such as dialogue corpora and genomic information.

In addition to the above, Internet of Things (IoT) and security will be essential technological fields for realizing the two worldviews.

Big data analysis makes use of vast amounts of information stored on servers connected on the Internet (cyberspace information). Meanwhile, IoT, currently a hot topic, creates data from things existing in the real world and from occurring phenomena, greatly expanding the kinds of data that can be used. Furthermore, IoT is broadening its scope of application to include acting on the real world by actuating the results of big data analysis. In this way, the application of big data analysis incorporating IoT can be expanded to a variety of industries. However, there are challenges. Even if the scope of big data grows, if security is inadequate, physical accidents and disasters can occur. To prevent these risks and create a safe and secure Smart Life society, we must engage in the major technological challenge of stronger security measures across a broader range of fields, in addition to authenticating IoT devices and controlling access.

The technologies presented here will be realized by synergistic, collaborative "links of technology" that integrate the two worldviews, which are values that customers experience. Also, as the technologies of future innovations deepen and diversify, NTT DOCOMO will not conduct all R&D by itself, but move forward with the entire range of our partners through open innovation.

Going forward, NTT DOCOMO R&D will continue to create innovations based on the feedback and needs of our customers by linking technologies together with all of our partners. We will continue to realize a Smart Life in which our customers feel the value and benefits of our achievements and command their use naturally.