Technology and Service Developments in the New Communication Age

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NTT Service Integration Laboratories is responsible for devising the R&D strategy that will make resonant communication a reality and for applying this strategy to coordinating the development efforts of the different laboratories. Resonant communication refers to a full-scale broadband and ubiquitous communications environment based on photonic technology. It is a new service vision that succeeds several previous concepts proposed and implemented by NTT: the INS Concept (1979), the VI&P Concept (1990), the Basic Concept for the Coming Multimedia Age (1994), and the Information Sharing Concept (1998). While the previous concepts aimed at providing new communications services and fostering new types of industries, our newest vision additionally aims to create an entirely new environment that will allow individuals to unleash their knowledge and skills to a degree unheard of in the past. We believe that it will also allow society as a whole to make a great leap forward by facilitating better cooperation and collaboration among individuals and organizations. This environment should resolve various information disparities (the so-called digital divides), help us adapt to Japan's fast-approaching aging society, and assist in creating a recycling society.

NTT Laboratories are deeply involved in R&D into a wide range of services and technologies that are needed to make this vision a reality. For the core network, our goal is a large-capacity, high-performance network that has the characteristics of both the conventional telephone network (safe, secure, and high quality) and the Internet (easy to use, inexpensive, and highly expandable). The core network will be designed to allow easy connection with a range of networks and devices and fast implementation of many new services. A typical service that will be provided over the resonant network is a video communication service. We consider this service to be fundamental because communication between individuals is the starting point of all forms of communication. We aim to provide video communication that is highly realistic with no delay or quality degradation perceivable by the user. The overall technical direction and framework for developing these technologies efficiently and quickly has already been firmly established. As we search for ways to ensure that new services continuously and increasingly capture the imagination of customers, we will design a service architecture that will help to define what services should be like and a corresponding network architecture. Since the future network will be increasingly global, consisting of multiple interlinked networks owned by different operators, an effective network cannot be built by NTT alone: the desirable architecture will be one that assists cooperation and collaboration between network operators while still allowing the provision of services unique to each operator. The architecture should also allow many different kinds of devices, such as RFIDs and sensors, to be connected to the network easily and quickly. We have started to propose a network architecture that will offer these features, and we are also involved in promoting international cooperation for building these future networks.

It is important to steer the development of services and technologies in directions that reflect market needs. If this is not done, the developed services will not be accepted by users and will fail to spread in the market. However, prior to a particular market's birth or while it is still immature, market needs cannot be ascertained clearly, if at all. Resonant communication is at the stage of market formation. Under these circumstances, there is a temptation to adopt a seeds-oriented development approach to services and technologies, but that would be misguided. To avoid this, we must not only observe social, market, and technological trends carefully, but also have a clear vision of what kind of society and services we want to see in the future. We must also commit ourselves to R&D with tremendous enthusiasm; otherwise, our vision is unlikely to be realized. If we can show everyone the kind of world our vision will bring, using prototypes or model systems, before the actual services are offered, we will be able to incorporate the interests and feelings of a wider spectrum of people and reflect them in the R&D. We consider that encouraging and expanding such activities and obtaining feedback from society are essential to ensuring the smooth dissemination of our R&D results to society.

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