Technology and R&D activities supporting KDDI's business

Improved technical edge of EV-DO

CDMA 1X WIN services from au make use of a specialized packet-switched data communications protocol known as CDMA2000 1x EV-DO. This technology optimizes the data transmission rate in real time depending on the strength of reception for individual users, thereby enabling high-speed data communications at downstream speeds of up to 2.4Mbps.

The next-generation upgrade of CDMA2000 1x EV-DO—Revision A (commercial launch planned during 2006)—uses new modulation technology and more-efficient error correction methods to facilitate larger data-transmission capacity while raising downlink and uplink speeds. The improved standard also employs quality assurance technology to allow the quality of the connection to be maintained for specific users and thus realize various two-way real-time communications services, such as multicasting (the simultaneous transmission of video or other data to multiple users). Other new possibilities include the upgrading of such services as music or video downloads or data streaming.

Strengths of 1xEV-DO Rev. A

		Current 1xEV-DO (Rev. 0)	1xEV-DO Rev. A
Peak speed	Downlink	2.4Mbps	3.1Mbps
	Uplink	154kbps	1.8Mbps
QoS (Quality of Service)		Strive for top quality in all packets, irrespective of service type	Priority control of packets possible for respective service types
Applied fields		High-speed data download	Bi-directional realtime transmission

Innovative ringtone research programs

The highly innovative EZ Chaku-Uta Full™ service allows users to download and play entire songs and to set specific portions of a song as a ringtone. KDDI has developed technology that smoothly fades in and out the extracted portion of the song used. Previously, such extraction could result in sudden bursts of music at full volume, which could be a shock for the listener. This technology achieves more natural ringtone playback, further enhancing the value of the service. The fade technology is ideally adapted for mobile phones, which have limited data-processing capabilities, because it realizes high-speed acoustic fade processing on the song data in compressed form. KDDI R&D Laboratories have previously developed a variety of processing technologies for compressed video and audio data, which allowed this special ringtone technology to be developed and marketed in a relatively short period of time.

Terrestrial digital broadcasting to handsets

Terrestrial digital TV broadcasts began to households in the Tokyo, Osaka and Nagoya regions in December 2003. Similar broadcasting services for mobile handsets are scheduled to begin at the end of 2005. KDDI has been investing in the development of fusion technologies that integrate communications and broadcasting, thereby allowing mobile handsets to receive digital broadcasts and related content. In May 2004, KDDI unveiled the first handset capable of receiving terrestrial digital broadcasts in Japan.

In addition to receiving such broadcasts, this handset can provide a number of original services due to its advanced communications capabilities. For instance, users can receive extra details on the performers in a program or can use the GPS function to find out program-related details for their locality. In fiscal 2004, KDDI conducted field trials to test the broadcast reception technology and other services offered

A terrestrial digital TV demonstration in Mie Prefecture

Ringtone services from au, such as EZ Chaku-Uta Full™ give users access to thousands of songs.

with this handset. In Mie Prefecture, KDDI was also able to test another service in which information on an earthquake or other natural disaster is broadcast to mobile phones. The tests successfully demonstrated that such a service could allow mobile handsets to be an important means of broadcasting information in the event of a major disaster.

Digital radio broadcasting is also set to become a reality in Japan. At the end of fiscal 2003, KDDI developed a PDA-type terrestrial digital radio receiver. During fiscal 2004, KDDI conducted field trials in conjunction with radio broadcasters in Tokyo and Osaka to test this receiver for use in various new communications and broadcasting services. These range from downloading the music from a certain program to electronic coupons and shopping services for electronic tickets and other items. KDDI plans to continue developing this technology to incorporate such functionalities into future cellular handset models.

Authentication services based on RFID technology

Electronic tags based on RFID (radio frequency identification) technology allow information on the tagged item to be transmitted and read wirelessly. The adoption of RFID technology is expected in many industries and consumer applications, particularly in areas such as logistics, inventory control, distribution record and product labeling. Cellular phones have become the most ubiquitous mobile device in daily life, with many people routinely carrying them around. Incorporating an electronic tag reader function into the mobile phone would open up vast new possibilities by providing a convenient link between various

data exchanges over the network and the information stored in RFID tags. Efforts are under way to develop electronic tag reader systems, which are expected to come into widespread use.

KDDI has developed a prototype cellular handset that incorporates an electronic tag reader function. It commenced field trials in March 2005 to test the practical utility of new services designed to link the benefits of such mobile phones and RFID tags. The tests have included the provision of information on stores and products at shopping malls and of street map services in Osaka. In addition, KDDI is researching the potential commercial applications of this technology, including the provision of traceability data (product origin, distribution history) for products, of real-time inventory control for logistics industries, and of specialist technologies for other industries.

A cellular phone equipped with an electronic tag reader

A terrestrial digital radio receiver

Testing the utility of RFID tags