Technology Reports

Special Articles on Technology toward Further Diversification of Life-Style Mobile

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"Life-Style Mobile" is a term coined from "mobile phone." Some readers may be encountering this term for the first time, but it encapsulates ideas about the future of the mobile phone. By removing the word "telephone," we seek to bring about a diversification of functions that transcends the idea of the telephone. And by emphasizing the word "mobile," we aim to make the mobile phone an indispensable part of the user's life, beginning with the idea of "carrying." With the "Life-Style Mobile" concept, we are aspiring to create a tool that the user always carries and never let go in all places of daily life, include work and business scenarios. Thus, it is critical to offer the user real, emotional qualities beyond those offered by a simple tool, such as comfort and security.
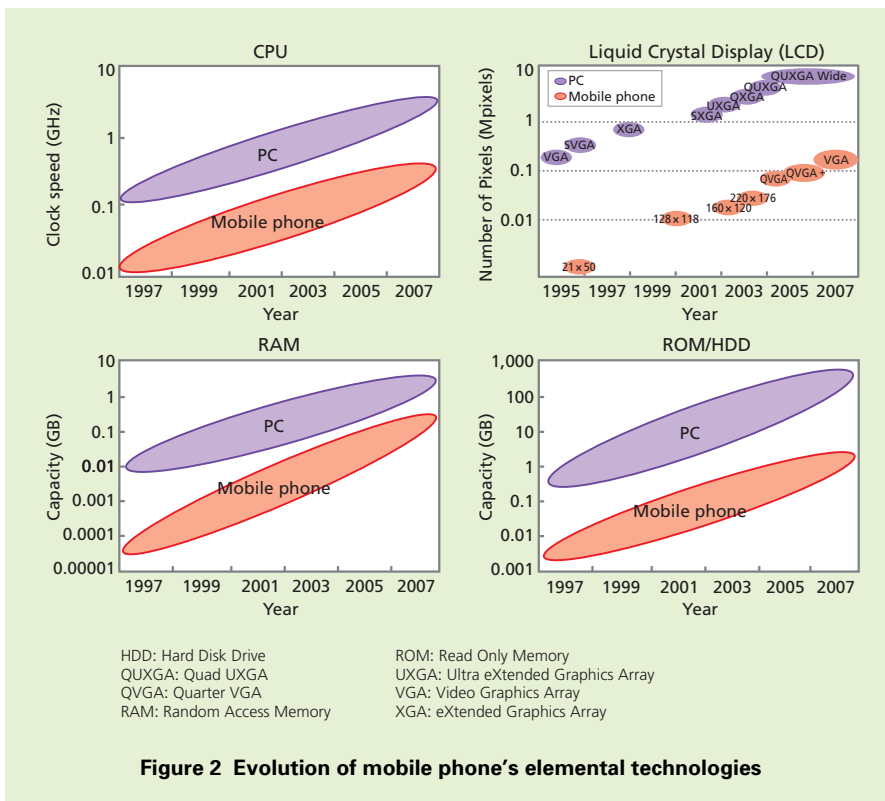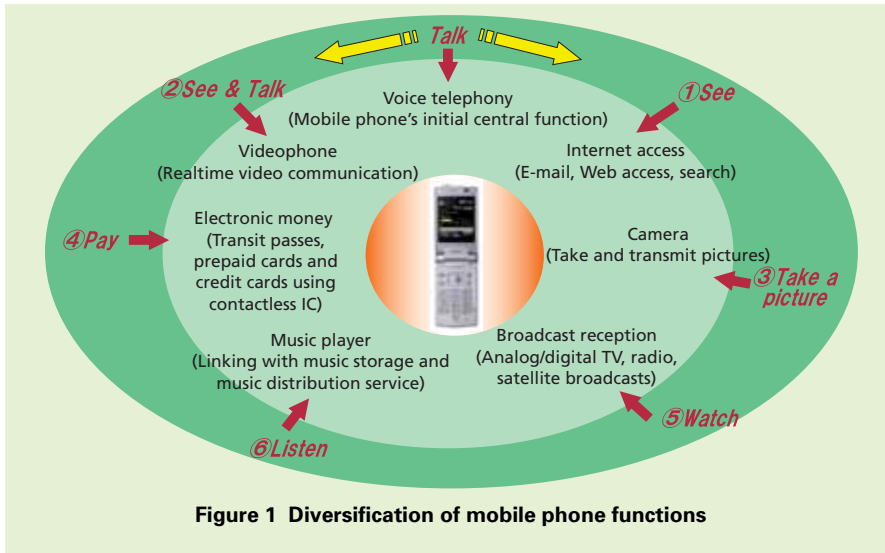
The adoption of mobile phones has exceeded more than 100 million sets in Japan and three billion worldwide. In industrialized countries, there are situations of more than one mobile phone per person, and the user base is also growing rapidly in developing countries. The number of mobile terminals sold in a year is about 50 million in Japan and more than one billion worldwide. Major reasons of such adoption rates are the ultraportability of the phones—they now fit in your pocket—implementation of services that make it possible to make a call anytime, anywhere, and the lowering of service fees. Together, these factors interacted with one another in spurring mobile phone adoption.

Qualitative improvements in pocket-sized mobile phones began around 2000. Thanks to the development of technologies such as LSI, the small size of mobile phones could be maintained while embedded functions grew one after another. In addition to the original call function, diverse functions such as Internet access, electronic money, and even TV broadcast reception were added to the mobile phone, as shown in **Figure 1**. These functions can be said to make up a part of

"Life-Style Mobile." Furthermore, from the viewpoint of the user, these tools transcend the traditional categories of "calling" or "talking." By allowing the user to "search" for train transfer information with Internet access, "take pictures" of tourist sites, and "make payments" at train stations and convenience stores, the mobile phone is being used for daily scenarios besides telephone calls. This multiplication of functions has developed from being interlocked with changes in mobile phone use. Their mutual interaction has led to the mobile phone's evolution.

The background leading to the achievement of the mobile phone's diversified functionality (the supporting technologies of "Life-Style Mobile") is shown in **Figure 2**. Mobile terminals have advanced by tracking the developments of PCs. The capabilities of onboard CPUs and Liquid Crystal Display (LCD) have grown, as have the capacities of RAM and ROM/HDD. Battery time has actually surpassed that of PCs. Having such pow-

Figure 1 Diversification of mobile phone functions

HDD: Hard Disk Drive
QUXGA: Quad UXGA
QVGA: Quarter VGA
RAM: Random Access Memory

ROM: Read Only Memory
UXGA: Ultra eXtended Graphics Array
VGA: Video Graphics Array
XGA: eXtended Graphics Array

Figure 2 Evolution of mobile phone's elemental technologies

more, we need to pay greater attention to the creation of appealing applications that integrate the terminal and network.

Our special article first introduces the diverse functionalization of mobile phones from two standpoints. The first looks that development of elemental technologies of mobile terminals involved in One Seg broadcast reception and contactless IC chips. The second looks at diverse functionalization from the development of onboard applications of mobile terminals such as browsers and music/video players. Next, we look at the efforts of the Peer to peer Universal Computing Consortium (PUCC), which promises to link information appliances to bring about a new field of use involving mobile terminals. We then introduce the development of the Keitai Shitei Lock function, a technology to bring safety and security to the indispensable mobile phone for the user. Finally, we present two case studies: the first, an expansion of the capabilities of Melody Call, a music service; and second, a model of visual features for realizing high-quality video service.

In this special article, we introduce our research efforts. Beyond this, however, it is critical to link R&D with business development to break ground for "Life-Style Mobile" as a service and to expand it. Besides connecting with NTT DoCoMo's internal business division, we wish to deepen partnerships with users and outside businesses to offer services that users can use with greater comfort and security, thanks to our advanced technologies.

erful mobile phones in everyone's hands—one mobile phone per person—will open the doorway to ubiquitous computing of the future.

To realize "Life-Style Mobile,"

besides technological improvement of the mobile terminal itself, development of networks to achieve diversified functionality, development of robust security, and reduction in costs are critical. Further-