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Innovative Business Models in the Era of Ubiquitous Networks

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The scope of corporate management issues that should be resolved by ubiquitous networks must be expanded to include not only process innovation but also product innovation, lest the potential range for improving corporate value be limited. Innovative approaches under these parameters are represented by (1) "concierge" type models aimed at consumer markets, (2) "knowledge asset management" schema focused on corporate users, and (3) "wide-area measurement" systems targeting public service fields. The size of the market to be served by these three business models is expected to grow to a very large ¥11 trillion around 2005. As there may be many other potential business models beyond these three, an important goal in corporate management is to develop a host of innovative approaches based on the suggestions presented by the business models highlighted here.

I Importance of Product Innovation

The issues of utilizing ubiquitous networks in terms of corporate management can be divided into two major themes. (Ubiquitous networks refer to an environment where information can be acquired at any time and anywhere through access to the Internet, etc. For details, see NRI Papers No.34: "Industrial Change and Corporate Management in the Era of Ubiquitous Networks," October 2001.) One theme relates to how to innovate or upgrade company products and services to increase the added value. Another is how to achieve efficient and advanced corporate management processes.

Efforts to utilize IT (information technology) in the area of corporate management have so far focused on management processes. The rationalization of the production process is of course important, as seen in supply chain management (SCM). However, winners through such rationalization—as represented by Dell Computer (US)—may be limited to a few top companies in the world, or even only one company. Moreover, these processes have ushered in a stage where nearly anyone can assemble a personal computer, a fact that has led to extremely severe competition. The added value of PCs has been lowered, and the winners in this business will be confined to companies with a global scale and advanced production processes, such as Dell. How many Japanese companies could survive in such a field?

In this sense, the corporate value that emerges as the core value in an era of ubiquitous networks really boils down to the value a company can offer customers through its products and services. As described in the following sections, we believe that product innovation is vital for Japanese companies, and that it is possible to innovate products and services if the concept of ubiquitous networks is fully utilized.

II Three Essential Elements and Innovative Business Models

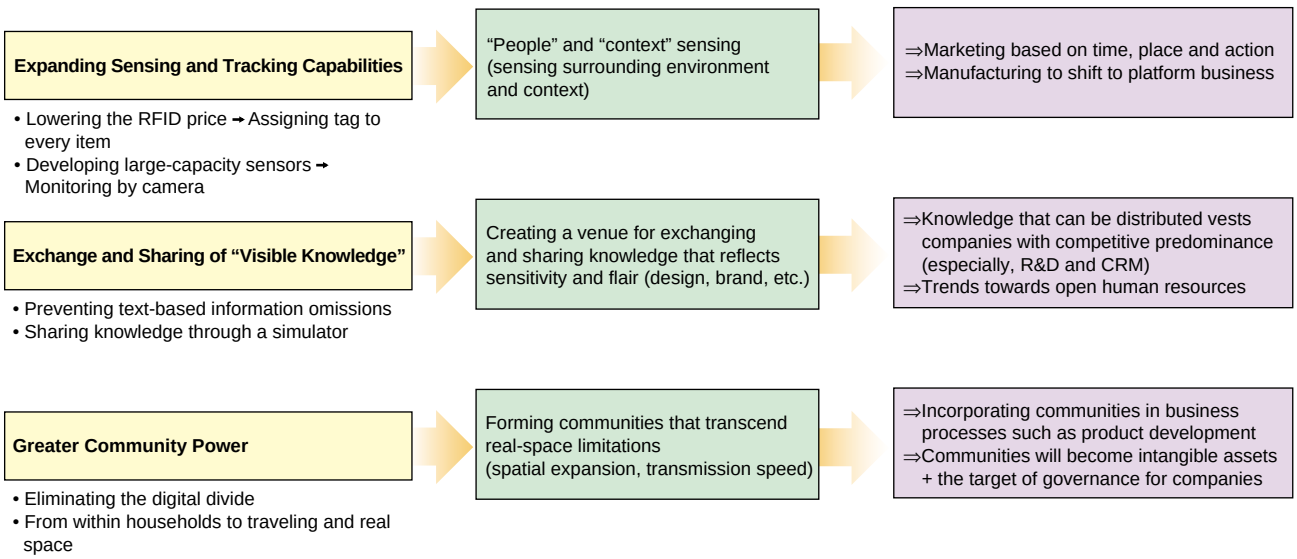
1 Three Essential Elements of Ubiquitous Networks

In considering the innovation of products and services by the use of ubiquitous networks, the essence of such networks needs to be defined. As described in the previous paper (NRI Papers No.34), these essential features consist of the following three elements (see Figure 1).

The first involves "expanding sensing and tracking capabilities." While the Internet has opened up the new concept of virtual space, ubiquitous networks are bringing about a convergence of the virtual and the real worlds—a new usage horizon in which our lives are being greatly expanded and enriched.

The second is the fact that major changes will take place in expressing, sharing and distributing knowledge through the support of broadband technology (high-speed, large-capacity circuits) and the evolution of Internet usage. We call this phenomenon the "exchange and sharing of visible knowledge (knowledge managed by not only text but also pictures and videos). For example, AOL Time Warner (US) has concentrated its customer center operations in the Philippines. As such, knowledge-based labor that was once believed to stop at national borders now easily flows throughout a borderless world. This is because the availability of

Figure 1. Three Essential Elements of Ubiquitous Networks



Notes: CRM = customer relationship management; R&D = research and development; RFID = radio frequency ID.
Source: Nomura Research Institute.

broadband technology enhances knowledge expression capabilities and facilitates the exchange and sharing of diversified knowledge. This will have a monumentally significant impact on business operations.

The third element can be expressed as "greater community power." From the historical perspective, the spread of communications from the nation to companies, and from companies to individuals has generated power shifts. Ubiquitous networks are now creating new information flows through the formation of communities that were once even beyond imagination.

2 Innovative Business Models Based on Ubiquitous Networks

These three elements constitute the core possibilities offered by ubiquitous network technology. In order to utilize this technology in innovating products and services, ideas and concepts must be organized from the perspective of the added value that ubiquitous networks can offer its beneficiaries (which include consumers). Accordingly, we first collected examples of innovative products and services to classify businesses (or approaches) in light of these three core elements. Next, we established the relationship shown in Figure 2 by adding to these business types the perspective of value creation by beneficiary. Through these processes, we were able to identify the following three major innovative business models:

(1) "Concierge" type business models aimed at consumer markets.
(2) "Knowledge asset management" schema focused on corporate users.
(3) "Wide-area measurement" systems targeting public service fields.

We believe these three models to be innovative business models for the era of ubiquitous networks. The following sections explain each of them.

III Concierge Type Business Models

1 Being Very Attentive When Needed

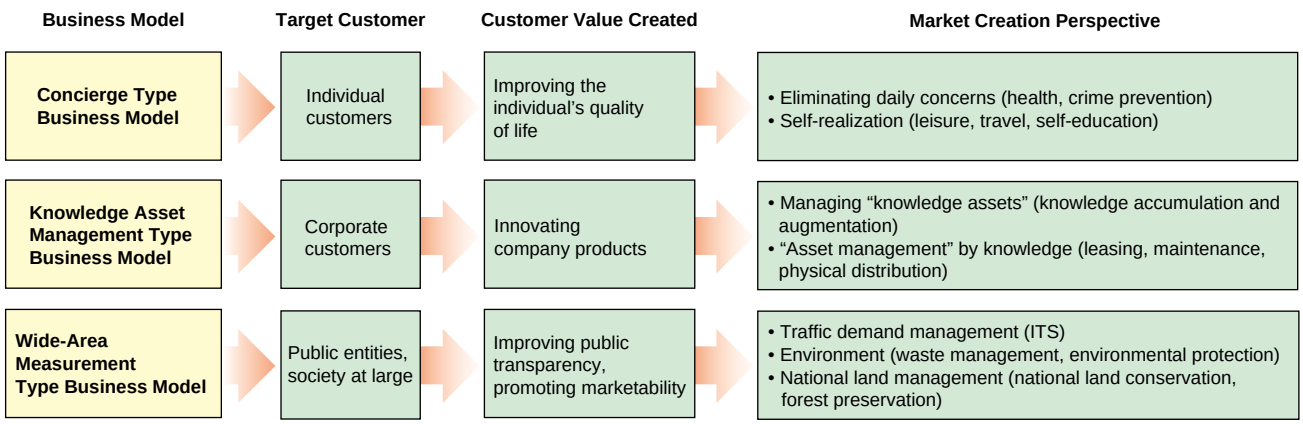
The concierge in a hotel is a person (and supporting staff members) who looks after guests by offering various services, such as sightseeing arrangements, guidance and responding to other customer requests. Based on this origin, the term is also applied to customer assistance personnel who provide information and assistance in specific fields. Accordingly, concierge type business models can be positioned as "very attentive services provided when needed" that support the everyday life of people in a non-intrusive manner.

Examples include providing information when people want, receiving notifications when appropriate, and taking steps in advance based on such notifications. In particular, it is assumed that users are willing to pay a reasonable fee for a service that can eliminate personal concerns and worries. This type of business can be developed around sensing and tracking capabilities of ubiquitous networks as the core, together with such functions as effective information delivery based on visible knowledge and support functions using community power.

2 Concierge Type Business Models Aimed at Eliminating Anxieties

According to a survey by NRI (Nomura Research Institute, Ltd.), the concerns and anxieties of Japanese people today typically relate to matters of health, personal security, their economic situation, education and the environment. In particular, health-related problems including worries about aging are issues that many people worry about. It is necessary to adequately address the issue of how to eliminate this anxiety and

Figure 2. Three Innovative Business Models



Note: ITS = intelligent transport systems.
Source: Nomura Research Institute.

assist family members (and the elderly themselves) in caring for those in their advanced years.

In addition, the general increase in serious crime also constitutes a factor that provokes a great deal of worry. Accordingly, mechanisms that provide for the management and monitoring of overall security for one's family at any time and anywhere are also important in terms of new business opportunities as well.

As indicated below, there are three means to eliminate such anxieties.

- Monitoring: constantly monitoring one's environment
- Notification: issuing notifications on abnormalities as they occur
- Support: providing assistance when required

If implemented in a timely manner, these measures will significantly contribute to the creation of a sense of security by eliminating worries relating to disease and minimizing the spread of accidents and/or even preventing their occurrence.

(1) Emerging cases: Healthcare Toilet

Matsushita Electrical Industrial Co. Ltd. is introducing a new service they are developing called Healthcare Toilet. This new system is now being displayed at the company's "e-HII (Home Information Infrastructure) House" showrooms in Moriguchi (Osaka) and Shinagawa (Tokyo) (see Figure 3).

The seat of this toilet is equipped with sensors to measure such data as weight and body fat, and glucose levels in the urine are automatically monitored to check one's daily health status. The reason a toilet is used for these purposes is that constant measurements can be made without otherwise interrupting one's life, as people use the toilet every day. Essentially, the monitoring is embedded in normal daily activities without the need to do something special—which is a typical example of ubiquitous network functions.

This service is based on a structure in which the toilet is connected to a home server at the Matsushita monitoring center via the network, and to a support organization that provides the necessary monitoring information and advice. And even more specifically, the next step will include transmitting the data to a diet-related site to provide guidance on healthy eating based on the measured data. Subsequent steps in the process flow may include offering appropriate advice and implementing specific action by automatically identifying causes when any symptom of poor health is detected.

(2) Next-stage: Monitoring elderly parents

While individual users themselves were the targets of management by the Healthcare Toilet system, cases in which people are concerned about family members such as elderly parents are not few. Accordingly, services such as care concierge service are provided to people who worry about the health condition of an elderly parent living alone in the countryside.

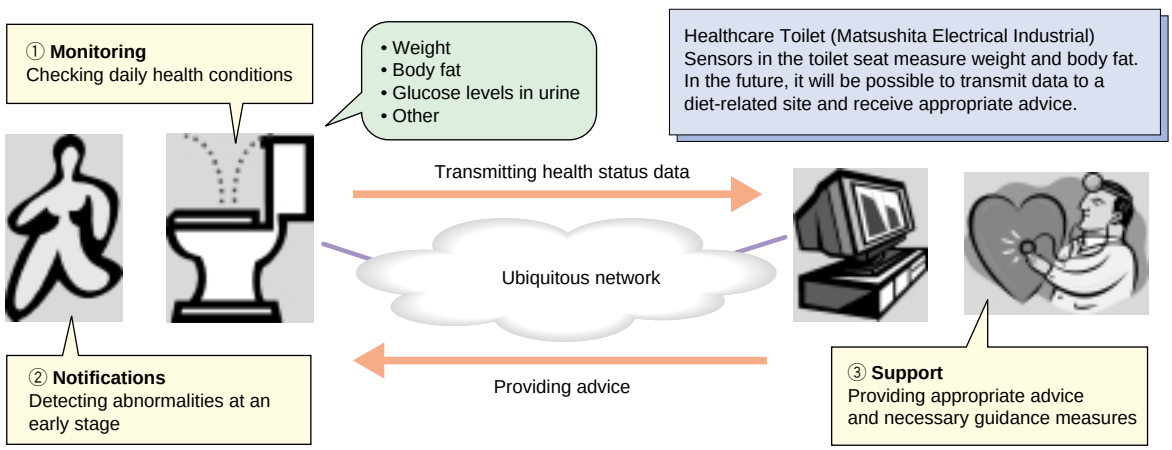
This service uses sensors installed in the parent's bed and a sensor-equipped robot located in the room. Settings are made so that if no response is detected from the bed and other sensors for an entire day, an alarm is sent to a pre-designated household and a nearby public health center to follow up as quickly as possible.

(3) Developing an advanced business model

Concierge type business models will be further advanced beyond the examples mentioned above, and will reach a stage in which all sources of user anxieties will be the target of concierge services as indicated in Figure 4. Naturally, the enhancement of "organizations providing required assistance" such as hospitals, police stations, doctors, public health centers, and communities will become important in raising the assistance level to the maximum degree.

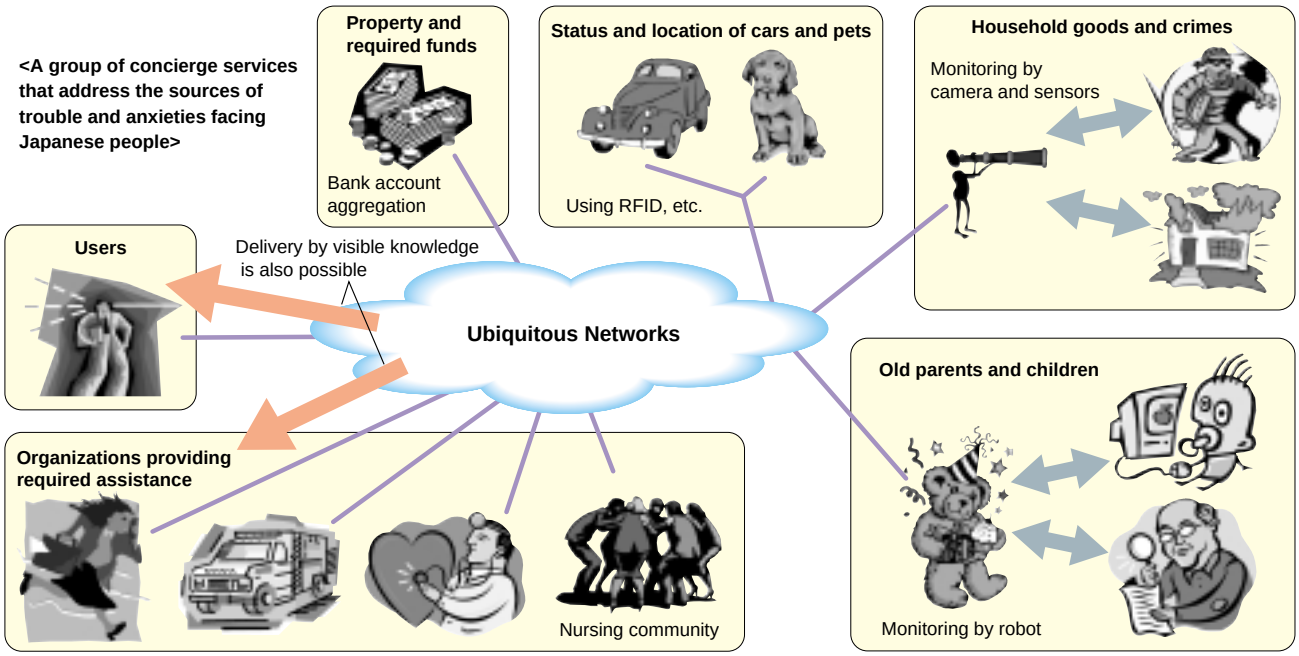
In addition to such services that eliminate anxieties and trouble, examples of further advanced formats may include services that support an individual's desire to

Figure 3. Health Management Service Using Toilet



Source: Nomura Research Institute.

Figure 4. Expansion of Anxiety-Eliminating Concierge Services



Source: Nomura Research Institute.

study or research some topic and to otherwise carry out self-improvement activities.

3 Major Features of Concierge Type Business Models

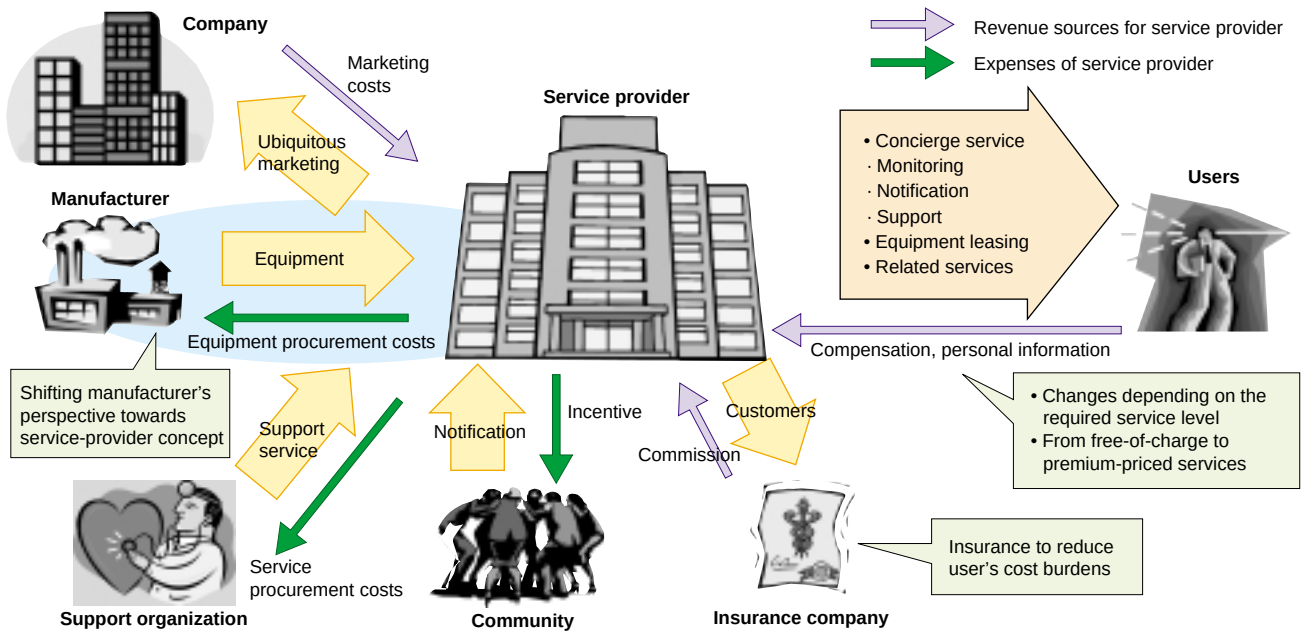
While we have so far outlined the concept of concierge type business models, the basic structure can be summarized in the following points as shown in Figure 5.

- Equipment leasing (end of the era of single-unit sales assuming the networking)
- Strengthening linkages with related companies and organizations
- Reducing user's cost burdens through ubiquitous marketing and insurance
- Designing billing systems

(1) Equipment leasing

The format of procuring the equipment required to provide concierge services will be shifted from outright sales as in the past to a model of equipment leasing that assumes networking. The effects of this shift can include a reduction in initial user costs, providing maintenance and additional services through the network, and the ability to deal with a broad range of usage formats and conditions. Accordingly,

Figure 5. Basic Structure of Concierge Type Business Model



Source: Nomura Research Institute.

equipment manufacturers will have little choice but to pursue service-focused activities, rather than simply concentrating on manufacturing.

(2) Strengthening linkages with major companies and organizations

Linkages among equipment manufacturers, support organizations (including communities), and insurance companies will become important in providing concierge services. If these entities separately carry out their respective activities, it will become difficult to create value for users. Hence, the future will likely see substantial increases in linkage patterns, some of which may involve surprising tie-ups.

(3) Reducing user burdens through ubiquitous marketing and insurance

User costs always constitute a problem in introducing new services, as other costs must be reduced to make the new services affordable. While there may be more than a few users willing to pay for services that can eliminate problems and anxieties, there would be some limitations on the amounts that individuals can pay.

Accordingly, ubiquitous marketing that bills corporate customers would be a solution to this issue. Such a marketing technique is based on the time, place and situation parameters surrounding a user, and makes it possible to provide more detailed information as compared to conventional marketing that is based on user attributes and purchasing history. As concierge services and ubiquitous marketing are closely related in terms of taking actions on the basis of user circumstances, these services should be used to reduce the direct payment burdens that are charged to users.

Furthermore, combining these services with insurance can minimize expenses on a total basis. If full preparations are made for the inevitable rainy day that everyone will eventually experience, this will naturally reduce the estimated payout of insurance benefits (which constitutes an advantage for insurance companies). If insurers provide premium discounts or special benefits depending on the extent of preparations or in order to encourage users to take preliminary steps on their own, users will clearly benefit from such measures—thereby bringing about positive effects to both sides and clearly establishing a win/win relationship. In the future, we may see an increase in the number of cases in which an affiliation with insurance companies becomes a key element.

(4) Designing billing systems

Fees are usually not directly paid to the concierge at a hotel. In many cases, they are included in the room charges since providing attentive services by a concierge is a means of cementing a guest's loyalty to the hotel. In short, one may consider that the hotel is an indirect beneficiary of the concierge costs, while the hotel guests are the direct beneficiaries. Thereby, if a third party is involved in the relationship between a service provider and a beneficiary (rather than a one-to-one basis), a billing method needs to be studied within the parameters of a beneficiary structure.

For example, LifeCare.com (US), a company providing support services relating to medical care and welfare, adopts an interesting billing method. While the end-users of medical care and welfare services are usually the consumers, this company sees the users' employers as its customers. This is because the employer will also face a heavy blow when any of its employees (i.e., consumers) encounter illness, the need to provide nursing care for their family or other contingencies. In case a death in the employee's family necessitates an absence from work, the employee will typically be absent for about a week at the minimum to handle the required arrangements, procedures, etc. Therefore, reducing this period of absence will have a positive effect on the customer company.

Specifically, in case of any contingency, LifeCare makes arrangements for hospitalization, related medical institutions or facilities (or funeral arrangements if necessary) on behalf of the relevant employee of the customer company. This reduces the mental and physical burdens on the employee, and means that the absence from work can be minimized. Accordingly, the customer company pays the LifeCare charges under this service scheme.

As this example illustrates, if the beneficiary structure on a total basis can be clarified, it becomes possible to identify the specific contents of concierge service, while at the same time develop leads for business opportunities. If ubiquitous networks can be utilized for such opportunities, a flexible response becomes possible even when it involves a complex billing structure.

IV Knowledge Asset Management Type Business Models

1 Amassing and Tapping Knowledge Resources

The value of ubiquitous networks to a company exists in allowing for product innovation and strengthening cost competitiveness. Any increase in sales as a result of improving operational efficiency through better products and lower costs will help maximize corporate value. This is where the huge potential for knowledge-based activities comes in.

"Knowledge asset management" is the term NRI has created to describe a service. This is an important business model, as it enables companies to develop advanced and efficient services by making the best use

of the knowledge that is available on the network. Knowledge asset management can be broadly classified into two categories: "knowledge asset" management and "asset management" by using knowledge. Both of these categories originate from gathering the knowledge that exists everywhere.

2 "Knowledge Asset" Management

This concept supports corporate activities by collecting, storing and transmitting knowledge as an asset via ubiquitous networks, which can be categorized into two types, "knowledge accumulation" and "knowledge augmentation" according to the elements. Examples of knowledge accumulation include cases in which many widely scattered experts and specialists linked via networking can each take just a little time to provide answers and/or assistance in response to inquiries. And knowledge augmentation may include cases in which a financial institution gathers specialists at a call center to handle inquiries and conducts sales for highly sophisticated products. Knowledge asset management uses the sharing and exchange of visible knowledge (including explicit knowledge) as the core, and consists of such essential elements as maximizing the use of community strength and sensing and tracking capabilities to identify the sources of knowledge.

(1) Type of knowledge accumulation

As represented by the format shown at the left of Figure 6, knowledge accumulation refers to value-based activities by accumulating and integrating knowledge dispersed throughout the network. NRI's Aggregation (information concentration) Service provides an interesting example of an emerging case.

NRI started this service in affiliation with major financial institutions to aggregate bank account data in order to provide individual clients with a summary of their financial assets and expenditures. We started by providing services, including lists of accounts, gathering necessary information and issuing alerts as required to customers who had home-trading accounts with Nomura Securities. Because this service is especially effective in building goodwill with customers of financial institutions, we are now aiming at broadening this initial format to provide more value-added services.

The scope of developments planned for the future includes selling financial assets, handling charge account payments, and providing advice about asset management. The collection of customer information is a key requirement in these cases, and we intend to actively carry out cross sales of various services on the basis of this information.

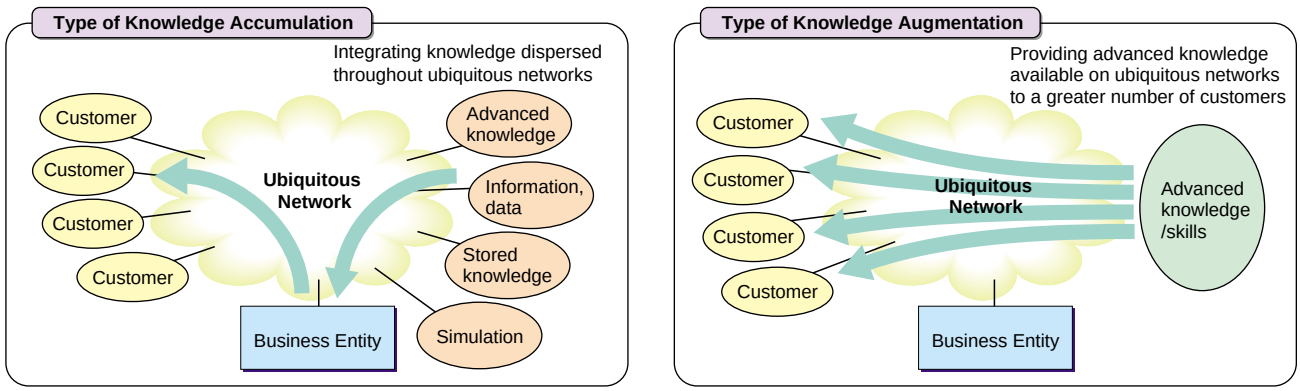
(2) Type of knowledge augmentation

Knowledge augmentation delivers advanced and/or special skills to multiple remote sites via the network, and corresponds to the format shown at the right of Figure 6. This makes it possible to use advanced skills by temporarily augmenting such skills. Budding cases include NTT's robot mole, which is used for tunneling and conduit construction. While the machine's operations look relatively simple at first glance, it requires detailed knowledge on geologic strata and rock beds and advanced handling skills—usually provided by a specialist who is assigned to the worksite. Because the number of people with such skills is extremely limited, simultaneous operations are not possible even when many works are planned. However, by employing ubiquitous networks in such cases, advanced skills can be utilized simultaneously at many sites.

3 Asset Management by Using Knowledge

The second is asset management by using knowledge. Unlike the previous subject, assets in this case mean products and tangible assets. This concept refers to value creation by using knowledge to manage such assets. While the principal objective is mainly focused on strengthening cost competitiveness, this concept can also be linked to market creation if the management of not only assets but also customers (as a target beyond assets) becomes possible.

Figure 6. Knowledge Asset Management (Knowledge Accumulation and Knowledge Augmentation)



Source: Nomura Research Institute.

The concept consists of two elements: one is leasing and maintenance, and the other is the advancement of physical distribution functions. The former provides various services on a total basis, including maintenance, by leasing networked equipment, rather than simply selling a product. The latter improves the efficiency of inventory management and customer management and enables automated settlement by tracking the output of the distribution and physical distribution industries. The core of this system essentially consists of sensing and tracking capabilities, to which management using visible knowledge, is added as required.

(1) Leasing and maintenance

The major objectives of the leasing and maintenance business model include securing service revenues through utilizing sensors and the reduction in production costs. The assignment of IDs (identifiers) to all products for networking will make the products themselves part of the network. And additional revenues can be expected from the platform and maintenance services provided on such networks. If the assignment of IDs to products is applied to SCM, inventory costs can be reduced and lost opportunities can be minimized. The reduction in costs for recycling parts and components and other environmental measures by using IDs will be a major source for corporate competitiveness in the manufacturing industry of the future.

Furthermore, it will become important to incorporate IDs and networks in the innovation of products themselves, rather than simply utilizing them for process management. In addition to the discussions above concerning the development of product platforms, this includes the creation of new added value by unifying products and the network. A typical example will be network games.

Hitachi Construction Machinery Co., Ltd. uses the GPS (Global Positioning System) to identify the location and operating status of leased construction machinery in order to improve its availability, prevent theft, and increase customer satisfaction. Hitachi realizes the maximization of business opportunities per construction machine by giving priority to allocating unused construction machines to meet customer needs, and carrying out refueling and the supply of maintenance parts on a timely basis. Recently, the company has been using mobile phones rather than GPS to prevent crime.

As the price of the relevant product (asset) is ¥10 million or more in this case, it is worthwhile to use highly sophisticated GPS technology. In the future, however, as a low-cost infrastructure—i.e., ubiquitous networks—is developed, the unit price of the target product (asset) for which leasing and maintenance is provided will drop substantially. In extreme cases, it will become possible to provide leasing and maintenance services even for products costing ¥10,000 or less.

(2) Advancement of physical distribution functions

The basic concept in this model is to simplify the procedures for inventory management, physical distribution management and charge settlements by making it possible to identify the inventory status, location, condition and product contents through assigning an RFID (radio frequency ID) tag to all products. If payment and customer information can be organically combined, such data can be utilized in marketing activities as well as for market creation.

Systems of this type are presently focused on improving work efficiency through process management. As an easy-to-understand example, improving the efficiency of cashiers at the Kaiten-Zushi chain of conveyor-line sushi restaurants can be cited. The OAISO system developed by Ishino Manufacturing, a company that makes sushi-related machinery, uses RFID tags made by OMRON that are embedded in the sushi dishes to calculate prices. As the Kaiten-Zushi chain offers a wide variety of sushi selections, it generally took new cashiers three to four months before they were able to calculate prices quickly and accurately. After the introduction of this system, however, it took only 10 minutes of training for new staff members to master the process. This has vastly simplified the employment process and improved work efficiency.

4 Expansion of Knowledge Asset Management Business Models

It is expected that emerging cases in the knowledge asset management model that have been introduced will spread and lead to even more advanced applications. The following section uses this perspective in examiningthe impact that visible knowledge and communities will have on such advances.

(1) Knowledge augmentation by visible knowledge

In the case of the manufacturing industry, the precision metal mold manufacturer INCS, for example, was successful in shortening the lead-time to complete a metal mold from six months to ten days by systemizing its substantial expertise and know-how through the use of 3D-CAD/CAE (computer-aided design/engineering). This systemization of know-how offers significant potential to improve the efficiency of research and development (R&D) to the fullest extent. A major factor behind the success of INCS was in bridging the information gaps in areas requiring a high sensitivity to functional needs in the course of exchanging information among the concept planner, designer and production engineer in order to create a product that could satisfy its originally intended purpose.

In the case of the distribution industry, efficiency in conveying the product concept can be improved by using visible knowledge. Similar to the manufacturing industry, the sharing of visible knowledge can minimize the lack of information in the course of conveying the brand concept from the personnel responsible for the product at the manufacturer to the buyer and the supplier, and at the same time reduce the labor involved. In the past, oversized vellum sheets bearing various illustrations were used to convey a product concept for the next season. In the near future, however, we will be no longer seeing scenes like this. At the same time, a method that skillfully uses charismatic personalities and entertainers in easy-to-understand presentations that incorporate pictures and videos to persuade consumers (who are already inundated with excessive information) will lead to successful marketing activities.

(2) Knowledge accumulation through communities

If, for example, collaboration that transcends space and language limitations is possible at the initial R&D stage, the availability of skilled human resources can be flexibly expanded as needed. Unlike the experience of the past, it is not necessarily required that all members of a project team gather at one place to carry out their work. As these new systems can lead to efforts to utilize outside staff members in creative work, the outsourcing of product development and prototype development processes may be accelerated.

There is another move aimed at improving productivity by incorporating within the R&D process the power that is being shifted to consumer communities. In the conventional method, questionnaire-based surveys are conducted to elicit a wide variety of needs and comments that are then averaged and reflected in product development. These new approaches, on the other hand, adopt a method in which user communities can evaluate the prototype product, and improvements are made based on such appraisals. The Linux OS software is a typical example of this.

When these approaches are successful, they lead to a strong commitment by the users engaged in the relevant processes, as well as making sure that appropriate user needs are fully reflected in the product. And such users often become vocal evangelists in spreading the news about such products on ubiquitous networks, and in creating the core of a user stratum with a particularly high product loyalty.

V Wide-Area Measurement Business Model

1 Gathering Data to Resolve Public Issues

The one and only objective of public service is to maximize benefits for everyone, including companies. For this purpose, it is necessary to check and see if the mechanism of public service is truly generating its intended effects, and to promote optimization where needed. In other words, it is important to improve transparency and promote marketability.

The wide-area measurement model provides solutions for this purpose, because this model makes it possible to measure the effects of public investment projects in which it was hard to grasp the specific outcome. For example, the economic effects of a newly constructed road can be identified by continually measuring traffic volume on the road. Such data will also facilitate the modification of subsequent road construction plans and permit road operational methods to be properly set up. Among the three essential elements of ubiquitous networks, this model utilizes sensing and tracking capabilities to the maximum extent. In addition, visible knowledge can be used for monitoring and recycling-related projects may feature the best practical applications that use the power of communities.

In the era of ubiquitous networks, the networks can precisely highlight everything in society, and that people can be equally benefited under fair condition. The fields subject to the wide-area measurement business model can broadly include transportation, environment and national land management.

2 Traffic Systems

Traffic-related wide-area measurement models are mainly those focused on measuring traffic volume. The evaluation of PFI (private finance initiative) projects becomes possible by measuring cost effectiveness accompanying road construction and management. Moreover, if road usage tolls can be changed in accordance with traffic volume, road congestion may be eased.

For example, the ETC (electronic toll collection) system that has already been widely commercialized can be regarded as an emerging case. While the main purpose of this system at present is to automatically collect tolls, it becomes possible to measure the effects of introducing the system to relevant roads or highway sections by monitoring traffic volume and thereby evaluating cost effectiveness. If these mechanisms can be provided via ubiquitous networks at low costs, the effect of newly constructed toll roads in local areas can be quantitatively evaluated and the validity of the projects can be objectively measured.

An advanced form of this system that adjusts tolls hourly on the basis of traffic volume has been already introduced in Singapore in order to ease the congestion of vehicles entering commercial and business areas. An easy-to-understand method is applied in which tolls are high at the time of congestion, but fall when traffic congestion eases up. The use of ubiquitous networks

will make it possible to employ such mechanisms with full flexibility and mobility (see Figure 7).

3 Environmental Systems

Recycling activities can be efficiently carried out by assigning RFID tags to parts and waste materials. As shown in Figure 8, the specific contents of the venous (recycling) industry can be clarified, as the focus will be placed on collection.

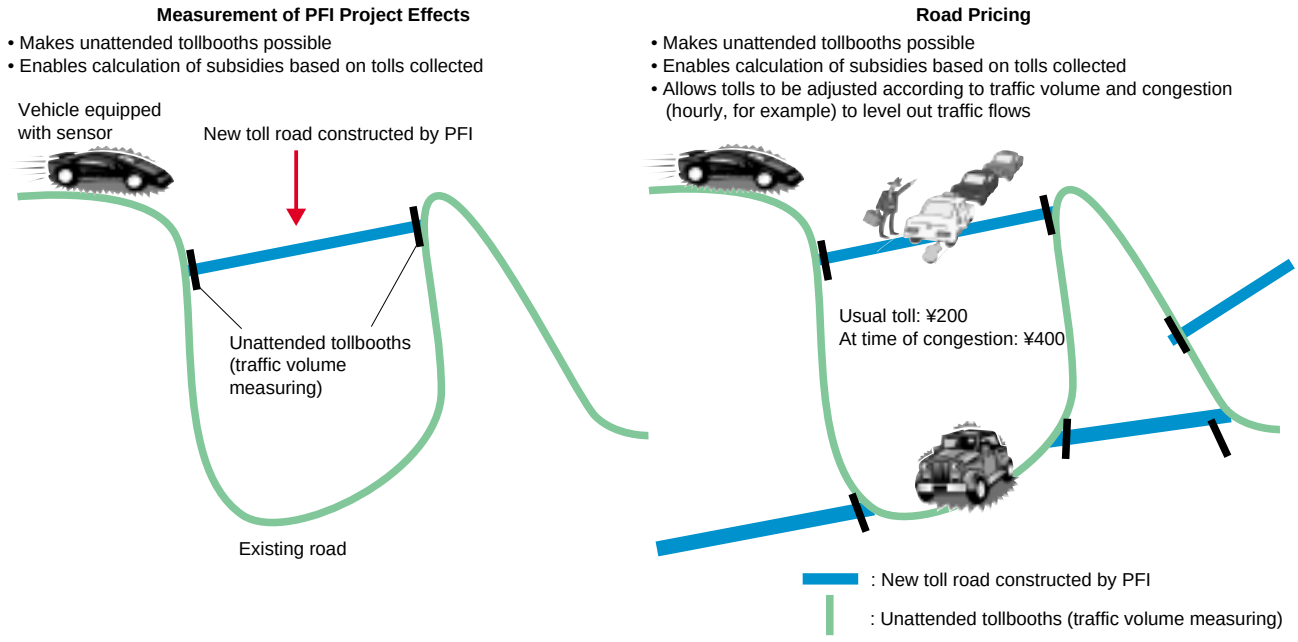
Emerging cases include the waste matter management information system operated by Fuji Electric Co., Ltd. As the system enables waste handling companies (users) to automatically prepare the manifests (management slips) and administrative reports used to calculate annual disposal volume in an easy manner, both information disclosure and transparency are improved. This will help such companies establish better reputations for reliability in terms of verifying that they are engaged in legal and proper disposal activities. At the same time, the system provider (local governments) will benefit from such advantages as being able to track the transport route of waste materials on a real-time basis and to confirm that processing is appropriately carried out.

4 National Land Management System

At present, there are no specific examples of applications used in national land management. As SOKIMAT in Switzerland has commercialized RFID tags for national land space management, however, the following rollouts can be expected in the future. The first envisions applications to mark triangulation points. If the location of all survey points can be managed via the network, it becomes possible to increase the precision of location information and to measure changes in topography. Tags installed in mountainous areas can also be used for safety purposes, such as confirming the location of climbers, for example.

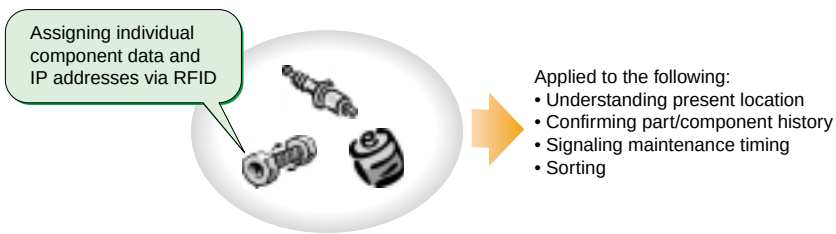
Furthermore, successful applications to forest management may offer new possibilities of employing such systems in managing the goals determined in the Kyoto Protocol (adopted in 1997 at the 3rd Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change), in which

Figure 7. Wide-Area Measurement Business Model (Applied to Traffic Field)



Note: PFI = private finance initiative
Source: Nomura Research Institute..

Figure 8. Wide-Area Measurement Business Model (Applied to Environmental Fields)



Note: IP = Internet protocol.
Source: Nomura Research Institute.

Table 1. Forecast of Market Scale for Three Innovative Business Models (Around 2005)

Business Model	U-Value	Market Scale
Concierge Type	Improving consumer QoL (quality of life) • Eliminating consumer anxieties: elderly parent concierge, home security, barrier-free concierge • Consumer self-realization (leisure, travel, self-education): car-focused concierge, traveling concierge	¥3 trillion (¥2 trillion) (¥1 trillion)
Knowledge Asset Management Type	Company's product innovation • Knowledge asset management • Asset management by knowledge	¥4.5 trillion (¥1.5 trillion) (¥3 trillion)
Wide-Area Monitoring Type	Improving public service transparency and promoting marketability • ITS (intelligent transport systems) • Environment • National land management	¥3.5 trillion
Total		¥11 trillion

Note: U-value means the real value that is created for consumers through the use of ubiquitous networks.
Source: Nomura Research Institute.

specific reductions in carbon dioxide emissions are defined.

VI Market Impact of Innovative Business Models

1 Creating a Market of ¥11 Trillion in 2005

In place of the era of PC-based electronic commerce that focused on improvements in efficiency, the era of ubiquitous networks offers the significant potential of vitalizing the creation of new markets as explained so far. As indicated in Table 1, we estimate the scale of this market in 2005 will total some ¥11 trillion.

The concierge type business model will create a market worth ¥3 trillion by focusing on improvements in consumer QoL (quality of life) parameters. The knowledge asset management business model will create a market amounting to ¥4.5 trillion through the support of product innovation activities by companies, and the wide-area measurement business model will create a market worth ¥3.5 trillion through improving public service transparency and promoting marketability.

Moreover, as this does not necessarily mean that these three business models will make up all the markets to be based on innovative approaches in the era of ubiquitous networks, the creation of other markets drawn from different business models is naturally conceivable. This means that the figure of ¥11 trillion may be somewhat conservative if we see the emergence of other new businesses that apply the three essential elements of ubiquitous networks in even more diverse and far-reaching ways. Accordingly, the scale of new market creation may be significantly larger. We look forward to a real product innovation that will accelerate and expand these objectives.

2 Pursuing the Creation of U-Value

The creation of greater U-value on the basis of the concierge, knowledge asset management and wide-area measurement business models means exactly the creation of ubiquitous network markets. This must be kept in mind by both management and the government to create future-model businesses and services. For consumers, the U-value represents the real value that is created with the use of ubiquitous networks.

The era of ubiquitous networks promotes product innovation by going beyond the simple use of electronic commerce as product transactions, and instead creates businesses that offer U-service that will ultimately give U-value to consumers.

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