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TOPICS

Outline of Ubiquitous Network Symposium 2007 (UNS 2007)

Introduction

Ubiquitous networks which will make possible a society where various services can easily be used anytime, anywhere and by anyone, have raised great expectations for the creation of new industries and businesses and the realization of a convenient and affluent lifestyle. At the same time, going beyond the simple industrial aspect, they are expected to make a major contribution in solving various social problems being faced by Japan such as bringing about a safe and secure society, use in the traceability and distribution fields, the promotion of vigorous regional use of information technology, and response to deepening environmental issues.

Looking towards the realization of ubiquitous networks, MIC promoted three research projects from 2003 as "Research and Development of Ubiquitous Network Technology," three research projects from fiscal year 2004 as "Research and Development Relating to Technology for the Efficient Use of Electronic Tags", "Research and development relating to Asia Ubiquitous Platform Technology", and "Integrated Research and Development of Network Human Interface (Network Robots Technology)," as well as, from fiscal year 2005, "Research and Development Relating to Ubiquitous Sensor Network Technology" and, from fiscal year 2006, "Research and Development of Technology for Highly Efficient Use of Intelligent Home Appliances."

This symposium was set up as an event at which to announce the results of the research and development projects commissioned by MIC on ubiquitous network technology, and has been held since fiscal year 2004. For this past fiscal year, the Ubiquitous Network Symposium 2007 (UNS 2007) was held in Akihabara, Tokyo, on November 29 and 30, 2007. At UNS 2007, under the organization of an executive committee (chaired by Prof. MORIKAWA Hiroyuki, Research Center for Advanced Science and Technology, University of Tokyo) that is run by those that have been entrusted with the MIC projects related to ubiquitous network technology (a total of 25 companies and universities working on 8 projects), there were "Results Exhibitions" to exhibit the results of the research and development as well as prototypes and "Results Presentations" to report on the outline of the research and development and the state of progress. The contents are outlined below.

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Opening Remarks: Professor MORIKAWA Hiroyuki (Research Center for Advanced Science and Technology, University of Tokyo), Chairman of UNS 2007 Executive Committee (left) and OKAMOTO Yoshiro, Vice-Minister for Internal Affairs and Communications (right)

Outline of the Symposium

Results Exhibition

The results exhibition of this symposium which exhibited the results of the 8 MIC research and development projects relating to ubiquitous network technology was not just an introduction of leading edge technology trends, but included demonstrations of effective use of the results of the research and development, an exhibition of business models and a visualization that was easy-to-understand by non-experts of the ubiquitous network society of the future.

o Exhibition Contents

(1) Project for Research and Development of Technology for Advanced Use of Intelligent Home Appliances

This research and development has been working on "technology to bring about the automatic coordination of authentication information for multiple intelligent household appliances that have different authentication performance," and "technology to bring about the distribution and updating of software using the most appropriate method in response to differences in functionality of various household appliances, as well as in the network environment and its state of usage." The aim is for it to become an elemental technology that will form the base of highly effective usage of intelligent appliances.

View from tape cutting at opening

- Demonstration

a) Health Concierge

Technology was introduced for maintaining the most appropriate security level for each service by coordinating user authentication, machine authentication, and service authentication, based on health management services that are specific to the individual user.

b) Disaster Public Information and Communication Services

Technology was introduced for distributing necessary information to various appliances, with instantaneous coordination from the communication of disaster information to the software distribution system.

(2) Ultra-Tiny Chip Networking Project

Research and development is being implemented on ultra-tiny active RFID tags for the realization of a safe and secure ubiquitous network society, and of the advanced information management systems based on them.

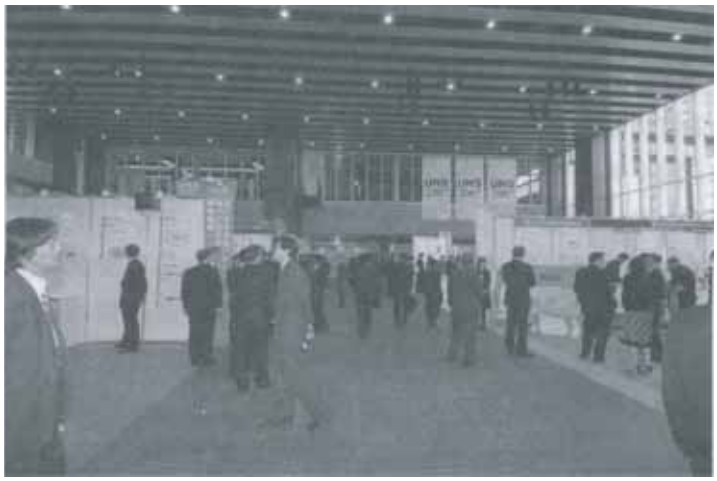
This research and development will make it possible to carry out high-level product management using the characteristics of active RFID tags and to provide detailed information using location information. With the

newly developed UWB (Ultra Wideband) active tags, very precise location (with an accuracy of within 30 cm) will become possible, and new applications are expected to be generated such as maintenance-free automated warehouse management systems. The aim is to bring to reality such tag management systems and compact mounting technology (volume: 1 cc).

- Demonstration
A system was introduced in which the positioning of a terminal that was fixed to a cart was measured to an accuracy of 30 cm, and the contents of the cart were processed efficiently and automatically (recording of transporters, time of reception or collection of goods, positioning of cart, temperature, etc.).

(3) Project for Research and Development Relating to Asia Ubiquitous Platform
In order to develop ubiquitous network technology internationally, research and development is being implemented with the aim of establishing next-generation ubiquitous platforms using Asia for field testing. The aim is to bring about technology to provide context-aware information such as, for example, technology to provide information in the language best-suited to the individual, or technology to provide information suited to age and gender.

- Demonstration
A traceability system for housing components was introduced as an example of use of the UCR (ucode relation) technology that has been set up by the Asia Ubiquitous Platform Project. This system records and preserves the building history of every single component that has been used inside a house (installation, repairs, disposal, etc.), and so enables more efficient maintenance management of housing components as well as rapid response in cases of product recalls.



Site of Results Exhibition (Akihabara UDX, 2nd Floor)

(4) Project for Research and Development of Technology for the Advanced Use of Electronic Tags
Looking ahead to the realization of a convenient and safe ubiquitous network society, research and development is being implemented on highly efficient usage of electronic tags so that information on people, things and places can circulate beyond the barriers of industry or sector.

The results of the onsite testing that had been conducted to date were presented. Through the introduction of examples of usage conducted in various actual environments, it was shown that the technologies which were researched and developed can be used effectively in a variety of environments rather than in just a specific one.

-Demonstration
Taking up the subject of food safety and security, there was a demonstration relating to the traceability of beef. In the process of beef distribution, which involves a number of companies, temperature information which was managed by the different companies was collected and appropriate information could be provided to users.

(5) Project for Research and Development of Network Robot Technology
Research and development is being implemented on technology to realize an environment where it will be possible to use a variety of services through robots safely and securely by connecting robots of different types (in addition to the android type robots that represent the human form, this includes robot cameras and sensors that can investigate people's positions and movements as well as virtual robots that operate as agents in cyberspace) through a network and enabling coordination and cooperation between the robots.

- Demonstration
There was an introduction and demonstration of robots coordinating with electronic tags or sensors to provide health management and lifestyle support. In a test and introduction, various robots were connected to a service base known as a robot platform and coordinated with a movement sensing robot and a sleep sensor to recognize the movements indicating physical exercise and the signs of awakening, and offer guidance on exercise and support on a pleasant awakening, with the health advice based on personal information provided by the participants themselves.

(6) Project for Ubiquitous Network Control and Management Technology (Ubila)
With the aim of bringing about ubiquitous networks that can be used by anyone, anytime and anywhere safely without being fully aware of networks, terminals or contents, research and development is being implemented relating to network control and management technology needed for this.

The development of technology is under way which, by using sensors to measure in real time the status of people, things and networks, and controlling and administering networks based on this, will make it possible to use large-scale ubiquitous networks even more comfortably.

- Demonstration
a) The strength of base technology that supports ubiquitous networks (network-related technology)
An approach was introduced that is aiming for an environment in which large-scale networks can be used more comfortably by combining technology to obtain rapidly information relating to degradation or problems relating to networks with technology that will automatically create a bypass if a blockage or congestion has occurred.

b) Linking everyone together, with you as the host (application-related technology)
There was a presentation, under the title of ubiquitous network services that support a pleasant and safe lifestyle, of measuring information concerning the status of the actual space, such as the person and the surrounding items, using sensors or mobile phones, and providing services that are appropriate to the conditions to make the life of users more convenient and pleasant. Approaches to bring about various media as spaces for communications that will bring people together were also introduced.

(7) Project for Ubiquitous Network Authentication and Agent Technology (UAA)
In order to realize a ubiquitous network society, research and development is being implemented on authentication technology that is very speedy and that offers high reliability in response to the user's position, and agent technology that grasps appropriately the user's status and aims, automatically putting together the functions that are necessary and obtaining the necessary information as appropriate.

- Demonstration
Authentication technology and agent technology are being prepared in response to "ubiquitousness" with the aim of creating a society in which the average citizen can receive services safely, securely and comfortably, and there were exhibitions and introductions such as dynamic exhibits using actual equipment that visitors could try out as well as views of actual testing and experiments using video recordings.

(a) I want to fully use the services I want here and now, and (b) I want to use the services anytime, anywhere, safely, securely and surely c these are the needs for ubiquitous network society that must be met, and there were introductions of examples of services for obtaining various kinds of information efficiently via mobile phones, terminals in town and personal computers.

(8) Project for Research and Development of Ubiquitous Sensor Network Technology
Research and development is being implemented relating to ubiquitous sensor network technology that will use sensors to verify the status of people and objects and their surrounding environment, distribute the information independently between sensors and respond to the conditions in real time.

- Demonstration
There was an introduction of approaches for the realization of a safe and secure society using high-level sensing technology.
a) There was a demonstration that visualized the activities of a sensor network in the case of an emergency, combining prototype image sensors that grasp the status of the emergency and sensors that define the location.

b) There were demonstrations of walk-through iris-recognition technology and technology to grasp the spatial information synchronously.

Results Announcement Meeting
The people in charge of each project made presentations on results, looking at the outline and state of progress of the eight projects for which research and development is under way. In addition, there was a lively debate at a panel discussion ("The 'Until Now' and 'From Now On' Aspects of the Realization of a Ubiquitous Network Society") with key persons and opinion leaders in the ubiquitous field. There was also a keynote lecture by Professor SHINOZAKI Akihiko , Graduate School of Economics, Kyushu University, with a valuable presentation on "The Macro, Micro and Semi-Macro Perspectives in ICT and Economic Growth," looking from an academic approach at ICT (ubiquitous) as the key to economic growth under a falling population, and reforms within corporations.

View of panel discussion

Conclusion

At present, MIC is promoting research and development of terminal technology and network technology to make it possible for anyone, anywhere and at any time to obtain the information they need in answer to their needs, looking ahead to the realization of a ubiquitous network society in 2010.

Its intention is to produce many results that will contribute to the industrial sector and the life of the people, and to realize a safe and secure ubiquitous society that is even more pleasant, by putting to use the knowledge and technology that are being gained from these 8 research and development projects.

Results Exhibition