

December 1, 2005

Press Release

YRP Ubiquitous Networking Laboratory

Start of feasibility study experiments with the largest specialty men's clothing shop, Aoyama Trading, aiming at the full-scale implementation of uID technology

The YRP Ubiquitous Networking Laboratory (Shinagawa Ward, Tokyo, Director: Ken Sakamura, Professor at the University of Tokyo) and Aoyama Trading Co., Ltd. (Fukuyama City, Hiroshima Prefecture, President and CEO: Osamu Aoyama) will start feasibility study experiments that utilize ubiquitous ID technology of which standardization is promoted by the Ubiquitous ID Center (Number of members: approximately 500 organizations, Representative: Ken Sakamura, Professor at the University of Tokyo), from the production stage to the sales stage using suits sold by Aoyama Trading in actual application.

The characteristics of the experiments are as follows.

- Products will be managed in an integrated way from factories through shops between Japan and foreign countries, across borders, using RFIDs (ucode tags) for the first time in Japan.
- A single tag will be used in many ways from distribution management, quality management to a product information provision service in shops.
- Aoyama Trading is proactively involved in these experiments assuming actual applications.

(1) International suit distribution experiments

In these experiments, ucodes (ubiquitous codes) * are assigned to each suit sold by Aoyama Trading to realize individual suit management. First, at a production factory in Asia, ucode tags (a passive RFID tag on which a ucode is stored) ** are attached to suits which are then shipped from the factory and transported to Japan by container ship via a distribution center and a container yard in the country. After passing through a container yard and distribution center in Japan, they are delivered to "Yofuku-no-Aoyama" shops. In each stage of distribution, in order to identify suits by lot, an ultra-tiny active tag that allows a longer communication distance, Dice *** will be used. Depending on how they are used passive tags may cause some problems, such as shorter communication distance and lower reading accuracy, but simpler and more secure distribution management can be achieved by using active tags together with passive tags

A ucode is a unique identifier (ID) that is used to identify physical objects and locations and can be used across companies and countries. For example, when a sales assistant holds a ucode tag attached to a suit over a reader in a shop in Japan, he can access information that is unique to the suit, such as “How, what factory and in which country was it made?”, “What route was used for delivery to the shop?”, “What were the conditions like during delivery?” and “What kind of materials are used?”.

Certain temperature and humidity during transport may cause creases and seams on suits and they occasionally require mending (re-ironing, etc.) after arriving in Japan. Various sensors are incorporated in active Dice and in these experiments they collect detailed information on temperature, humidity and impact during transport and the collected information can be used to decide whether mending is needed.

As you can see, conducting experiments using RFIDs, from factories through shops between Japan and foreign countries across borders will be the first attempt of its kind in Japan.

(2) In-Store experiments to provide product information on suits

In a “*Yofuku-no-Aoyama*” shop, using ucode tags that are attached to each suit, information on the details, such as materials and sewing methods, and recommendations for shirts and ties that match the suit will be provided to consumers by a kiosk terminal setup in the shop and portable terminals called Ubiquitous Communicators. In most of the past experiments in which RFIDs are used, they were used in a specific application, but in these experiments, they will be used in many applications, not only in distribution management, but also in quality management and the provision of product information in a shop, which is a feature of these experiments.

(3) Technology used in the experiments

Ubiquitous ID infrastructure technology will be adopted for all the experiments. This technology has been researched and developed mainly by the YRP Ubiquitous Networking Laboratory in research sponsored by the Ministry of Internal Affairs and Communications, and its standardization is being advanced at the Ubiquitous ID Center. This infrastructure used to assign a unique code called ucode to every single physical object and location, and provides information and services related to these ucodes. Barcodes and RFIDs will be used as devices that assign ucodes to actual physical objects and locations. These devices are called ucode tags and the most appropriate device can be selected for each application. Furthermore, the Ubiquitous Communicator (UC) will be used as a portable terminal that receives information and services related to physical objects and locations from ucodes.

In these experiments, we will verify systems that make it possible to easily access information obtained from various devices that exist in major bases in Asia, from anywhere in Asia and Japan, by setting up Ubiquitous ID Centers in these major bases and linking them via international telephone lines, etc. with the Ubiquitous ID Center in Japan.

In these experiments, the YRP Ubiquitous Networking Laboratory and the Ubiquitous ID Center, the world leaders in the fields of ubiquitous technology and RFID technology, will partner with Aoyama Trading, a leader in the apparel industry in many areas, including business type development, overseas business, customer management, etc. in order to realize detailed quality management and to deal with next-generation distribution models and address verified customer needs. In addition, based on the results of these experiments, Aoyama Trading will implement ucodes in full-scale, and aim to improve efficiency and create higher added value in various situations from production to sales where ucodes are used.

Appendix 1: About the YRP Ubiquitous Networking Laboratory

The YRP Ubiquitous Networking Laboratory, is a laboratory established with the goals of constructing a ubiquitous computing environment where microcomputers, sensors and actuators etc., that possess communication ability are embedded in all physical objects surrounding us, and operate in cooperation while mutually exchanging information in order to support the lives of people at a higher level, as research sponsored by the Ministry of Internal Affairs and Communications and to establish a next generation communication protocol which will be a base of ubiquitous networking environments.

Appendix 2: About Aoyama Trading

Aoyama Trading, which is called “Aoyama, the suit shop”, has been recognized by the Guinness Book of World Records as “The company that sells the largest number of suits in the world”. They sold 2,480,000 suits in the fiscal year 2004 and this was equal to an approximately 20% share in the domestic market. In other words, one in five people are wearing an Aoyama suit. Aoyama Trading conducts their business globally by importing fabrics for suits from Europe, making suits at overseas factories and opening shops in Shanghai and Taiwan, in addition to actively working on improving quality by setting unique and strict quality standards.

Appendix 3: About Ubiquitous ID Center

The Ubiquitous ID Center is conducting activities towards the goal of establishing and promoting infrastructure technologies that enable automatic identification of “physical objects” and “locations” with the final goal of realizing a ubiquitous computing environment.

The main activities of the Center are as follows.

1. Construction of an ID system assigning ucodes to “physical objects” and “locations”.
2. Establishment of infrastructure technologies to use ucodes.
 - Data carrier devices that store ucodes (RFIDs, smart cards, Active chips, etc.)
 - Device that communicates with data carrier devices (Ubiquitous Communicator)
 - Establish information communication infrastructure technology to find information related to ucodes.
3. Establishment of infrastructure technology for secure wide-area distributed systems that distribute ucodes and information related to them.
4. Assignment of ubiquitous ID spaces.
5. Operation of the ucode resolution database.
6. Operation of eTRON authentication

*** ucode (Ubiquitous Code)**

A ucode is an identifier used to assign a unique number to every single “physical object” and “location”. If unique numbers (ucodes) are given to every single physical object and location, it will be possible to manage information that is unique to individual physical objects even of the same product type, such as when they were made and what delivery route they took, and in case of locations, it will be possible to provide control and information according to each location. In addition, since a ucode is a unique number in the world, specific physical objects or locations can be always identified no matter who reads the information where, and the same numbers can be shared across companies and countries. A ucode is basically 128 bits long and can be extended as needed in 128-bit units (256, 384, 512 ...).

**** ucode tag**

A ucode tag is a device that is used to assign a ucode to actual “physical objects” and “locations”. Various types of devices, such as barcodes, RFIDs, smart cards and active chips, are comprehensively handled as ucode tags. There is a framework that enables the users to flexibly select a device type and security level according to the situations in which they are used.

*****: Dice**

Dice is an ultra-tiny computer, sponsored by the Ministry of Internal Affairs and Communications, that is being developed for research and can be attached to physical objects, locations and the surrounding environment. It is to be positioned as the smallest unit of ubiquitous computing with a built-in power source that continually obtains information on physical objects, locations and environments over a long period of time, and communicates wirelessly. It is the world's smallest active electronic tag with the size of 15mm x 15mm and as it requires low amount of power, it can operate for a long period of time. Furthermore, a framework for encrypted and authenticated communication called, "eTRON" is provided for secure communication.

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|-------------|-----------------------------------|
| アジア諸国 | Countries in Asia |
| スーツ工場 | Suit factory |
| 無線 LAN | Wireless LAN |
| 工場用サーバ | Factory server |
| Dice 基地局 | Dice base station |
| アジア各国ネットワーク | Network in countries in Asia |
| 国際回線 | International telephone line |
| 情報管理サーバ | Information management server |
| 日本国内ネットワーク | Network within Japan |
| 大阪商品流通センター | Osaka Product Distribution Center |
| Dice 基地局 | Dice base station |
| 流通センター用サーバ | Distribution center server |
| 無線 LAN | Wireless LAN |
| RFID リーダ | RFID reader |
| 日本 | Japan |
| 無線 LAN | Wireless LAN |
| Dice 基地局 | Dice base station |
| 店舗用サーバ | Server for the stores |
| キオスク端末 | Kiosk terminal |

洋服の青山（池袋東口総本店）*Yofuku-no-Aoyama* (Ikebukuro Higashiguchi General Main Store)

実験システム構成図

Experiment system configuration diagram

[Inquires regarding this issue]

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