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# In Tokyo's Shopping District, Auto-ID Tags Are the Latest Fad

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**Sunday marks the start of an experiment in ubiquitous computing, where RFID and other types of tags, read by cell phones and special handheld devices, will serve as virtual tour guides.**

By Mary Catherine O'Connor

Jan. 18, 2007—Starting Sunday, visitors to Tokyo's Ginza shopping district can take part in a new experimental information network, created by Japan's Ubiquitous ID Center. The objective of the seven-week trial is to test the feasibility of an information network that visitors can use to quickly and easily gather information about their surroundings, according to Ken Sakamura, a professor of information science at the University of Tokyo. Sakamura is also chairman of the Ubiquitous ID Center, a nonprofit research organization (see Japanese Promote Ubiquitous RFID).

In the case of the Ginza trial, Sakamura says, the system uses RFID and other auto-identification technologies to provide sightseers and shoppers with information and directions for sites and retailers of interest, and to inform individuals with disabilities about accessibility options. The group hopes the pilot program will verify the usefulness of the proposed system in a commercial setting, while revealing any problems that might be encountered during a permanent deployment. It will also use the project to measure demand for such a wireless information network.

The project will employ many different types of automatic-ID tags embedded in posters throughout Ginza's pedestrian walkways—totaling approximately half a mile in length—as well as along a small underground pedestrian area. There are four different types of auto-ID tags: Fujitsu's passive 13.56 MHz RFID tags, compliant with the ISO 15693 air-interface protocol; active 315 MHz RFID tags, made by YRP Ubiquitous Networking Labs, a technology company linked to the Ubiquitous ID Center and chaired by Sakamura; active tags that transmit data using standardized infrared technology, developed by the Infrared Data Association (IrDA); and paper labels printed with a two-dimensional bar code that can be read using cameras or laser-based scanners able to support 2-D bar coding.

A 128-bit identification number, called a ucode (unrelated to NXP's UCode RFID chip), is written to each tag—regardless of which type it is. The Ubiquitous ID Center developed the ucode as a numbering system that can be utilized in compliance with such numbering standards as the Japanese Article Number (JAN), a bar-code standard comparable to the European Article Number and Universal Product Code standards. The center supports the four types of auto-identification technologies—from printable 2-D bar codes to more sophisticated RFID and infrared tags—because it believes they can be used to support a wide diversity of applications and cost structures.

Participants will use the system in one of two ways. If visitors to the area are carrying Web-enabled cell phones equipped with a camera capable of reading and decoding 2-D bar codes called QR (or quick response) codes, they can gather information from the pilot's 2-D bar code labels, which are encoded with a ucode compliant with the QR format. These users will read the QR ucode, then use the phone's Web browser to call up a Web page linked to the ucode on the tag. Information printed on the tagged posters indicates the type of information they'll get from reading the tag—such as detailed directions or

historical information linked to tourist sites—and in which languages that information will be presented. Cell phones capable of reading QR codes are widely available in Japan because such codes have become a common means of communication there. For instance, many companies encode contact information on business cards using the QR codes so new acquaintances can download the information into their cell-phone address books.

Alternatively, participants visiting the area on one of 24 designated testing days during the pilot program will be able to borrow a handheld reader called a Ubiquitous Communicator, provided by the YRP Ubiquitous Networking Labs. The Communicator can read all four tag form factors, and a built-in screen will display information linked to the tag IDs in the back-end database. This information will be available in four languages: Japanese, English, Chinese (Simplified/Traditional Chinese letter) and Korean. The devices will be available for free on a first-come, first-serve basis, but testers will be asked to complete a survey about their experience using the device.

The tags will provide information about retailers, sightseeing and route-finding to help visitors locate stores and tourist sites; emergency and evacuation information (encoded to tags located in the underground); and routes for people in wheelchairs or those with limited mobility to get around the area. Various types of tags are embedded in different locations, depending on a number of factors, such as the cost of the tag and the environment in which it is placed. For example, because the bar codes are the lowest cost, and because both QR-enabled cell phones and Ubiquitous Communicators can read them, they are most widely used for the many posters in the aboveground pedestrian areas. In underground locations, however, IR and active RFID tags are installed because they send data to the Ubiquitous Communicators automatically, without the user needing to hold the handheld device up to the tags or initiate reading them. This is important for the safety-related information that can be sent in the event of an emergency.

The Ginza pilot project is partially funded by Japan's Ubiquitous Computing Technology Corp., a joint venture between the Japanese government and industry, including Fujitsu, NEC, Hitachi and NTT East Corp. The Tokyo Metropolitan Government and Japan's Ministry of Land, Infrastructure and Transport are also providing financial support.

While it has gathered a significant amount of media attention in the United States, the Ginza project is not the first such experiment deployed by the Ubiquitous ID Center. The center has initiated a number of other trials recently, including one using RFID tags to provide information to visitors at the Arakawa River, one of Tokyo's main waterways. The center has also deployed a system in Tokyo's Ueno zoological park, where visitors use the Ubiquitous Communicators to learn about animals at the zoo.