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Exhibition Visitor Support System Based on Active Wireless Tag and Multi-Agent Technology (Aichi Expo 2005 Global House).

--- Support Marketing Efforts While Respecting User's Privacy ---

Key Points

1. Integrated information support system for exhibition brought to practical use. The system will be used in Aichi Expo 2005 Global House.
2. Locus and tracking data acquired from each active IC tag is flexibly analyzed by multi-agent technology, to deliver digital contents according to visitor's interest, while respecting his/her privacy.
3. Support marketing efforts while respecting user's privacy
4. The user device has characteristics of low cost, small size and light weight
5. Readily customized for the nature of exhibition, and the time and cost of system development and exhibition operation extensively reduced

Synopsis

The Multi-Agent Research Group, headed by Dr. Koichi Kurumatani, of the Information Technology Research Institute (ITRI), National Institute of Advanced Industrial Science and Technology (AIST), an independent administrative institution, has brought into practical use an exhibition visitor support system which was designed to be used in the ubiquitous computing environment, in collaboration with TOTOKU Electric Co., Ltd. (TOTOKU, hereinafter). The system consists of a multi-agent architecture "CONSORTS" developed by ITRI-AIST and an active wireless IC tag system "MEGRAS" developed by TOTOKU. The system has the following features.

- By using the active wireless IC tag system at an exhibition hall, data on visitors' positions and trajectories can be collected and processed from a remote site, in real time and at low cost, without infringing visitor's privacy.
- Individual visitors can receive digital content according to his/her interest.
- Using data mining and simulation provided by CONSORTS, exhibition supports such as exhibition layout and marketing (human flow analysis) are provided.
- For marketing support, following info services may be provided: 1) assessment of visitors' interest in each of showpieces, 2) selection and delivery of contents depending upon the degree of interests, 3) prediction of crowding at different booths and aisles, and 4)

providing appropriate navigation guides to alleviate jam-up.

- The info services may help reducing manpower needed for hall steering extensively.
- The software is designed with adequate scalability and versatility, so that the selection of devices can be made in customized manner according to the nature of exhibition, saving the use of expensive tailor-made software and contributing to cost reduction for the operation.

The exhibition visitor support system has been completed through the combination of CONSORTS, software developed by ITRI-AIST for integrating diverse sensory and user devices, with a wireless tag system MEGRAS developed by TOTOKU.

The present system will be verified for its practical applicability by providing voice, character, and image content delivery service, marketing and other exhibition support services for Aichi Expo 2005 Global House.

The subsequent efforts will be concentrated in expanding the application field of the system to various public facilities, commercial establishments, road traffic and other public spaces, upgrading efficiency in production lines in factories, and in software packaging for the ubiquitous computing society.

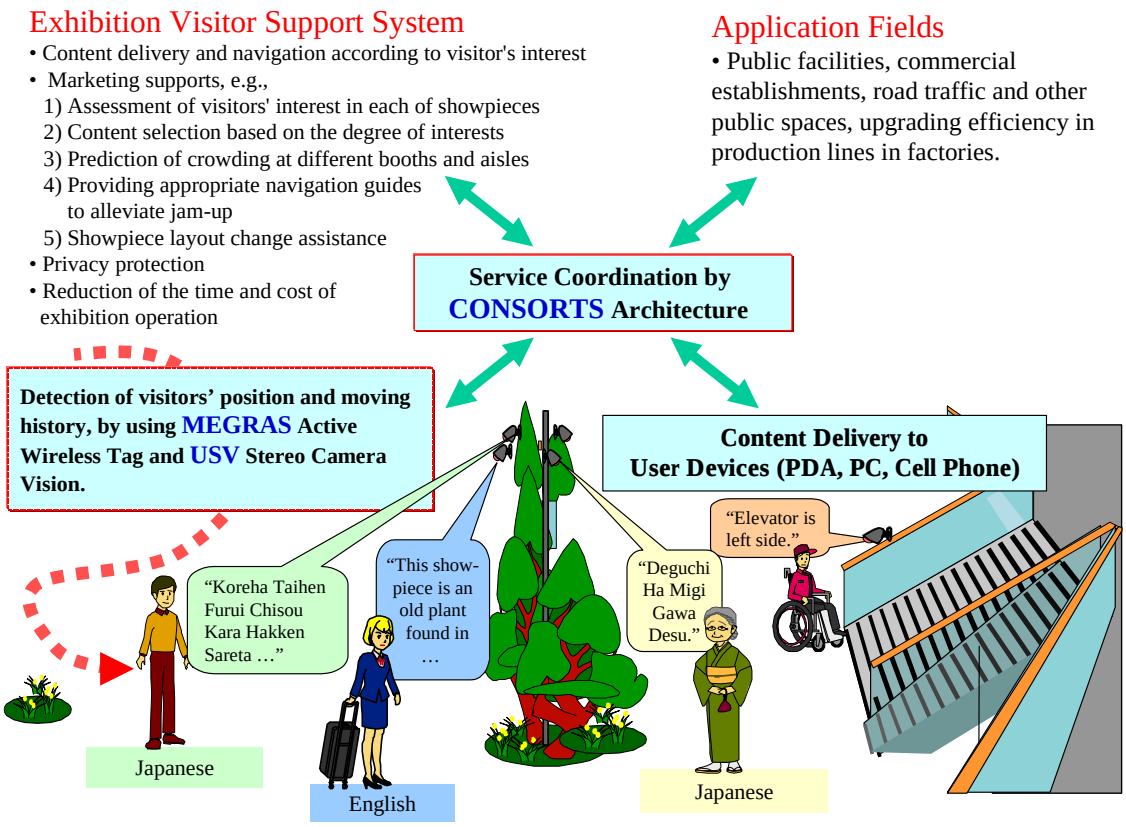

Fig. 1. A concept diagram of exhibition visitor support system

Background

In the ubiquitous computing society to be realized in near future, it is expected that the various info services will be made available by using diverse user devices, such as wireless tag, mobile phone, portable digital assistance (PDA), and so on.

It is essential in such ubiquitous computing society 1) to find out services you need and to make full use of them by flexibly combining them; and 2) to enjoy the best suited services for individuals in local point of view and to optimize the overall system operation.

The ITRI-AIST has been engaged in R&D of multi-agent architecture (for overall design of info system), where various software agents are working in a distributed manner for info processing in public spaces.

The multi-agent architecture, CONSORTS, underlying the present exhibition visitor support system, was awarded with the second prize in the International Convention[1] on Agent Technology in 2003. It is expected that the software technology developed by the ITRI-AIST will play a central role in the flow of international standardization for agent technology.

The system can detect visitors' location in the hall without infringing his/her privacy with an accuracy of 1~10 m, to acquire movement tracking data for individual visitors. Data mining is executed for the human flow information based on these data, to create a numerical model named "visitor model". The visitor model and the human behavior simulation based on it will make it possible to assess the degree of visitor's interest, to select contents, to predict jam-up and give navigation guide, and to support the exhibition layout design.

Owing to these features, a visitor with a single-round ID can enjoy info services with voice, character, and image guides for showpieces and hall navigation by simply standing in front of an exhibit, without infringing his/her privacy and complicated operation such as entering codes.

For exhibition managers, the system will provide such advantages as assessing visitors' degree of interest for each of showpieces on the basis of data mining and simulation for human flow info, supporting contents selection and showpiece layout change, hall navigation to alleviate congestion by creating a guidance program to prevent visitors from concentrating at a particular site, and if necessary, assisting the exhibition layout design.

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[1] Agentcities iD3 Worldwide Agent Technology Competition, EU Agentcities.NET Project, Second Prize in Applications Category, February 6, 2003 (Barcelona, Spain), hosted by EU Agentcities.NET Project.