INNOVATION ON M2M COMMUNICATION SYS-TEMS FOR FUTURE SMART COMMUNITY

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Aging of population, energy waste, disaster, etc., there are so many subjects to be addressed and resolved by the community to protect the life of resident. Although there are some differences, this is the fact for all communities on the globe. In these days, Information and Communication Technologies (ICT) is widely recognised as a powerful tool to establish a solution and the smart community becomes an active area of research. But the smart community was not the main concept from the beginning. A local electricity distribution network or a home electricity system was a target system where ICT was applied to improve the energy efficiency. Soon, the scope of target system has been extended in the sense of energy variety and system dimension. Finally, the smart community concept appears to cover the wider subjects as described above.

A machine-to-machine (M2M) communication system is one of key players in ICT for the smart community. M2M communication system provides a mean to relay the data from a variety of sensors to a server under the effective and promised way. Based on the past wireless data communication technology research, we have studied M2M communication system involving a wireless link for the last several years. The wireless M2M communication system provides flexibility in the system design, especially when it is deployed into an existing environment. European R&D Project, 3e-Houses, will be an example of such study. 3e-Houses is a regional collaborative project with the main goal to involve customers in the energy system through ICT, allowing them to develop or enhance their relationship with the utility for saving energy. This will be achieved by piloting, in many social housing buildings, the interaction between smart devices and the users (being tenants, promoters and utilities) to create, initially, awareness around their energy consumption and therefore a change in their energy-use behaviour. For this purpose, a wireless M2M communication system for a home energy management was designed and operated in a stable state for more than one year to collect data from local residential homes. The system design and early result of the on-going project will be presented. That provides many insights to us on the requirement of wireless M2M communication system even for a future smart community.

Further, important technical subjects on future M2M communication system will be discussed by including results from our other research toward the total energy innovation.

In 1988, Mr. Baba has joined Toshiba R&D Center after receiving MEng. from Osaka University, Japan. In Toshiba R&D Center, he engaged in the research on optical communication systems, the Internet systems, wireless VOIP systems and so on. He was a visiting researcher at University of Pennsylvania, PA, USA from 1996 to 1997. After moving to the Telecommunications Research Laboratory, Toshiba Research Europe Ltd. in Bristol, UK in 2012, he engages in the research on the M2M communication system for future smart community and the future wireless communication system as Deputy Managing Director.

He received The Young Researchers' Award of IEICE in 1995. He is a Member of IEICE.