

Title	ホームネットワークにおけるプッシュ型情報のユーザへの提示方法に関する研究
Author(s)	福田, 隆弘
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Research on user-notification methods for push type information in home networks

Fukuda Takahiro (0610075)

School of Information Science,
Japan Advanced Institute of Science and Technology

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With the rapid prevalence of home appliances that can be networked, more and more home networks are being constructed. As the availability of Internet connection become ordinary for common families, people living inside their homes are able to acquire information conveniently from outside. But when a user uses his home appliances, different home appliances will have different operations, even if they provide the same service. Moreover, usually it is necessary to operate two or more home appliances so that the user can win his end. If there is an interface to control multiple home appliances together, then the user will always perform the same operations, thus he may be able to win his end even if the home appliances that actually work are different. We propose the user notification system for push type information as one example of such kind of applications.

In this research, we focus on the user notification system for push type information, which uses the home appliances connected with the home network as information display devices. In this system, push type information is used as the form of information to be notified to the user. By "push type", we mean the form of notification information that is one-sidedly transmitted from the information origin to the user. For example, the urgent alarm signals for earthquake and the task-finish notification signal of a washing machine are different kinds of push type information. To notify

the user such kind of information, special display devices were used in earlier systems. And to make the user informed in time, many such display devices were needed in previous methods. Here in our system, a user will use only one home appliance nearby him as the display device, and he will be able to get the information promptly.

As for the implementation method, the information origin will not directly operate the home appliances that are used as display devices. Instead, the push type information will be transmitted to the management server of the proposed system, and the server will manage to operate the home appliances according to the content of push type information. The push type information sent to the management server will be in the form of various protocols, which are decided by the original information generators. The management server will convert the push type information of different protocol forms into push type information in unified form. When the system manages a home appliance used as a display device, the home appliance will be operated according to the content of push type information in unified form. The advantage of using push type information in unified form is that, by converting push type information in different protocol forms into common form information, the home appliances used as display devices can be conveniently controlled in a generalized fashion.

This research presented the push type information reception-conversion function, the display device operation function, and the control function as the mechanism of the management server. The push type information reception-conversion function is a function to convert push type information of various forms generated from the original information sender into push type information in a unified form. The display device operation function is a function to operate the home appliances that present the information to users based on the content of unified form push type information. The control function is a function to manage the push type information reception-conversion function, the display device operation function, and information of the home appliances as display devices.

As a method to evaluate the proposed system, we compared the system that used push type information in unified form with the system of push type information in one to one form. The system of one to one form is a system in which push type information is not converted into the uni-

fied form, while the push type information reception conversion function and the display device operation function support only one protocol. On comparison of the necessary amount of code and number of functions for development, the amount of development efforts of the system with one to one form is less if the number of supported protocols is one, but the amount of development efforts of the system with unified form is less when the number of supported protocols is plural. For the difficulty of the addition and deletion of the home appliances used as display devices, if the user notification system for push type information supports two or more protocols, then the system modification will not be easy for those in one to one form.

In summary, this research proposed the push type information notification system as a special design of user notification system that utilizes the home network technologies. For future work in using home appliances as information presentation equipments, we will further consider about to what extent can the detailed content be informed and how the user can recognize the emergency of urgent information.