C-Y. Tai, Y-L. Hsu, K-W. Chang, L-F. Chang, K-T. Xie. ***Development of a smart living IoT (Internet of Things) information structure.*** *Gerontechnology 2016;15(suppl):25s*; doi:10.4017/gt.2016.15.s.919.00 **Purpose** There are increasingly more Internet of Things (IoT) products in the market. Smart living is an important IoT application. In particular, IoT provides new possibilities and opportunities to assist daily lives of older adults. For example, Ray presented an H^{3}IoT architectural framework for monitoring health of older adults[1]. This research provides a home health hub to collect different kinds of physiological activities by sophisticated biosensors. A gateway is needed for transmitting sensor data. Furthermore, H^{3}IoT only displays information but does not control another end device. This paper presents the development of a smart living information structure which integrates IoT technologies into housewares as individual products. To increase acceptance of IoT products to older adults, we emphasize on designing the housewares older adults are familiar with into IoT products. The Wi-Fi access point, which is commonly used in almost every household, is the only infrastructure needed. Machine to machine (M2M) communication is also achieved in this structure. **Method** *Figure 1* shows the Body-Cerebellar-Brain (BCB) IoT information structure developed in this research. 'Body' refers to housewares, includes mattress, bed-frame, carpet, seat cushion, etc. Instead of adding additional electronic components, the housewares are designed into sensors. 'Cerebellar' refers to micro-controller built in the housewares which deals with I/O of sensor data and communication between brain and body in remote and local application. 'Brain' is in charge of data analysis and decision. In this structure, customization can easily be done by modifying the program in 'Brain' without changing the hardware. Smart device is used as the user interface for displaying daily information, notifying users when events are issued, and gateway of posting events to Facebook. The M2M communication protocol, MQTT, is implemented in 'Brain' and 'Cerebellar' to enable direct communication between devices. Comparing with existing IoT standard structures, BCB further achieves local application based on Bluetooth Low Energy (BLE). Its low power consumption provides a possibility to make portable IoT devices. **Results & Discussion** BCB information structure is already implemented in a series of smart living products named 'Whiz-Housewares'. For instance, 'WhizPAD' is a comfortable mattress capable of motion sensing. The micro-controller in WhizPAD transmits motion sensing data to the cloud server via Wi-Fi. By analysing motion sensing data in the cloud server, users can obtain real-time motion, sleep report, leave-bed events in their smart device app. The WhizPAD can also control lights or air conditioner according to the sleep condition of the user. For local application example, WhizSEAT, a portable motion sensing cushion, synchronizes data to smart device via BLE, then upload the data to the cloud server or social network. Smart device is a user interface and also a gateway for data transmitting in local applications. Modularizing the components and sharing the same structure across different products also reduce the development cost and time. Field trials in senior housing and nursing homes are planned to further verify the reliability and acceptance of the system.

Reference

1. Ray PP. Home Health Hub Internet of Things (H 3 IoT): An architectural framework for monitoring health of elderly people. International Conference on Science Engineering and Management Research 2014; doi:10.1109/ICSEMR.2014.7043542

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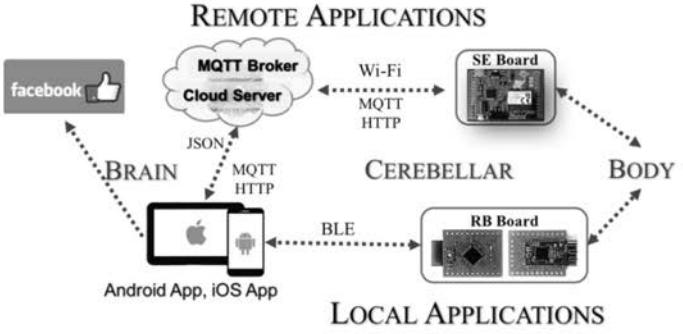

Figure 1. Body-Cerebellar-Brain information structure