Abstract

Knowledge Sharing in Agriculture Using IoE: Using Smart Voice Messaging System to Convey Awareness and its Validation

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In the Japanese agriculture industry, the decrease in the number of agricultural workers and the aging of the population have become serious problems. As a result, the shortage of successors is becoming more serious, and it is feared that the skills of skilled farmers will be lost without being transferred. In response to this problem, smart agriculture is being promoted in Japan, and efforts are being recommended to realize a new type of agriculture in which farmers' know-how can be easily collected and smoothly acquired.

Many studies have tried to visualize the know-how of skilled farmers by using physical sensors. However, physical sensors alone are insufficient to reveal the know-how of experts on crop conditions and work methods. Therefore, we are using Smart Voice Messaging System to extract agricultural know-how from farmers' perceptions, which we believe will lead to knowledge sharing. Smart Voice Messaging System is capable of recording, taking, and sharing voice and photo data, as well as converting the data into text by voice recognition and capturing the location of the message by GPS. The system can record, take, and share voice and photo data, and can also convert the data into text by voice recognition and track the location of the message by GPS. The system can also collect and recognize farm workers' awareness by voice, and share it with other farmers in quasi-real time.

In this study, we examine effective awareness and its transmission in knowledge sharing using Smart Voice Messaging System. First, we interviewed 11 farmers to understand the current situation and issues in agriculture. In agriculture, there are difficulties in unifying standards due to differences in cultivation methods, climate, and soil conditions. Farming is not manualized and is handed down by word of mouth. In many cases, there are no records of farm work. Even when records are kept, they are not shared with others.

Then, we conducted a trial experiment using Smart Voice Messaging System for three months with the cooperation of four farmers: an experienced farmer, a mid-career farmer, and a young farmer. We evaluated the effectiveness of the system by interviewing 449 messages. As a result, we confirmed the effectiveness of messaging in increasing the amount

of information for communication and recording, expressing judgments and intentions, and visualizing gaps in knowledge. Based on the results, we propose an operational method of this system for knowledge sharing.