

Comparison of the Effects of Perceived Usefulness Factors of Korean Smart Farm on Farmers' Technology Acceptance Intention and Non-farmers' Rural Entrepreneurial Intention

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Abstract

Globally, ICT convergence technology is spreading and applied to various industries and societies. In the case of Korea, interest in the spread of smart farms and rural start-ups is high as a means to solve various agricultural challenges such as aging of rural areas, shortage of labor, reduction of arable land, abnormal climate, and price instability of agricultural products.

The purpose of this paper is to find implications for different smart farm recipients by comparing the results of two studies targeting farmers and non-farmers. Study A looked at the factors affecting the farmers' intention to accept smart farms technology in terms of the perceived usefulness of smart farms. In addition, Study B examined the factors affecting the non-farmers' intention to start a rural business using smart farms in terms of perceived usefulness.

Each survey was conducted on 203 farmers who are actually engaged in agriculture and 296 general adults over the age of 20. And the data were analyzed using SPSS v22.0. As research methods, exploratory factor analysis and multiple regression analysis were performed. As independent variables of Study A and Study B, availability, reliability, and economic efficiency, which are used as representative perceived usefulness factors in information technology and information systems, were selected as perceived usefulness factors of smart farms. In Study A, the effect on technology acceptance intention, which is a dependent variable, was analyzed, and in Study B, the effect on the intention to start a rural business using smart farm, a dependent variable, was analyzed.

As a result of Study A, it was found that availability and economic efficiency of smart farms had a positive (+) effect on farmers' acceptance intention and reliability did not affect acceptance intention. On the other hand, as a result of Study B, it was found that the reliability and economic efficiency of smart farms had a positive (+) effect on non-farmers' rural entrepreneurial intention using smart farm.

The order of the magnitude of the influence on the dependent variable was also different. In Study A, the magnitude of the influence on the intention of farmers to accept smart farms was found in the order of availability and economic efficiency. On the other hand, in Study B, the magnitude of the influence on the non-farmers' rural entrepreneurial intention using smart farms was found in the order of economic efficiency and reliability.

The implications of these results are as follows.

First, the more farmers believe that smart farm technology can always be used in relation to crop cultivation and the performance of functions is stable, rather than the belief or importance of the data and information provided by the smart farm, the higher the willingness to introduce the smart farm.

Second, in the case of non-farmers, the availability of smart farms did not have a positive (+) effect on the intention to start a rural business, which is contrary to the positive (+) effect on the intention to accept the technology in the case of farmers. These results show that, in the case of farmers who have tacit knowledge about crop cultivation, the belief they can use smart farm technology and function performance freely has a positive effect on acceptance intention. On the other hand, in the case of ordinary people, no matter how freely they can use smart farm technology and function, they lack cultivation-related knowledge on their own, so it can be interpreted negatively to start a business in rural areas using smart farms.

Third, in the case of non-farmers, it was found that reliability had a positive (+) effect on the intention to start a smart farm rural business. It can be seen that the higher the level of trust in the cultivation environment and growth-related data and information provided by the smart farm, the more positively it affects the will to start a business using the smart farm.

Fourth, it is common to both farmers and non-farmers that the willingness to introduce a smart farm or start a business using it increases when the economic effects such as cost reduction or profitability improvement to be gained by introducing a smart farm become clear.

The results of this study have significance in that we devised and empirically revealed factors affecting technology acceptance intention or rural entrepreneurship intention from the perspective of perceived usefulness of smart farms, away from past studies of general factors such as internal personal characteristics and external environmental factors. It is expected that the research results and implications can be used in establishing differentiated policies for different potential users of smart farms, and in smart farm education and support programs.

Keywords—smart farm, perceived usefulness, technology acceptance intention, entrepreneurial intention