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Innovation For Strengthening Food Independence Using Information Technology

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ABSTRACT

Food independence is the ability of the state and nation to produce diverse foods from within the country that can guarantee the fulfillment of sufficient food needs to the individual level by utilizing the potential of natural resources, human, social, economic, and local wisdom with dignity. National food security is a strategic issue for Indonesia, various government policies have been carried out to overcome the problem of food availability, one of which is through the implementation of Industry 4.0 in the agricultural sector, farmers can use information technology to find out various information about agriculture, good crop cultivation to the way overcome and overcome various types of plant problems. In addition to farmers, information technology can also be used by agricultural extension workers to provide technical guidance and share information about agriculture without having to go directly to the field, it can increase the empowerment of farmers through preparing agricultural information that is timely and relevant to support the decision making process of farming so that it can increase the productivity of independence and food security.

Keywords : Farmers, food security, information technology

1. INTRODUCTION

Food independence is the ability of the state and nation to produce diverse foods from within the country that can guarantee the fulfillment of sufficient food needs up to the individual level by utilizing the potential of natural resources, human, social, economic, and local wisdom with dignity [2]. National food security is a strategic issue for Indonesia and efforts to strengthen food security cannot be separated from the handling of food insecurity because food insecurity can be a cause of food security instability. Food security not only includes the notion of adequate food availability, but also the ability to access including buying food and not having food dependence on any party. Farmers have a strategic position in food security. Farmers must have the ability to produce food while also having sufficient income to meet family food needs [6].

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Various government policies have been taken to overcome the problem of food availability. Food Policy and Strategy 2010-2014 which mentions the development of food diversification and strengthening food security through a comprehensive approach that is by ensuring the availability of food based on domestic production, increasing productivity, modern agriculture by using technology that is efficient, environmentally friendly and sustainable. The above policy has implicitly led to efforts to strengthen food security based on independence and diversification of domestic food production, and the creation of a conducive farming climate, as well as maintaining sustainable agricultural development [4]. Now through the implementation of Industry 4.0 in the agriculture sector, it is hoped that the farming process will become more efficient. Minister of Agriculture Andi Amran Sulaiman in the news on the page economy.okezone.com said that to support the 4.0 industrial revolution, the upcoming agriculture sector is experimenting with new business models and innovations, namely: precision farming, vertical farming, smart farming . Big data, sensors and drones, analysis tools, internet agriculture and Alsintan automation are some of the technologies that support Industry 4.0. Utilization of the Internet of Thing in Internet Agriculture is to connect objects around us with the internet through smartphones and other gadgets. On the news page also mentioned, Balitangtan launched a technology developed by a combination of cloud computing technology with mobile internet, namely: UPJA Smart Mobile and Sapa Mektan [11].

UPJA Smart Mobile is an android application that is used to conduct land processing services, irrigation services, rice planting services, rice harvesting services, rice milling services, seed selling services, grain selling services, training services for alsintan operators, maintenance and repair of alsintan, and alsintan spare parts sales services. Meanwhile, Sapa Mektan is a web-based android and web-based Alsintan testing administration application used at the BBP Mektan Testing Laboratory [11].Utilization of the use of information technology that focuses on Android to support the industrial revolution 4.0 in the agricultural sector has also been implemented by the Department of Agriculture and Forestry in Karimun District by creating a new idea that is an Android-based system [9]. the Office of Agriculture in the Province of West Java Province makes food applications m-farmers [8]. the Department of Agriculture and Food Crops in the Regency of Grobogan made an Android-based digitalization program, and others [5].

2. LITERATURE REVIEW

2.1 Prior Research

This research is a development of the Dissertation with the title Farmer Behavior in Achieving Household Food Security in Bangkalan Madura District by Hamidah Hendrarini in 2018. Fundamental conclusions and suggestions from the results of the study are the role

of government is needed by farmers both socially and technically for farmers who are still productive [6]. These things can be realized in various ways, one of which is by utilizing the use of information technology as implemented by the Agriculture and Forestry Service Office of Karimun District to create new ideas using the Android-based system, the Agriculture Service Office of West Java Province makes the application of m-farmers , The Department of Agriculture and Food Crops in the Regency of Grobogan made an Android-based digitalization program, and others.

2.2 Android

Android is an operating system and programming platform developed by Google for smartphones and other mobile devices such as tablets. It can run on many different devices from many different manufacturers. Android includes a software development kit for writing original code and assembling software modules to create apps for Android users. It also provides a marketplace to distribute apps. All together, Android represents an ecosystem for mobile apps [10]. The following are the reasons why in this study using Android as a medium for Information Technology [7]:
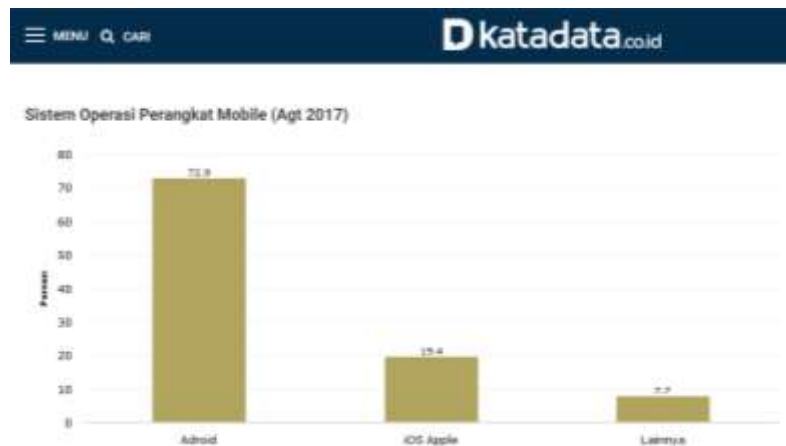

Figure 1. Operating System User Survey

From the picture above it can be seen that 72.9% android users while Apple iOS users19.4% and the remaining 7.7%.

2.3 Information Technology Devices

According to a survey report of the Indonesian Internet Service Providers Association it is known that the most information technology devices used to access the internet are using a smartphone or personal tablet [1].
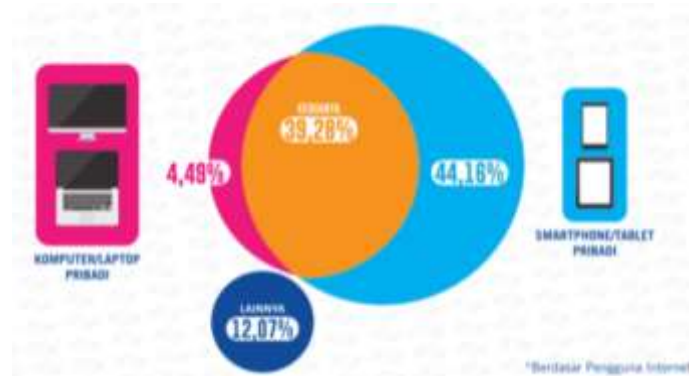
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Figure 2. Survey of Information Technology Devices

From Figure 3 it can be seen that the most information technology devices used to access the internet are using a smart phone or personal tablet that is as much as 44.16% then personal computers or laptops are 4.49% while both users are 39.28% with the remaining 12.07 %.

3. METHOD

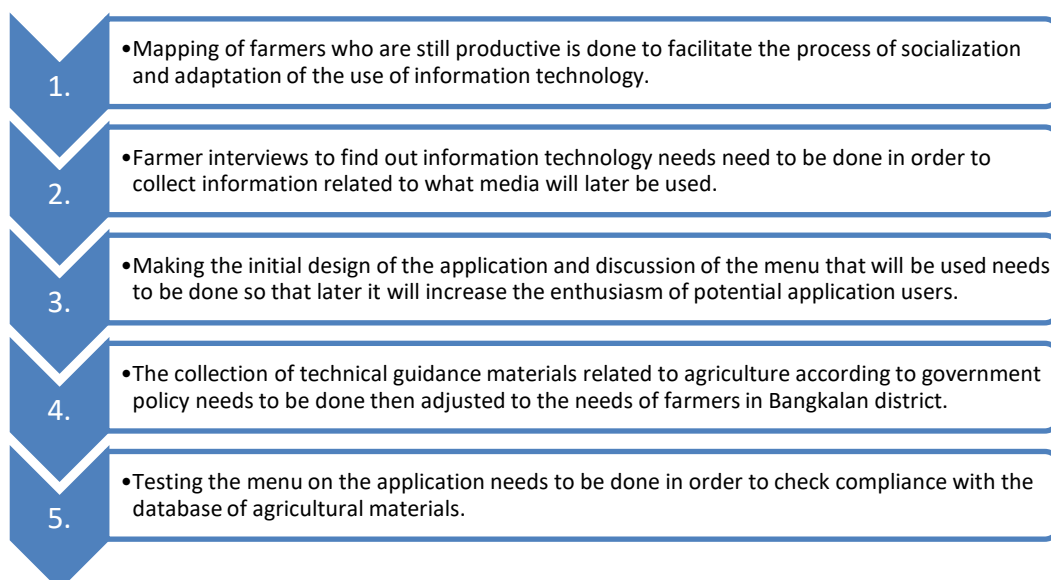Method stages for strengthening food independence by utilizing information technology. are as follows:

1. •Mapping of farmers who are still productive is done to facilitate the process of socialization and adaptation of the use of information technology.

2. •Farmer interviews to find out information technology needs need to be done in order to collect information related to what media will later be used.

3. •Making the initial design of the application and discussion of the menu that will be used needs to be done so that later it will increase the enthusiasm of potential application users.

4. •The collection of technical guidance materials related to agriculture according to government policy needs to be done then adjusted to the needs of farmers in Bangkalan district.

5. •Testing the menu on the application needs to be done in order to check compliance with the database of agricultural materials.

Figure 3. Method Stages

4. RESULTS AND DISCUSSION

Based on this discussion, an application was made as a means of developing farmers' behavior in realizing the following information technology-based food security:
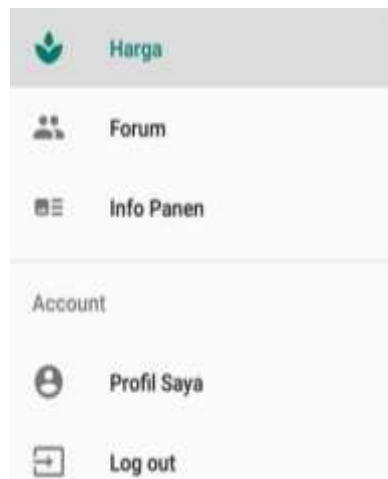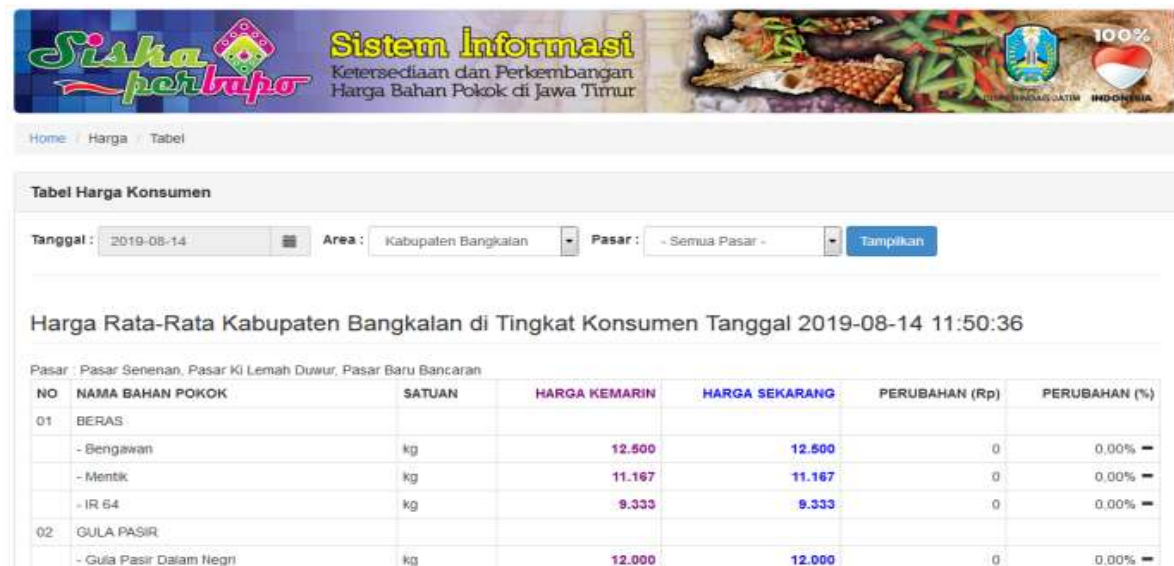

Figure 4. Application Menu

Click on the price menu, the display will display information on the name of agricultural products along with the latest market prices that are directly connected to the Government's price policy information website [3].

Figure 5. Price Information

Click on the harvest info menu, it will display information on the current harvest season for agricultural products.

Figure 6. Harvest Information

Click on the forum menu, a discussion room will appear among registered members of the application to be able to share knowledge and experiences about agriculture and food security improvement. In addition to discussion, in the forum menu can also exchange pictures and videos which is certainly very useful as a means of practice and counseling.

Figure 7. Discussion Forum

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5. CONCLUSION

Strengthening food technology-based food independence has been realized in the form of android-based applications to find out various information about agriculture, good crop cultivation to how to overcome and overcome various types of plant problems. In addition to farmers, information technology can also be used by agricultural extension workers to provide technical guidance and share information about agriculture without having to go directly to the field, it can increase the empowerment of farmers through the preparation of agricultural information that is timely and relevant to support the decision making process of farming so as to increase food productivity and independence. The next step is to conduct an implementation study after the application is officially used and assess the effectiveness of changes in farmers' behavior in realizing food technology-based food independence.

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