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## Samahan ng Magsasaka Santa Rosa Laguna Portal

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**Abstract:** Farming is known to be the oldest profession in human history and Philippines is known as an agricultural country, rich with natural resources. Most people support themselves through agriculture, especially the people living in rural areas. Rice farmers face challenges in producing quality rice crops due to factors such as climate change that can alter patterns of tropical storm. They need weather updates such as wind velocity and humidity to enable them to make decisions. Another challenge for them is being able to sell their produce directly to the rice millers or the customers in order to maximize their profit. The objective of the study is to develop a portal for the Samahan ng Magsasaka Santa Rosa Laguna (SMSRL) and the City of Agriculture (CAO) Office of Santa Rosa to assist the farmers by providing a fast and easily accessible way of viewing weather conditions and forecasts and provide a platform where rice farmers can sell their produce and have direct contact with their customers. The methodology used in this study is the Rapid Application Methodology since the users of the system are not exposed to modern technology. It would be a great opportunity for them to check the system at each stage so that the researchers could build a system that is more suitable for them. Both farmers and the CAO staff are satisfied with the system since they can store and access up-to-date information and connect with the customers through the portal. The R.S.S. updates feature addresses the problem related to bad weather which ruins the quality of their products. Dark Sky API was used for gathering the weather information. With the help of this feature, it allows the rice farmers to see if there is an extremity in the weather which will ruin their crops. Integrating an SMS feature for weather updates will make it better for the farmers.

**Key Words:** rice farmers; portal; weather updates; ecommerce; information and communication technology (ICT)

### 1. INTRODUCTION

Farming is known to be one of the oldest

professions in human history and can be found almost anywhere in the world. The Philippines is known as an agricultural country, rich with natural resources.



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Most people support themselves through agriculture, especially the people living in rural areas. With the advancements in information and communication technology (ICT), farming has also advanced with technology to provide better harvest through improved farming techniques and equipment. However, the Philippines has yet to adapt to the continuous changes of technology in farming and faces certain challenges that lead them to have less harvest and ultimately less income. For the past years, use of ICT in agriculture has become prevalent. For example, there are websites and apps that allow farmers to access agri-related information and even simple record keeping, among others. In his 2019 article, Tallada said that the challenges rice farmers are facing are climate change, shrinking farmlands that put greater pressures to produce more rice at even lower farm gate prices and the increasing number of high intensity typhoons. (Tallada, 2019). He also said that ICT can greatly improve production and economic efficiencies such as improving decision making in crop care and getting better marketing arrangements. Some of the technologies include Philippine Rice Information System (PRISM) that monitors the intensity and scale of rice production and Rice Crop Management (RCM) that provides rice crop recommendation such as fertilizer, crop health and water management. There are also mobile applications like AgriDoc and eWeeds but nothing was mentioned about providing weather updates. Since the signing of the Agriculture and Fisheries Modernization Act of the Philippines in 1997, efforts have been made to provide information to farmers such as the DA's Agricultural Training Institute e-learning platform and a web-based agriculture and fisheries market information system (Bagaforo, 2017).

According to an IRRI specialist, "ICT can provide rice farmers access to accurate, relevant, and timely information that can help improve their productivity" (n.a., 2015). In his 2012 study, Adegbidi et al. said that traders behave as opportunists due to lack of or no access to information on the quantity and quality of produce being traded (Adegbidi, 2015). Kiplang in Das (2016) noted the importance of relevant information reaching the farming communities at the right time. It can help the farmers

make decisions on the market and the effective adoption of agricultural inputs (Das, 2016).

In his 2011 study, Aker said that the use of ICTs in mobile phone services in the agricultural sector has provided information such as weather, market, and agricultural techniques for rural farmers. The use of mobile phones has defined a new approach in providing information to the farmers helping them make better farming decisions. He also compared farmers who had no access to mobile phones to those with access. Those without access are more likely to have more problems in terms of getting information regarding market (Aker, 2011).

Another study by Chhachhar et. al. in 2013 indicated that more farmers are using mobile phones and has led them in getting access to marketing, weather and business information. It may now be possible for farmers to directly contact market brokers to sell their product. This would also include an avenue for farmers to search and focus on useful and up-to-date market information from social and business networks. Mobile phones can now be a powerful tool in providing basic information about agriculture. The importance of accessible, accurate and timely information would greatly benefit and enhance the livelihood of the farmer (Chhachhar et. al, 2013).

Rich Site Summary (RSS) feed allows both users and applications to access constantly updated online information. Though RSS is one of the older ways of getting information, it is one of the most efficient since it allows one to view different updates from different websites in a single list without having to go through every single website (Lacoma, 2016).

The City of Santa Rosa, Laguna is known for its agricultural farmlands that produces rice as their main product. The rice farmers interviewed were part of the Samahan ng Magsasaka ng Santa Rosa Laguna (SMSRL) which is basically a group formed by all the farmers in the city and they work together with the City Agriculture Office (CAO). According to the farmers, they need up-to-date weather information such as wind gustiness, humidity and temperature in order to make better decisions that can help in rice



crop production. CAO, on the other hand, need to gather data from the different farmers so that they can generate and submit to Department of Agriculture (DOA) the needed reports such as the expected produce and actual yield of produce (including the harvested crops and withered crops), sales report and damage report. During one of the interviews, the farmers said that they rely on TV or radio news for weather updates or sometimes, rely on their gut feel to determine if they must harvest the crops already. Up-to-date or real time weather update is not readily available for the farmers. In selling their crops, they are very dependent on the middleman since they need to be able to sell their crops (including the withered crops) the soonest possible time.

The objective of the study is to develop a portal for the City of Agriculture Office of Sta. Rosa and SMSRL to assist the head farmers by providing a fast and accessible way for the farmer to view weather conditions and forecasts and alert his group, provide a platform where rice farmers can sell their produce and have direct contact with their customers; and for the CAO staff to generate needed reports by the DOA. The scope of the study will be on the recording of the needed information by the farmers such as setting the season for planting rice up to crop produce and harvest and selling to customers by allowing customers to order through the website. It will not include an integrated payment system since farmers transact on a cash basis. Dark Sky API was used for gathering the weather information. The system is not yet deployed since there is another project on SMS information gateway that needs to be integrated to this project so that the farmers can get weather updates through SMS instead of the portal wherein the head farmer is the one who can access weather updates and disseminate among his farmers through SMS.

## 2. METHODOLOGY

The methodology used in this study is the Rapid Application Methodology (Figure 1) since the users of the system are not exposed to modern technology. It would be a great opportunity for users to check the system from each stage so that the

researchers could build a system that is more suitable for them. It has four phases as follows: requirements planning to define scope and business requirements, user design, construction, and implementation/cutover (casemaker.com, 2007). During the Requirements Planning phase, interviews were the primary method of the researchers to identify the problems and determine and agree on the system's scope and objectives. The information gathered was used to finalize the conceptual framework (Figure 2). The next phase is the User Design phase where the farmers and CDO staff worked with the developers in building the system. User stories, program specifications and user interface design are some of the outputs for this phase. The third phase is the Construction phase. The progress of each prototype was done in iterative cycles to complete the modules of the system. Once the modules are complete, testing was done to examine the functionality of the system. The last phase is the Cutover phase wherein the user acceptance testing was conducted. However, implementation was not included but User's Manual and Training plan were prepared for the users.

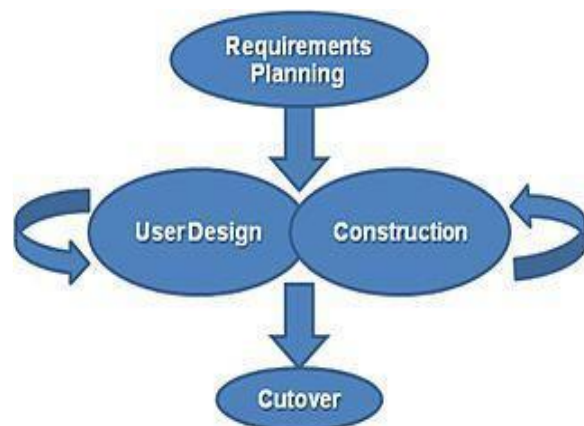


Figure 1: Rapid Application Development (RAD)

## 3. RESULTS AND DISCUSSION

Based on the data gathered and interviews conducted, the rice farmers experience is that the middleman or trader reduces their product profit.



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They cannot directly sell to the mill owners since they rely on the “suki” system wherein the middleman will buy even the withered crops from the rice farmers. For the CDO side, there is no centralized system to organize agriculture-related information about the farmers that resulted to delay in preparing the DOA reports. When it comes to the rice crops, failure to avoid or prepare for bad weather affects the product quality. Through the portal, the farmers can upload the information about their crops such as the volume and price and get up-to-date weather information. Likewise, buyers will be able to see the available crops and the prices and can order from several farmers. The proposed solution has two modules, namely, the e-commerce module and the information management module and the Rich Site Summary (R.S.S.) for up-to-date weather forecasts. Please refer to Figure 2 for the Conceptual Framework showing the sub-modules, problems and tools and techniques that were used in developing the system. The e-commerce module allows the rice farmer to gain direct contact with its customers. The information management module allows the farmers and the CDO staff to store and retrieve data from the database, this includes data like farmer’s farm information, harvest information during harvest seasons, order information, order history, sales data and damage reports. The RSS updates allow the rice farmers to see if there is an

extremity in the weather which will ruin their crops, this will help in planning early, if for example they need to harvest a little bit earlier or plant at a later time.

Upon logging into the system, the head farmer sees his homepage. Please refer to Figure 3 for the Farmer’s Homepage Screenshot. He has the option to add a new season, generate the plant report, add farmers and generate the damage report. He can also see annual graphs of the products he sold. He has the option to add the small farmers in his account. The information he needs from them is sent via text message and vice versa. Once he receives the information, the head farmer will update the records by encoding the information. As mentioned in the previous section, there is another group who came up with the SMS information gateway so that the

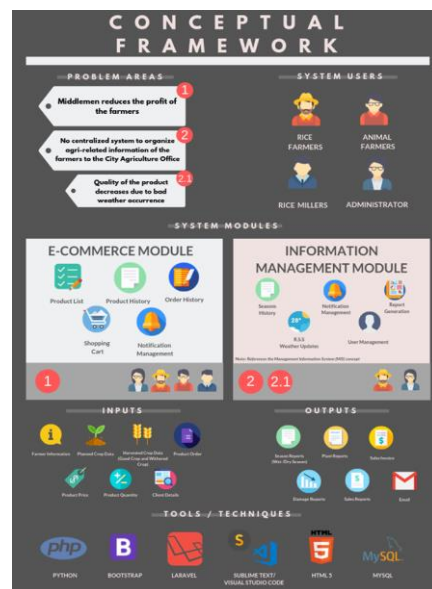


Figure 2: Conceptual Framework



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information can be sent to the system directly via SMS.

Sky. Different shading colors were used to alert the user if data is favorable or not. Refer to Figure 5 for the Weather Statistics Screenshot. It can also show detailed weather status that contain the essential information that will help the farmer make important decisions such as wind and humidity. Refer to Figure 6 for the screenshot.

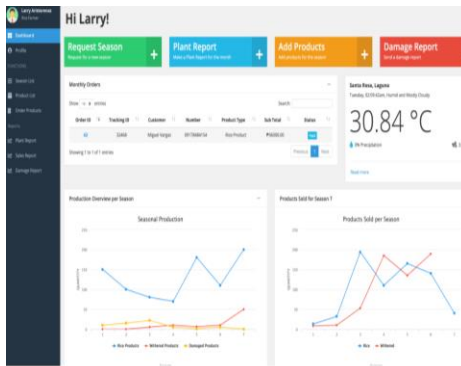


Figure 3: Farmer's Home Page

Since this will be deployed in the internet, millers/customers will be able to see the rice produce of the different farmers with corresponding prices so they can choose to whom they can place their orders. He can order from different farmers based on his requirements. Refer to Figure 4 for the screenshot of the Customer Page.

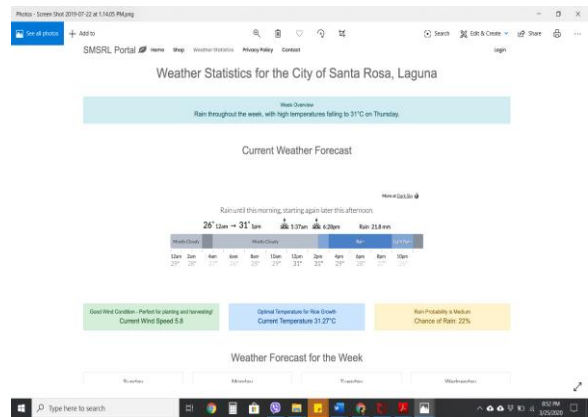


Figure 5: Weather Statistics for Santa Rosa Laguna

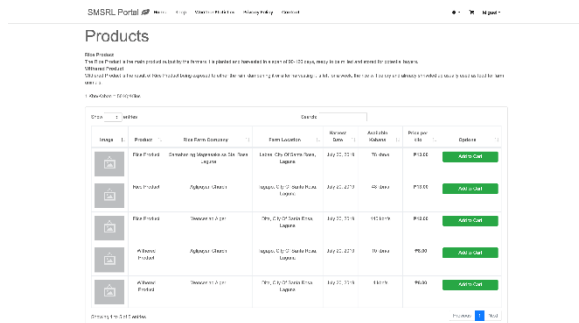


Figure 4: Customer Page

The portal can also display the weather statistics of the city for the current day using Dark



Figure 6: Detailed Weather Status

The system can consolidate the information from the different farmers in order to generate needed



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reports. Refer to Figure 7 for the sample consolidated report to be submitted to an external entity.

through the portal can help farmers in the delivery of their products.

REPUBLIC OF THE PHILIPPINES PHILIPPINE STATISTICS AUTHORITY															
DAMAGE ASSESSMENT REPORT FOR OTHER CROPS															
A. Geographic Information															
1. Region: REGION III - CALABARZON															
2. Province: Laguna															
C. Production															
# of Crop	Name of Crop	Number of Farms Affected	Area of Blasting (Ha)	Stage of Crop Development	Month of Use	Harvested Area (Ha)	Total Area (Ha)	Total Production (MT)	Partially Damaged (Ha)	Yield Before Blasting (MT)	Yield After Blasting (MT)	Yield Loss (MT)	Volume (MT)	Grand Total	Remarks
1	Rice	5	5	Reproductive	August	5	5.4	2.5	50	50	50	50	50	50	none

Figure 7: Damage Assessment Report

Based on the User Acceptance Testing (UAT) results from the CAO staff and farmer users, the General, User Interface, Security and Overall Functionalities averaged at 4.4, 4.4, 4.75, and 4.75 respectively. This shows that the system is functioning properly and efficiently and that it has met the expectations and the needs of the users.

#### 4. CONCLUSIONS

The SMSRL portal allows the farmers to get the relevant information about the weather such as wind, humidity and temperature in a timely manner thus enabling them to decide what to do with the crops like if they need to harvest earlier thus reducing the risk of ruining their crops. It also allows them to connect with the potential customers/rice millers and receive orders allowing them to earn a higher profit. It is recommended that the portal should be hosted by the City Agriculture Office Santa Rosa Laguna Municipality and the system administrator would come from the IT office of the municipality so that it can be integrated to the SMS information gateway project where the farmers can directly inquire about weather conditions through SMS. Another recommendation is a mobile application version so that more farmers can use the system. Partnering with logistics companies

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