



5.0 Proposed System

5.1 System Description

The proposed system is aimed to address the problems encountered by the organization. The system also aims to make the work of the MDO easier by providing visual presentation of vast amounts of farm data. As for the farmers, the system will also assist them in having constant communication with the MDO with regards to their concerns.

5.1.1 Data Acquisition Module

This module will focus on acquiring the needed data for analysis for the next module. For the mobile application, the farmer will be able to plot the area of their farm using the map so that they can determine how much is the actual area they have harvested and this data is synced to a common database and so the MDO can also see updates done by the farmers. This would later display how much percentage of the area has been harvested and is yet to be harvested. The farmers are also able to enter the amount of tons cane which they have given to the mills. The data sent by the farmer through mobile will update the weekly crop assessment.

If the farmer is unable to plot his own farm to get the area harvested, then the mill district officer will be the one plotting it using the mobile application. The data of the crop assessment is updated by the submission of production data by the farmers from their Quedan. The mill district officer can add a narrative or remarks to be used in the crop assessment report which is submitted weekly.

The MDO also conducts a quarterly survey using the mobile application to update the farmer and farm profile. The profile contains the farmer's basic information and the details of his farm/s. Details include soil ph, tillers, total area and other crop related information. All of these data will be used by the MDO to create an observation and comparison in the farmer recommendation module.

Whenever there are unforeseen scenarios like a typhoon, fire, drought or pest infestation that hits the district, the mill district officer can conduct an "emergency" or disaster survey which plots the area that has been affected by the scenario and can determine the amount of crops that have been damaged or destroyed. The mobile application is used for this disaster survey. The disaster survey also contains the photo of the damage in the area which can serve as a basis for the remarks that will inputted by the MDO. To have a better estimate for the damage report, the mobile application of the farmers will enable them to plot from the map the area that is damaged by the calamity.

For other related scenarios, the farmer can post in the forum using the mobile application the problems they are encountering and they can take a



photo for the MDO to validate the problem. Aside from problems, the farmer is also able to post recommendations to be viewed by other farmers.

5.1.2 Crop Estimate Module

For the pre-preliminary estimate, the data to be used for calculating the initial estimate will be historical data which is from previous crop years. For the following quarters of the crop season, the crop estimate will be adjusted on a weekly basis. The crop estimate and productivity will be based on the generated crop assessment reports, crop validation survey, and other factors such as weather and agronomic factors (e.g. rainfall, tiller count and average temperature). Crop estimate will be determined by the use of predictive model/s that can help derive to an acceptable forecast. The estimate will be for determining the production for the next year. The model will not change, instead the parameters adjusts in reference to the historical data.

Creating the model requires an expert for the suggestions and recommendations of models to be used that are critical to the proposed system. Constant communication with the expert is needed as this module is being developed. Models to be used in this system are regression models. Each of the models used in the system are continuously customized and tested until all the models can come up with reliable crop estimates. At least three (3) years' worth of data from the previous years is going to be used. Historical data will be needed in order for the model to work and check the consistency of the model's accuracy. That will be used to generate a real forecast. The required data can be gathered from SRA. The weather data to be used in the system during the actual operations are going to be gathered from PAG-ASA's forecast (Data Acquisition Module). Soil analysis data can be gathered from the farmer's profile. The parameters in the model used in the system will adapt based on the actual production being input. The actual production and estimates are used to create the weekly statistics report. The MDO is able to generate his forecasts for validation purposes. The forecasts can be updated when there are damage reports. There, the area affected will be reduced to the total area and will reflect to the production. Simulations can be seen and are considered as tests. The MDO can then select the forecast which will reflect in the crop assessment report if the crop estimate is to be updated. For the MDO, he will be using tons cane for the forecast while the board member uses LKG. The weekly statistics report is displayed to the board members to help in making decisions for the nationwide sugar allocation.

5.1.3 Programs, Farmer Recommendation and Assistance Module



The mill district officer can send farming recommendations to the farmers like irrigation, drainage and cultivation. The recommendations are either ones that aims to solve a problem or ones that are for improvement. Recommendations that are for improvement have durations and can be modified. These are dependent on the crop phases of the crop calendar. If the recommendation is aimed to solve a problem, the MDO will select the problem/s to be solved by that recommendation. The MDO can also create a new recommendation and can choose whether the recommendation will be aimed at solving a problem or for improvement. The details include the farm's productivity, farmer profile and agronomic practices used in each farm. These recommendations are sent by the MDO and then once approved, it can be viewed by the farmers from their mobile application. These farm data are shown via the comparison page where the MDO can select different tags (e.g. area, barangay, etc.) to filter the farms with similar characteristics. There the MDO can create a comparison from the selected farms and see the differences and similarities. The MDO can also view the similar problems and recommendations that the similar farms have. Afterwards, the MDO can send recommendations or report problem for the farms he has selected in his comparison.

Programs sub Module

A submodule would consist of the programs and projects, the board members can see in the homepage the weekly production for the different regions nationwide as well as the ongoing programs. The weekly production data is generated into a weekly statistics report for the nationwide production. The board member can view and update the program by editing the actual values of the performance indicators which reflect in the annual targets. For creating a program, the board members can select the type of program and the duration. The board member can also select the problems that the program will be aiming to solve. Afterwards, the performance indicators or objectives will be set with annual targets based on the duration set earlier. The progress can also be seen and is updated every time the performance indicator values are edited. The system would be able to record the difference and improvement in productivity from before, during and after the program has been implemented. Based on this, the board members could decide whether to keep the program or update it.

Assistance sub Module

The mill district officer can send weather updates to the farmers and notifying if there would be a possible typhoon and that the MDO can also



recommend the farmers to harvest the remaining crop. The farmer will be notified from the mobile application and can decide whether to harvest the crop if needed. Additional updates can also be given to the farmers as needed. These are the assistance that are not required to go through the board members. The farmers can inquire to the MDO through the mobile application if they have questions or concerns regarding their farms. This will be in the form of a forum. Through the forum, the farmer can ask for assistance from the mill district officer if the farmer does not clearly understand the farming practice that was recommended to them. The farmer is able to post problems and the MDO is the one to validate those posts. When posting, the farmer can take a picture as part of his proof that he has the problem. The MDO can send recommendations to the farmer from the forum and the farmer will be given a notification of that recommendation. He can also determine the problem based on the picture and details posted by the farmer. He can click yes or no to that recommendation to validate his response to the MDO's message. When the MDO opens a post, he can either approve or reject the post.

Please Refer to Appendix E for the Proposed Process Diagram

5.2 System Objectives

5.2.1 General Objective

The proposed system aims to help and improve the production monitoring for the board members and for the MDO in assisting the farmers.

5.2.2 Specific Objectives

The proposed system specifically aims to:

- Generate reports that were not present from the existing system for aiding in business decision making.
- Monitor and track the flow and progress of programs created by the board members.
- Improve and facilitate of data gathering by utilizing mobile application for farmers.
- Provide recommendations and assistance to the farmers quickly

5.3 System Scope

The proposed system will tackle the three main modules of the company, namely data acquisition, crop estimate and programs, farmer recommendation and assistance modules.

5.3.1 Modules



5.3.1.1 Data Acquisition Module

This module will be responsible for retrieving data from the farmer by means of the mobile application. This is too speed up the data gathering for the MDO because of the large number of farmers in his assigned district. The data that will be mainly gathered for the farmer would be the area and production and his farm information which will be used to create report and for the MDO's observation. This module will also enable farmers to quickly report disasters that occurred to quickly notify the MDO.

5.3.1.2 Crop Estimate Module

This module will be responsible for generating forecasts for the MDO and board members. It will make use of historical data in order for the prediction model to work and for accuracy checking. Here the user can generate 3 different forecasts depending on the parameters inputted. There the forecasted values can be used for evaluation on which is more accurate and reliable. The weekly forecast can be used by the MDO for analysis of weekly production.

5.3.1.3 Programs, Farmer Recommendation and Assistance Module

This module will be responsible for providing recommendations to the farmer by the MDO depending on his observation of the farms. Another way would be through the forum where the farmers can post their problems and ask the MDO for assistance. The farmer is also able to post recommendations that can be shared to other farmers. For the board members, the can create programs and set different performance indicators or objectives with annual targets.

5.3.2 Features

5.3.2.1 Mobile Application

This feature will make use of the mobile application for the farmers to send their data to the MDO as well for easier and efficient communication with each other for inquiries and assistance.

5.3.2.2 Print Report Functionality

This feature would allow the conversion of the system files to pdf.

5.3.2.3 Notification



This feature would allow the farmers on their mobile application to receive notifications from the MDO whenever he or they system sends them farming recommendations.

5.3.2.4 Map area plotting

This feature will enable the farmer as well as the MDO to plot the area of the farm. This helps in measuring the area faster for the farmer or the MDO.