



Community-Based Decision Support System for the Manila Health Department

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Abstract: Decision Support Systems are used extensively in different industries to assist in decision-making across a wide spectrum of problem areas. These systems are being developed with much consideration of its enormous benefits, both in time and cost savings, and most especially in helping organizations in their decision making. The researchers have identified the main problem of the Planning and Coordination Unit in the Manila Health Department (MHD) which is its poor use of information resulting to wrong identification of specific programs for the communities of Manila City. This results to the difficulty of health centers in identifying what barangays need to be prioritized and what nutritional programs have to be implemented. The objective of the study is to develop a community-based decision support system which is web-based that helps MHD in planning and implementing nutrition and health programs to the community in District V of Manila City. Rapid Application Development (RAD) methodology was used to develop the system and PHP, HTML, and My SQL were used as the primary programming language following appropriate programming standards to ensure that all parts and features of the system are working properly. Users from the Manila Health Department and Health District, a Barangay Health Worker and a Registered Nurse tested, verified and validated if the developed system has met the organizational requirements. The system was able to track and authenticate community information accurately, provide MHD an overview of health cases in specific community, provide visual and non-visual reports to MHD, and enabling them to keep track of implemented programs in communities. Additional functionalities such as mobile survey or mobile profiling of the community will be helpful. The system could also suggest the recipe or food for its feeding program based on historical data.

Key Words: Nutrition Program, information system, decision-support system

1. INTRODUCTION

1.1 Background of the Study

The city of Manila is one of the

busiest, biggest and populous cities in the Philippines. The city provides Filipinos and tourists a large variety of leisure and business life. It has the most popular nightlife, entertainment, attractions,



amenities, occupations, etc. Although it is one of the most profitable cities in the country, a portion of the city population is still experiencing poverty, hunger, and other society issues. (Manila Gateway, 2010)

To help the city address different health problems in their communities, the city government has established the Manila Health Department as a division in the Manila City Hall. The Manila Health Department or MHD is the division of the Department of Health in the City of Manila which is responsible for the planning and implementation of health programs that are and will be executed in different communities in the city. It handles chains of health centers, lying-ins and hospitals which are owned and operated by the city government. It is handled by the city health officer and is the main health provider of the City of Government of Manila City residents especially the urban poor.

1.2 Relevant Developments

According to the World Health Organization (WHO), malnutrition is the gravest single threat to global public health. "Malnutrition essentially means "bad nourishment". It concerns not enough as well as too much food, the wrong types of food, and the body's response to a wide range of infections that result in improper absorption of nutrients or the inability to use nutrients properly to maintain health. Clinically, malnutrition is characterized by inadequate or excess intake of protein, energy, and micronutrients such as vitamins, and the frequent infections and

disorders that result." (WHO, 2011)

Malnutrition is a major problem in the Philippines most especially in women and children. A joint UNICEF-World Food Programme assessment in 2009 revealed that 87 per cent of households faced food insecurity and 75 per cent were limiting their meal sizes. This aggravates the likelihood of under nutrition. (UNICEF, 2011)

According to Dr. Gina Pardilla, Chief Head of Planning and Coordination of MHD, the gathered information from different barangay health centers are not properly used in evaluating community health status thus causing delay in giving nutritional programs to the said areas. Also, the Manila Health Department is having a hard time in their planning and decision making process on what programs should be implemented for the prioritized barangay. The group also analyzed that there is irregular monitoring of nutritional programs which causes them to have inaccurate evaluation of the community programs' effectiveness. These programs should be monitored by calculating percentages, and comparing it to other programs. Another problem that the group analyzed is that MHD provides untimely reports and inappropriate assessment of what district should be given more focus; this gives them a hard time in showing consolidated reports to the government that is needed for the programs that they wish to implement to be funded.

The main problem of Planning and Coordination Department in MHD is its poor use of information resulting to wrong identification of specific programs for the communities of Manila City. This results



to the difficulty of health centers in identifying what barangays need to be prioritized and what nutritional programs have to be implemented.

1.3 Objectives and Scope of the Study

The project is developed to help the Manila Health Department in planning and implementing nutrition and health programs to the community in District V of Manila City. Its specific objectives are: To gain knowledge on what and how Planning and Management of Nutrition Programs are being utilized in districts of Manila under MHD; to acquire information about the data in monitoring nutrition status of District 5 in Manila City by collaborating with MHD; and to identify the importance of adequate monitoring of nutritionally poor children in District 5 by reviewing information and checking the records and reports as prescribed by MHD.

The study includes District 5 of Manila City to ensure that services and programs will reach those whom they are meant for. The researchers collaborated with the Manila Health Department, Health District Office, National Nutrition Council, and the different Health Centers specifically in District 5 of Manila in order to obtain data which when combined with other data from other sources can be of great use in the overall decision-making process of the Planning and Coordination Division of the Manila Health department.

Barangays 702, 704 and 705, having a population of 2618, 5,202 and 2,210 respectively, and children with ages 0 to 71 months old were the main focus of

the researchers. The system was intended to be used by four (4) users: 1) Manila Health Department, 2) Health District Officer, 3) Registered Nurse, and 4) Barangay Health Worker.

2. METHODOLOGY

The Rapid Application Development (RAD) method was used to develop the system faster while reducing the development costs and maintaining quality. According to James Martin, "Rapid Application Development is a development lifecycle designed to give much faster development and higher-quality results than those achieved with the traditional lifecycle. It is designed to take the maximum advantage of powerful development software that has evolved recently." This methodology is appropriate for the system because RAD systems provide a number of tools to help build graphical user interfaces, and it enables the programmers to build programs more quickly. The use of RAD will help increase the speed of development and quality of the proposed system.

In order to clearly understand the system requirements and user expectations, active user involvement throughout the RAD development cycle was considered. The fundamentals used for RAD methodology include: 1) Combination of best techniques available and



specification of system tasks; 2) Usage of evolutionary prototypes which are helpful in the development of the final system; 3) Provision of guidelines for success and identification of pitfalls that needs to be avoided; 4) Team development to quickly build the core of the system.

This lifecycle of RAD includes four stages and these are: Requirements Planning or Concept Definition Stage, User Design or Functional Design Stage, Construction or Development Stage, and Implementation. All of the activities and tasks required to scale and describe business requirements and design, develop, and implement the application system that supports those requirements. The business functions and data subject areas that the system will support were defined in Requirements Planning. To build a working prototype of system components and to model its data and processes, workshops were used in the User Design. The construction of the physical application of the system was completed in the Development Stage wherein the conversion system was built, user aids were developed, and work plans were implemented. The final user testing and training, data conversion, and the implementation of the system were included in the Deployment Stage.

3. RESULTS AND DISCUSSION

After assessing the present procedure, the team has examined that the Planning and Coordination Department of the Manila Health Department is having problems in identifying which barangays should be prioritized due to its poor use of information resulting to wrong identification of specific programs for the communities in the City of Manila. The details gathered from different barangay health centers are not effectively used in analyzing the community health status, thus, resulting in delays of providing nutrition interventions and programs. The irregular tracking of health programs causes incorrect evaluation of program efficiency. There is a need to address such untimely reviews, reports, and unsuitable evaluation of what district should be given more focus by the Planning and Coordination Department.

A Decision Support System allows the Manila Health Department to fully maximize the programs and projects that they have in line for the communities that are under their jurisdiction. The system has three modules:

3.1 Community Status Module

The Community Status Module controls the system with regards to its performance and safety of the communities that are under the system's jurisdiction. The following actions are



sub-modules of the Community Status Module:

3.1.1 Patient Recording

The patient recording is performed by the Health District Office. This sub-module accumulates information regarding the individual who is revealed to have a condition case. This sub-module also has the individual history feature, allowing condition cases to be stored for different patients thus making future files quicker. This element also protects the procedures done by the Health District Office. Patient results are also done in this sub-module.

3.1.2 Patient Verification

The patient confirmation is performed by the Health District Office. This module allows district coordinators a perspective to record of patients to be verified of a certain situation of condition. This sub-module allows publishing, and different types of filtration.

3.1.3 Edit Patient

This sub-module allows the editing of Patient. This is performed by the Administration of the system. It can be done by the Health District Office through the respective Barangay Health Worker.

3.1.4 Edit Barangay Information

This sub-module allows the editing of barangay information.

3.1.5 Add/Edit/Delete Users

This sub-module allows the adding, editing, and deleting of users in the system.

3.2 Project Implementation Module

The Project Implementation Module contains the procedures wherein information regarding a program that's to be implemented are collected, saved, prepared, and provided. The following activities are elements of the Project Implementation Module:

3.2.1 Program Creation

The program creation component allows the MHD to create a program for a certain area. The National Nutritional Council can suggest

programs to barangays. The Manila Health Department is now tasked to whether approve and implement the suggested program or not. Having said this, MHD officers can approve suggested programs through the system.

3.2.2 Program Reports Generation

The program reports generation component allows officers to keep track of historical data on implemented programs in a certain barangay.

3.3 Decision Management Module

The Decision Management Module contains the procedures wherein different types of information regarding the patients are used to help the user make a decision as to what projects to implement in a certain barangay. The following activities are elements of the Decision Management Module:

3.3.1 Reports Generation

This sub-module gives the Manila Health Department and the National Nutritional Council avenues to view the status of the areas with the aid of reports that are generated by the system. These reports can be printed out in hard copy format. And most importantly, these reports will be able to help in their decision processes of the system.

3.3.2 Disease Notification

The disease notification sub-module gives the users an avenue to receive notifications about those barangays that needs attention. These notifications will help the users in giving out programs and solutions to the problems that may occur in their respective barangays.

3.3.3 Program Suggestion

The system is able of producing program recommendations to different barangays. This sub-module allows this to happen by verifying past historical programs of the identical barangays. The system indicates the programs implemented during an identical scenario in a different barangay.

4. CONCLUSIONS



Decision Support Systems are used extensively in different industries to assist in decision-making across a wide spectrum of problem areas.

The Community-Based Decision Support System (CBDSS) for MHD was developed to help the organization in planning and implementing nutrition and health programs to the pilot barangays in Manila City 5th District: Barangay 702, Barangay 704, and Barangay 705. The researchers prepared test case scenarios to test the functionality of the system, and the users were given User Acceptance Test that provided feedback to the team regarding the efficiency and effectiveness of the system. The developed system was tested, verified and validated, and has met the primary requirements of the Manila Health Department in identifying specific programs for the pilot barangays in the study.

Future researchers should also be aware of the processes that MHD performs in order for them to understand the importance of each step and how its basis will affect the output of the whole process. Also, the team recommends a thorough communication between the researchers and the Manila Health Department. This would allow the future researchers to be able to adapt on to whatever changes MHD has to go through being under the World Health Organization (WHO) and the

Department of Health (DOH) here in the Philippines and make the necessary adjustments on their research giving them the opportunity to have a better output.

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