EFFECTIVITY OF CHILD NUTRITIONAL STATUS MONITORING BASED ON INFORMATION TECHNOLOGYAT DISTRICT HEALTH OFFICE, SUKOHARJO REGENCY

Agus Widodo[1], Mutalazimah[2], Bana Handaga[3]

[1]*Department of Physiotherapy, Faculty of Health Science Muhammadiyah University of Surakarta*
[2]*Departmentof Nutrition, Faculty of Health Science Muhammadiyah University of Surakarta*
[3]*Department of Electro,Faculty of Technic Muhammadiyah University of Surakarta*

Abstract— The research was conducted to develop the information system model on nutritional status of child monitoring based on information technology support the plan of increasing the nutrition improvement at the District Health Office, Sukoharjo Regency. This descriptive research was carried out by implementing interview to subjects who were involved in the activity of the monitoring. Observation was also performed to two objects, namely the structure and the procedure of information. The collected data were analyzed descriptively by applying result of structure and the procedure analysis. The system development was designed by using the approach of FAST (Framework for the Application of System Techniques) and by using the tools of Data Flow Diagram and Entity Relationship Diagram. The observation to the problem, its scope and property as well as the interview with the subjects indicate that the research subjects at all levels from top managers to persons in the transactional level as well as those who are at cross section department support the development of monitoring system to the improvement of nutrition status program, and this system is reliable to mapping perform of nutrition status of child based on the category as severe malnutrition, under nutrition, normal and overweight. In the future nutrition information based on information technology has the benefits of the new system in supporting the monitoring activity toward the nutrition improvement program and it is also supports the plan.

Keywords— Information Technology, Monitoring, Children Nutritional Status

I. Introduction

Macro nutrition improvement program geared to lower its main macro nutritional problems to overcome problems of protein energy malnutrition, especially in poor areas in both rural and urban areas by improving the nutritional state of the family, increase community participation, improve the quality of nutrition services both in health centers and in neighborhood health center, and improve consumption of energy and protein malnutrition in children under five (MOH, 2002)

Malnutrition is one manifestation of a disturbance in the growth process. Infant growth can be interpreted as a change in the number, size and function of cells or organs that occurs in infants. Growth is measured by the size of the weight (grams, kilograms), length (centimeters, meters), the age of the bone and metabolic balance (Supariasa et al, 2002). The most simple indicator to determine whether or not normal infant growth by looking at the physical condition or called nutritional status with anthropometric methods.The easiest parameter and appropriate to measure the nutritional status of children is the weight, height or body length and age, with the index used is the Weight/ age, weight /height and height /age. Methods of calculation using the formula z-scores with standard median weight or height divided by the standard deviation (Supariasa et al, 2002).

Manually calculating z-scores is quite complicated to do especially when the number of infants measured relatively large nutritional status. Although it has been available tables for easy interpretation, but still in the process of data entry and data processing activities became an obstacle because they have twice the work.

At this computerized era of information technology advances can not be separated from the presence of computer applications can improve system performance information, such as data that is processed into a more complete, accurate, convenient and timely. Thus the information produced will be able to support decision-making related to management activities from planning to the evaluation of nutrition programs.

The focus of the development of health information systems in the district are directed to support management decision making required in order to improve health services and programs directly. It often happens quite adequate data collection is done through regular information by the holder of the program or through a special survey but data or information may not be adequately analyzed or can not be accessed in a timely manner and for the correct user unit (MOH, 2001).

The Office of Sukoharjo particularly in Section Nutrition, infant growth monitoring activities covering 21 territories of 12 districts health centers with the overall number of villages as much as 167 villages. Of the activity results of data analysis and processing is still done manually, from the data input process, the process of calculating the nutritional status, category and interpretation of the nutritional status of course this takes a relatively longer, not to mention the possibility of data input errors and miscalculations which will be able to affect the results of the analysis and decision making. Additionally infant growth monitoring information system that exists today is not based Database Management System (DBMS) that still met the redundancy and disintegration data, and can not be done sharing data between parties who require such information for example with other sections such as Maternal Health section, section of Child Health, Health Promotion section or other relevant section.

Results of the development of information technology-based systems made by Mutalazimah and Handaga (2005) in Sleman indicate any difference in performance before and after the development of computer-based information system on iodized salt monitoring activities. Still the results of research and Handaga Mutalazimah (2006) regarding the development of the information system monitoring the nutritional status was also shown to result in improved performance of the system. Thus the research to be developed on other all fields, because of activities that infant growth monitoring based on information technology.

II. Results and Discussion

A. Problems Monitoring System

Point the cause of the problems in the information system monitoring the nutritional status of infants from the analysis of the problem include the speed, ease, completeness and accessibility are derived from the processing of monitoring data on the nutritional status of children as well as data storage and process information. Processing and data storage is becoming a problem because the old system is not using the database approach that complicates the process of change in the data structure.

B. Needs Analysis

1) Analysis of external entities related

In addition to the internal entity, the drafting process should also be known to external entities linked either directly or indirectly in the system, with the goal of keeping in mind the source and destination data stream will be designed. From the observation can be known external entities involved in the system of monitoring the nutritional status information is: a). PHC b). Nutrition Section DHO c). Head of Sub Office of Family Health d).Head of the health office Sukoharjoj e).Head of Central Java Provincial Health Office and f).Cross-Sector (Department of Agriculture, Hospitals, Binsos, Bappeda, Dolog, PKK and DPRD Commission IV).

2). Analysis of all the data elements that will be used as a reference for the design of the database. Results of observations of forms and interviews with staff nutrient that the required data elements include:
a). Data toddlers such as name, age, sex, weight, height
b). Data health centers such as the name and address of the health center health center.

3). Analysis of information needs From observations and interviews on information needs can be briefly described as the following needs:
a). Information system monitoring the nutritional status of children under five that will be

developed can produce information quickly, easily and completely.

b) .System information can generate reports based on the area health centers.

c). The information system can generate information in the form of tables automatically

d). The system can generate information easily accessible information as needed.

C. Decision Analysis

Analysis of this decision is the stage of selecting alternative solutions related to the development of new information systems, while such solutions are as follows:

1). Selection of a New Information Systems Development Model. The approach used in the model development of this system is a combination of bottom-up approach and top-down conducted on staff nutrition and Nutrition Section Head, combined with the approach of the Head of Sub Office of Family Health and Head of the Department of Health, so as to bring the two elements in a model development of new information systems. Moreover approach to Key Success Factor ieLocal Government and Planning Agency as a policy holder in finance, also made with regard to the issue of computerization in the ranks digulirkannya local government agencies Sukoharjo.

2). Selection of a New Information Systems Software. Selection of the software can be done by buying in the market or develop their own, but is selected to develop itself with the

consideration that by developing its own everything associated with the agency needs will be met, especially when this autonomy that makes each district has potential, abilities and different needs that can not be generalized to other districts. If there is software on the market do not necessarily correspond with the needs of Sukoharjo district.

3). Selection of Operating Systems New Information System. On the development of the information system monitoring the nutritional status of children under five is used under Windows operating system because the operating system is being used in Sukoharjo Health Department so that operators are familiar with the operating system.

4). Selection of a New Information System Tools. This study used a Drupal PHP as monitoring information system development tools nutritional status of children and Postgres SQL as tools for database creation.

D. Design

From the analysis of information needs, related entities and elements required data as described previously then the next can be done development context diagram, DFD development level 0, development DFD level 1 which illustrates the process of data entry, data processing and reporting. More clearly seen in the following pictures.
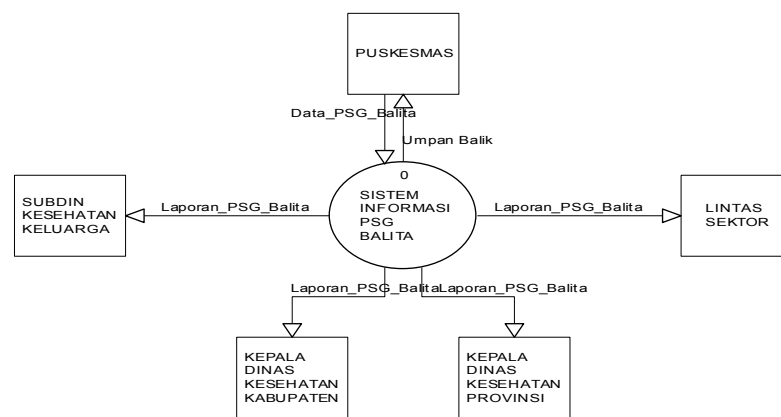
1). Diagram Konteks

Figure 1. Diagram Context Information Systems Toddler Nutritional Status Monitoring

2). List of events in the System

a).Data entry is the process of recording / data entry of results form the nutritional status monitoring carried out at primary care level, such as data and data toddler clinic.

b). Processing of the data is the data processing nutritional status of children by area health centers such as poor nutritional status, less, better and more.

c). Reporting is an activity report the results of monitoring the nutritional status of children under five that includes rekapitulasi data, reports recap health centers, district recap report and mapping of nutritional status and health centers per district.

7). Design Input

On the development of a monitoring system of this nutritional status of children under five in addition to data and Community Health Centera s main data elements, then also use the input data as well as monitoring indicators index like weight /age, weight / height, and height / age, while the data using a reference standard raw WHO / NCHS standardized. Data targets or achievement adjust to the Health Department for a minimum of 80% good nutrition and malnutrition maximum of 0.5%.

E. Building a New System

1). Programming

a).Data base design, database tables created using a programming language with Postgre SQL.

b).Form design input data used for data entry created using programming languages and models phpdrupal push button interactive menu, ie by pressing the interactive buttons that have been available.

c).Preparing reports, by connecting each table in the database and is ready to print directly from a data entry form.

2). Examination

This experiment is testing the system, which is done by testing the system as a whole to ensure the system can work according to function and expected demand. System testing is done by simulating the data entry toddlers that includes the name, date, month and year of birth,sex, and anthropometric measurement such as weight and height. It also simulated data entry date, month and year of the weighing and the name of health centers. Furthermore, functional testing system information on the nutritional status of the calculation process, the recapitulation results in accordance with the results of the analysis. Download Summary of the Draft Table Toddler and Child Nutritional Status.
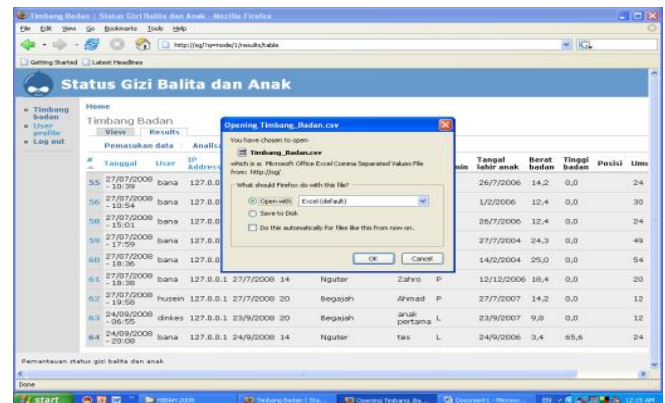

Figure 2. Summary of Table Design Download Toddler Nutritional Status

CONCLUSIONS AND SUGGESTIONS

1. Monitoring nutritional status of children in Sukoharjo conducted by the Nutrition Section of the Department of Health Sukoharjo already have a clear structure and procedures ranging from implementing subjects, the process of collecting, processing and reporting of data and all still done conventionally.

2. The cause problems in monitoring the nutritional status of children is the lack of speed, convenience, completeness and accessibility, which is based on the problem of processing and data storage.

3. The scope consisting of the system, users, processes and outputs on monitoring nutritional status of children in the Department of Health Sukoharjo adequate for the development of IT-based systems.

4. In technical, operational, economic development schedule and monitoring information systems nutritional status of children in the Department of Health Sukoharjo feasible.

5. The development of the information system monitoring the nutritional status of children under five are needed in the Department of Health is eligible Sukoharjo easy, fast, informative and mapping.

6. Analysis of the decision resulted in the selection of Windows operating system-based web server, phpdrupal application tools and database tools Postgre SQL

7. The data stream is designed based on the procedures and the flow of information from the diagram context of monitoring the nutritional status of children under five while the structure of the database is composed of data flow diagrams.

8. Suggestions for the Department of Health should develop IT-based information systems on other health activities. For further research to develop a variety of area-based health programs to improve the performance and appearance of the system for the better, effective and efficient

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