Conference Paper

Analysis and Design of Dashboard Information System Results of Nutrition Status Monitoring Year 2016 As a Supporter of Community Nutrition Policy

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Abstract

The availability of data and information presented comprehensively and easily understood is still very limited until it has not been able to fully support the process of decision making and the formulation of appropriate policies for the organization. A dashboards information system is an application that provides information about key indicators of organizational activity at a glance in a single screen. Dashboards can be a tool to present summaries of data and information in an easily understandable visual form. This study aimed to analyze and design the dashboard information system based on Nutrition Status Monitoring surveys conducted in 2016 by the Ministry of Health. Nutrition Status Monitoring is a survey that produces an overview of nutritional status and indicators of community nutrition program performance outcomes in 514 districts/cities in 34 provinces in Indonesia. The method used in this research was the development of a methodology for the construction of an information dashboard with a focus on the activity of requirement identification, planning, and design of the prototype. The output of this research was the design of the dashboard information system that processes and presents data/information on the results of Monitoring of Nutritional Status of 2016 in the form of easy-to-understand visualization. With this information system, it could be an effective means to measure the performance of the organization and support relevant stakeholders in the process of taking action intervention and policy formulation to improve the nutrition of the community.

Keywords: dashboard, Nutrition Status Monitoring, information system, community nutrition

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1. Introduction

One of the directions of nutrition improvement policy by Presidential Regulation No. 2 of 2015 on RPJMN is to improve nutrition surveillance including growth monitoring. One of the efforts in getting information about nutrition problem in Indonesia is through Nutrition Status Monitoring (PSG) survey activity.

Nutrition Status Monitoring (PSG) is a monitoring activity for the development of nutritional status of children under the age of five years continues to provide an overview

of the nutritional status of children under five years old. The 2016 PSG survey was conducted using a rapid-survey methodology in 514 districts/municipalities in 34 provinces with a cluster in each region determined by 30 groups. For each cluster selected ten households with toddlers aged 0-59 months with the respondent is a toddler or mother who represents a toddler. Samples of household members other than toddlers (school children, adolescent girls, pregnant women / WUS and adults) are found only in selected households (Kemkes, 2017).

Implementation of PSG aims to guard efforts to improve the nutrition of the community to be more effective and efficient, through monitoring changes in nutritional status and performance of the program over time, to precisely determine the action effort, change policy formulation, and program planning (Kemkes, 2017).

To maximize the utilization of data and information on PSG results in 2016, effective and efficient media is needed to present the data and information so that it can be easily accessed and understood by the users.

The availability of data and information presented comprehensively and easily understood is still very limited until it has not been able to fully support the process of decision making and the formulation of appropriate policies for an organization. Utilization of information and communication technology is one effort that can be done to produce information effective and efficient.

Dashboard information systems can be a tool that organizations use to get data and information presented with exciting visuals. Dashboards provide a variety of interface views like diagrams, reports, and visual indicators combined with dynamic and relevant information (Hariyanti, 2008). Panels are a visual display of the essential information needed to reach a goal, consolidate and compile the data on a single screen so that information can monitor at a glance (Few, 2006).

Based on Colombus (2015), IDG Enterprise surveyed the most preferred method of data analysis in the United States, the dashboard ranks second as the most widely used tool to get a quick overview of the achievements and data of organizations in a visually appealing and understandable form.

This research aims to analyze and design the dashboard information system of Nutrition Status Monitoring (PSG) survey results in 2016. The outcome of this study is expected to be active and efficient media to measure organizational performance and related support stakeholders in the process of taking intervention and policy formulation To improve people's nutrition.

2. Methods

The method used in this research is the development of a methodology for the development of information dashboard proposed in the previous study conducted by Eva Hariyanti with focus on the activity of identification of need, planning, and design of prototype (Hariyanti, 2008).

2.1. Identification of needs

The demand identification stage is done with a top-down approach, starting from the identification of high-level dashboard scenario to get an overview of the information scenario to presented on the dashboard (Setiawan, Hendrawan, & Tyasnurita, 2013). The identification of high-level dashboard scenarios done through interviews with the active users who will later use the dashboard, which is represented by the Head of Sub Directorate of Nutrition Precautions, Directorate of Community Nutrition, Ministry of Health. From the high-level dashboard scenario, further identification of data/information in detail is the result of PSG data in 2016 as well as the performance indicators of the community nutrition program.

2.2. Planning

The planning stage aims to analyze the data obtained from the identification of needs. Data obtained PSG results achieved in 2016 analysis to get the meta-information contained and grouped by indicators for each program that will present in the dashboard (Malik, 2005). Also, the identification of user requirements will be further analyzed to plan functional panels.

The planning phase involves the user actively, especially when the micro-data analysis of PSG 2016 results and information content analysis.

2.3. Prototype design

The design of the prototype is vital in system development. This stage is done using a user-centric approach. The user-centric approach accomplished through the creation of prototypes, which focus on designing useful and functional interface designs. The design of the model and data structure placed in the second position, after the protip by user needs (Gonzalez, 2008).

Based on Hariyanti (2008), the prototype is a medium used to see the suitability between the needs of users and the planned system, before implemented in real. By using prototypes, dashboard construction becomes more efficient, because any errors that occur due to misperceptions can be detected earlier.

The design of prototype consists of 3 (three) stages, namely design and layout design dashboard, communication mechanism design, and design of navigation control.

The design of the dashboard looks at elements such as color graphics display, chart form, animation, and information content placement. The design of the dashboard layout considers things like some frames, symmetry and frame proportions, as well as media resolution (computer/smartphone). The design of the communication mechanism is done with the purpose to design a communication structure between a user with the dashboard information system. The design of navigation controls involves the effort of sharing information into several different screens, by providing the right connector. Navigation allows users to drill-down to get more detailed information (Figure 1).

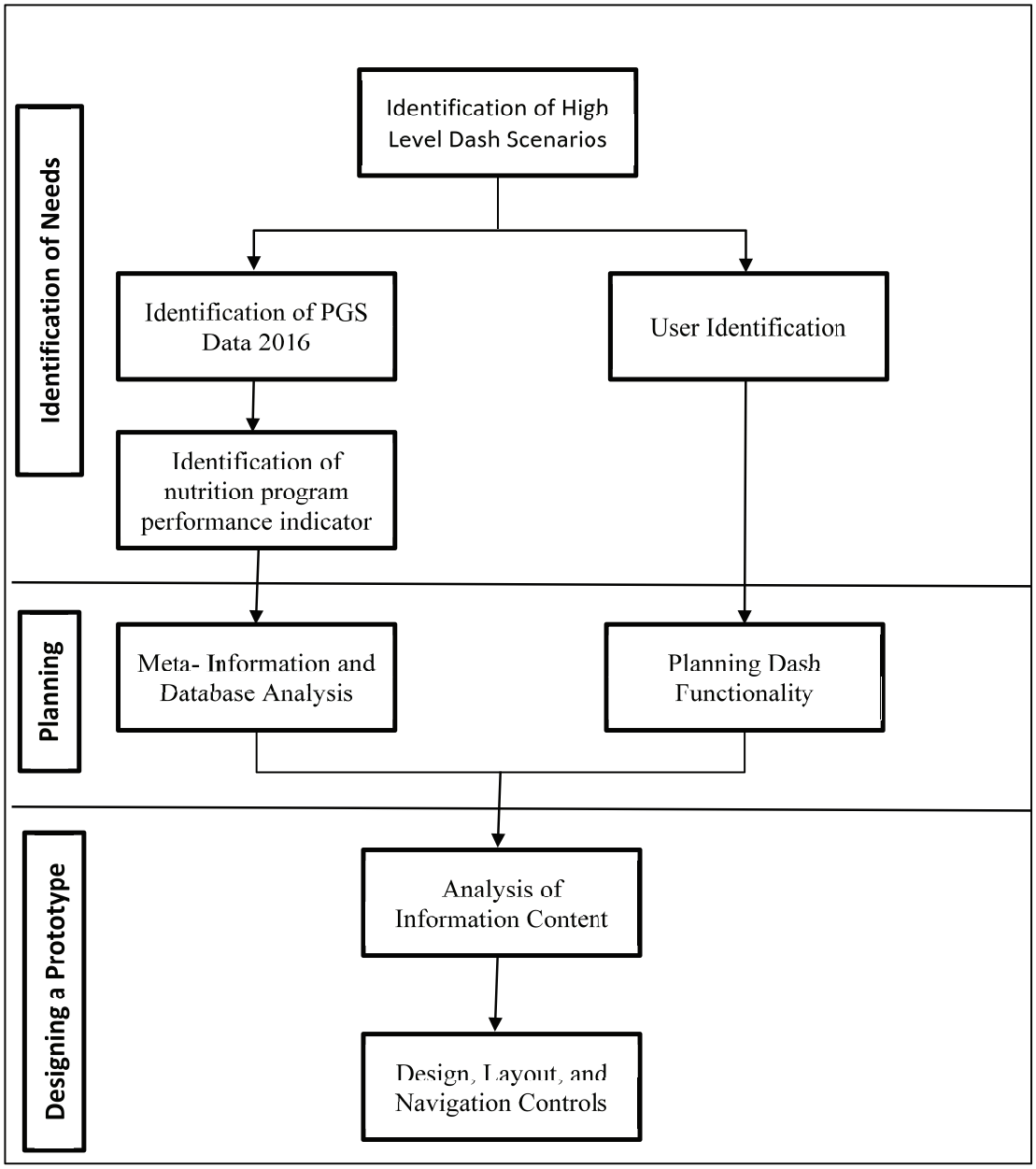


Figure 1: Dashboard Development Methodology.

3. Results

3.1. Identification of needs

3.1.1. Identify the need for high-level dashboard scenarios

Identification of high-level situations aims to get an overview of the information scenarios to be presented by the dashboard information system (Wijayanto, 2011). Based on the interviews it was found that the Directorate of Community Nutrition requires an information system that can present the results of PSG 2016 into a system that is easy to use, easy to access, interactive, and responsive to facilitate users to get data/information

quickly and accurately. To meet these needs, it will develop information system dashboard PSG results in 2016 that can be accessed either online through the website or offline in the form of applications through smartphone devices.

3.1.2. Identify data of PSG result 2016

At this stage successfully identified microdata of PSG result 2016 covering household data, household member data, iodized salt consumption data, health data of toddler, Supplementary Food Supplementary (PMT) data for infant and pregnant mother, data of vitamin A capsule Toddlers and postpartum mothers, weighted toddler data, data of Blood Plus Tablets (TTD) for adolescent girls and pregnant women, and anthropometric measurement data (individual nutritional status).

The number of PSG samples in 2016 that successfully obtained were 154.200 households and 500.721 household members with details of 165.085 under-fives, 53.216 pregnant women, and 282.420 other household members (adolescent girls, WUS, and adults).

The next step after the data identified is to convert/codify the data into the database form. The database consists of 5 (five) main entity tables, among others: households, household members, questionnaire data, and provincial and district/municipality data that contains the appropriate population number according to unit analysis needs.

3.1.3. Identify indicators of community nutrition program performance

Indicators of organizational performance were obtained based on interviews and literature study documents of the Ministry of Health Strategic Plan (Renstra Kemkes) Year 2015-2019.

Table 1: Identification of Community Nutrition Performance Indicators.

Indicator	Baseline	Target
Prevalence of underweight in under five children (percent)	19.6 (2013)	17.0 (2019)
Prevalence of stunting (short and very short) in children but (under two years) (percent)	32.9 (2013)	28.0 (2019)
Percentage of KEK pregnant women receiving additional food		95% (2019)
Percentage of pregnant women who received Tablet Added Blood (TTD)	82% (2014)	98% (2019)
Percentage of infants less than six months of age who received exclusive breastfeeding	38% (2014)	50% (2019)
Percentage of newborns received early breastfeeding initiation (IMD)	35% (2014)	50% (2019)
Percentage of underweight toddlers who received additional food		90% (2019)
Percentage of girls who received tablets plus blood (TTD)		30% (2019)

3.1.4. User identification

The 2016 PSG dashboard information system aims to disseminate information on PSG results by 2016 to the maximum extent possible so that there are no clear access rights for each user. This system can be accessed by all people who need data/information related to PSG results in 2016.

3.2. Planning

3.2.1. Meta-information and database analysis

Meta-information analysis is done to find the data elements to produce information on each indicator.

Table 2: Meta Information PSG data 2016.

Information	Data
Percentage of nutritional status of children under five years old	Birthdate, weight, height
Percentage of nutritional status of school children and adolescents	Birthdate, weight, height, marital status
Percentage of adult nutritional status	Birthdate, weight, height, marital status
Percentage of nutritional status of pregnant women	Birthdate, weight, height, pregnancy status
Percentage of pregnant women with SEZ risk	Sex, pregnant status, upper arm circumference
Percentage of newborns received early breastfeeding initiation	Date of birth, questions about early breastfeeding initiation
Percentage of infants received exclusive breastfeeding	Birthdate, the question of breastfeeding
Percentage of toddlers got vitamin A	Date of birth, questions about giving vitamin A
Percentage of toddlers have Healthy Towards Card (KMS)	Date of birth, the question about Healthy Towards Card (KMS)
Percentage of toddlers in weigh > 4 times	Birthdate, the matter of weighing
The percentage of underweight toddlers gets supplementary feeding	Birthdate, weight, height, the question about supplemental feeding
Percentage of teenage girls get tablets added blood (TTD)	Birthdate, marital status, questions about giving pills added blood (TTD)
Percentage of pregnant women get tablets added blood (TTD)	Birthdate, marital status, examines about giving tablets added blood (TTD)
The percentage of pregnant women with SEZ risk given additional feeding	Sex, pregnant status, upper arm circumference, questions about giving another feeding
Percentage of household consumption of iodine	Household, questions about iodine consumption

The database design of the dashboard information system serves to see the relationships between data entities — the result of the database design described as an Entity Relationship Diagram (ERD).

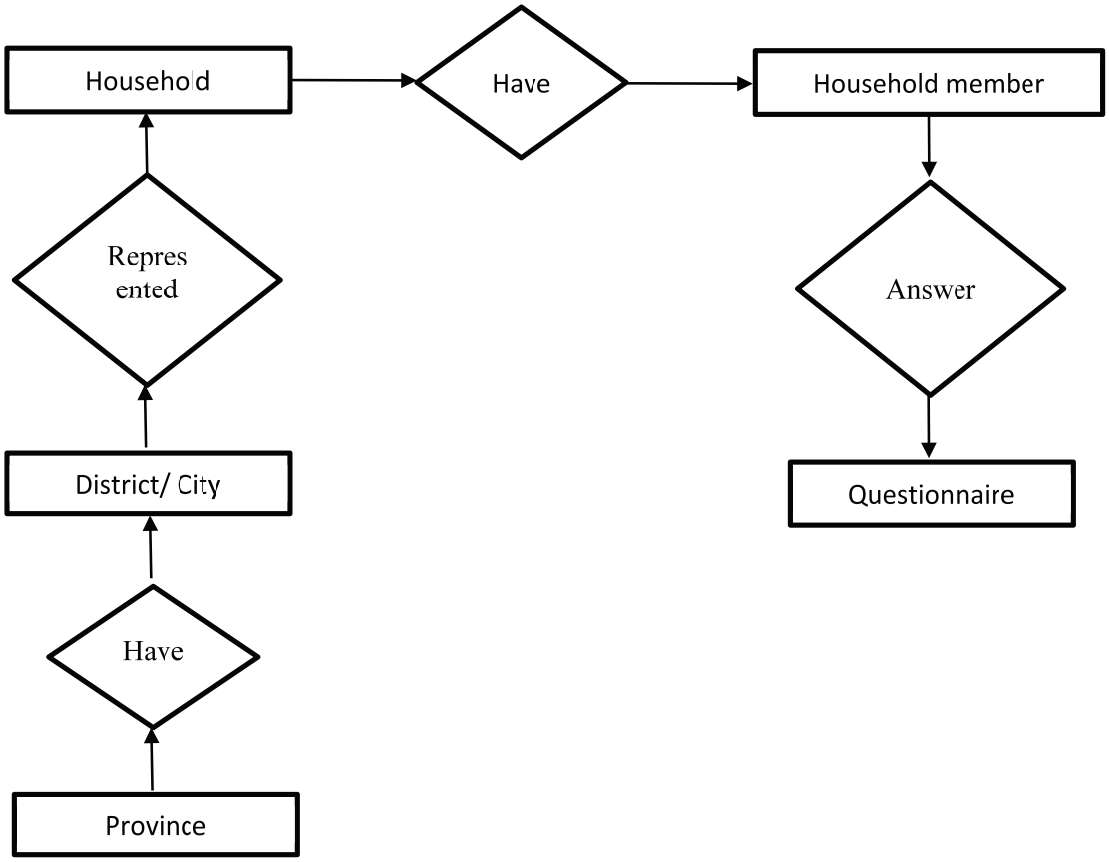


Figure 2: Entity Relationship Diagram (ERD).

3.2.2. Planning dashboard functionality

Dashboard functionality planning based on user needs. At this stage is done to identify what information place on the main page and identification grouping menu presentation of other information. All data based on predetermined indicators presented on a national scale. To see the provincial or district/city information can be done by drill-down information through the available menu.

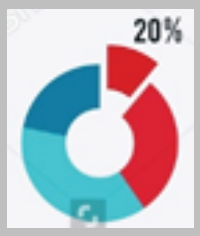
Based on the results of the analysis, there are 6 (six) information presented on the main screen is the percentage of nutritional status of children under five, the rate of nutritional status of pregnant women, the percentage of nutritional status of school children and adolescents, percentage of adult nutritional status, percentage of newborn infants get early breastfeeding initiation, Exclusive breastfeeding — other information provided through the menus available in the system.

3.3. Prototype design

3.3.1. Analysis of information content

Information content analysis phase aims to examine the form of presentation of information into the system.

Table 3: Analysis of Information Content.

Information	Presentation & Data Analysis
Percentage of nutritional status of children under five years old - Based on the index BB/U age 0-23 months - Based on the index BB/U age 0-59 months - Based on the index TB/U age 0-23 months - Based on the index TB/U age 0-59 months - Based on the index BB/TB age 0-23 months - Based on the index BB/TB age 0-59 months Percentage of nutritional status of school children and adolescents based on the BMI index Percentage of adult nutritional status based on BMI index Percentage of pregnant mother's nutritional status based on BMI index Percentage of pregnant women with SEZ risk The percentage of newborns gets early breastfeeding initiation Percentage of infants received exclusive breastfeeding Percentage of toddlers got vitamin A The percentage of toddlers has a Healthy Towards Card (KMS) Percentage of toddlers in weigh> 4 times. The percentage of underweight toddlers gets supplementary feeding. Percentage of adolescent girls get tablets added blood per type of pills plus blood. Percentage of pregnant women get tablets added blood per type of pills plus blood. The percentage of pregnant women with SEZ risk given additional feeding. Percentage of household consumption of iodine	 On bar-line charts, the number of toddlers is presented based on specific nutritional status/population number in a given region unit, the lines on the graph indicate the target of the indicator achievement  In the map form presentation, it presented nutritional status per region based on specific color according to area area  Presentation of data for one particular region level is presented in pie chart form  The presentation of data to compare between regions at a given regional level present in the form of a bar-line chart

3.3.2. Design, layout, and navigation control prototype

To meet responsive elements, layout design and navigation of dashboard information systems are different for when accessed on computers and smartphones.

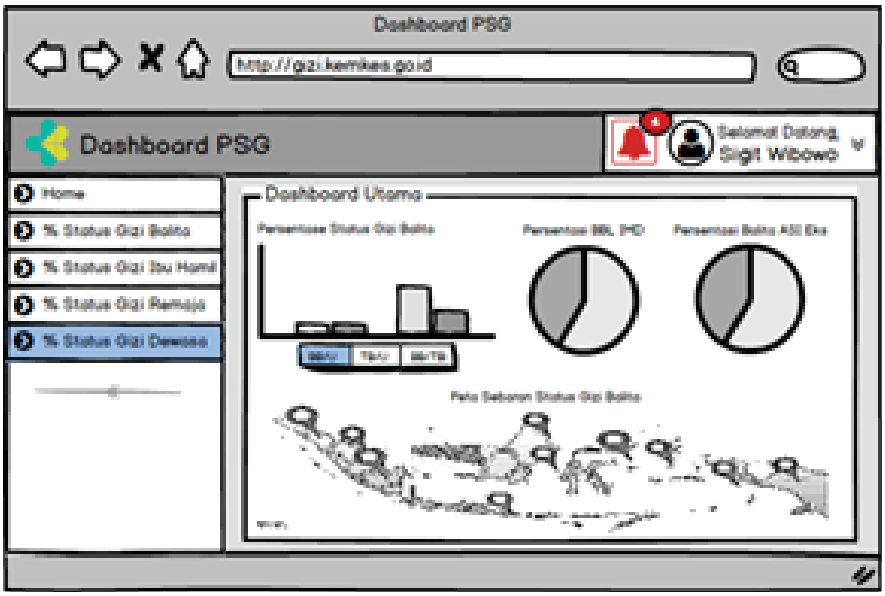


Figure 3: The layout on the computer.

Figure 4: Navigation on the computer.

4. Conclusion

This dashboard information system is a tool that can be used to obtain data and information of Nutrition Status Monitoring (PSG) results in 2016 presented visually and interactively. A good dashboard should be able to display data and information with an efficient, compelling, and uninterrupted view of details while keeping in mind the functionality of the dashboard's information system.

The design of this dashboard information system using the dashboard development methodology proposed in research conducted by Eva Hariyati (identification of needs, planning, and prototype).

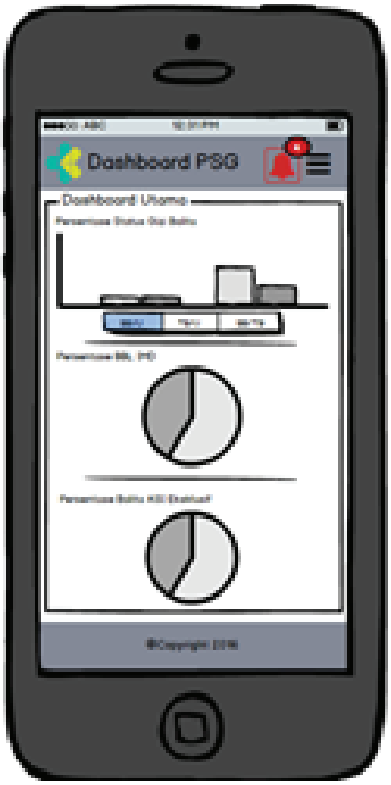


Figure 5: layout on the smartphone.

Figure 6: Navigation on the smartphone.

This 2016 PSG dashboard information system provides analysis of data and information on PSG results in 2016 based on indicators of performance of community nutrition improvement programs that have established.

The use of information system dashboard results PSG 2016 is expected to help all stakeholders associated with community nutrition improvement programs as an effective means to measure the performance of the organization and support the process of taking action intervention and policy formulation to improve the nutrition of the community.

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