Application of baby's nutrition status using Macromedia Flash

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***Abstract*— In this paper we proposed a method to create application of baby's nutrition status using Macromedia Flash. The anthropometry is used as input of application. The anthropometry like age, gender, weight, height and head circumference. The proposed method consists of stage of literature study as a preparation stage, stage of making application as a crucial stage in this research, data retrieval stage to get data as input in application, and stage of application testing as a stage in which application was tested using data from data retrieval stage. Output of the application was normal, below normal or above normal. It can be said normal if input is in around standard of nutrition status, it can be said below normal if input is below standard of nutrition status and it can be said above normal if input is above standard of nutrition status. The accuracy of program was 100% based on similarity between output of application and standard of nutrition status from ministry of health.**

Keywords—application of baby's nutrition status; nutrition status; baby's nutrition status; macromedia flash; antropometry;

I. INTRODUCTION

Nutrition status is health status generated by a balance between nutrition needs and inputs. In the development and growth of baby, nutrition status must be considered especially premature baby because it affects the baby's brain and physical development [1]. Assessment of nutrition status can be done in two ways, that is, direct measurement and indirect measurement. Direct measurement can be done through biochemical, clinical and biophysical while indirect measurement is through anthropometry. The most commonly used in nutrition status assessment is antropometry. Anthropometry is related with body size and body composition based on age and nutrition level. Its body size is weight, height and head circumference. The advantage of using anthropometry is easy to obtain and use, measurement can be done repeatedly, easy and objective, cheap, result can be concluded easily and scientifically recognized [2].

Some parameter to measure anthropometry in baby are age, weight and height (baby's length). The age parameter is crucial in determining nutrition status because mistake in age parameter can make incorrent interpretation of nutrition status. The weight parameter can be used to see the physical growth rate as well as the nutrition status and the height parameter is condition which compare past and curent state [1]. According to decree of the Ministry of Health Republic of Indonesia No: 1995/MENKES/SK/XII/2010, standard of baby's nutrition status assessment is shown in Figure 1 [3]. Standard of baby's nutrition status contains information on the upper and lower limit of weight and height based on age of baby. In this paper, there is also measurement of head circumference to know development of baby's brain. The standard of head circumference is determined by age and gender parameter. Baby boy has growth of head circumference more rapidly than baby girl. The standard of measurement head circumference is shown in Table 1.

UMUR	BERAT BADAN (dalam Kg)		TINGGI BADAN (dalam Cm)	
	Ideal	80% Ideal	Ideal	80% ideal
Saat Lahir	3,40	2,70	50,50	40,40
1 Bulan	4,30	3,40	55,00	44,00
2 Bulan	5,00	4,00	58,00	46,40
3 Bulan	5,70	4,60	60,00	48,00
4 Bulan	6,30	5,00	60,50	48,40
5 Bulan	6,90	5,50	64,50	51,60
6 Bulan	7,40	5,90	66,00	52,80
7 Bulan	8,00	6,40	67,50	54,00
8 Bulan	8,40	6,70	69,00	55,20
9 Bulan	8,90	7,10	70,50	56,40
10 Bulan	9,30	7,40	72,00	57,60
11 Bulan	9,60	7,70	73,50	58,80
12 Bulan	9,90	7,90	74,50	59,60
1 Tahun 3 Bulan	10,60	8,50	78,00	62,40
1 Tahun 6 Bulan	11,30	9,00	81,50	65,20
1 Tahun 9 Bulan	11,90	9,50	84,50	67,60
2 Tahun	12,40	9,90	87,00	69,60

Figure 1. The standard of baby's nutrition status assessment

Table 1. The standard of measurement head circumference in baby

Gender	Age (month)	Ideal (cm)
Male	0-3	38 – 44
	3-6	41 – 47
	6 -24	41 + (0.5*age-6)
Female	0-3	37 – 42
	3-6	40 – 45
	6 - 24	40 + (0.5*age-6)

Practically in posyandu, when measuring anthropometry health workers need ability to remember the standard of baby's nutrition status assessment because standard of weight and height each age is different. Therefore, an application is needed that can determine nutrition status more easily and quickly. That application is called application of baby's nutrition status based on macromedia flash 8. Macromedia Flash 8 is a application is used to build and create things related to computer graphics such as multimedia, interactive animations on web pages, application and advertisements [4].

In application of nutrition status needs input like age, gender, weight, height and head circumference. Output of application is normal if input is around standard anthropometry, below normal if input if input is below standard anthropometry and upper normal if input is above standard anthropometry.

The paper is organized as follows. Section 2 gives information about material and methods. Results will be provided in Section 3 and finally Section 4 provides conclusion of this paper.

II. MATERIAL AND METHODS

A. Material

In this research, tools and materials were needed such as computer, software macromedia flash and software evolus pencil. The computer used in this research have specification of intel i5, nvidia geforce 740M and windows 8. The function of computer do the processing using software like macromedia flash and evolus pencil.

Software macromedia flash is an application commonly used in computer graphic. This software provide features that make user easier in making application with simple animation [5]. Animation in macromedia flash consists of some frames with images in each frame. Form of image in frame is a vector so that it can be zoomed and very smoothly. Definition of frame is change of object called keyframe [6]. As a designer, the Flash file programmer creates (called a Flash document, with flash extension) contains all the information to develop, create, and test interactions. Then, the Flash document is exported into Flash Movie or Flash movie, which has swf extension. This Flash movie is played or run by users with Flash Player software. If analogous to programming, the fla file is the source code and the swf file is the executable [7].

Software evolus pencil is an open source application used to design an user interface that available for all platforms. Pencil is built for the purpose of providing a free and open-source GUI prototyping tool. This software has six advantages. The first advantage is easy GUI prototyping that provides various built-in shapes collection for drawing different types of user interface ranging from desktop to mobile platforms. The second advantage is built-in shape collections included by default, its collections includes general-purpose shapes, flowchart elements, desktop or web UI shapes, Android and iOS GUI shapes. Pencil also provides programmer to grab a collection created by the community and can install it into Pencil with a simple drag-and-drop operation. The third advantage is diagram drawing support, connectors which can be used to wire shapes together in a diagram. A collection of flowchart shapes also available for drawing diagrams. The fourth advantage is exporting to different output formats which the drawing document exported into different types of formats like PNG files, as a web page, openoffice text documents and adobe pdf. The fifth advantage is easily find cliparts from internet by a simple drag and drop operation. And the last advantage is inter-page linking that elements in drawing can be linked to specific page in the same document [8].

B. Methods

Method in this research covered several stages, that is, stage of literature study as a preparation process before research began, stage of making application as a crucial stage in this research, data retrieval stage to get data used as input in application and stage of application testing as stage in which application was tested using data from data retrieval stage. Research metodology is shown in Figure 2.

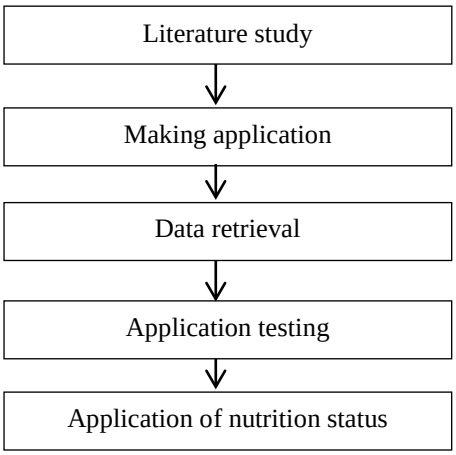

Figure 2. Research methodology

Stage of literature study

As preparation stage, stage of literature study was done after finding a problem to be discussed in a study. In this stage, researcher was searching references related to the problem. Problem in this paper was related with baby's health. References were from book, journal and website page. References in this research shown in reference chapter.

Stage of making application

The next stage was the stage of making application using macromedia flash 8. In this stage, there were some steps such as installation program, making Graphical User Interface (GUI) as interface that appears when user uses application, making source code in application as a process that occured in application and testing application to know if there was error or not. If there was no error, the application was running well.

The first step in this stage was installation program done using computer with file installer from program. File installer was downloaded in website page of software. In this research using Macromedia Flash 8 and Evolus Pencil. Their file installer was downloaded in http://www.adobe.com dan http://pencil.evolus.vn. It was easy in installing two softwares because it was free software. Making Graphical User Interface (GUI) was the second step. Graphical User Interface (GUI) is an interface that used more graphics or images than word. Interface must be user friendly to user [9]. The third step made source code in application. Source code controlled the entire process occuring application. The source code was used with programming language in software. To make easy in writing source code, researcher made flowchart first. The last step was testing application to know if application was running well or not. But application must be debugged to know if there is error or not in source code. Debugging in macromedia flash could be done by click test movie [7].

Data retrieval stage

In this stage, data was taken in posyandu. Data was used as input in application such as weight, height, head circumference and age of baby. Weight was obtained from the scales in kilogram unit, height was obtained from microtoice in centimeter unit, head circumference was taken using gauge in centimeter unit and age was known from certificate of birth in month [3]. When taking data, researcher got help from health workers. The amount of data in this paper was 30 data.

Application testing

Application testing was the last stage in this study. In this stage, application was testing using data from posyandu. The output of application was below normal, normal or above normal. It is called normal if the input was around standard of anthropometry and it is called below normal if the input was under standard of anthropometry and it was called above normal if the input was upper standard of anthropometry. The accuracy of program was obtained from average accuracy each running program. Program was called running right if the output of program was the same as the standard of baby's nutrition status assessment and standard of measurement head circumference in baby.

III. RESULTS

After some references were found, the research was done by making application. The first step in making application stage was installing software such as macromedia flash and evolus pencil. After installing software was done, the next step was making Graphical User Interface. Making Graphical User Interface was done by utilizing software evolus pencil. GUI was the outer appearance of the application that appeared when user was operating the application. The design of GUI in evolus pencil is shown in Figure 3. The purpose of designing GUI in evolus pencil was to make programmer easy in making GUI in macromedia flash. In macromedia flash, programmer could give some color and image based on their creatifity. Whereas design of GUI in macromedia flash is shown in Figure 4. GUI of application consisting of two buttons, that is, process and reset. The process button was used to process input so that the output of the application appeared. The reset button was used to make all input and output were clear so that application was ready to use again. The reset button could make application more effectively when used repeatly.

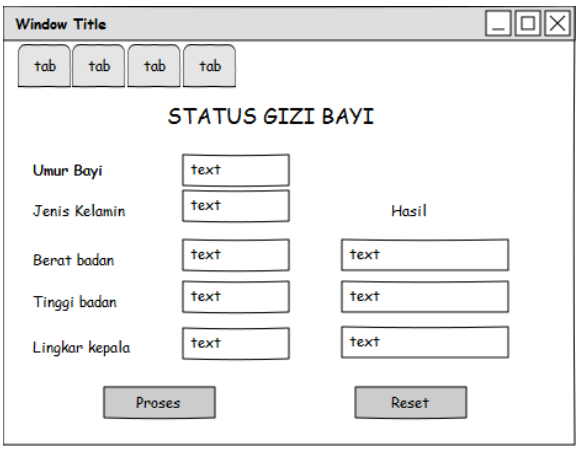

Figure 3. GUI of application in Evolus Pencil

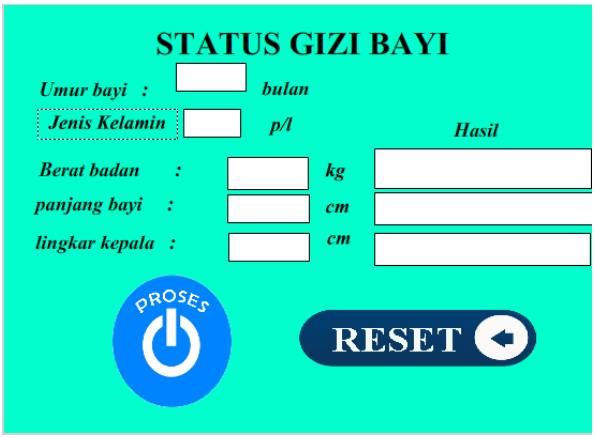

Figure 4. GUI of application in Macromedia Flash

The next step was making source code. The source code was made after Graphical User Interface was done. The source code was used in software macromedia flash 8. The source code was placed on process button and reset button. Because the value of the output of application was three so the flowchart was divided into three parameters, that is, weight, height and head circumference. The flowchart was made according to standard of baby's nutrition status assesment and standard of measurement head circumference in baby. The flowchart of weight, height and head circumference is shown in Figure 5, 6 and 7. Flowchart was made using if-else operation.

When application was running well or there was no error, it meant application was ready to use. To run this application, user could use video player like gom player. The first user must entry inputs such as weight, height, gender, age and head circumference of baby. After that, user could click process button so that the output occured in application. The output of application was below normal, normal or above normal. If user want to entry input again, user could click reset button so that the input and output in application was blank again. But if user wanted to close application, user could click sign "X" with red color in right top corner. Example testing of application is shown in Figure 8.

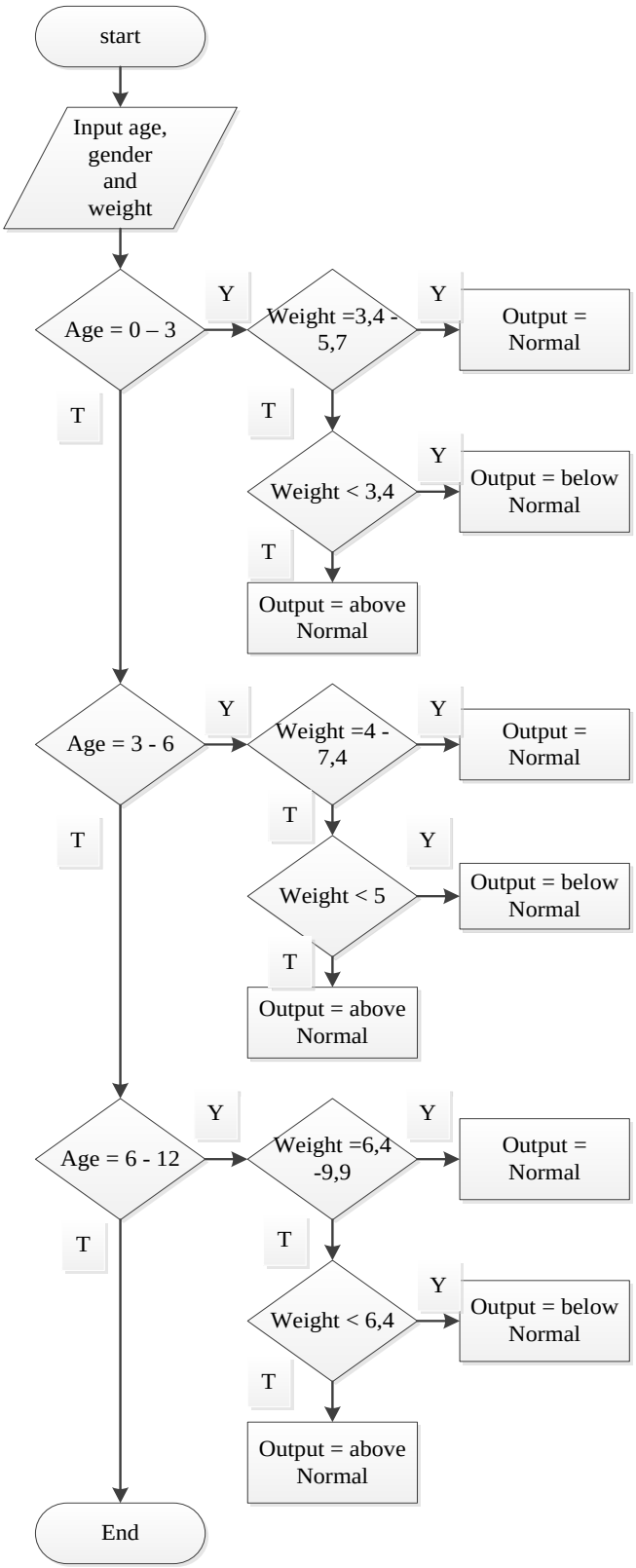

Figure 5. Flowchart of weight parameter in application

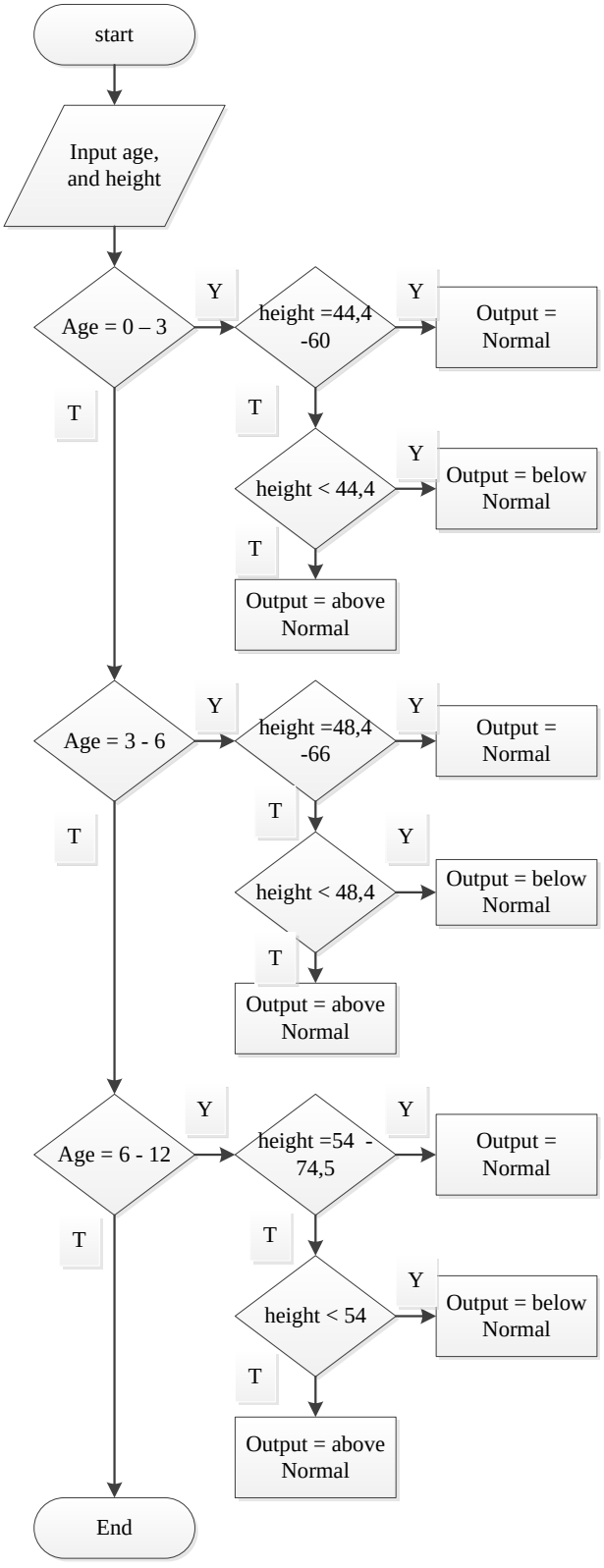

Figure 6. Flowchart of height parameter in application

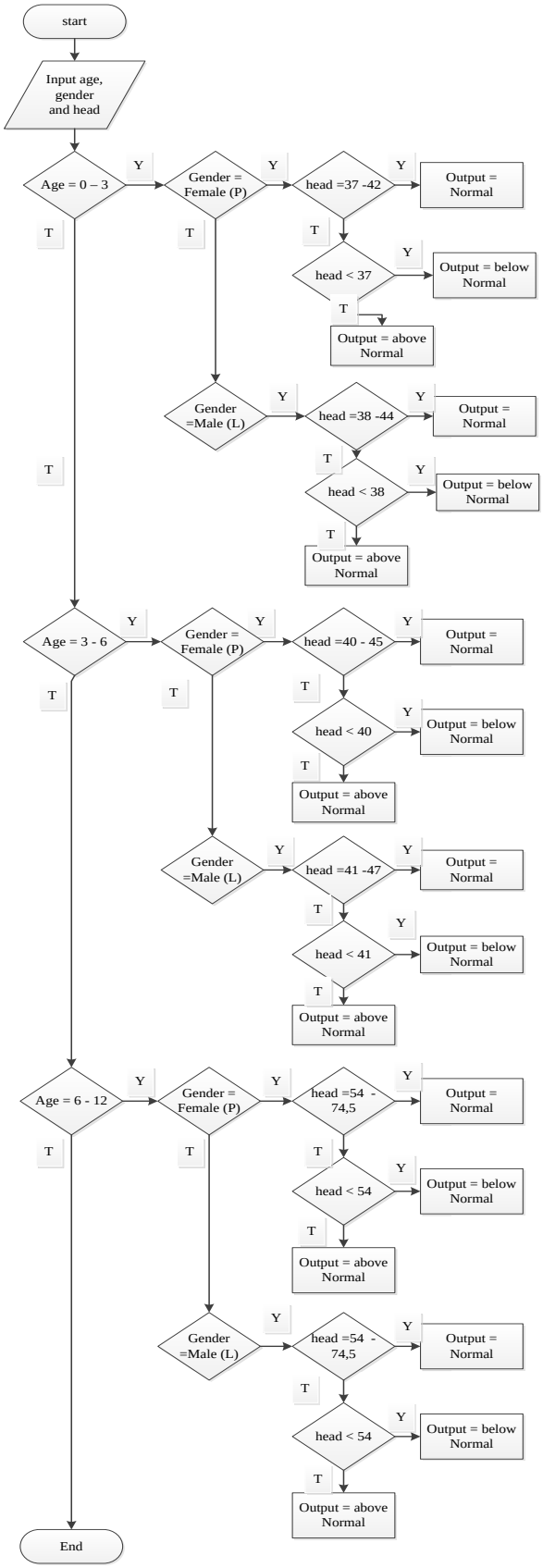

Figure 7. Flowchart of head circumference parameter in application

Figure 8. Testing of application

According to Figure 8, user entry inputs such as baby with age was four months, gender male, weight was 6 kg, height was 68 cm and head circumference was 38 cm. So the output of application was for weight was normal, for height was above normal and for head circumference was below normal. When the output of application was compared with standard from ministry of health and the result was same in weight, height and head circumference so the accuracy of application is 100%. The accuracy of application in each data is shown in Table 2 with Normal (N), Above normal (AN) and below normal (BN).

Table 2. Accuracy of application in each data

Number	Output of application			Standard from health ministry			Accuracy
	weight	height	Head circumference	weight	height	Head circumference	
1	N	AN	BN	N	AN	BN	100 %
2	AN	N	N	AN	N	N	100 %
3	AN	AN	N	AN	AN	N	100 %
4	N	BN	N	N	BN	N	100 %
5	AN	N	N	AN	N	N	100 %
6	N	BN	N	N	BN	N	100 %
7	AN	N	N	AN	N	N	100 %
8	N	N	N	N	N	N	100 %
9	N	AN	N	N	AN	N	100 %
10	N	N	N	N	N	N	100 %
11	BN	N	N	BN	N	N	100 %
12	BN	N	N	BN	N	N	100 %
13	BN	N	AN	BN	N	AN	100 %
14	N	BN	N	N	BN	N	100 %
15	N	AN	N	N	AN	N	100 %
16	N	N	N	N	N	N	100 %
17	N	N	N	N	N	N	100 %
18	N	N	N	N	N	N	100 %
19	BN	N	N	BN	N	N	100 %

20	N	N	N	N	N	N	100 %
21	N	AN	N	N	AN	N	100 %
22	N	N	N	N	N	N	100 %
23	N	N	N	N	N	N	100 %
24	N	N	N	N	N	N	100 %
25	N	N	N	N	N	N	100 %
26	AN	N	N	AN	N	N	100 %
27	AN	BN	N	AN	BN	N	100 %
28	N	N	N	N	N	N	100 %
29	N	BN	N	N	BN	N	100 %
30	N	N	N	N	N	N	100 %

According Table 2. Average accuracy of application is 100%. It proved that macromedia flash could make application of baby's nutrition status. In the future research, the application could be more detail, consists of more than three parameters, could be redesign using other software computer graphics, could be converted in website page so health workers could work efficiently and effectively.

IV. CONCLUSIONS

We have presented a method to making application of baby's nutrition status using Macromedia Flash 8. This method consists of some procedures that is stage of literature study as a preparation stage, stage of making application as a crucial stage in this research, data retrieval stage to get data as input in application and stage of application testing as stage which application tested using data from data retrieval stage. The output from application is below normal, normal or above normal. The application is also be equipped with GUI (Graphical User Interface) to make it user friendly to user. The accuracy of program is 100% obtained from comparison between output of application and standard from ministry of health. In the future research, application could be more detail, consists of more than three parameters, could be redesigned using other software graphics computer, could be converted in website page so health workers can work efficiently and effectively.

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