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Intelligent Application of Stunting Monitoring and Mapping Systems (Smart Ting) in Toddlers Based on Android in Jember

Erna Selviyanti[1,*], Mochammad Choirur Roziqin[2], Dony Setiawan Hendyca Putra[3], Muhammad Syeikhoni Noor[4]

[1, 2, 3, 4] *Health Department, Politeknik Negeri Jember, Indonesia*
[*] *Corresponding author. Email: ernaselviyanti@polije.ac.id*

ABSTRACT
The Jember Regency Government, across sectors, across programs, and the community will synergize in a massive movement to accelerate stunting reduction down to the village level. The prevalence of stunting over the last 10 years shows no significant change, therefore stunting needs to be addressed immediately. In line with the strategic efforts made by the Ministry of Health and departing from the stunting problem in Jember Regency, researchers developed a smart mobile-based application that can monitor and map stunting for toddlers in Jember. The research method uses an expert system development model ESDLC (Expert System Development Life Cycle) and to accommodate the uncertainty of thought (inexact reasoning) from an expert using the certainty factor method. The development of this smart application makes it easier to monitor the growth and development of toddlers for health cadres and parents of babies, can map stunting in infants in Jember and accelerate the distribution of information between related parties.

Keywords: *intelligent application, stunting, monitoring, mapping systems, health information system*

1. INTRODUCTION

The Ministry of Health of the Republic of Indonesia has made the main points of the 2020-2024 Strategic Plan, which impact on health development, one of which is stunting. The direction of government policy in the health sector 2020-2024 is to improve health services towards universal health coverage, in particular strengthening basic health services (Primary Health Care) by encouraging increased promotive and preventive efforts supported by innovation and the use of technology. The Ministry of Health targets the prevalence of stunting under five (%), data from the 2018 Basic Health Research of 30.8%, a decrease of 14% in 2024 [1]. One of the strategic efforts carried out by the Ministry of Health is the acceleration of stunting reduction by increasing the effectiveness of specific interventions, expanding and sharpening sensitive interventions in an integrated manner to the village level [2].

Stunting is a condition of failure to thrive in children under five due to chronic malnutrition, especially in the first 1,000 days of life [3]. The prevalence of stunting over the last 10 years shows no significant change and this shows that the stunting problem needs to be addressed immediately [4]. Data on the prevalence of stunting toddlers collected by the World Health Organization was released in 2019, South-East Asia Regional (SEAR) was in the high category of 24.7% [5]. Based on Basic Health Research data, the Ministry of Health in 2019, before the COVID-19 pandemic recorded 6.3 million children under five from a population of 23 million children under five in Indonesia were stunted. Indonesia's stunting rate is fourth in the world. The prevalence of stunting under five in Indonesia in 2019 was 27.7% [6]. The stunting prevalence rate in Indonesia is still above 20%, meaning that it has not reached the WHO target of below 20% [7].

Deputy Governor of East Java Indonesia, Dr. H. Emil Elestianto Dardak said that the 2018 Basic Health Research Data on the prevalence of Stunting in East Java (East Java) is currently not far from the national figure of 26.91% with the highest stunting risk in

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Probolinggo, Trenggalek, Jember, Bondowoso and Pacitan regencies [8]. Jember Regency is one of the districts in the spotlight because in 2019 the stunting rate actually increased. The number of stunting sufferers in Jember Regency increased from 17,344 in 2018 to 19,870 in 2019 [9]. The Regent at the district level stunting meeting held at the PB Sudirman Hall of the Jember Regency Government, Thursday, October 22, 2020, said that, in accordance with the monitoring and evaluation of the determination of priority areas for the acceleration of stunting reduction and prevention, Jember Regency was designated as one of the special locations for stunting prevention. Therefore, the Jember Regency Government, across sectors, across programs, and the community will synergize in a massive movement to accelerate stunting reduction, down to the village level [10].

In line with the strategic efforts carried out by the Ministry of Health, and departing from the stunting problem in Jember Regency, researchers are interested in researching with the title "Smart Application of Stunting Monitoring and Mapping System (Smart Ting) in Android-Based Toddlers in Jember Regency". Developed an intelligent application media for stunting monitoring and mapping systems in android-based toddlers in Jember Regency. This research is a development of our previous research on Recording Natural Disaster Victim Patients by Using Android-Based in Jember Regency [11].

2. RESEARCH METHODS

2.1. Method

In the stage of developing an intelligent application for a stunting monitoring and mapping system (Smart Ting) for android-based toddlers, using an expert system development model (Expert System Development Life Cycle). Intelligent application development using the ESDLC expert system development model will to monitor and map stunting in toddlers using the android platform. The stages are:

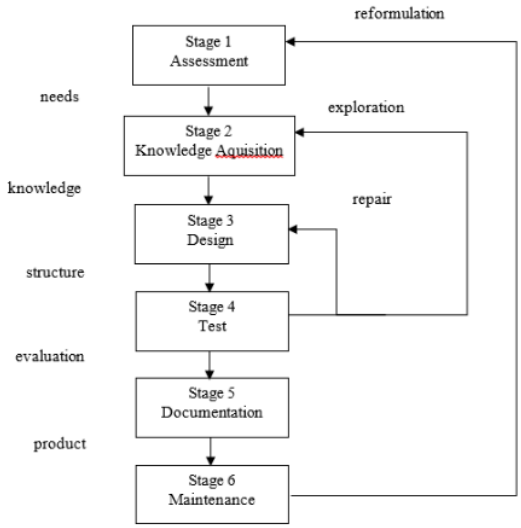

Figure 1 Expert System Development Life Cycle Method

2.1.1. Assessment

Perform analysis of stunting problems, availability of experts, software feasibility. The requirements specification for application development consists of early detection of stunting prone, stunting information, stunting mapping, immunization information, tips and simulations of nutrition improvement.

2.1.2. Knowledge Acquisition

Various factors are affecting stunting, signs of stunting, representation of knowledge related to stunting, data collection on stunting, stunting prevention solutions, data on stunting cases in the Kaliwates area with a toddler age range of 1-5 years. Knowledge is obtained by interviewing the Jember Health Office and Kaliwates Health Center, collecting data, books or references related to stunting.

2.1.3. Design

Carried out to design an intelligent application design for an Android-based monitoring system which is available; early detection of stunting prone, such as data collection on the growth and development of toddlers, in the form of digital KMS. Stunting mapping, such as mapping based on villages in the Kaliwates area and data on toddlers who are categorized as prone to stunting. The monitoring system, as described in the form of graphs and growth data for toddlers. Information on healthy toddlers, namely nutritional needs based on age, developmental stages based on age, stimulation based on age.

2.1.4. Testing

Testing is carried out in developing an intelligent application for the stunting monitoring and mapping system. Black Box Testing: is a software testing method used to test software without knowing the internal structure of the code or program. In Black Box Testing, testing is carried out based on application details such as application's appearance, the functions that exist in the application, and the suitability of the function flow with the business processes desired by the customer. Black Box Testing is more testing to the Interface of an application to be easy to use by users. This test does not see and test the source code of the program.

2.1.5. Documentation

Need identification documentation. Carry out all documentation for each stage of developing a smart application for monitoring and mapping stunting (smart ting) systems for toddlers in Jember Regency.

2.1.6. Maintenance

Perform of smart applications for stunting monitoring and mapping systems (Smart Ting) for toddlers.

2.2. Research Flow

Figure 2 Expert System Development Life Cycle Method

The activity began by conducting a literature study for toddlers' intelligent application of a stunting monitoring and mapping system. It was continued to identify the need for intelligent application monitoring and mapping systems for stunting in toddlers. Analyze the intelligent application of the stunting monitoring and mapping system for toddlers, which will carry out an at this stage. Designing and developing intelligent applications for monitoring and mapping stunting systems for toddlers. Testing step for the intelligent application of the stunting monitoring and mapping system in toddlers, at this stage as well as documenting. Furthermore, evaluating and maintaining intelligent applications for monitoring and mapping stunting systems in toddlers.

3. RESULTS AND DISCUSSION

3.1. Assessment

3.1.1. Stunting Problems

Based on the results of interviews with the Jember Health Office, stunting is influenced by many factors, the basic one being a previous history of dietary diversity, infection and other epigenic factors. It could also be from environmental factors, for example from parents who smoke. The Jember Health Office will collect data on children under five in 17 special stunting locations in 2021. Toddlers who are brought to the posyandu will have early stunting detection using the z score. The data results are recorded into the application (Microsoft Excel). If the data has been processed and stunting is detected, the next process, the midwife will provide additional food. This additional food will be provided if there is a budget from the office or from the local village. Not all villages set aside village budgets for stunting management. Furthermore, conducting education related to stunting from cadres to mothers of toddlers and providing assistance such as there is a toddler class in the village.

Table 1. Data for 17 Villages Specific Stunting Locations in 2021

Districts	Number of Stunting Children	%Stunting
Kaliwates	554	30,08
Tegalbesar	535	28,86
Mangli	306	28,60
Sempusari	301	34,20
Manggisan	263	32,51
Kalisat	233	37,16
Jatisari	228	31,84
Ajung Kalisat	222	35,98
Paseban	200	45,56
Pringgodani	190	40,08
Badean	187	36,74
Kemuning Sari Lor	185	32,51
Slateng	183	27,81
Karangrejo	182	26,73
Sumberagung	170	26,15
Kraton	167	27,29
Sumberjambe	162	37,50

3.1.2. Software Eligibility

Based on the results of interviews with the Jember Health Office, the development of stunting applications is urgently needed, because the existing data has not been integrated between the puskesmas in each village, this makes it difficult to see changes in data in real time. The specifications needed for the stunting monitoring system requirements are a menu that can record the development of toddlers, produce output status of toddlers, provide information whether the status of toddlers is normal, prone to stunting or stunting. There is a mapping menu for each village, a menu of tips and nutrition improvement simulations are included in the application referring to the toddler growth book which has been adapted to the simulation standards provided by experts.

3.2. Knowledge Acquisition

The various factors influencing stunting are the level of knowledge of maternal nutrition under five, parenting (history of breastfeeding, the accuracy of complementary feeding, the behavior of nutrition-aware families), availability of food in the family, maternal health services during pregnancy, access to clean water and family sanitation, level of family economics of toddlers, socio-culture, toddler care practices, gender of toddlers, age of toddlers, history of infectious diseases, nutritional status of toddlers based on height or age, the accuracy of immunization.

One solution to prevent stunting is to provide proper parenting. There are several ways to prevent stunting for pregnant and maternity mothers with optimal health monitoring and treatment, in the first 1,000 days of a baby's life. Pregnancy check-ups or antenatal care routinely and periodically. Perform the delivery process at the nearest health facility. Provide foods that are high in calories, protein, and micronutrients for babies. Conduct early detection of existing disease history, whether the disease is infectious or non-infectious. prevent children from getting intestinal worms. Do exclusive breastfeeding for 6 full months.

Prevent stunting in toddlers by routinely monitoring the toddler development. Provide additional food for toddler's. Doing early stimulation of child development. Provide optimal health care and services for children. Prevent stunting in toddlers by routinely monitoring the development of toddlers. Provide additional food other than rice for toddlers. Doing stimulation at the beginning of the child's growth and development. Provide optimal health services for children.

3.3. Initial view of the application

The initial appearance of the application when first opened will bring up a splash screen. Next displays an

onboarding screen that contains information about an overview of the features in the application. At the bottom is also shown the version of the application that is being used. Log in is the view that will appear first after the application is opened. If the user does not have an account, then they can register by clicking "register". On the login page view, the user must enter the user's username and password to log in. The development of this application can be seen in figure 1, figure 2 and figure 3 in the appendix below.

3.4. Home Menu

The initial On the home menu, the user can see a summary of all activities that have been carried out. At the top, there is a profile photo, menu title, and an icon for the sidebar. In the home section there are also shortcuts and mini views of the distribution map of the health status of infants and toddlers. Thumbnails are also displayed on the home menu to make it easier for users to see a graph of the baby's current status. The last entered data on the health status of infants or toddlers can also be seen in the home menu. Navigation in this application is located at the bottom in order from the left sequentially as follows:

1) Home Menu

2) Growth Chart Menu

3) Distribution Map Menu

4) Growth Chart Graphics and Data Menu

5) User Profile Menu

The development of this application can be seen in figure 4 in the appendix below.

3.5. Growth Chart Menu

On the growth chart menu, it will display all toddler data that has been inputted.

Adding new data, the user can click the button in the bottom center. After clicking, a growth chart will appear. The user can enter the family card number of the baby or toddler who will input the data, then the toddler's name, gender, date of birth, weight, height, address, and photo. After all the data has been filled in, the user can press the add data button to save the data.

After all the data has been processed, the results of the toddler's growth will be displayed in a normal, insufficient, or excessive status. This is by the regulation of the Minister of Health of the Republic of Indonesia number 2 of 2020 concerning Child Anthropometry Standards and Maternal and Child Health Books 2016. Recommendations for nutritional needs, stages of development, stimulation for infant and toddler development are also displayed. The development of this application can be seen in figure 5, figure 6, figure 7 and figure 8 in the appendix below.

3.6. Distribution Map Menu

In the distribution map menu, data on the distribution of children under five that has been recorded is displayed. The development of this application can be seen in figure 9 in the appendix below.

3.7. Growth Chart Graphics and Data Menu

In this menu there are growth chart graphics for each region. The development of this application can be seen in figure 10 in the appendix below.

3.8. User Profile Menu

In this menu there is a profile of the user. There is a profile photo, office location, and office address. The development of this application can be seen in figure 11 in the appendix below.

4. CONCLUSSION

Intelligent Application of Stunting Monitoring and Mapping Systems (Smart Ting) in Toddlers Based On Android in Jember was developed using the ESDLC (Expert System Development Life Cycle) expert system development model. Data collection was obtained from the Jember Health Office, the Kaliwates Health Center and health service providers who went directly to the field to collect data on the growth and development of toddlers. Intelligent Application of Stunting Monitoring and Mapping Systems (Smart Ting) in Toddlers Based On Android in Jember has been successfully developed and has gone through an evaluation stage by the Kaliwates Health Center.

AUTHORS' CONTRIBUTIONS

The author is a lecturer who conducts research and development of Intelligent Application of Stunting Monitoring and Mapping Systems (Smart Ting) in Toddlers Based On Android in Jember

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REFERENCES

[1] Rahmadhita. Kinanti, Permasalahan Stunting dan Pencegahannya, Jurnal Ilmiah Kesehatan Sandi Husada 9, no 1, 2020, 225-229.

[2] Kementerian Kesehatan, Renstra Kemenkes 2020-2024, 2020, https://www.kemkes.go.id/.

[3] Kementerian Kesehatan Republik Indonesia, "Situasi balita pendek (stunting) di Indonesia", Jakarta: Pusat Data dan Informasi Kementerian Kesehatan Republik Indonesia, 2018.

[4] Kementerian PPN/Bappenas, Pedoman Pelaksanaan Intervensi Penurunan Stunting Terintegrasi Di Kabupaten/Kota, tnp2k.go.id, 2018.

[5] Nutrition and Food Safety, "Levels and Trends In Child Malnutrition", United Nations Children's Fund, World Health Organization, World Bank Group, ISBN: 9789240003576, 2020.

[6] Dewan Perwakilan Rakyat Komisi IX, "Jangan Kesampingkan Program Pencegahan Stunting di Masa Pandemi", in press, 2020.

[7] Mohammad Teja, "Stunting Balita Indonesia dan Penanggulangannya", Bidang Kesejahteraan Sosial Info Singkat: Kajian Singkat Terhadap Isu Aktual dan Strategis, Pusat Penelitian Badan Keahlian DPR RI, Vol XI, No22/II/Puslit/November/2019, ISSN 2088-2351, P 13-18, 2019.

[8] Media Indonesia, "Jatim Tergetkan Angka Stunting di Bawah 25% pada 2024", in press, 2020.

[9] D. I. Mayasari, "Evaluasi Program Gerakan 1000 Hari Pertama Kelahiran (HPK) Dalam Pencegahan Stunting di Puskesmas Jelbuk Kabupaten Jember", Universitas Jember, 2019.

[10] Pemerintah Kabupaten Jember, "Pemkab Jember Perkuat Percepatan Penurunan Angka Stunting", in press, 2020.

[11] M. C. Roziqin, D. S. H. Putra, M. S. Noor, "Information System for Doctor Practice Scheduling at Hospitals in Jember District", In The First International Conference on Social Science, Humanity, and Public Health (ICOSHIP 2020), pp. 29-31, Atlantis Press, January 2021.

APPENDIX

Smart Ting application development image

Figure 1 Splash Screen

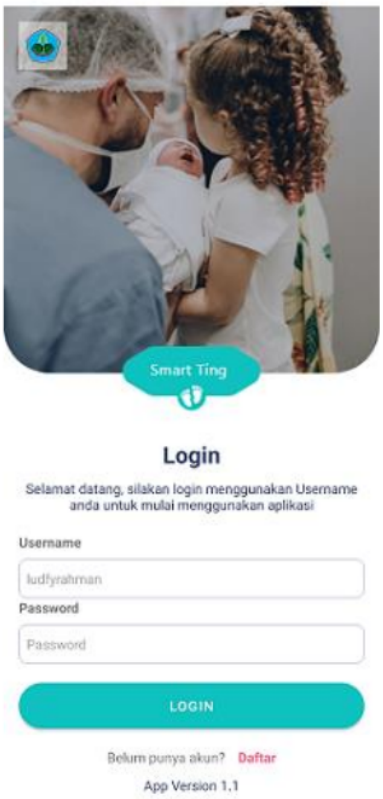

Figure 2 Login Interface

Figure 3 Register Interface

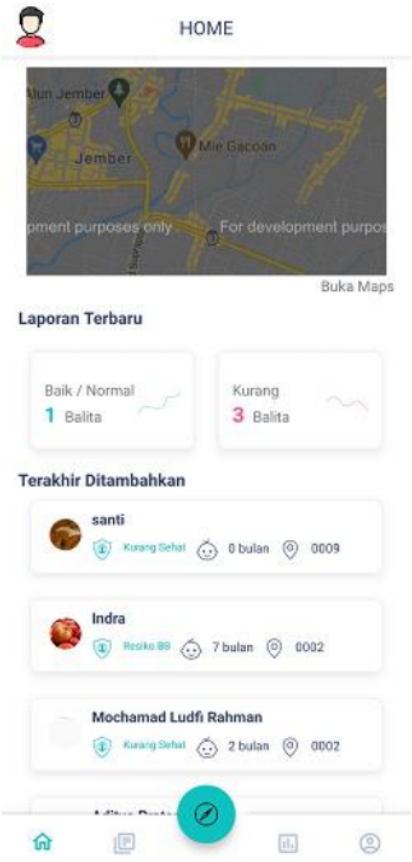

Figure 4 Home Interface

Figure 5 Toddler Dataset

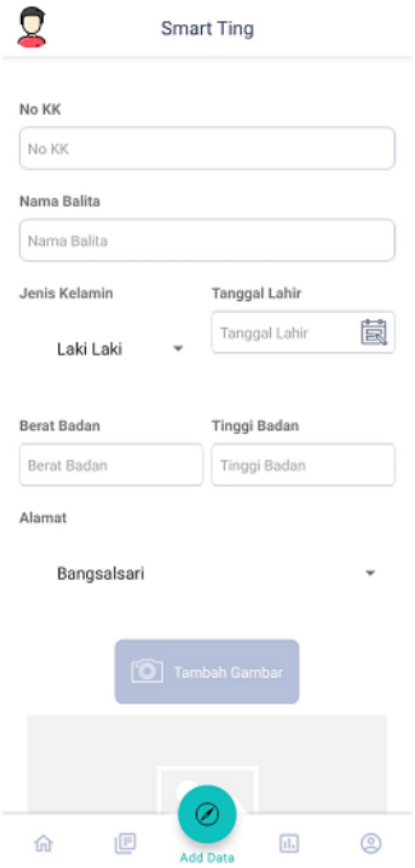

Figure 6 Growth Chart Menu

Figure 7 Toddler Data

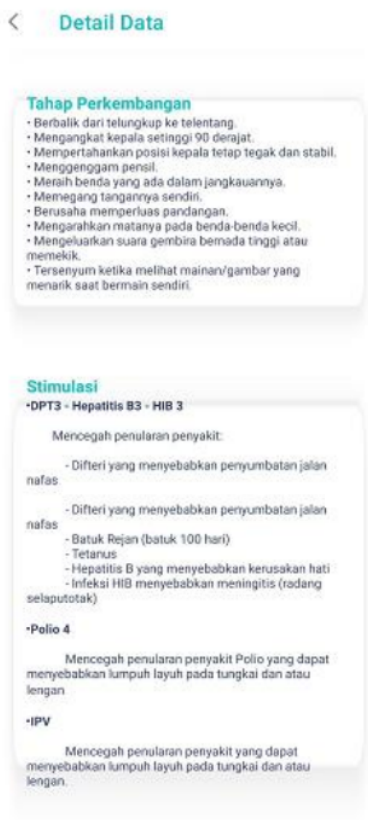

Figure 8 Toddler Data

Figure 9 Distribution Map Menu

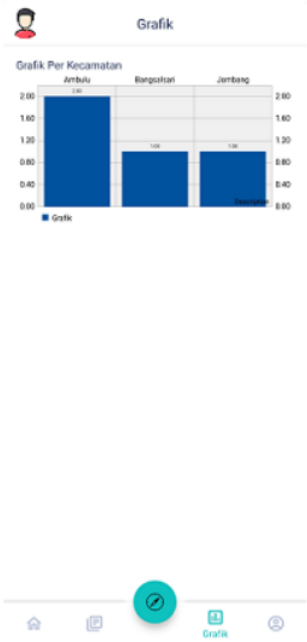

Figure 10 Growth Chart Graphics and Data Menu

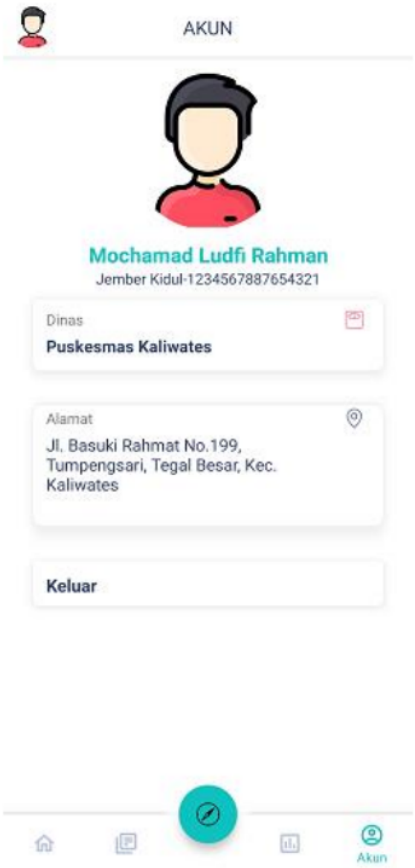

Figure 11 User Profil Menu

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