

IOP_2020

by lop2020 lop2020

Submission date: 23-Dec-2021 08:49AM (UTC+0700)

Submission ID: 1735155224

File name: Haryanti_2020_IOP_Conf._Ser._Earth_Environ._Sci._469_012088.pdf (526.17K)

Word count: 2014

Character count: 11008

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To cite this article: Tining Haryanti and Winarno 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **469** 012088

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Document Management System and Reminder using SMS Gateway

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Abstract. This research is an observational research using descriptive analysis on rural areas that have little technological exposure to support social welfare, especially for baby. The lack of good documentation in social facility services for baby, especially on immunization has cost failure in meeting local government program's standard. This has led to suboptimal health care for baby. Another impact is that repeat immunization will not be effective for the social services themselves as there are no sufficient & reliable records. The information regarding to the implementation of health care for baby has failed to reach sizeable part of the society. As a result, many people are still not yet well-informed with the service schedule or types of the immunization suitable for their baby. This research is done in ABC village through data collection in forms of observation, interviews and documentation. With the existence of document management system and reminder using SMS as to leverage health care for baby, it is expected that government program in terms of social health care especially for baby can be implemented optimally.

Keywords: document, SMS, health care

1. Introduction

Health care is one of human rights in our society. The facility of free vaccination to baby by the government is one of the efforts in ensuring the fulfillment of such human rights. Vaccination or immunization is delivered through Posyandu (integrated health care posts) reaching out to even many of the most rural places with the hopes of being able to cover all parts of society. Problem arises when the documentation and spread of such health care information are compromised. Significant part of the targeted people will not be able receive vaccination due to failure in knowing when or whether or not the vaccination is done suitable with their children's age. By using appropriate technology it is expected that such problems could be minimized.

Some researches have been done related with health care. One of the researches has been done by titled "Application for Posyandu Data Processing". The result of this research is the application for Posyandu data that can help Posyandu in reporting health care related activities on babies and pregnant mothers. The other research that has been done related to other health care is "The Implementation of SMS Gateway to Increase Number of Traffics in Catleya 14 Jember Posyandu". The result of the research is the creation of application with automatic features that can help solve problems.



According to field observation, current documentation of health care/Posyandu still uses manual records by using physical ledger, while personal data such as information related to baby vaccination is recorded on specific book that must be carried out by the patients whenever they want to participate in the health care activities. The spread of information is also done manually through microphone/loudspeaker nearby. The application is made so that it can help data processing and act as reminder for health care activities so that it can help increase number of people visits in the health care posts. The creation of the application uses Ms. Access & SMS Gateway.

2. Methodology

The research is observational using qualitative-descriptive data analysis through development of prototyping system. The model is then developed until it becomes suitable for users' need. The data used is data from the result of observation, interview and secondary data from ABC village. Application used in this system design is Ms Access and SMS Gateway. Ms Access is one of Ms Office program used for database processing that has user-friendly features. Database files in Ms Access are relatively lightweight as it doesn't require specific computer as database server.

The choice of Ms Access is because the minimum requirement for the computer used in ABC village, its capability to store the necessary data, and its user friendliness to average computer users. SMS Gateway Application is software used with the help of computer aid and cellular technology to help distribute messages through information system using SMS as media, governed by cellular network. The use of SMS Gateway in the system design will be adjusted as necessary in village ABC by ignoring the quota/internet network to access the information.

The research is conducted first by identifying the system's health care in ABC village. The identification is done by observation and interview with social & health care officers. After the identification phase, analysis is then conducted to assess the improvement gap in ABC health care. From the analysis then it can be suggested the alternative solutions to help solve the problem of health care in ABC village.

3. Findings

One of the government social service programs for the society is in the form of vaccination for baby covering many of the most rural places, including ABC village. The benefit of such social service program has not yet been fully realized because of the limited use of technology in helping spread the information and documentation process. According to the problem analysis, the system proposed for the document management system and short message service reminder for health care can be described below :

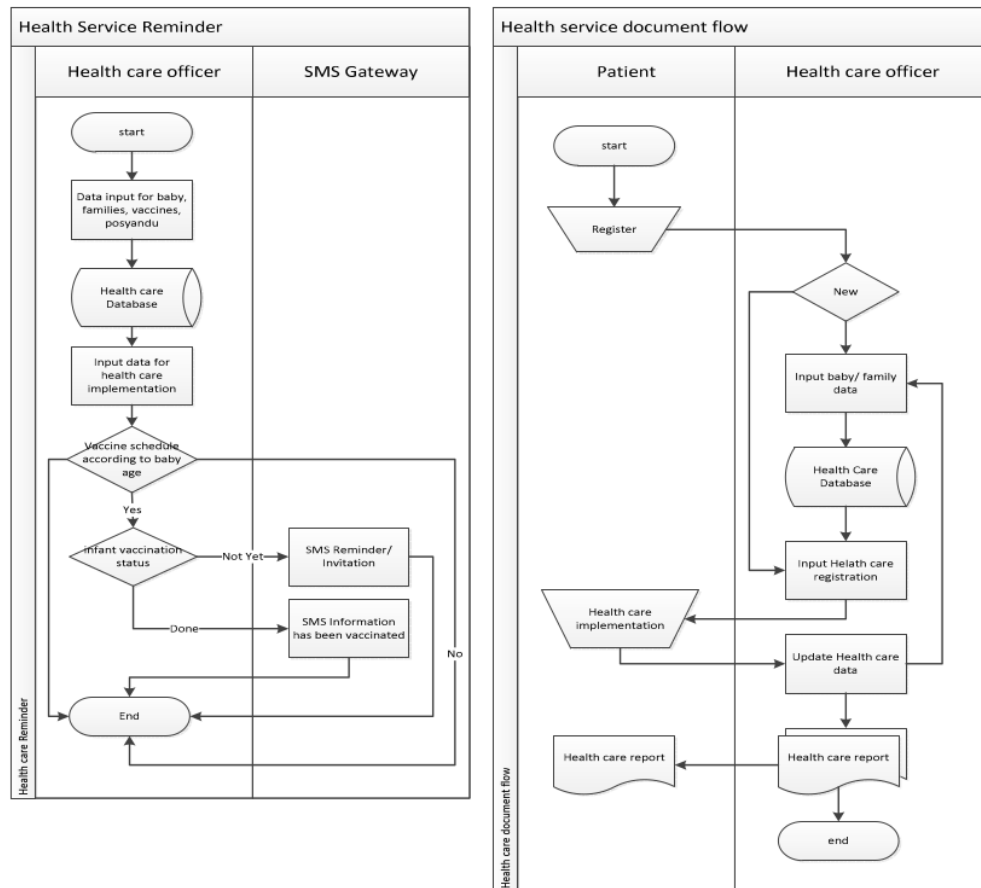


Figure 1. Proposed Phase of Document Management System & Reminder using SMS Gateway on Health Care

The proposed system above is expected to be able to fulfill the needs of health care data processing and act as a reminder to health care activities for the targeted people through SMS Gateway, along with validation match for vaccination/health care activities schedule against their children age and previous vaccination status. Therefore, it not only reminds but also becomes filters for the health care patients.

Before the application is created in accordance with the proposed system, the system design is first prepared. The tools needed to model the system design is Context Diagram, DFD and ERD.

3.1. Context Diagram

Context diagram help visualize scope of the system. In this research, the context diagram can be described below:

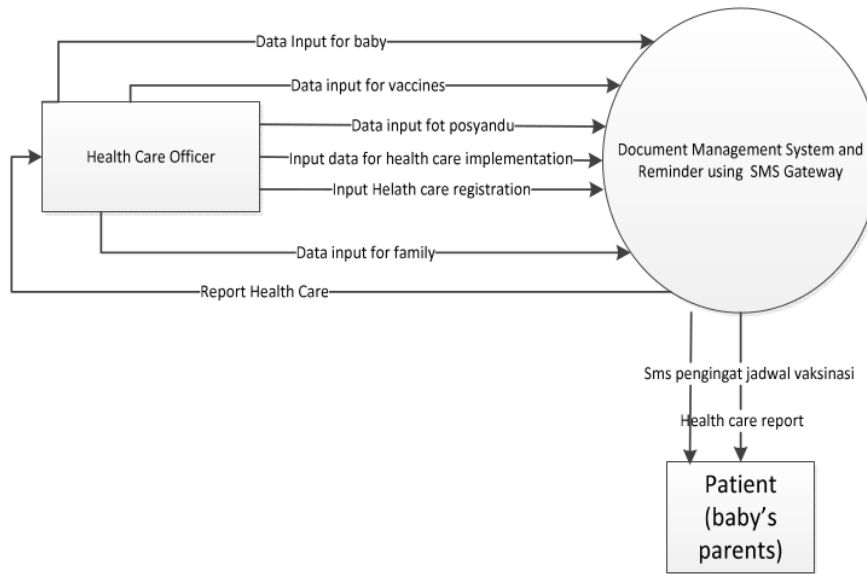


Figure 2. Context Diagram

3.2. Data Flow Diagram

Data Flow Diagram (DFD) is a logical data model/process that is created to visualize where the data comes from and where it leads to out of the system, where the data is stored, what processes results in such data and the interaction among the stored data and the process assigned to the data [7]. In this research, data flow diagram can be described below:

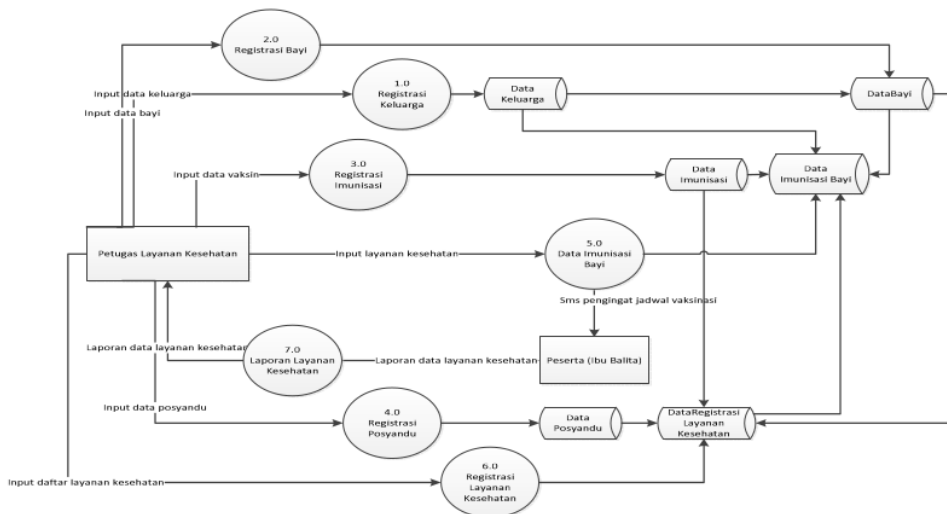


Figure 3. Data Flow Diagram

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3.3. Entity Relationship Diagram

Entity Relationship Diagram (ERD) is one of the models from relational data base that is founded on the perception that the real word consists of a collection of interrelated objects. The object is called entity and the relation among them is called relationship. An object is unique and has attributes which differentiate it from the rest. ERD in the system design can be seen below:



Figure 4. Entity Relationship Diagram

4. Discussion

This research produces application for Document Management System and Reminder using SMS Gateway that is used to support health care in ABC village. The application goal is for document management for health care and act as reminder using SMS Gateway. The health care reminder uses schedule-children age match and previous vaccine status validation. Therefore, it not only acts as reminder but also as filters for the health care patients. The master data includes Baby Data, Family Data, Vaccination Data, and Posyandu Data. The input of the baby data can be seen below.

The screenshot shows a web form titled "Bayi" with the following fields and values:

- id_Bayi: By_02
- Nama_Bayi: Angge
- Gender: Laki - laki
- Tgl.Lahir: 02-June-17
- No_KK: KK_1001

At the bottom of the form, there are four buttons: "TambahData", "RubahData", "Hapus Data", and "Laporan". To the right of the form is a small image of a smiling baby.

Figure 5. Baby Data Input

Reminder for the health care using SMS Gateway is sent automatically by the system once it fulfills the validation process of the children’s age against the vaccine specifications and its previous vaccine status.

Figure 6. Baby Immunization Data (Reminder)

Reminder for the SMS Gateway is sent by the system after being inputted, 3 days before the care activities is conducted. The immunization registration is one with the patients (mothers) when they participate in the health care. The system will then update the vaccination status. On the next occasion, the participants will not receive reminder on the same vaccination activities that they have previously participated in.

Figure 7. Immunization Registration

After the implementation, the health care program has seen improvement changes in the process,

Table 1. Trial Result

No	Trials	Process	
		Before	After
1	Health care registration	10 minutes	5 minutes
2	Data gathering	15 minutes	2 minutes
3	Health Care Report Update	15 minutes	2 minutes
4	Error in data searches/data not found	21%	0%
5	Patient Visits (Mothers)	56%	88%

5. Conclusion

The role of technology involvement in supporting health care especially on baby helps in solving problems in ABC village. With the existence of document management system and reminder using SMS Gateway on health care, the data process on health care can be done more accurately (minimizing possibility of missing data). The patient visit rate also increases with the help of the reminder using SMS Gateway with validation based on children's age against vaccination schedule and vaccination participation. Significant number of people has become more aware of the vaccination schedule according to the vaccination period set by the government.

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