

Monitoring And Data Management Of Participants Of Family Planning Program With SMS Reminder

¹ Dwi Mulyani; ² Rintana Arnie

¹ Information System, STMIK Banjarbaru,
Banjarbaru, 70712, Indonesia

² Information System, STMIK Banjarbaru
Banjarbaru, 70712, Indonesia

Abstract - Indonesia is a country with a population of 269 million at the end of 2018 and is the fourth most populous country in the world after China, India and the United States. The Family Planning Program which aims to regulate births and limit the number of children in the family has officially entered the government program since 1967. The target is couples of childbearing age (Participants). The mechanism of implementation is overseen by a doctor or midwife. One of the factors that caused the failure of the Family Planning program was the lack of awareness and knowledge of the community about the Family Planning program. Not timely using contraception can cause pregnancy. The use of SMS Reminder can help remind participants by sending information about contraceptive use schedules to participants so they can be on time for contraceptive use.

Keywords: SMS Reminder, Monitoring, Family Planning Program.

1. Introduction

Indonesia is a country with a very large population. Based on the Indonesian Statistics book published by the Indonesian Central Statistics Agency in 2018, Indonesia's population data in 2017 is 261,890,900 with a population growth rate of 1.34% per year. By the end of 2018 Indonesia's population reached 3.54% of the total world population and became the fourth most populous country in the world after China, India and the United States, as shown in Fig.1. Large populations have been very worrying because this is a major problem in populations that will affect other fields such as economic and social.

The Indonesian government continues to make efforts to reduce the number of births to reduce population numbers. One of the Indonesian government's efforts to reduce the number of births in Indonesia is by promoting the Family Planning Program. According to Law No. 10 Th 1992 Family planning is an effort to increase awareness and participation of the community through maturing the age of marriage, birth control, fostering family resilience, improving family welfare to create a small, happy and prosperous family.

The goal of the Family Planning Program is for couples of childbearing age. The aim is to regulate birth spacing and limit the number of children in the family so that the Indonesian population can decline. The mechanism of the Family Planning program is to provide contraception for Fertile Age Couples, including biases in the form of Pills, Injections, IUDs, implants and others. Use of contraception varies in time. Some are every day, every month, every two-three months and some even several years.

Based on population data at the end of 2018 which is still high, this shows that the goals of the Family Planning program have not been achieved. Many factors hamper the achievement of the Family Planning program. One reason for the failure of the Family Planning Program is the lack of awareness and knowledge of the community in the Family Planning program. There are still many people who participate in family planning who still consider it

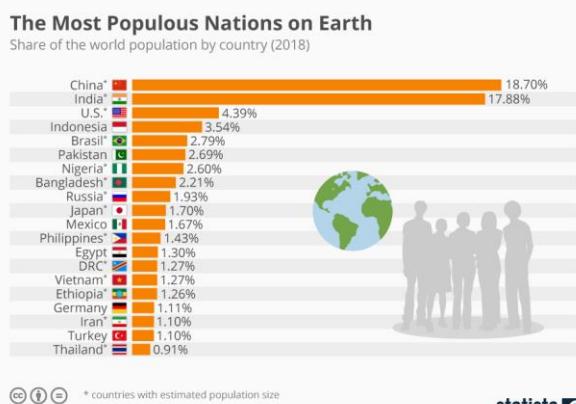


Fig. 1. World Population

trivial in the rules of contraceptive use, especially the rules for the use of family planning injections. Violations of the rules for reuse of contraception have resulted in many failures in the Family Planning program that have been implemented.

The most widely used contraception is injection. Injection contraception has a long repetition period of one month and 3 months. Because the length of the repeat injection schedule is not uncommon, Participants in the Family Planning Program often experience delays due to forgetting the injection schedule date and the mindset that the injection is not easy for the acceptor to get pregnant even though it is too late. to repeat injection contraception.

One of the factors influencing the accuracy of injecting contraceptives to acceptors (participants) is the knowledge of participants about family planning programs. this is compliance by acceptors to repeat the injection on schedule.

Delay in repeating the use of contraceptive injections or the use of contraceptive injections that are not timely according to the scheduled date, can cause the failure of the family planning program, namely the occurrence of pregnancy thereby reducing the effectiveness of the Family Planning Program. .

Doctors and Midwives as health workers play an important role in the implementation of the Family Planning Program. they are assigned to provide counseling and services using contraception. so that sufficient skills are needed for these health workers. In the Family Planning Program information is given precisely such as the usage procedure, validity period, control time, counseling and so on. some contraceptives used in the family planning program are pills, injections, implants and others that have different periods of use.

It also conveyed the advantages and risks in using each contraceptive. Doctors and Midwives have also provided repetition schedules for examinations and follow-up on the Family Planning Program in each period.

The schedule of visits for the examination and repetition of contraceptive use is not always considered by participants in the Family Planning program. There are still many participants in the Family Planning Program who are late checking due to reasons for forgetting and so on. Doctors and Midwives cannot always monitor the schedule of examinations of participants in the Family Planning Program they handle. They only write visit schedules for participants in the Family Planning Program

in the visit book and on the participant's visit card, but sometimes the visit card is left behind or forgot to save. Because there are so many participants in the Family Planning Program that there are difficulties in the monitoring process. Doctors and Midwives cannot check the notes in the book one by one. this takes a long time and due to lack of accuracy results in hard to find data. This results in delays in examinations and repeated use of contraception, not infrequently causing pregnancy in Participants in the Family Planning Program so that the Family Planning program fails to be implemented.

Based on a survey of 50 Family Planning Program Participants with the results of 28 participants in the Family Planning Program it was still too late to repeat contraceptive use or not follow the rules of contraceptive use and 7 people experienced pregnancy because they were late using or repeating contraceptive use.

Problems faced by participants in the Family Planning Program can be overcome by developing information technology systems. One way is to use services in the form of SMS services. SMS has become a daily necessity and is familiar with everyone, because of its simplicity, speed and also only cheaper than a telephone[24][25] [26]. A text message reminder system may prove to be an effective method for achieving improved attendance [14][21][23], So that it can be used by clinics to send schedule information to examine participants in the Family Planning Program and not be late in re-checking.

Short Message Service (SMS) is a form of text communication through mobile phones that are widely used in Indonesia. Portable mobility and information is desirable. SMS technology is an opportunity for the development of various information systems. Utilization of SMS as a means of information services can be used as a database that can provide information services to users [9].

The most widely used form of SMS service now is SMS Reminder. Reminder is a message feature that can help everyone remember something that is usually found on cell phones or other important media records. The way SMS Reminder works is almost the same as the way SMS works in general, only different in terms of the device used. In SMS Reminder, the sending device is no longer a cell phone, but a modem that uses a provider network. This modem will be controlled by a computer for information dissemination and transfer.

Research conducted by Marcia Vervloet et al. Offers innovative monitoring of type 2 diabetics in the

consumption of oral antidiabetic drugs by utilizing SMS Reminder. The combination of monitoring and SMS reminders provides an opportunity to improve patient compliance with oral antidiabetic drugs. The results show that increased medication adherence leads to better glycemic control [1].

Another study was by Per E Hasvold and Richard Wooton. They saw many patients who failed to attend meetings with hospitals. This results in inefficient use of resources. Then they try to apply SMS Reminders to remind patients of their appointments. The result is that SMS Reminder has increased patient appointments with hospitals, besides being more practical, regular SMS is also cheaper compared to the cost of manual telephone calls. [2][19][20][22]

Muhammad Shama conducted qualitative research to understand user perceptions, acceptance and involvement with an interactive SMS reminder system designed to improve treatment compliance for patients with tuberculosis (TB). Most patients find reminders useful and encouraging. The average response rate over the study period was 57%. this shows that interactive SMS reminders are an acceptable and valued method for supporting TB patients in taking medication. [8]

Research conducted by Gretchen J.Domek et al, namely Reminder Text Messages to Increase Coverage of Vaccination of infants in Guatemala. Vaccination reminder systems are evidence-based ways to increase children's vaccination rates, but are difficult to implement in low and middle income countries (LMICs). SMS Reminder is a solution offered because of the low cost and the number of cellphones used by the public. The results of this study indicate that the new application of SMS technology can be widely implemented in LMIC with a high level of parental satisfaction. Larger studies with modifications in the SMS system are needed to determine effectiveness [11][17].

The development of information systems monitoring software can help document projects well so that they can be monitored in real time by system analysts.

Monitoring and Management of Participants in the Family Planning Program Program on Midwife Practices Based on the SMS Reminder, it is expected to be able to help Doctors and Midwives monitor participants in the Family Planning Program. Participant data can be searched quickly. Information about the repeat examination date can be monitored daily, so that Doctors and Midwives can provide immediate information to participants in the family planning program before the check deadline date. As such,

participants are expected to know immediately when they should immediately go to a doctor or midwife to repeat their use of contraception. This can help prevent the failure of their family planning program.

The results of the study by Thiago Martinida Costa and colleagues showed that sending reminders of appointments as text messages to patient cellphones was an effective strategy for reducing absenteeism [10]. The use of SMS Reminder can reduce the failure rate of meeting schedules and others [7]. Reminders on SMS usage may also be more cost-effective than traditional appointment reminders and require less labor. This finding must be confirmed by a more robust research design before a wider launch [4][6] [8] [27]

2. Research Method

SMS Reminder based application that can be used to explore data and monitor Participants in the Family Planning Program. Monitoring in this case is in the use of contraceptives and repetition schedules for the use of contraceptives with the aim of maintaining regularity in the use of contraceptives to prevent the failure of family planning programs.

This type of research is Research & Development, research methods used to produce certain products and to test product effectiveness. This research was conducted in the Midwife Practice area that handles participants in the Family Planning program.

The data used in this study were participants of the Family Planning Program in the clinic. Information relating to Participants in the Family Planning Program is obtained by studying the files in the clinic, by direct interviews with the clinic manager and from participants of the Family Planning Program through a questionnaire questionnaire.

Monitoring is a routine and ongoing activity that is part of management to monitor and observe an activity. The purpose of monitoring is to supervise an activity carried out whether it is in accordance with established procedures and plans, as soon as possible to identify problems that arise during the activity so that they can be directly addressed, carry out work assessment and appropriate management to achieve the objectives

Monitoring is a monitoring or observation activity that takes place during the activity to ensure and control the harmony of the implementation of the program with the planned plan. Research monitoring is the activity of

monitoring a research program so that its implementation is in accordance with a predetermined plan.

SMS is a facility for sending information via a cell phone that allows users to communicate via text message lines. Initially SMS was part of the standard GSM cellular technology, then it was also available in CDMA technology, PSTN home phones and others. SMS is a form of information that is delivered to mobile phones by delivering information that is easy, efficient, real-time and has broad reach and relatively lower cost.

SMS Reminder is a service that is available at the SMS gateway. SMS Reminder is a messaging feature to help people remember something that is usually found on cell phones or other important media records. SMS Reminder will send an SMS automatically depending on the situation, conditions, triggers that have been determined by the system. SMS Reminder serves as a reminder of conditions that have been set on the system. SMS Reminder is integrated with the SMS gateway where the SMS gateway manages the sending of messages, retrieves data from the database, then the message is sent automatically as a reminder via the SMS reminder feature. Users can set when to send messages and fill messages automatically.

Zenziva is an Online SMS Center Service & SMS Masking. Zenziva can be used as a replacement modem and Gateaway

sms software. This form of service can be combined with the software that we create by adding certain codes. Through Zenziva we can send individual SMS or mass SMS. The cost needed to connect with Zenziva jg is cheap so it is very helpful for businesses and others.

The reason for using the SMS Reminder for monitoring Family Planning Program Participants as observers of the visit schedule and checking is that the SMS Reminder on this system is quite practical and easy to use, flexible because it does not depend on a particular brand and mobile phone type, and can reach patients wherever they are in signal range.

In this research, an application will be made to manage data about Family Planning Participants. In the application there are several forms of information about participants in the family planning program, contraceptive data input, inspection forms and participants in the family planning program. the design can be seen in the Fig.2. The data collected is Participant data and Contraception Data. This application will be connected to the Online SMS Center service. Online SMS Service Center will continue to send SMS applications to devices belonging to participants in the family planning program. see in the Fig. 3.

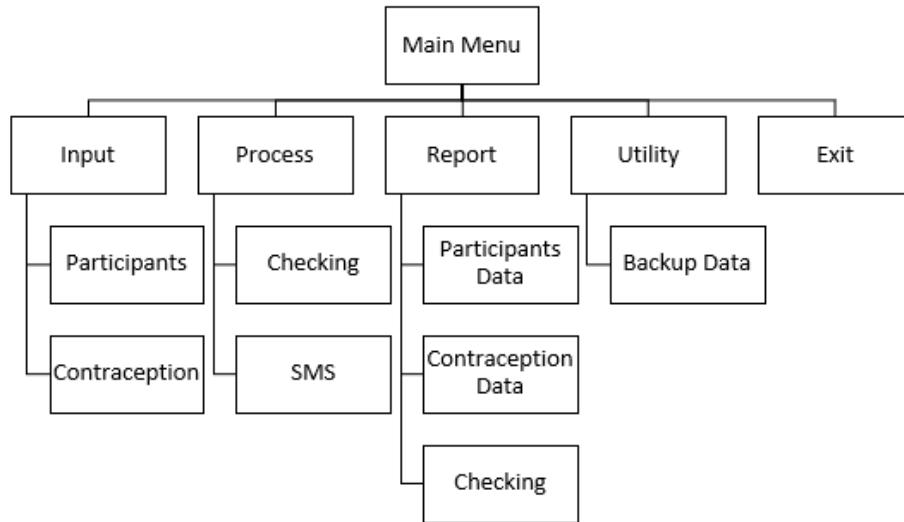


Fig. 2. Architectural Design

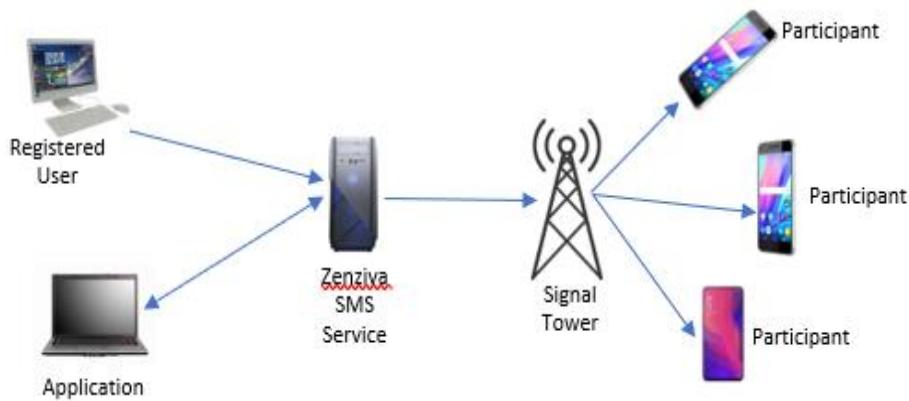


Fig. 3. SMS Reminder

Following are some of the data tables used in making monitoring and data processing applications for family planning program participants by SMS Reminder

The Participant table is used to store participant of family Planning Program data. The data required includes participant id, name, city of birth, date of birth, partner's name, address and telephone. table design can be seen in table 1

Table 1. Participant

Name	Type	Width	Index
Idpar	Character	10	✓
Name	Character	15	
City	Character	15	
Birthdate	Date	8	
Partner	Character	15	
Address	Character	100	
Phone	Character	13	

Contraception tables are used to store data of contraceptives used by participants. contraception data includes id of contraception, type of contraception and period of contraception. contraception table design can be seen in table 2.

Table 2. Contraception

Name	Type	Width	Index
Idcon	Character	10	✓
Type	Character	10	✓
Period	Character	10	

The Visit table is used to record participant visits that repeat the use of contraceptives. The data in the visit table include the date of the visit, participant id, contraception id, and others. visit table design can be seen in table 3.

Table 3. Visit

Name	Type	Width	Index
No	Character	10	✓
Visitdate	Date	8	
Idpar	Character	10	✓
Name	Character	15	
Type	Character	10	✓
Period	Character	10	
Prevdate	Date	8	
Nextdate	Date	8	
Phone	Character	13	
Act	General	4	

3. Results and Discussions

The monitoring process that runs on the clinics of Doctors and Midwives who handle the Family Planning Program is currently still manual only by recording the schedule of visits to the book. There is no application that can be used to manage family planning participant data and monitor the schedule of visits for family planning programs. Midwives cannot provide information on the schedule of visits of family planning participants because they have to examine data on family planning participants in the book one by one. The problem with monitoring that is currently happening is that there is no application that can store and display data on family planning participants and schedule of visits by family planning participants. There is no monthly report that can display the number of family planning participants visiting. All records are still in manual form so they can be lost or scattered.

The application created can be used to monitor and manage data on family planning participants at the same time. This application can also be used to send Reminder SMS to family planning participants about scheduled family

planning program visits. The Participant Form is used to include Participants in the Family Planning Program data, the Visit Form is used to record visits and re-examination of the Family Planning participant, the Schedule Form is used to check the family planning participant's visit schedule and send Reminder texts to Family Planning Program Participants.

Participants in the Family Planning Program are input on the Participants Form. The data entered included Participant Id, Participants name, Day of Birth, Couples name, Address, Phone. Then the data will be saved. See Fig.4.

PARTICIPAN IDENTITY

ID.PARTICIPAN	V001	
NAME	Vita Windu	
CITY /DAY OF BIRD	Banjarbaru	09/06/1986
COUPLE NAME	Eko Saputra	

AGE 33 YEARS OLD
ADDRESS Komplek Wengga No. 10 Gt. Payung Landasan Ulin
PHONE 085256950005

Save Add Edit Delete Cancel eXit

Idpas	Nama	Tempat	Tgl	Namakk	Alamat	Telp
H001	Hilda Puteri Hajati	Martapura	05/10/91	Agus Supriyanto	Jl. Permata Komp. Irigasi No.154 Martapura	08193378787
A002	Annisa	Banjarbaru	08/06/90	Rahmadi	Jl. Hercules No. 17 Landasan Ulin	08125061595
D003	Dwi Mulyani	Sragen	03/07/79	Abdul Sayid	komplek Griya Manunggal no.7A Gt. Payung	08956210757
A001	Ari Yulianti	Banjarmasin	09/10/75	Heru Kartika Chandri	Komplek Wengga Utama No.126 Banjarbaru	085821133703
OS01	Sumarni	Sragen	11/09/87	Agni Yudanto	Komplek Benawa Putra No.76 Blok H Gt. Payung	08134834685
T001	Tri Hastuti	Bandung	06/12/83	Priyanto	Komp. Permata Bunda Blok B10 Banjarbaru	08586783255
D001	DWI MULYANI	SRAGEN	03/07/79	ABDUL SAYID	JL. SOERATNO KOMP. GRIYA MANUNGAL NO.7A GT.PAYU	08134821995
D002	Dewi Purnama Wati	Banjarbaru	06/28/80	Agus Rohmadi	Jl. Hercules No. 35 Landasan Ulin	08956177844

Fig. 4. Participant's Form

The Contraception Form is used to store contraception data used by participants. See Fig.5.

Contraception

DATA CONTRACEPTION

ID	<input type="text"/>
TYPE	<input type="text"/>
PERIOD	<input type="text"/>

Save Add Edit Delete Cancel eXit

Idcon	Type	Period
I001	INJECTION	1 MONTH
I002	INJECTION	3 MONTH
I003	IUD	1 YEAR
I004	IUD	2 YEARS
I005	IUD	3 YEARS
S001	SPIRAL	1 YEAR
S002	SPIRAL	2 YEARS

Fig. 5. Contraception's Form

Visiting Form is used to input data on Family Planning Participants who visit to check and repeat the use of contraceptives. In this process, the schedule for the next

visit will also be determined based on the type of contraception used. See Fig.6.

Fig. 6. Visiting's Form

The Visit Schedule form is used to display a schedule of future visits for Family Planning Participants. This form includes facilities to filter data based on the date of the next visit, making it easier to find participant data in the

Family Planning Program based on the date of the next visit. This form is also equipped with a facility to send SMS Reminder to Participants in the Family Planning Program to remind the schedule of visits for Participants in the Family Planning Program concerned. Reminders sent by SMS will be marked with confirmation from the system. See Fig.7.

Fig. 7. Schedule Of Visit's Form

Here is an SMS Reminder received by Participants in the Family Planning Program on their Phone. With the SMS reminder, it is expected that the Family Planning Program Participants will immediately go to their clinics or doctors to conduct checks and repetitions of the use of contraceptives, so that there is no delay in the use of contraceptives that can cause the failure of the Family Planning program. See Fig. 8.

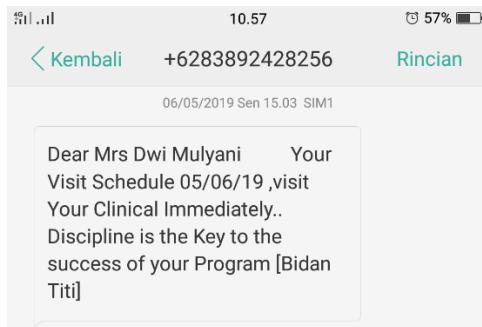


Fig. 8. SMS Reminder

After going through the trial process, the application was tested on 52 respondents to find out the level of application benefits. respondents are participants of the family planning program. the results showed 83% of respondents agreed with the application because it can remind their visit schedule, as many as 11% of respondents did not agree because they thought it was not too important and 3% of respondents stated that they were neutral because they were pregnant. See Fig.9.

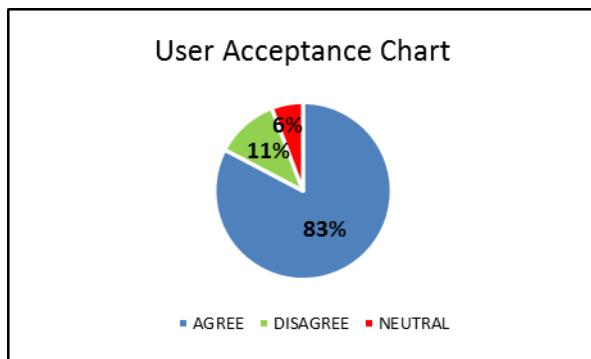


Fig. 9. User Acceptance Chart

4. Conclusion

The application of Monitoring and Data Management for Participants in the Family Planning Program to Midwife Practices with SMS Reminder can be used as a medium to monitor and deliver information on the schedule of repeated visits for family planning program participants, and is

expected to improve the discipline of family planning program participants in using contraception. In accordance with the research by Ulla Strandbygaard at all which says that a daily SMS reminder was found to have a significant effect on adherence to asthma treatment. our findings expand upon those described by charles. as non-adherence not only problematic in respect to asthma treatment, it also opens the possibility for daily sms reminder to address the larger spectrum of cronic deseases [3][13][15][16][18]. Any form of reminders may thus decrease the rate of missed appointments, reducing the inefficienciesand costs generated by non-attendance.[6][8].Appendix

Acknowledgments

Thank you to the Ministry of Research and Technology of Higher Education as funders in this study.

References

- [1]. M. Vervloet; L. Van Dijk; Santen-Reestman; B. Van Vlijmen; P. Van Wingerden; M.L.P. Bouvy & D.H. de Bakker, "SMS Reminders Improve Adherence to Oral Medication in Type 2 Diabetes Patients Who Are Real Time Electronically Monitored" *International Journal of Medical Informatics*, vol. 81, issue 9, pp. 594-604, 2012.
- [2]. P. E. Hasfold;R. Woottton, "Use of Telephone and SMS Reminder to Improve Attendance at Hospital Appointment" *Journal of Telemedicine And Telecare*, vol. 17, issue 7, pp. 358-364, 2011
- [3]. Ulla Standbygaard,Simon Francis Thomsen, Vibeke Backer, "A Daily SMS Reminder Increases Adherence to Astma Treatment" *ELSEVIER Respiratory Medicine*, vol. 104, pp. 166-171, 2010
- [4]. Elizabeth Koshy;Josip Car; Azeem Majeed, "Effectiveness Of Mobile-Phone Short Message Service (SMS) Reminder For Ophthalmology Outpatient Appointment: Observational Study" *BMC Ophthalmology*, vol. 8, issue 9, pp. 1-6, 2008
- [5]. Frank J. Schwebela; Mary E. Larimera, "Using text message reminders in health care services" *ELSEVIER Internet Intervention*, vol. 13, issue -, pp. 82-104, 2018.
- [6]. Zhou-Wen Chen, Li-Zheng Fang, Li-Ying Chen, Hong-Lei Dai "Comparison of an SMS text messaging and phone reminder to improve attendance at a health promotion center: A randomized controlled trial", *Journal of Zhejiang University SCIENCE B*, vol. 9,issue 2 , pp 34–38,2008
- [7]. Foley, J., and M. O'Neill. "Use of mobile telephone short message service (SMS) as a reminder: the effect on patient attendance", *European Archives of Paediatric Dentistry*,vol 10. issue1,pp 15-18. 2009
- [8]. Mohammed, Shama, et al. "User engagement with and attitudes towards an interactive SMS reminder system for patients with tuberculosis" *Journal of telemedicine and telecare* vol 18, issue 7. pp: 404-408, 2012.
- [9]. Downer, Sean R., John G. Meara, and Annette C. Da Costa. "Use of SMS text messaging to improve

- outpatient attendance." *Medical journal of Australia* vol.183.issue 7, pp.366-368. 2005.
- [10]. Da Costa, T. M., Salomão, P. L., Martha, A. S., Pisa, I. T., & Sigulem, D."The impact of short message service text messages sent as appointment reminders to patients' cell phones at outpatient clinics in Sao Paulo, Brazil". *International journal of medical informatics*, vol 79, issue 1,pp 65-70. 2010.
- [11]. Domek, G. J., Contreras-Roldan, I. L., O'Leary, S. T., Bull, S., Furniss, A., Kempe, A., & Asturias, E. J. "SMS text message reminders to improve infant vaccination coverage in Guatemala: A pilot randomized controlled trial", *Vaccine*, vol 34,issue 21,pp: 2437-2443, 2016.
- [12]. Virtanen, Vesa, Timo Sirkiaä, and Virve Jokiranta. "Reducing nonresponse by SMS reminders in mail surveys." *Social Science Computer Review*, Vol 25. Issue 3,pp 384-395. 2007
- [13]. Ware, Norma C., et al. "The Meanings in the messages: how SMS reminders and real-time adherence monitoring improve antiretroviral therapy adherence in rural Uganda." *AIDS (London, England)*. Vol 30. Issue 8, pp 1287, 2016.
- [14]. Guy, Rebecca, et al. "How effective are short message service reminders at increasing clinic attendance? A meta-analysis and systematic review." *Health services research*, Vol 47. Issue 2, pp 614-632, 2012.
- [15]. Huang, Hsiu-Ling, et al. "Effects of and satisfaction with short message service reminders for patient medication adherence: a randomized controlled study." *BMC medical informatics and decision making*, Vol 13. Issue 1, pp 127, 2013.
- [16]. Rodrigues, Rashmi, et al. "Supporting adherence to antiretroviral therapy with mobile phone reminders: results from a cohort in South India." *PloS one*, Vol 7. Issue 8, pp e40723, 2012.
- [17]. Manakongtreeep, Kasidet. "SMS-reminder for vaccination in Africa: research from published, unpublished and grey literature." *The Pan African medical journal*, Vol 27. Issue 3, 2017.
- [18]. Lin, Haotian, et al. "Effectiveness of a short message reminder in increasing compliance with pediatric cataract treatment: a randomized trial." *Ophthalmology*, Vol 119. Issue 12, pp 2463-2470, 2012.
- [19]. Boksmati, Nasim, et al. "The effectiveness of SMS reminders on appointment attendance: a meta-analysis." *Journal of medical systems*, Vol 40. Issue 4, pp 90, 2016.
- [20]. Kruse, L. V., L. G. Hansen, and C. Olesen. "Non-attendance at a pediatric outpatient clinic. SMS text messaging improves attendance." *Ugeskrift for laeger*, Vol 171. Issue 17, pp 1372-1375, 2009.
- [21]. Tolonen, Hanna, Anna Aistrich, and Katja Borodulin. "Increasing health examination survey participation rates by SMS reminders and flexible examination times. " *Scandinavian journal of public health*, (2009):Vol 42. Issue 7, pp 712-717, 2014.
- [22]. Prasad, Sumanth, and Richa Anand. "Use of mobile telephone short message service as a reminder: the effect on patient attendance." *International dental journal*, Vol 62.Issue 1,pp 21-26, 2012.
- [23]. Akhu-Zaheya, Laila M., and Y. Shiyab Wa'ed. "The effect of short message system (SMS) reminder on adherence to a healthy diet, medication, and cessation of smoking among adult patients with cardiovascular diseases." *International journal of medical informatics*, Vol 98, pp 65-75, 2017.
- [24]. Hallsworth, Michael, et al. "Stating appointment costs in SMS reminders reduces missed hospital appointments: findings from two randomised controlled trials." *PloS one*, Vol 10. Issue 9, pp e0137306, 2015.
- [25]. Sims, Hannah, et al. "Text message reminders of appointments: a pilot intervention at four community mental health clinics in London." *Psychiatric Services*, Vol 63. Issue 2, pp 161-168, 2012.
- [26]. Milne, Robin G. "Reducing non-attendance at specialist clinics: an evaluation of the effectiveness and cost of patient-focussed booking and SMS reminders at a Scottish health board." *International Journal of Consumer Studies*, Vol 34. Issue 5, pp 570-580, 2010.
- [27]. Gurol-Urganci, Ipek, et al. "Mobile phone messaging reminders for attendance at healthcare appointments." *Cochrane database of systematic reviews*, vol. 12, no.-, pp.-, 2013.
- Available:
<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD007458.pub3/epdf/full>

Authors -



Dwi Mulyani, Born in Sragen, Indonesia in 1979. Graduated with a Bachelor's degree in Computer from STMIK Banjarbaru in 2009, graduated with a Masters in Computer at STMIK Amikom Yogyakarta in 2015. Now teaches at STMIK Banjarbaru.
very interested in the field of computer research. has published several national and international journals..



Rintana Arnie, Born in Banjarmasin, Indonesia in 1965. graduated in 1990 at Lambung Mangkurat University in the field of forestry science. graduated from the masters of Information Technology at the Surabaya Technical College (STTS) in 2007. Now works at STMIK Banjarbaru as a Lecturer