A Design of Partograph Mobile with Android Based to Monitoring Childbirth Process

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Abstract. Monitoring labor with Partograph make sure that the mother and her baby get childbirth care adequate, on time and than can help the midwife to prevent complications during childbirth. Using partograph during childbirth has not been fully carried out according to the procedure. In the reality midwives did not use partographs completely, correctly and on time. Situation and condition factors make it difficult for midwives to record partographs are part of the solution that must be found. The purpose this research in general is to develop A Desigen of Partograph Mobile with Android Based to Monitoring Childbirth Process. Research method used the system development life cycle (SDLC) which consists of requirements and analysis, design, test, implementation / deploy and maintain. Result show an Android-based Partograf mobile application has been developed that can be used to assist midwives and facilitate monitoring of labor so that documentation is more effective and efficient.

1. Introduction

The high incidence of maternal and child mortality in developing countries is still very important. Death cases are still a hot topic that is always discussed for efforts to reduce them. The maternal mortality rate (MMR) in Indonesia increased from the previous year at 359 / 100,000 live births. This figure is more than 20-30 times compared to other developing countries.

90% of maternal deaths occur when childbirth and 95% of causes of maternal death are obstetric complications that are often unpredictable. Therefore, when carrying out childbirth care, the helper must be aware of the problems or complications that may occur. The cause of maternal death also occurs because of two important things that require special attention, namely the occurrence of prolonged and late delivery of referrals.

Based on the explanation, special attention is needed in the implementation of quality maternity care. Released issuing issuing issuing accelerates accelerates accelerates accelerates accelerates accelerates accelerates accelerates accelerates accelerates accelerates accelerates accelerates accelerates Because most difficulties can be prevented appropriately, namely by measuring labor using partograph.
Partograf is a childbirth aid tool to make clinical decisions, monitor, evaluate and manage labor. Partograph can be used to detect problems and complications early in labor so that they can manage the problem as soon as possible or refer the mother in optimal conditions. With the application of partograph, the maternal mortality rate can be reduced meaningfully so that it can support the health system towards the level of community welfare. Regular use of partographs by midwives can ensure that the mother and her baby receive safe, adequate and timely delivery care and help prevent the occurrence of complications that can threaten life’s safety. Therefore partograph filling by midwives is a decisive part in reducing the incidence of prolonged labor (abnormal delivery) which can ultimately suppress maternal and child mortality.

The phenomenon that was observed show that midwife were not able to document using partograph. The use of partograph during childbirth has not been fully carried out according to the procedure. In the reality midwives did not use partographs completely, correctly and on time. There were factors of a midwives did not using partographs to monitoring childbirth. Situations and conditions that make it difficult for midwives to record in one of the factors that are difficult to avoid. Some studies have shown that lazy midwives are not taking partograph savings. The role of midwives as implementers in the childbirth process is one of the important factors for the safety of mothers and babies. Factors in situations and conditions that make it difficult for midwives to fill partographs are obstacles that must be found. For this reason, a new breakthrough is needed as a step to facilitate midwives in monitoring labor. Therefore, it is very necessary to have an Android-based application that can be used by midwives in carrying out childbirth. The application is in the form of partograph filling in applications that have been installed on the handphone. Aside from being a communication medium in the form of calls and short messages, in its development is a medium that is able to be equipped with a variety of additional applications for user convenience. One form of utilization of mobile phones is for health services, namely partograph. This can help users, especially midwives, to monitor the progress of childbirth so that care can be more effective and efficient.

2. Research Methods
2.1 Observation
Observation is a way to collect data by conducting research directly coming to the midwife’s practice, this is to observe and record the events being investigated in the object of research.

2.2 Literature Study
At this stage, what is done is to read the existing literature and look for additional literature needed in the deepening of the material on the concepts and theories of making the application.

2.3 Interview
A method of collecting data through direct question and answer between researchers (data collectors) and respondents (data sources), in this case interviews were conducted with midwives about partograph use at the time of delivery assistance.

2.4 System Development Method
Structured application development using the Waterfall method at the Software Development Life Cycle (SDLC) stage includes: analysis, design, coding, testing, implementation and maintenance.

2.4.1. Requirements & Analysis: This phase includes gathering needs and analyzing all application / system needs that will be developed.
2.4.2. Design: This phase is a follow-up to the previous phase. In this phase, the system / application design will be made according to the needs identified in the previous phase. The design created includes system / application design and interface design.
2.4.3. System testing. This phase includes the overall testing of the system / application that has been built. Testing is done to find out whether the application / system that is built is in accordance with the needs or not. If an error is found / does not match the need, then the application / system revision will be carried out. The system testing method used in developing this application is the Black
Box Testing Method. Black box testing is the program testing carried out by the developer (programmer) by providing certain input and seeing the results obtained from the input. In other words, black box testing focuses on system functionality.

2.4.4. **Implement / Deploy**: This phase is done after the system is tested and the test results are in accordance with the requirements that have been determined. In this phase, the client application will be implemented by installing it on an Android device, while the web service will be implemented on the web server.

2.4.5. **Maintenance**: The last phase is application / system maintenance. In this phase, the application / system will be maintained so that it can always meet the needs of its users. In order to be used continuously, the software must be maintained by taking into account several aspects, including:

- 2.4.5.1. Able to handle data development due to over time.
- 2.4.5.2. Able to handle threats of damage by viruses or other intruder programs.
- 2.4.5.3. Able to handle repairs if an error or bug is found in the application that is running.
- 2.4.5.4. Able to handle the addition of new features.
- 2.4.5.5. Able to handle technological developments and progress.

![Figure 1. Model Development of Mobile Partograph Application](image)

### 3. Result

This research resulted in an android-based system that was built based on the system requirements that had been obtained.

#### 3.1. Needs analysis

The data used in this research is identity of midwife including: place, register number. The identity of the patient (mother who gives birth) includes: name, age, gravida, para, abortion (miscarriage), medical record number, date and time to start being treated (or if at home, the date and time of delivery help begin to treat the mother), the time of rupture of the membrane amniotic membranes. Fetal conditions include: Fetal Heart Rate, Color and presence of amniotic fluid, Infiltration (molasses) Fetal Head Bone.

#### 3.2. Design

The design used in this study includes designing systems / applications through flowchart grooves, Activity Diagrams and Application interface design. Android-based partograph application is an
application that later contains several monitoring functions for labor progress available in the program. Interface design can be seen in the following flowchart:

![Flowchart application](image)

**Figure 2.** Flowchart application
3.3. System testing

This stage is the testing phase of the system using the blackbock testing method. Here are the results of testing the Android-based KHS application.

| No. | Functionality of the application | Testing functionality application | Appropriate |
|-----|----------------------------------|----------------------------------|-------------|
| 1.  | Opening Page                    | The page appears for 3 (three) seconds after the application starts | √ | - |
| 2.  | Main menu                        | The available menu works well (pointing to the page that matches the menu) | √ | - |
| 3.  | Menu Partograph                  | Displays mother's data<br>Displays data on the progress of labor<br>Displays data on fetal conditions<br>Displays data on maternal conditions<br>Displays data on drug and fluid administration during labor<br>Displays labor record data<br>Displays monitoring data when IV<br>Provide error confirmation if filling in the field is incomplete.<br>Refresh to change all data contents entered<br>Can return to the Main Index / Menu page | √ | - |
| 4.  | Configuration menu               | Display partograph fill data<br>Provide confirmation if there is a form that has not been filled.<br>Save partograph data to the server.<br>Can return to the Main Menu contents page | √ | - |
| 5.  | Page about                       | Display information about the application.<br>Can return to the Main Index / Menu page | √ | - |
| 6.  | Conclusion menu                  | Display conclusions of partograph filling<br>Save partograph data to the server.<br>Can return to the Main Menu contents page | √ | - |
| 7.  | Exit menu                        | Provide exit confirmation from the application.<br>Close the application. | √ | - |

3.4. Implement / Deploy

In this phase, the client application is implemented by installing it on an android device, the system implementation is generated based on the design that has been created, the following is the system view that is generated:

3.5. Maintenance (maintenance)

This phase is a periodic maintenance of applications / systems to always meet the needs of its users. In this phase you can also revise the application if you need it at any time.

4. Conclusions

Based on the results of the study, it can be concluded that the Android-based partograph mobile application can be an electronic documentation tool to monitoring childbirth process by midwives. Android is not the only operating system that can be used on cellphones, but there are various operating systems that are also popularly used by the public. This Android-based partograph mobile application can still be developed again so that this application can be run on other operating systems.
besides Android and with the same functionality. To produce a more perfect application, there are several things that can be suggested including:

- Development of application products so that they can be used by other health workers
- The need for wider implementation so that partograph application products can facilitate midwives to monitoring childbirth process

5. References

[1] Agus, Nugroho. 2012. Pengenalan Flas dan Action Script 3.0. Tersedia di http://lecture.ukdw.ac.id/cnuq/ [05 – 6 - 2017].

[2] Depdiknas. 2003. Kamus Besar Bahasa Indonesia Edisi Ketiga. 2003. Jakarta: Balai Pustaka

[3] Depkes. 2008. Asuhan persalinan normal dan inisiasi menyusui dini. Jakarta

[4] Fitria, W. 2014. Faktor-faktor yang Berhubungan dengan Kepatuhan Bidan terhadap Penggunaan Partograf pada Pertolongan Persalinan di Wilayah Kerja Puskesmas Bergas Kecamatan Bergas Kabupaten Semarang. [12 Juni 2017]

[5] JNPK-KR. 2010. Pelatihan Asuhan Persalinan Normal: Buku Acuan. Jakarta: JNPK

[6] Lahan, A. dan Ridho, M. 2014. Rancang Bangun Aplikasi Kartu Hasil Studi (KHS) berbasis Android di PTIK Universitas Muhamamdiyah Purwokerto. JUITA ISSN: 2086-9398 Vol. III Nomor 2. [05 Juni 2017].

[7] Mobiliu S. 2011. Hubungan Pengetahuan Bidan Dengan Penerapan Penggunaan Partograf di Ruang Kebidanan RSUD Toto Kabila Kabupaten Bone Bolango Jurnal Health & Sport. Volume 5, No. 3, Agustus 2012. http://ejurnal.ung.ac.id/index.php/JHS/article/.../853. [12 Juni 2017]

[8] Novitasari, M. 2014. Studi Perilaku Bidan dalam Pengisian Partograf pada Persalinan Normal di Poli KB/KIA Poliklinik Bhayangkara Polresta Purwakarta. [12 Juni 2017]

[9] Nugroho, A., 2002. Analisis dan Perancangan Aplikasi dengan Metodologi Berorientasi Objek. Informatika Bandung, Bandung.

[10] Ogwang S, Karyabakabo Z, Rutebembewa E. 2009. Assessment of partogram use during labour in Rujumbura Health Sub distric, Rukungiri District, Uganda. Makerere University School of Public Health, Uganda and Rukungiri District Directorate of Health Services, Uganda. African Health Sciences. 9(51):27-34. [12 Juni 2017]

[11] Orhue A, Aziken ME, Osemwenkha AP. 2012. Partograph as a tool for team work management of spontaneous labour. Department of Obstetrics and Gynecology, University of Benin Teaching Hospital, Benin City, Edo State, Nigeria. US National Library Of Medicine National Institutes Of Health. Jan-Mar:15(1):1-8. [12 Juni 2017]

[12] Safaat, Nazruddin. 2012. Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android. Bandung: Informatika Bandung.

[13] Safiuddin. 2002. Buku Acuan Nasional Pelayanan Kesehatan Maternal dan Neonatal. Jakarta: EGC.

[14] Sommerville, Ian. 2003. Software Engineering (Rekayasa Perangkat Lunak). Jakarta: Erlangga

[15] Suprianto. D., & R. Agustina. 2012. Pemrograman Aplikasi Android. Yogyakarta: MediaKom.

[16] Umar, A. 2015. Rancang Bangun Aplikasi Rekam Medis Poliklinik Universitas Trilogi. Jurnal Informatika Vol.9 No.1. [11 Juni 2017]

[17] Wikipedia. 2013. Aplikasi Android Wikipedia. [30 Mei 2017]

[18] Yisma E, Dessalegn B, Astatkie A, Fesseha N. 2013. Knowledge and utilization of partograph among obstetric care givers in public health institutions of Addis Ababa, Ethiopia. BMC Pregnancy and Childbirth. 1471-2393/13/17. [13 Juni 2017].