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# Development of Medical Record System Posyandu Taman Salak with Waterfall Method

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**ABSTRACT**

One form of ICT utilization in the health sector is a digital-based health application. Health applications are included in the National Health System (SKN). Posyandu is a form of health service effort that is managed by, for and from the community with the aim of facilitating access to basic health services for mothers and children. Posyandu Taman Salak is one of the health facilities available in Madiun City. The process of recording and processing data on all Posyandu Taman Salak activities is still done by handwriting in a report book. This causes cadres to have difficulty monitoring children's growth and development and are overwhelmed in preparing reports to the integrated health post supervisors. Based on the description of the problems at the Taman Salak Posyandu, it is necessary to develop a Posyandu medical record system to make it easier for Posyandu cadres to process Posyandu data, monitor child growth and development and make reports. The purpose of this study is to design and build a Posyandu Taman Salak medical record system using the Waterfall system development modeling. The design stages use DFD and ERD. The system has been completed based on the website and has conducted functional system testing with the result that all system functions can be run

**Keywords:** Posyandu; Medical Record; Waterfall; DFD; ERD

## 1. INTRODUCTION

The development of the digital era will have an impact on the diversity of forms of utilization of Information and Communication Technology (ICT) in the health sector. One form of utilization of ICT in the health sector is a digital-based health application. Health applications are included in the National Health System (SKN). Integrated service posts or commonly abbreviated as Posyandu are a form of health service efforts whose management is carried out from, by and for the community with the aim of facilitating access to basic health services for mothers and children (Egeten, Damanik, Agustina, & Panggabean, 2019). The role of cadres in organizing integrated health post activities is very large as providers of health information to the community and helping the government to encourage the community to come to integrated health posts ((Izazi, Eritiana, Pasha, & Puspaningrum, 2022). Posyandu not only provides maternal and child health services, but the government hopes that Posyandu can reduce infant and toddler mortality rates (Padilah, 2023). Posyandu has several work programs that support national goals such as maternal and child health programs, family planning, immunization, and nutrition (Farmani, Adiputra, & Laksmini, 2021).

Taman Salak Posyandu is one of the health facilities available in the Taman Salak housing complex in Madiun City which is tasked with providing community-based health services in the form of maternal and child health. The process of recording and processing data on all Taman Salak Posyandu activities is still done by handwriting in a report book. This causes cadres to have difficulty monitoring child growth and development and are overwhelmed in preparing reports to Posyandu supervisors. Posyandu cadres need a data processing system that is able to provide accurate and fast information on child growth and development conditions.

Based on the description of the problems at the Taman Salak Posyandu, the author developed a Posyandu medical record system to make it easier for Posyandu cadres to process Posyandu data, monitor child growth and development and make reports. The purpose of this study is to design and build a Posyandu Taman Salak medical record system using the Waterfall system development model.

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## 2. LITERATURE REVIEW

There are several previous studies related to the development of the posyandu system, including those conducted by Arip and Angga based on the results of data visits to the Pondok Jagung Timur Posyandu, it was found that data recording was still carried out conventionally by rewriting the results of the examination into the visit book. Data processing that still uses conventional media has various weaknesses, takes a long time, and is also lacking in consistency, because the potential for error is quite large. So based on these problems, the research team developed a website-based Posyandu Information System used by cadres to manage data and reports at the Pondok Jagung Timur sub-district Posyandu, making it easier for cadres to process data and make reports (Kristiyanto & Pramadjaya, 2022).

In a study conducted by Andriyan and his team at the Palemgede hamlet integrated health post, it was found that data recording was often lost and caused problems for administrators because it was still done manually. Monitoring of children's health was not optimal, so to overcome this problem, it was necessary to create a web-based integrated health post information system application (Putra, Pratiwi, & Asharudin, 2022)

Previous research conducted by Warjiyono, et al. stated that Posyandu Krasak Tegal Regency has activities that are held once a month, where data recording uses a ledger that causes difficulties in finding data and monitoring nutrition. To overcome this problem, it is necessary to develop a posyandu information system so that data processing is more efficient and effective (Ismail, Setyawan, Firdaus, & Ari, 2023)

The development of the posyandu information system was also carried out in Indah and Nurul's research. It was explained that the Posyandu in Sendangsari Village experienced problems in delivering child health information, monitoring child development, and lack of child health education to the community. To improve the quality of posyandu services, the Posyandu Health Information System (SIKEPO) was developed which was able to provide convenience for cadres in managing the posyandu and increase community understanding of the importance of Posyandu (Kastriana Dewi, Alfiah, & Komputama Majenang, 2023).

Research conducted by Gilang and the team that highlights the Posyandu service process in Tulusrejo Village where in its implementation the recording is still done manually. This causes problems in data processing, information to the community and implementation that takes a lot of time. To overcome this problem, it is necessary to build a Posyandu Tulusrejo website system (Ramadhan Sukoco, Irawan, & Prabowo, 2022).

The development of an integrated posyandu information system in Sei Limbat Village, Langkat Regency has been carried out by Chairul Rizal and his team in previous research. It is explained that the condition of Sei Limbat Village has a fairly large population. There are 3 Posyandus from 6 existing hamlets, so a web-based system is needed to make it easier for village cadres to manage data from 3 posyandus. The system development process uses the RAD method and it is concluded that the system was successfully built (Rizal, Iqbal, Rian Putra, & Israr Fathoni, 2023).

## 3. METHOD

In this study, researchers used system development with waterfall modeling. The use of the waterfall method can provide a clear and structured research activity framework to manage software development. The Waterfall method is a method that provides a sequential or ordered approach to software life cycles (Badrul, 2021). Waterfall modeling allows for tracking project progress well and ensuring that each stage has been completed well before moving on to the next stage. This development model is linear from the initial stage of system development, namely the planning stage, to the final stage of system development, namely the maintenance stage (Anis, Mukti, & Rosyid, 2023). The next stage will not be carried out before the previous stage is completed and cannot be returned or repeated to the previous stage (A. A. Wahid, 2020). The framework in this research refers to the waterfall stages as shown in Figure 1 below..

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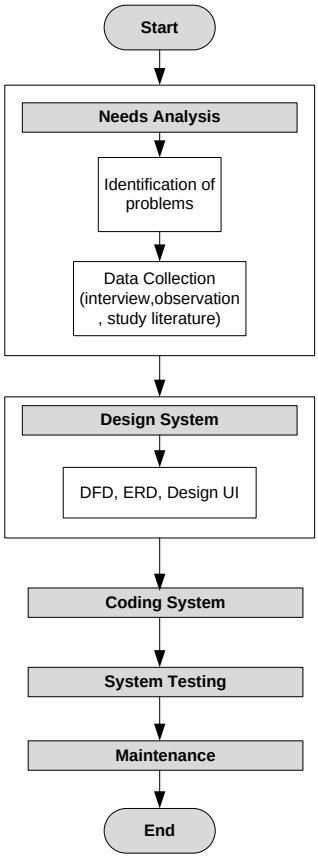


Fig.1 Research Methodology

Explanation of the research framework activities are as follows:

1. Need Analysis, analyzing system needs by identifying problems and collecting data. Interviews and observations were conducted at Posyandu Taman Salak Kota Madiun.
2. Design System, designing a system with a data flow design in the form of DFD, data relation design with ERD.
3. Coding System, the process of translating needs analysis and system design into PHP programming language and MySQL database.
4. System Testing, conducting trials of each subsystem to see if it is in accordance with user needs or if there are any bugs
5. Maintenance, the process of repairing the system if damage is found

## 4. RESULT

The next stage is based on the waterfall modeling that has been chosen as a guide in developing the Posyandu Taman Salak medical record system, the first step taken is to analyze the needs. Data on system needs were obtained through interviews with Posyandu cadres and conducting observations. The data needs obtained based on the interview results are described in table 1 below:

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Table 1.
Data Requirements Analysis

| No | Table Name | Field Data |
|---|---|---|
| 1 | Toddler Data | Name |
| | | Date of Birth |
| | | Gender |
| | | No.KK |
| | | No.NIK of child |
| | | BBL |
| | | PBL |
| | | Parents Name |
| | | Parents Address |
| | | NIK.Parents |
| | | No.KK of Parents |
| 2 | Stunting Data | Age |
| | | Gender |
| | | BB |
| | | TB |
| | | Measurement date |
| 3 | Weighing Data | Name |
| | | immunization |
| | | Head circumference |
| | | NTOB |
| 4 | Report | Weighing Data Report |
| | | Stunting Report |
| | | Toddler Report |

The next step is after the needs analysis is identified is to design the system in the form of DFD design, ERD design and interface design. The results of the DFD design can be seen in Figure 2 as follows:

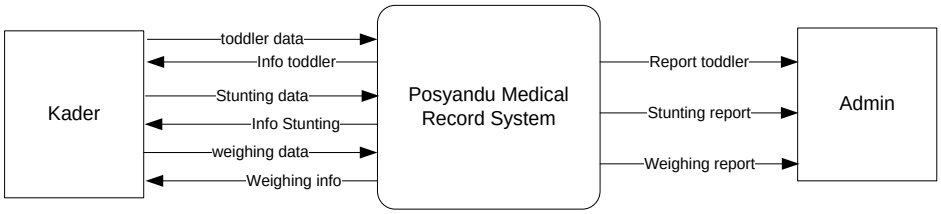


Fig. 2 DFD Level 0

Based on DFD level 0, the next step is to break down to DFD level 1 to find out the data flow and how many data stores are needed. The description of DFD level 1 can be seen in Figure 3 below:

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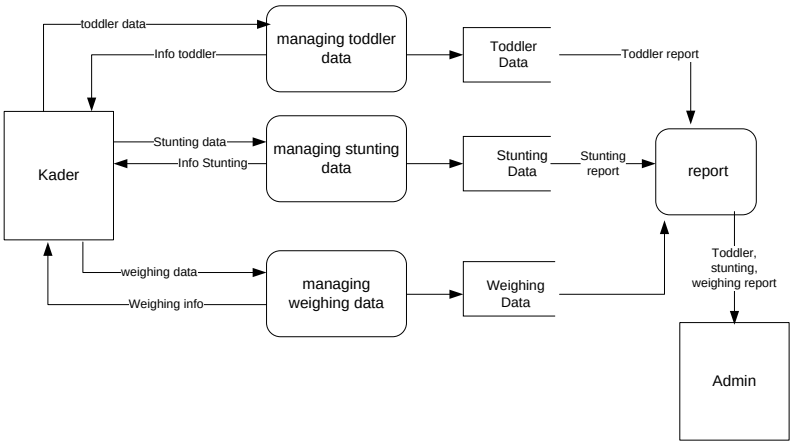


Fig. 3 DFD Level 1

Based on DFD level one, there are 3 candidate tables, namely toddler data, stunting data and weighing data which will be related to the ERD diagram. Stunting data has a relationship with toddler data and weighing data has a relationship with weighing data. The ERD diagram can be seen in Figure 4 below.

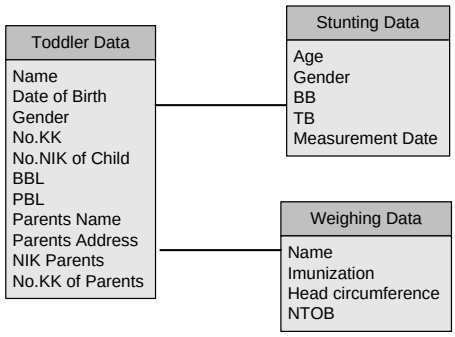


Fig. 4 ERD Diagram

After the design process is complete, the next stage is coding to build the system. The system built is website-based using PHP and MySQL. The results of the system implementation can be seen in Figure 5 below, as follows:

Fig. 5 Posyandu Medical Record System

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The system creation has been completed, the next stage is to test the system by asking the integrated health post cadres to practice according to the system functional list provided by the research team, the results of the test show that 100% of the system's functionality for data management and report printing can function, the test data can be seen in table 2 below:

Table 2
Functional System Testing

| No | Functional System | Test Status |
|---|---|---|
| 1 | Adding Toddler Data | Passed |
| 2 | Delete Toddler Data | Passed |
| 3 | Edit Toddler Data | Passed |
| 4 | Print Toddler Report | Passed |
| 5 | Adding Stunting Data | Passed |
| 6 | Delete Stunting Data | Passed |
| 7 | Edit Stunting Data | Passed |
| 8 | Print Stunting Report | Passed |
| 9 | Adding weighing Data | Passed |
| 10 | Delete weighing Data | Passed |
| 11 | Edit weighing Data | Passed |
| 12 | Print weighing Report | Passed |

## DISCUSSIONS

The medical record system of Taman Salak Posyandu has been successfully built with the results of testing all system functions that can be run. A similar system has been created in previous research by Firiyah and Anita but it was concluded that the research only produced a system design that could be used for the system development process in the future (Kamilah & Ratnasari, 2020).

Taman Salak Posyandu cadres can operate the Posyandu medical record system, however, as stated in Sri and her team's research, the process of moving from manual recording to the Posyandu cadre system requires additional special time to enter all Posyandu data into the system (Kusumadewi, Kurniawan, & Wahyuningsih, 2019). Based on previous research, the difference lies in the complete development process, where this research has reached the stage of system development and system testing.

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## 5. CONCLUSION

Based on the research results, it was concluded that the medical record system of the Taman Salak integrated health post has been completed and tested with the result that all system functions can be run. The Taman Salak integrated health post cadres have used the system by entering integrated health post data into the system. In the next stage, the Taman Salak integrated health post medical record system can be developed towards an Android-based system, making it easier for cadres to access the system

## 6. REFERENCES

A. A. Wahid. (2020). "Analisis Metode Waterfall Untuk Pengembangan Sistem Informasi," . *Jurnal Ilmu-Ilmu Informatika Dan Manajemen STMIK*, 1(October).

Anis, Y., Mukti, A. B., & Rosyid, A. N. (2023). Penerapan Model Waterfall Dalam Pengembangan Sistem Informasi Aset Destinasi Wisata Berbasis Website, 4(2), 1134–1142. Retrieved from https://doi.org/10.30865/klik.v4i2.1287

Badrul, M. (2021). Penerapan Metode waterfall untuk Perancangan Sistem Informasi Inventory Pada Toko Keramik Bintang Terang. *PROSISKO: Jurnal Pengembangan Riset Dan Observasi Sistem Komputer*, 8(2), 57–52. Retrieved from https://doi.org/10.30656/prosisko.v8i2.3852

Egeten, A. E. J., Damanik, S. A., Agustina, I., & Panggabean, M. (2019). Perancangan Sistem Informasi Posyandu Berbasis Web Pada Yayasan Kalyanamitra Di Jakarta Timur Untuk Mendukung Program Bidang Pendampingan Komunitas. *MATRIK : Jurnal Manajemen, Teknik Informatika Dan Rekayasa Komputer*, 18(2), 330–338.

* Corresponding author

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Retrieved from https://doi.org/10.30812/matrik.v18i2.408

Farmani, P. I., Adiputra, I. N. M., & Laksmini, P. A. (2021). Perancangan Sistem Informasi Posyandu Sebagai Upaya Digitalisasi Data Posyandu di UPTD Puskesmas II Dinas Kesehatan Kecamatan Denpasar Timur Pendahuluan, 9(2), 115–126. Retrieved from https://doi.org/10.47007/inohim.v9i2.311

Ismail, A. W., Setyawan, M. D. N., Firdaus, A. N., & Ari, M. (2023). Pengembangan Sistem Informasi Posyandu ( SIPANDU ) Desa Slarang Lor Menggunakan Model Waterfall, 9(2), 171–180.

Izazi, D., Eritiana, E., Pasha, D., & Puspaningrum, A. S. (2022). E-POSYANDU PENGOLAHAN DATA STATUS TUMBUH KEMBANG PADA BALITA (Studi Kasus: Posyandu Cahaya Kartini). *Jurnal Teknologi Dan Sistem Informasi (JTSI)*, 3(1), 27–33.

Kamilah, F., & Ratnasari, A. (2020). Analisa dan Perancangan Sistem Informasi Posyandu Berbasis Web ( Studi Kasus : Posyandu Mandala 2). *Jurnal Sistem Informasi Dan E-Business*, 2(4), 479–495. Retrieved from http://download.garuda.kemdikbud.go.id/article.php?article=2928752&val=25863&title=ANALYSIS AND DESIGN OF WEB-BASED POSYANDU INFORMATION SYSTEM CASE STUDY POSYANDU MANDALA 2

Kastriana Dewi, I., Alfiah, N., & Komputama Majenang, S. (2023). Sistem Informasi Kesehatan Posyandu (Sikepo) Di Desa Sindangsari. *Majalah Ilmiah UNIKOM*, 21(2), 1–8.

Kristiyanto, A., & Pramadjaya, A. (2022). Analisa Perancangan Sistem Informasi Posyandu Kelurahan Pondok Jagung Timur dengan Metode RAD. *Jurnal Ilmu Komputer Dan Sistem Informasi (JIKOMSI)*, 5(2), 57–67. Retrieved from https://doi.org/10.55338/jikomsi.v5i2.294

Kusumadewi, S., Kurniawan, R., & Wahyuningsih, H. (2019). IMPLEMENTASI SISTEM INFORMASI POSYANDU BERBASIS WEB DAN ANDROID DI DESA BIMOMARTANI IMPLEMENTATION OF WEB-BASED AND ANDROID-BASED POSYANDU INFORMATION produktif secara sosial dan ekonomis masyarakat adalah melalui Posyandu . Kegiatan yang dipilih secara s, 3(2).

Padilah, J. (2023). Sistem Informasi Pendaftaran Posyandu Berbasis Web. *Jurnal Ilmiah Multidisiplin*, 2(5), 1654–1663. Retrieved from https://doi.org/10.56799/jim.v2i5.1480

Putra, A. D., Pratiwi, T., & Asharudin, F. (2022). Sistem Informasi Posyandu Dusun Pelemgede Desa Sodo Kecamatan Paliyan Kabupaten Gunungkidul. *Information System Journal*, 5(1), 7–12. Retrieved from https://doi.org/10.24076/infosjournal.2022v5i1.367

Ramadhan Sukoco, G., Irawan, D., & Prabowo, D. (2022). Perancangan Sistem Informasi Posyandu Desa Tulus Rejo Berbasis Web. *Jurnal Mahasiswa Ilmu Komputer (JMIK)*, 03(01), 278–283.

Rizal, C., Iqbal, M., Rian Putra, R., & Israr Fathoni, M. (2023). Rancang Bangun Sistem Informasi Posyandu Ibu Dan Anak Berbasis Web Web-Based Information System of Mother and Child Posyandu Design. *Jurnal Testing Dan Implementasi Sistem Informasi*, 1(2), 102–110.

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