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Design Overview Of User Interface Design For Medical Record Filling System At Dharma Yadnya General Hospital

Made Wahyu Aditya[1*],
[1] Medical Records and Health Information, STIKES Wira Medika Bali, Denpasar, Indonesia

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ABSTRACT

The manual recording of borrowing and returning medical record documents using expedition books leads to several challenges, such as incomplete data on borrowing and returning medical record documents beyond 24 hours, as well as delays in returning medical record documents. Additionally, manual expedition book usage is less effective and efficient. The purpose of this research is to understand the overview of designing the user interface for filling system medical record documents. The research method used is descriptive qualitative with the waterfall design method.. The research results indicate that the user acceptance level of the user interface design falls within the acceptable category. This indicates that the user interface design for the electronic expedition system of inpatient medical records has a good level of usability. With an average score of 90, there is no need for further improvements in the user interface design, which can be considered as a recommendation to Dharma Yadnya General Hospital.

1. INTRODUCTION

Health services are the rights of every person as regulated by law. This needs to be realized through various efforts to improve the health of the community. One of the facilities that plays an important role in this case is the hospital which has a significant contribution in improving the health of the community as a whole. According to Law Number 44 of 2009, a hospital is a health facility that organizes individual health services which include promotive, preventive, curative, and rehabilitative services (RI, 2022). Hospitals can carry out their duties and functions well by providing quality services in accordance with the rules.

Health data management is one of the important activities in realizing an information system in a health service. Manual data processing has many shortcomings, in addition to taking a long time, its accuracy is also less acceptable, because the possibility of error is very large. With the development of current information technology, manual data processing work can be replaced with a computerized system. In addition to affecting speed and ease, data management becomes more precise and accurate (Aditya & Jayanti, 2024).

The development of technology, especially in the health sector, is the application of electronic medical records, which is the use of information technology devices used in managing health data, both in merging, retrieving and archiving data that has been stored in the patient's medical records (Aditya & Jayanti, 2024).

Medical record management system is a method of organizing medical record documents in a special place, designed to facilitate the process of storing and retrieving the documents. The main purpose of this system is to protect medical records from damage, both physical and non-physical. In the process of retrieving and storing medical records, an expedition book is used. The expedition book functions as a guide to monitor medical record documents that are being borrowed or have been returned, as stated by. With the expedition book, the existence of the Medical Record files can be tracked properly, as explained by.

In polyclinic practice, the medical record files that come out will be recorded in the medical record expedition book. Officers who receive the medical record files can record them

* *Corresponding Author: Made Wahyu Aditya:* wahyuaditya.md@gmail.com

manually in the expedition book by listing the medical record number, patient identity, and the destination polyclinic by giving a check mark in the book.

Indonesia has entered the era of industrial revolution 5.0, which is marked by a number of significant changes, especially in the communication and information technology sector. Rapid developments in this field have had a broad impact, including in the health sector, which plays a role as an institution that provides direct services to the community. Therefore, it is very important for health institutions to continue to follow developments in technology and information in order to meet the demands for fast, effective, and efficient services. In an effort to meet patient needs, health institutions need to continue to innovate by developing technology that can improve the performance of health service facilities (Aditya et al., 2023).

The user interface is an integral part of an application, functioning as a link between the application and the user to enable easy interaction (Gristiari et al., 2024).. The quality of the user interface in an application not only affects user comfort, but can also provide an indication of the extent to which the application is of interest to users (Sitorus, 2021). Understanding the nature and habits of general users, as well as the user population, is an important aspect in interface design. Correctly applied interaction design principles are also key to achieving all usability goals in effective interface design.

Based on initial observations conducted in December 2023, it was found that recording of borrowing and returning medical records was still done manually in the expedition book. This caused several obstacles, such as the completeness of data on borrowing and returning medical record documents more than 24 hours, and the delay in returning medical record documents by 16% calculated from quarterly data (July, August, September) of borrowing and returning medical record documents. In addition, the use of expedition books manually is less effective and efficient. In connection with this problem, the researcher conducted a study entitled "Overview of the Design of the User Interface for the Medical Record Filling System at Dharma Yadnya General Hospital". A good user interface design will make it easier for officers to record and track borrowed medical record documents and provide complete and accurate information. The database system will enable more effective management, including fast searching, monitoring the status of medical record documents, and reducing the risk of document loss. By designing an optimal and efficient user interface design, it is hoped that Dharma Yadnya General Hospital can improve the effectiveness, efficiency, and security of medical record document management in health services.

2. LITERATURE REVIEW

Hospitals are health service institutions that provide comprehensive health services. Based on this law, hospitals are tasked with organizing effective and efficient health services, with a focus on a coordinated and integrated healing and recovery process. Hospitals also have an obligation to improve disease prevention efforts and carry out patient referrals. Other tasks include providing comprehensive health services to individuals.

In accordance with PERMENKES Number 24 of 2022, Medical Records are documents containing patient identity data, examination results, treatment diagnoses, actions, and other services provided to patients.

Medical Records also contribute to the improvement of the overall quality of health services. With clear, complete, and accurate medical records in medical practice, the quality of service can be improved, so that good health can be achieved.

User Interface (UI) is the part of an experience that interacts with the user (Gristiari et al., 2024).. UI is not only about colors and shapes, but also about presenting the right tools to the user to achieve their goals. In addition, (Firdaus et al., 2024).

The filling system is a system to identify Medical Records that are being borrowed or have been returned, as stated by (Mellyana et al., 2024). The main function of the filling system or expedition book is as proof of handover of Medical Records, including handover from the filing unit to the polyclinic, from filing to the medical records unit, and also to reduce the risk of

losing Medical Record files (Jamil et al., 2020). However, sometimes there is a delay in providing the necessary medical records.

3. METHOD

This study uses two methods, namely descriptive qualitative research and the waterfall design method (Hidayati & Sismadi, 2020). The qualitative research method is also called the naturalistic research method because the research is conducted in natural conditions (natural settings).

The design of the user interface design uses the Systems Development Life Cycle (SDLC) method with waterfall design which is shown in Figure 1. This research was conducted in the medical record filing unit of Dharma Yadnya General Hospital. The research was conducted in January - February 2024.

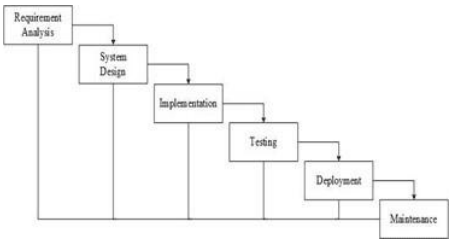

Figure 1. SDLC with Waterfall Model

Stages of the Waterfall Model Approach used:

1. Needs Collection and Analysis: This stage includes collecting comprehensive needs, which are then analyzed and defined to determine the criteria for the program to be developed. This phase is very important to ensure that the resulting design is also comprehensive.
2. System Design: After all needs have been successfully collected, the next stage is to design the system based on existing information.
3. Implementation: At this stage, the program design is converted into a predetermined programming language and tested to ensure its functionality.
4. Integration and Testing: At this stage, program units are combined and tested as a whole (system testing).
5. System Implementation: After testing is complete, the program is operated in a real environment. At this stage, maintenance is also carried out, including adjustments or changes that are needed to adapt the program to the real situation.
6. Maintenance: This process includes all activities including repairs and updates that may be required in the future.

4. RESULT AND DISCUSSION

To get an idea of the user interface design of the medical record filling system, researchers have conducted observations and analysis of user needs. The stages of designing the user interface in this study are:

1. Preparation: Determine the problem you want to solve, identify users, and collect product requirements.
2. Wireframe: Create a rough sketch of the product's appearance, such as a website or application. Wireframes can be created by hand or using a special application.
3. Mockup: Create a detailed picture of the product, such as colors, images, typography, and icons. Mockups help translate ideas into easy-to-understand language.
4. Prototype: Create a simulation of user interaction with the product. Prototypes allow users to see and interact with the UI directly

The next stage is design DFD and ERD systems. the first stage making context diagrams in Refer to figure 2.

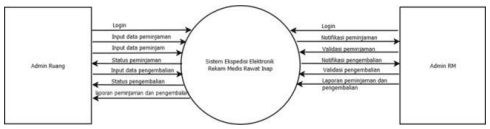

Figure 2. Context Diagram of medical record filling system

Data Flow Diagram (DFD) Data Flow Diagram (DFD Level 0) System Filling Medical Records

In the Medical Record Filling system there are 5 processes, namely the login process that can be done by the RM admin and the room admin, the borrower data input process is done by the room admin and the database is stored in the admin database, the borrowing data input process is done by the room admin by taking data from the medical record database, the return data input process is done by the room admin and inputting the return data, and the reporting process is done by the room admin by inputting the report data. The following is a Data Flow Diagram (DFD) level 0 of the medical record filling system:

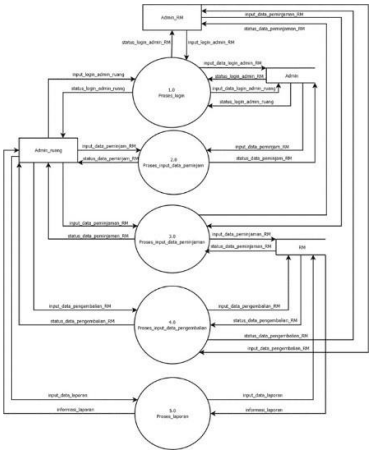

Figure 3. Data Flow Diagram (DFD) level 0 of medical record filling system

Data Flow Diagram (DFD) Level 1 Electronic Expedition Inpatient Medical Records

A. Data Flow Diagram (DFD) Level 1 Login Process

There are 3 processes in this login process DFD. The first is the username and password input process. In this process, the room admin and RM admin input their respective usernames and passwords. The second process is validation. In this validation process, the system will verify the login data from the room admin and RM admin. The last process is the login status process. In this process, the system will send the login status from the room admin and RM admin whether it was successful or not. The following is a Data Flow Diagram (DFD) level 1 login process:

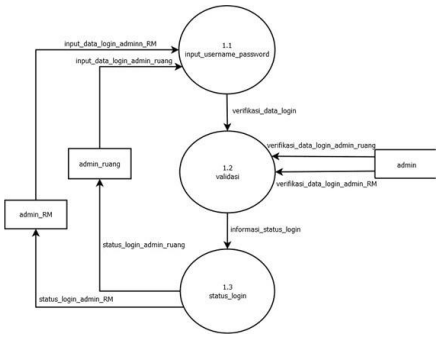

Figure 4. Data Flow Diagram (DFD) level 1 login process

B. Data Flow Diagram (DFD) Level 1 Borrower Data Input Process

There are 3 processes in DFD level 1 borrower data input process. The first process is borrower data input. In this process, the room admin can input medical record borrower data such as inputting the officer's name and the name of the room that will borrow the medical record. The second process is borrower data validation. In this process, the system will verify the borrower's data. The last process is borrower status. In this process, the system will display the borrower's status, namely the borrowing form. The following is a Data Flow Diagram (DFD) level 1 borrower data input process:

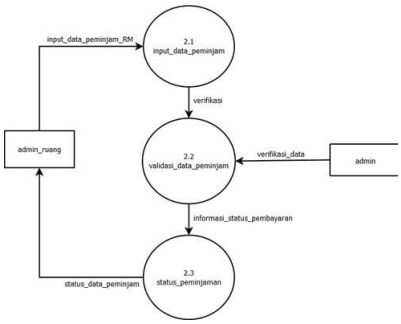

Figure 5. Data Flow Diagram (DFD) level 1 borrower data input process

C. Data Flow Diagram (DFD) Level 1 Loan Data Input Process

There are 3 processes in DFD level 1 loan data input process. The first process is the loan data input process. In this process, the room admin inputs the loan data, namely the loan purpose, RM number, patient name, and patient address. The second process is the loan validation process. In this process, the system will verify the loan data. The last process is the loan status process. In this process, the system will send the loan status to the room admin and RM admin whether the loan was successful or not. The following is the Data Flow Diagram (DFD) level 1 loan data input process:

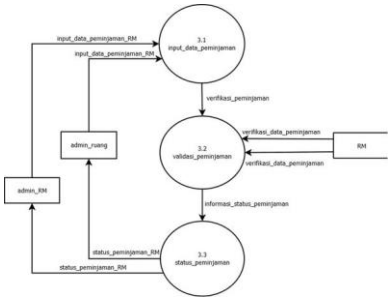

Figure 6. Data Flow Diagram (DFD) level 1 of the loan data input process

D. Data Flow Diagram (DFD) Level 1 Return Data Input Process

There are 3 processes in DFD level 1 return data input process. The first process is the return data input process. In this process, the room admin inputs return data, namely the borrowing room, borrower's name, borrowing purpose, borrowing date, return date, RM number, patient name, and patient address. The second process is the return validation process. In this process, the system will verify the return data. The last process is the return status process. In this process, the system will send the return status to the room admin and RM admin whether the return was successful or not. The following is the Data Flow Diagram (DFD) level 1 return data input process:

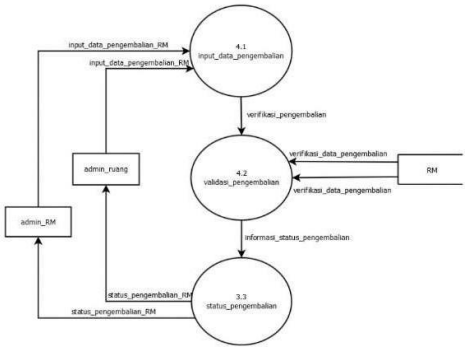

Figure 7. Data Flow Diagram (DFD) level 1 input return data

E. Data Flow Diagram (DFD) Level 1 Report Process

There are 3 processes in the DFD report process. The first process is the report data input process. In this process, the admin inputs the report data for borrowing and returning medical records. The second process is the report validation process. In this process, the system will verify the report data. The last process is the report status process. In this process, the system will send the status of the report for borrowing and returning medical records. The following is the Data Flow Diagram (DFD) level 1 report process:

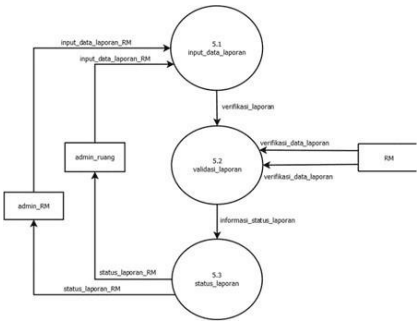

Figure 8. Data Flow Diagram (DFD) of the report process

ERD (Entity Relationship Diagram)

ERD Medical Record Filling System

In the ERD (Entity Relationship Diagram) of the Medical Record Filling System, the room Admin can borrow and return Medical Records. The second is the RM Admin can validate medical records. In this ERD there are 3 entities. The first is the Room Admin. In this entity, it has several attributes, namely rm number, room username, password, room, officer name and loan purpose. The second entity is medical records. In this entity there are several attributes, namely rm number, patient name, address, borrow date, return date, room username, RM username, return code, borrow code. The last entity is the RM Admin. In this entity there are

several attributes, namely RM username, rm number, password, officer name. The following is an image of the ERD (Entity Relationship Diagram) of the Medical Record Filling System:

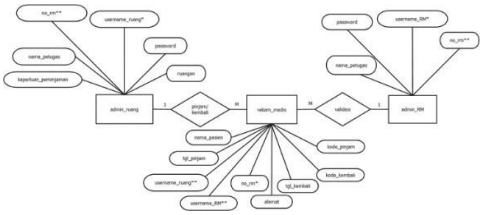

Figure 9. ERD (Entity Relationship Diagram) Medical Record Filling System

ERD Admin Room Relationship I (one to one)

In this ERD the relationship between the room admin and the medical record is that 1 room admin can only borrow or return 1 medical record. The following is a picture of the ERD Relationship I Admin Room:

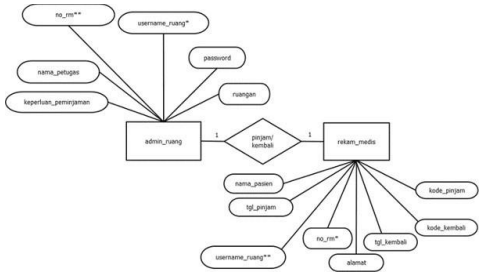

Figure 10. ERD (Entity Relationship Diagram) relationship between I and admin space

Relationship II (one to many)

In this ERD the relationship between the room admin and medical records is that one room admin can borrow or return many medical records. The following is a picture of the ERD (Entity Relationship Diagram) relationship II room admin:

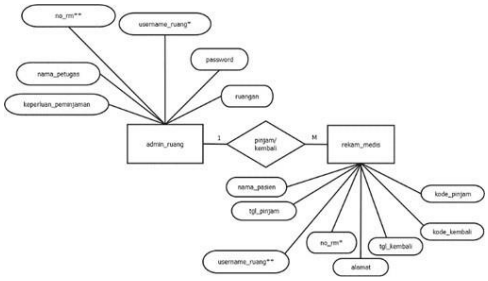

Figure 11. ERD (Entity Relationship Diagram) relationship II admin room

Relationship III (one to many)

In this room admin ERD, it uses relationship III, namely one room admin can borrow or return many medical records. This RM admin relationship III (one to many) ERD will be used in this study. The following is an image of the ERD (Entity Relationship Diagram):

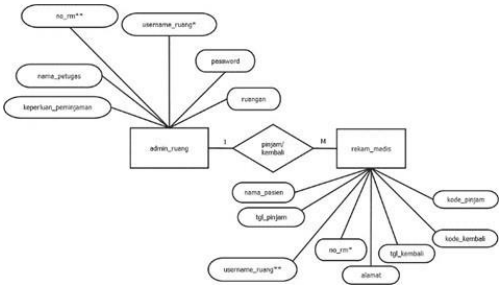

Figure 12. ERD (Entity Relationship Diagram) relationship III admin room

ERD Admin RM

Relationship I (one to one)

In this ERD, the relationship between the RM admin and the medical record is that 1 RM admin can only validate 1 medical record. The following is a picture of the ERD Relationship I RM Admin:

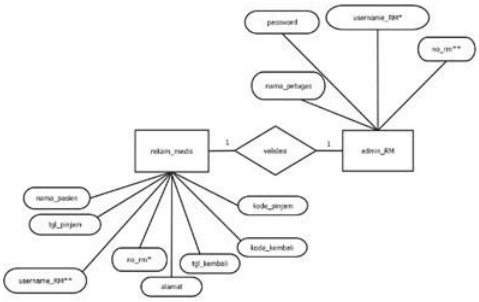

Figure 13. ERD (Entity Relationship Diagram) relationship I admin RM

Relationship II (one to many)

In this ERD, the relationship between admin RM and medical records is that 1 admin RM can validate many medical records. The following is a picture of the ERD Relationship I Admin RM:

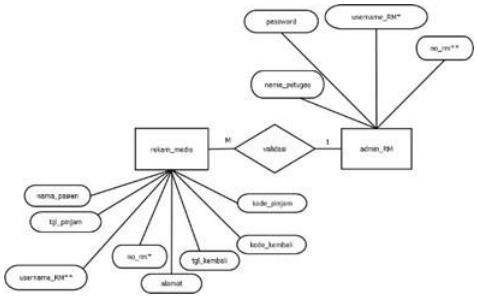

Figure 14. ERD (Entity Relationship Diagram) relationship II admin RM

Relationship III (one to many)

In this ERD, the relationship between admin RM and medical records is that 1 admin RM can validate many medical records. This ERD relationship III (one to many) admin RM will be used in this study. The following is a picture of the ERD Relationship I Admin RM:

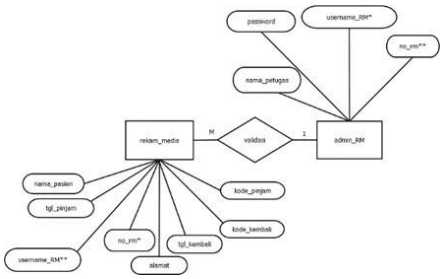

Figure 15. ERD (Entity Relationship Diagram) relationship III admin RM

Desain User Interface

Here is the design of the medical record filling system using the figma tool with a screen size of 360px X 640px. The colors on the dominant interface are dark blue and white with a hospital background. The language used is Indonesian because it is easy to understand. The writing uses rakkas model letters with sizes 14 and 12pt.

Desain User Interface Login

On this login screen, the room admin and RM admin can input their respective username and password. After that, the room admin and RM admin can press the login icon. If the room admin and RM admin login process fails, press the forgot password text to change the username and password. If the login process is successful, the system will direct the room admin and RM admin to the home screen.

Figure 16. Login Menu Medical Record Filling System

Desain User Interface Home

On the home screen, the room admin and RM admin can perform the process of borrowing medical records and returning medical records. If you want to borrow medical records, the admin can press the add icon in the medical record borrowing section. If you want to return medical records, the admin can press the add icon in the medical record return section.

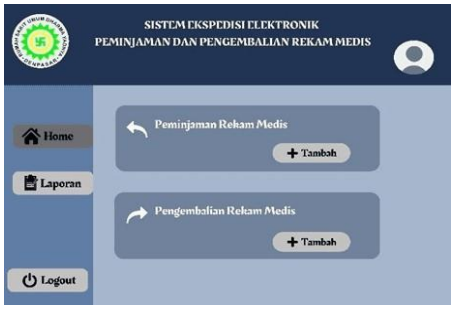

Figure 17. Home View

Medical Record Borrowing User Interface Design

After pressing the add icon on the medical record loan, the admin is asked to input the borrower's data, namely the borrower's name and the borrower's room. In the borrower's room, the admin can select the room name by pressing the drop down icon. After that, the admin can press the continue icon.

Figure 18. Borrower data input display

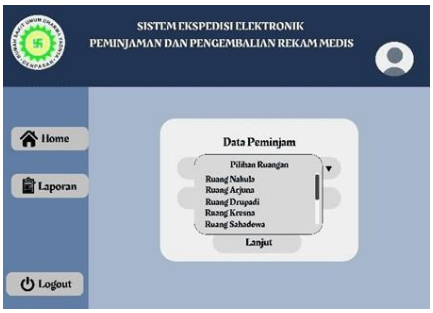

Figure 19. Loan Room Options

After inputting the borrower data, the system will direct the admin to the loan form display. On the loan form, the borrower's room section, borrower name and borrower code will be filled in automatically. The admin can input the loan purpose, borrowing date, and medical record number. After the medical record number is filled in, the patient's name and patient address will be filled in automatically. After inputting the loan data, the admin can press the submit icon. If the loan data is incomplete, there will be a notification "medical records cannot be borrowed", if the loan data is complete, there will be a notification "medical record borrowing successful".

Figure 20. Medical record loan form view

Figure 21. Notification that medical records cannot be borrowed yet

Figure 22. Notification of successful medical record loan

Medical Record Return User Interface Design

After pressing the add icon on the return of medical records, the admin is asked to input the return data, namely the borrower's name and the borrower's room. In the borrower's room, the admin can select the room name by pressing the drop down icon. After that, the admin can press the continue icon.

Figure 23. Return data input display

Figure 24. Return Room Options

After inputting the return data, the system will direct the admin to the return form display. On the return form, the borrower's room section, borrower's name and return code will be filled in automatically. The admin can input the purpose of the loan, borrowing date, return date and medical record number. After the medical record number is filled in, the patient's name and patient address will be filled in automatically. After inputting the borrowing data, the admin can press the submit icon. If the return data is incomplete, there will be a notification "medical record failed to be returned", if the return data is complete, there will be a notification "medical record return successful".

Figure 25. View medical record return form

Figure 26. Medical record notification failed to return

Figure 27. Notification of successful return of medical records

Report User Interface Design

In the report view, the RM admin can validate the process of borrowing medical records and returning medical records. In addition, the room admin and RM admin can view the medical record report.

Figure 28. Report View

Loan History User Interface Design

To validate the borrowing of medical records, the admin can press the medical record borrowing history icon. Then, the system will direct the admin to the medical record borrowing display. To validate, the admin can press the sent icon. After that, a notification will appear "medical records successfully sent".

Figure 29. Medical record borrowing validation display

Figure 30. Medical record notification successfully sent

Return History User Interface Design

To validate the return of medical records, the admin can press the medical record return history icon. Then, the system will direct the admin to the medical record return display. To validate, the admin can press the accepted icon. After that, a notification will appear "medical records successfully received". If the medical record has not been filled in completely, the admin can press the rejected icon. After that, a notification will appear "medical records successfully rejected".

Figure 31. Medical record return validation display

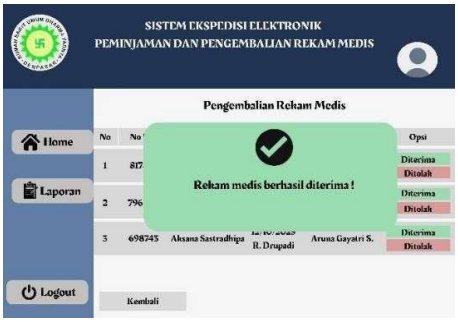

Figure 32. Medical record notification successfully received

Figure 33. Medical record notification successfully rejected

Medical Record Report User Interface Design

On the medical record report display, the room admin and RM admin can see the medical records that have been borrowed, when the medical records were borrowed, the borrowing officer, and when the medical records will be returned. If the medical records are returned on time, namely 1x24 hours, the medical record report will be green. If the medical records are returned more than 1x24 hours but less than 2x24 hours, the medical record report will be yellow. If the medical records are returned 2x24 hours or more, the medical record report will be red.

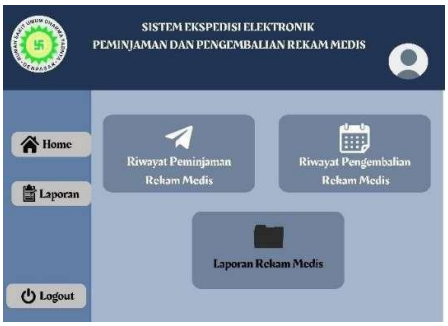

Figure 34. View medical record report

Figure 35. Medical record return report

Design User Interface Logout

To log out, the admin can press the logout icon located in the lower left corner. Then press the exit icon. If the admin wants to cancel the logout, press the cancel icon.

Figure 36. Logout notification

Overview of Designing User Interface for Medical Record Filling System at Dharma Yadnya General Hospital

Based on the results of the study, delays in returning medical record documents still occur at Dharma Yadnya General Hospital. This is not in accordance with the SOP of Dharma Yadnya General Hospital which states that Medical Records must be returned within 1x24 hours. In addition, the use of manual medical record expedition books still has several obstacles such as inputting data for borrowing officers and the date of return of medical records, some of which are still not written or empty. This user interface design is expected to be used by Dharma Yadnya General Hospital as a reference for creating an electronic-based

medical record filling system to make it easier for officers to record and track borrowed medical record documents and provide complete and accurate information.

5. CONCLUSION & SUGGESTIONS

Conclusion

The conclusion of the researcher is to design the user interface design of the inpatient medical record filling system at Dharma Yadnya General Hospital using 2 methods, namely the qualitative descriptive research method and the waterfall method). Based on the results of the interviews that the researcher has conducted, the informants agree with the creation of the interface design of the medical record filling system. However, there are still improvements and additions that are considered more appropriate for users later, such as time (date of discharge and return of medical records), reports of borrowing and returning medical records.

Suggestions

1. For Dharma Yadnya General Hospital, it is expected that this researcher can be used as a reference for evaluation in improving the quality of health services in the electronic medical record expedition system.
2. For researchers, it is recommended to consider several things such as adding experts who will test the user interface design and can use other testing methods.
3. For institutions, they can apply and compare the knowledge gained during the study with the reality of work in the field and can be used as a reference or source of literature for other researchers.

6. ACKNOWLEDGEMENT

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7. REFERENCES

Aditya, M. W., Sukajaya, I. N., & Gunadi, I. G. A. (2023). Forecasting Jumlah Pasien DBD di BRSUD Kabupaten Tabanan Menggunakan Metode Regresi Linier. *Bali Medika Jurnal*, *10*(1), 1-12. https://doi.org/10.36376/bmj.v10i1.290.

Firdaus, N. A., Pratiwi, A. L., Saputra, M. I., & Fitri, A. S. (2024). Perancangan Desain User Interface E-Posyandu Melati 2 Berbasis Mobile Melalui Metode User Centered Design (UCD). *Innovative: Journal Of Social Science Research*, *4*(5), 3713-3722. https://doi.org/10.31004/innovative.v4i5.15396.

Gristiari, N. M. P., Adiputra, I. M. S., & Aditya, M. W. (2024). Perancangan desain user interface ekspedisi elektronik dokumen rekam medis rawat inap. *Health Sciences and Pharmacy Journal*, *8*(3), 181-190. https://doi.org/10.32504/hspj.v8i3.1161.

Hasibuan, R. I. P., Prasetya, R. D., Ahadi, M. F., & Utami, N. D. (2023). Evaluasi Usability Aplikasi Satu Sehat Dengan Metode System Usability Scale. *Methodika: Jurnal Teknik Informatika dan Sistem Informasi*, *9*(2), 1-7.

Hidayati, N., & Sismadi, S. (2020). Application of Waterfall Model In Development of Work Training Acceptance System. *INTENSIF: Jurnal Ilmiah Penelitian Dan Penerapan Teknologi Sistem Informasi*, *4*(1), 75-89.

Jamil, N. M., Muna, N., Wijayanti, R. A., & Wicaksono, A. P. (2020). Sistem Informasi Peminjaman dan Pengembalian Dokumen Rekam Medis Menggunakan Metode Waterfall (Studi Kasus Puskesmas Banjarsengon). *J-REMI: Jurnal Rekam Medik Dan Informasi Kesehatan*, *1*(2), 94-103. https://doi.org/10.25047/j-remi.v1i2.2241.

M. Wahyu Aditya, P. Komang Astami Jayanti, R. Medis Dan Informasi Kesehatan, S. Wira Medika Bali, J. Kecak No, And G. Subroto Timur, “Gambaran Kelengkapan Pengisisn Formulir Pendaftaran Pasien Online Rawat Jalan Poliklinik Bedah Di Rumah Sakit Umum Dharma Yadnya,” Jurnal Kesehatan Terpadu, Vol. 8, No. 1, Pp. 7–14.

Mellyana, M., Nurhasanah, N., & Ardan, M. (2024). Analisis Sistem Filling Dokumen Rekam Medis di UPTD Puskesmas Resak Kabupaten Kutai Barat Tahun 2023. *Jurnal Sains dan Teknologi*, *6*(1), 58-63.

RI, K. (2022). Peraturan menteri kesehatan republik indonesia nomor 34 tahun 2022 tentang Akreditasi pusat kesehatan masyarakat, klinik, laboratorium kesehatan, unit transfusi darah, tempat praktik mandiri dokter, dan tempat praktik mandiri dokter gigi. *Kemenkes RI*, *1207*, 1-16.

Sitorus, J. H. (2021). Perancangan user interface sistem informasi akademik sekolah dasar (Siakad) menggunakan metode waterfall. *Simpatik: Jurnal Sistem Informasi dan Informatika*, *1*(2), 98-107. https://doi.org/10.31294/simpatik.v1i2.671.