



Information System for Analyzing Disease Trends in the Region Cerenti Health UPTD

Dilla Juniarti¹, Aprizal², Sri Chairani³

^{1,3} Program Studi Teknik Informatika, Universitas Islam Kuantan Singingi, Indonesia

Article Info

Article history:

Received 03 21, 2024

Revised 04 14, 2024

Accepted 05 21, 2024

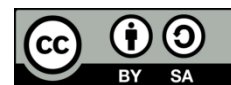
Keywords:

Information System,
Analyzing Disease,
Aplikation,
Website

ABSTRACT

The Cerenti District Health Service is the implementing element of regional autonomy in the health sector which is located below and is accountable to the region through the regional secretary on the principles of regional autonomy and assistance duties. The performance of the system in managing data at the Cerenti Health UPTD, especially in reporting disease data, is not yet effective and efficient even though it uses a computer and stores data using Microsoft Word and Excel, because the creation and storage are separate, it still uses Microsoft Word and Excel, making it difficult to search for data. when needed again [1]. Management is designed to build a computerized system to make it easier for agencies to process data. The data processing created can manage disease reporting data more efficiently, effectively and can be controlled with data graphs [2]. With the final result of a computerized system, data processing will be more effective and efficient. This computerized system can store data properly so that it will avoid damage and loss of data [3]. With this computerized system, it will be easier to find data that has been stored for a long time [4]. With the existence of a computerized system regarding disease trends in the Cerenti Health UPTD area, it will provide a classification report on existing disease trends, based on data on patients who have contracted the disease.

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



Corresponding Author:

Dilla Juniarti

Program Studi Teknik Informatika

Universitas Islam Kuantan Singingi, Riau, Indonesia

Email: Dila.juniarti@gmail.com

© The Author(s) 2024

1. Introduction

The Regional Technical Implementation Unit, hereinafter abbreviated to UPTD, is an organization that carries out operational technical activities and supporting technical activities at the health service [5]. Puskesmas is a community health center, health sector and comprehensive and integrated first-level health service center that focuses on a community that lives in a certain area [6].

The 1945 Constitution mandates that the State Apparatus is obliged to serve each country to fulfill basic needs in order to improve the welfare of society [7]. All public interests must be implemented by the government as the organizer, whether it concerns the service sector, especially those related to fulfilling civil rights and basic community needs [8]. In other words, all interests relating to the lives of many people must have a service [9]. Based on Law No. 23 of 1992 concerning health, it is stated that health is a state of physical, mental and social well-being that enables every person to live a socially and economically productive life [10]. In article 7 it is stated that the government is tasked with implementing equitable and affordable health efforts [11]. Article 9 states that "the government is responsible for improving the level of public health" [12]. The public health sector has the main task of carrying out part of its duties [13]. Head of the health service in the fields of nutrition, health promotion and community empowerment, environmental health, occupational health and sports as well as carrying out other duties given by the head of the service. There are 3 main functions of community health centers, namely as public health in their area [14]. Fostering community participation in the work area in order to increase the ability to live a healthy life [15][16]. Providing comprehensive and integrated health services to the community in its area. Public health has an important role in efforts to improve the quality of human resources, poverty alleviation and economic development. The human development index places health as one of the main components of measurement besides education and income [10].

Disease is a bad condition in certain organs or parts of the body caused by dangerous microorganisms such as bacteria, viruses, wounds, chemical imbalances in the body, exposure to toxins and the appearance of imperfect cells. Disease trend analysis is a method of analyzing disease reports to determine whether the disease trend is increasing, decreasing or remaining constant [17]. The Cerenti District Health Service is the implementing element of regional autonomy in the health sector which is located below and is accountable to the region through the regional secretary on the principles of regional autonomy and assistance duties. The performance of the system in managing data at the Cerenti Health UPTD, especially in reporting disease data, is not yet effective and efficient even though it uses a computer and stores data using Microsoft Word and Excel, because the creation and storage are separate, it still uses Microsoft Word and Excel, making it difficult to search for data. when needed again[18]. Management is designed to build a computerized system to make it easier for agencies to process data [19]. The data processing created can manage disease reporting data more efficiently, effectively and can be controlled with data graphs [20].

2. Research Method

Research Flow Diagram

The following are the research stages used in completing this research.

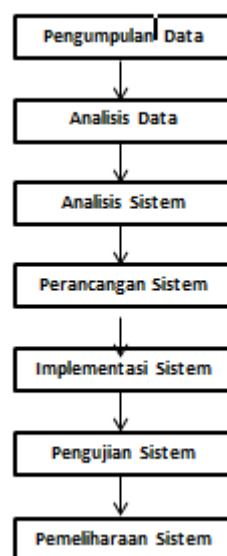


Figure 1. Research Design Diagram

Data collection technique

The data collection techniques are:

1. Observation

This is data collection by researching directly in the field to obtain accurate data and information sources and interacting directly with system users [21].

2. Literature Study

The library study collection technique is an activity of studying a topic and knowledge related to research comes from books, journals, the internet, magazines and so on.

3. Interview

This is a technique carried out by interviewing divisions to obtain the required information.

1.1 Implementation

Use Case Diagram

By looking at this use case diagram you can explain the flow of data in a computerized system. The following is a use case diagram of the disease trend analysis information system in the Cerenti Health UPTD area [22].

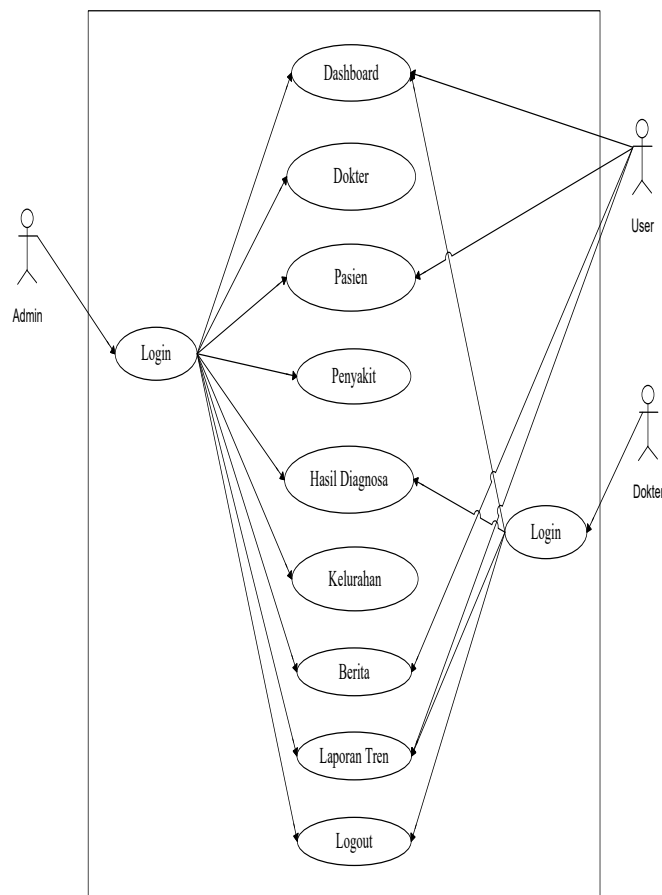


Figure 2. Use Case Diagrams

Activity Diagram

The following Activity process design illustrates the Login Activity Diagram which can be seen in Figure 3.

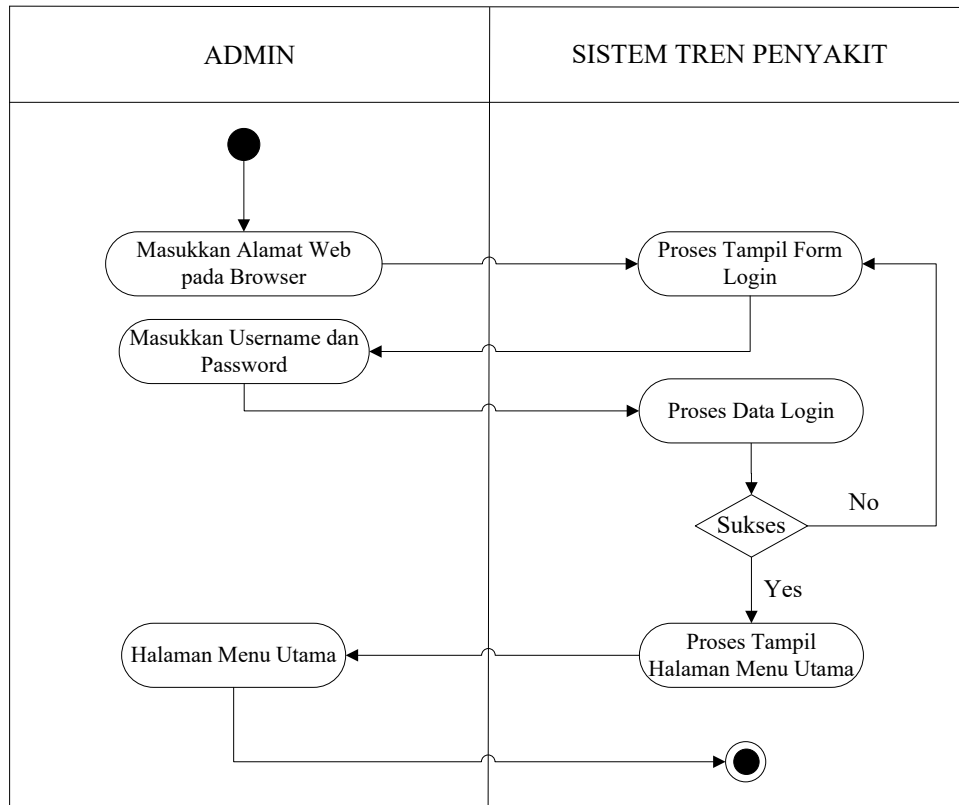


Figure 3. Login Sequence Diagram

Admin Activity Diagram Inputting Doctor Data

The following activity process design illustrates the Admin Activity Diagram Inputting Doctor Data which can be seen in the figure 4.

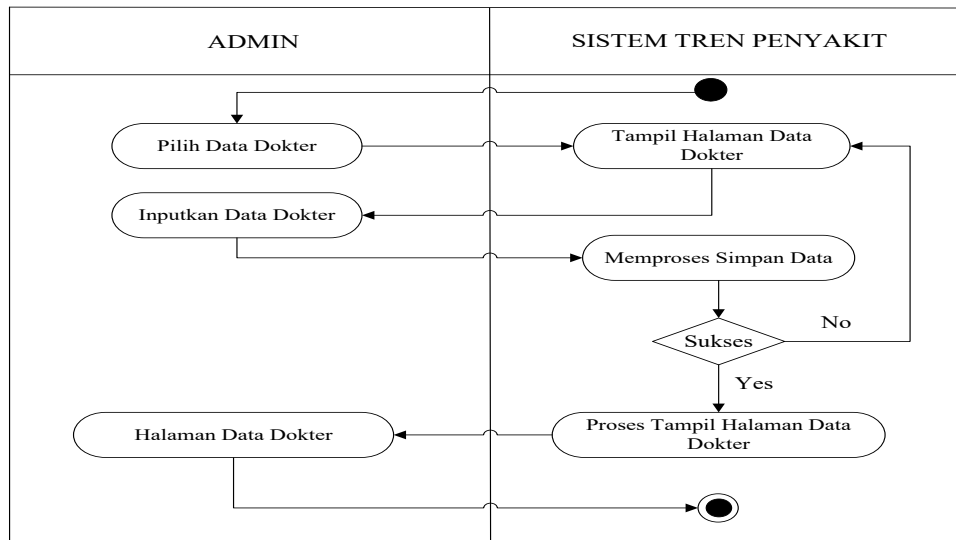


Figure 4. Sequence Diagram Admin Inputting Doctor Data

Activity Diagram Inputs Patient Data

The activity diagram admin inputs patient data into the disease trend analysis information system in the Cerenti Health UPTD area so that data on patients seeking treatment is properly recorded in the system. The following illustrates the customer sequence diagram which can be seen in Figure 5.

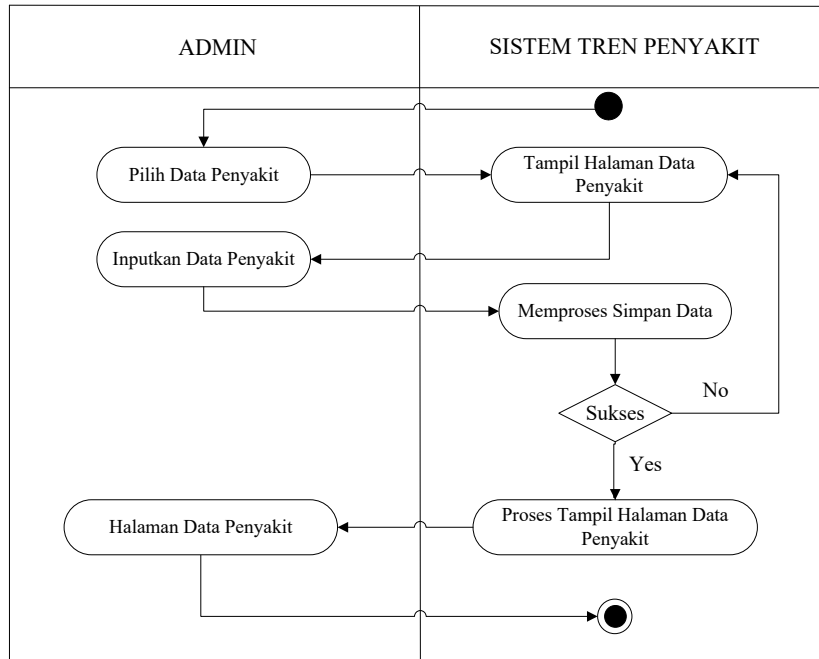


Figure 5. Activity Diagram Inputs Patient Data

Activity Diagram Admin Inputs Disease Data

The activity diagram admin inputs disease data into the disease trend analysis information system in the Cerenti Health UPTD area so that all disease data is recorded in the system so that existing disease trends can be determined from the most abundant disease data [23]. For more details, see the activity diagram. The admin login inputs disease data as follows.

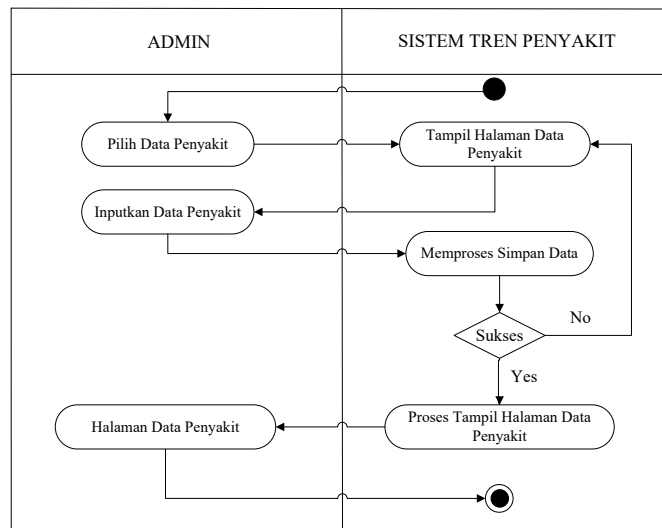


Figure 6. Activity Diagram Admin Inputs Disease Data

Activity Diagram Inputs Diagnostic Data

The activity diagram admin inputs diagnostic data into the disease trend analysis information system in the Cerenti Health UPTD area so that all disease diagnosis data is recorded properly in the system [24]. For more details, you can see in the login activity diagram that the admin inputs diagnostic data as follows.

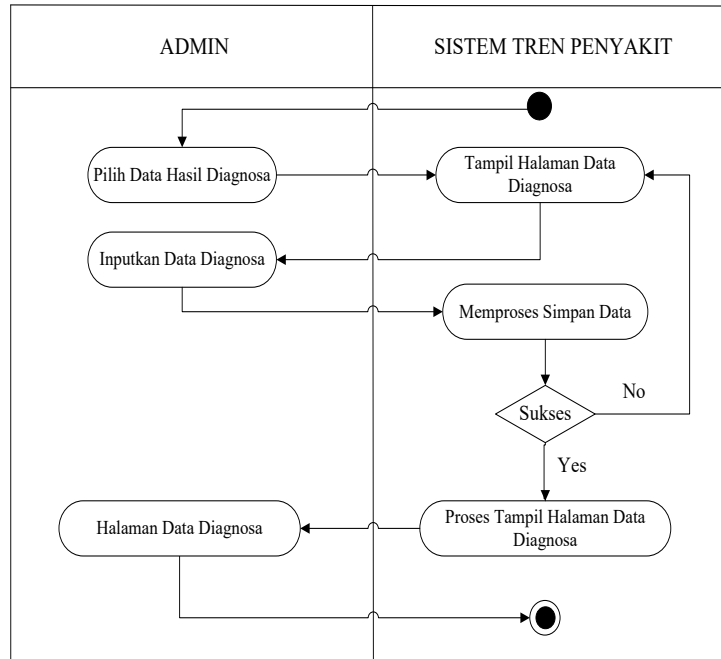


Figure 7. Activity Diagram Admin Inputs Diagnostic Data

Activity Diagram Inputs Subdistrict/Village Data

For more details, you can see in the activity diagram the admin inputs sub-district/village data as follows.

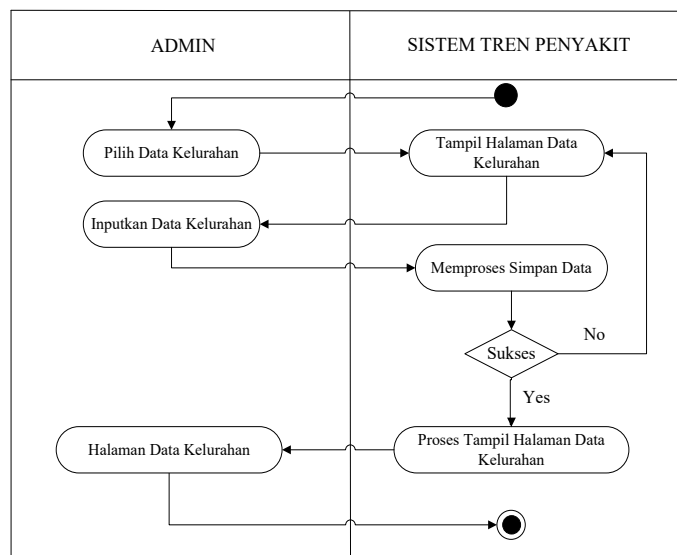


Figure 8. Activity Diagram Admin Inputs Subdistrict/Village Data

Class Diagrams

The class diagram provides an overview of the database design that will be used in the disease trend analysis information system in the Cerenti Health UPTD area so that with this design it will be easier to create the system database that will be used. For more details, you can see the class diagram of the disease trend analysis information system in the Cerenti Health UPTD area, which is as follows.

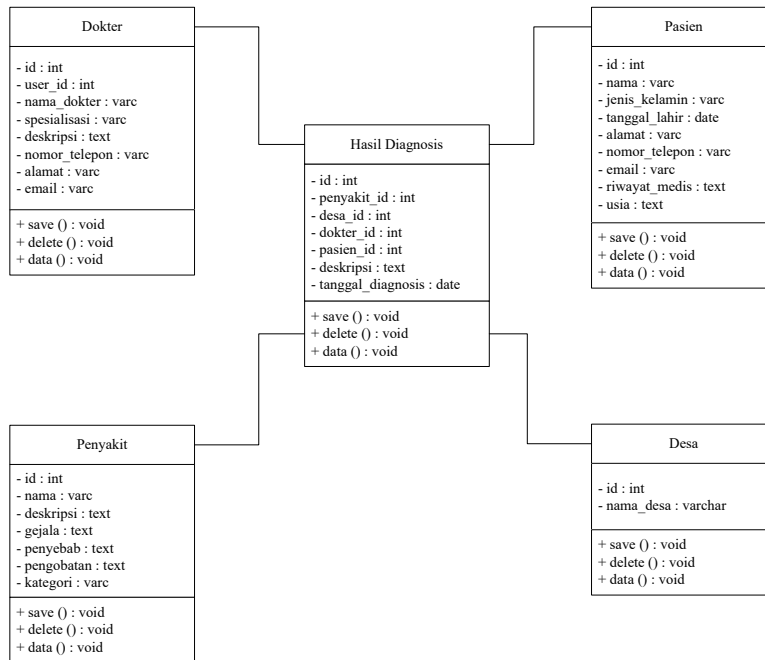


Figure 9. Class Diagrams

Sequence Diagrams

Sequence diagram admin views and manages data in the disease trend analysis information system in the Cerenti Health UPTD area. So with this computerized system, data will be stored better and will also produce more effective reports. This admin sequence diagram shows or displays interactions between objects in the system which are arranged in a sequence or time series in the disease trend analysis information system in the Cerenti Health UPTD area[25]

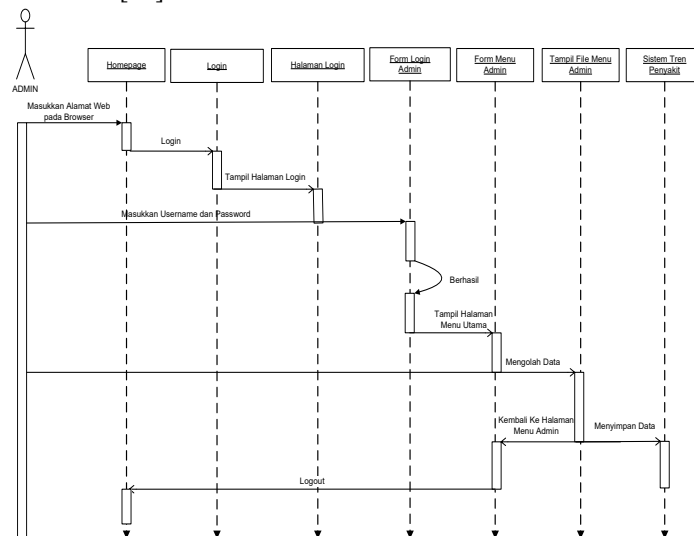


Figure 10. Sequence Diagram Admin Processing Disease Trend System

Design Results

User Menu Form Display

This form will appear if the user types the website address into the browser. This form will present a home menu, disease trends and about which contains information related to the Cerenti Health UPTD. In the disease trend analysis information system in the Cerenti Health UPTD area, users will be limited to processing data because this form is specifically for viewing information related to the Cerenti Health UPTD. For more details, see the form as follows.



Figure 11. User Main Menu Form

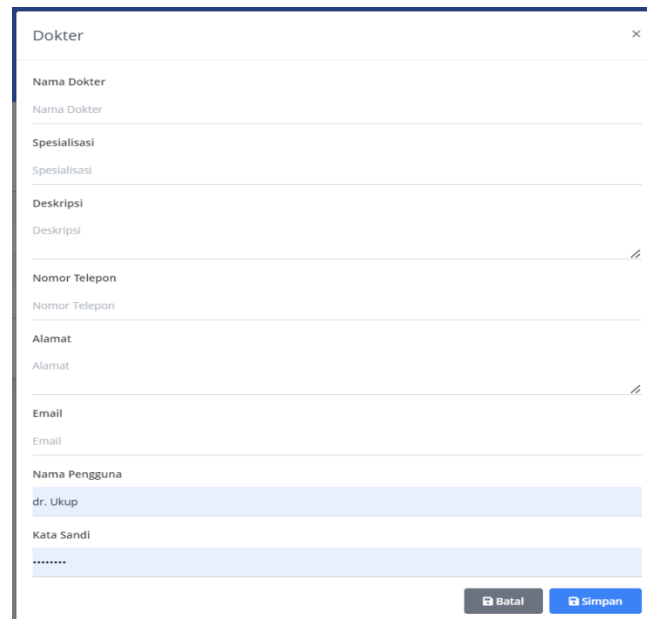
Login Menu Form Display

The admin login form functions to provide restrictions on users who process the system, so that with this login form only users who are trusted can process data in the disease trend analysis information system in the Cerenti Health UPTD Area. The login requirement is to have a username and password that have been previously registered in the system. For more details, see the admin login form figure as follows.

Figure 12. Login Menu Form Display

Display of Doctor Data Input Form

This doctor's data input form can only be accessed by the admin of the disease trend analysis information system in the Cerenti Health UPTD area. In this form the admin can add data on doctors on duty at the Cerenti Health UPTD so that every doctor who carries out treatment can be recorded properly. For more details, see the doctor's data input form figure as follows.

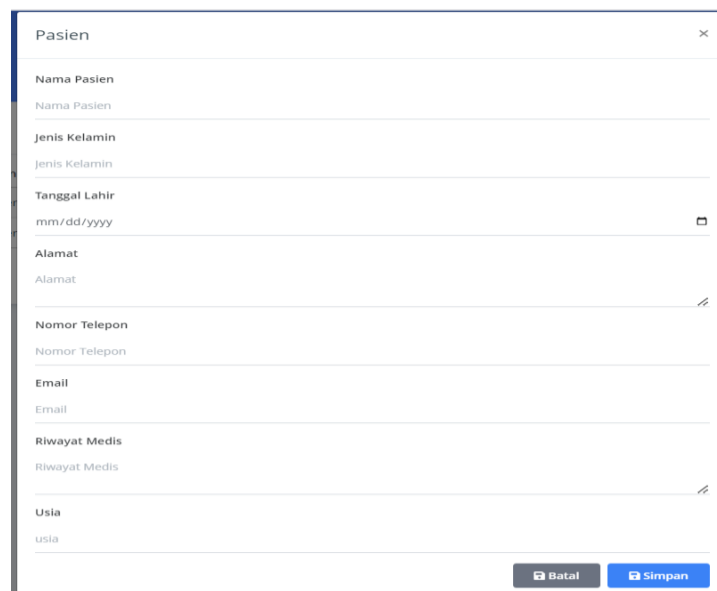


The screenshot shows a web form titled "Dokter" with a close button (X) in the top right corner. The form contains several input fields: "Nama Dokter" (with a placeholder "Nama Dokter"), "Spesialisasi" (with a placeholder "Spesialisasi"), "Deskripsi" (with a placeholder "Deskripsi" and a text icon), "Nomor Telepon" (with a placeholder "Nomor Telepon"), "Alamat" (with a placeholder "Alamat" and a text icon), "Email" (with a placeholder "Email"), "Nama Pengguna" (with a placeholder "dr. Ukup"), and "Kata Sandi" (with a placeholder "....."). At the bottom right, there are two buttons: "Batal" (Cancel) and "Simpan" (Save).

Figure 13. Display of Doctor Data Input Form

Display of Patient Data Input Form

This patient data input form is used to input data on patients who undergo consultation or treatment at the Cerenti Health UPTD so that every patient who has received treatment is properly recorded in the disease trend analysis information system in the Cerenti Health UPTD area. For more details, see the patient data input form figure as follows.



The screenshot shows a web form titled "Pasien" with a close button (X) in the top right corner. The form contains several input fields: "Nama Pasien" (with a placeholder "Nama Pasien"), "Jenis Kelamin" (with a placeholder "jenis Kelamin"), "Tanggal Lahir" (with a placeholder "mm/dd/yyyy" and a calendar icon), "Alamat" (with a placeholder "Alamat"), "Nomor Telepon" (with a placeholder "Nomor Telepon"), "Email" (with a placeholder "Email"), "Riwayat Medis" (with a placeholder "Riwayat Medis" and a text icon), and "Usia" (with a placeholder "usia"). At the bottom right, there are two buttons: "Batal" (Cancel) and "Simpan" (Save).

Figure 14. Patient Data Input Form Display Results

Village Data Input Form Display

This village/kelurahan data input form functions to record every village in the Cerenti Health UPTD Area so that every community in the Cerenti District can be properly recorded in the disease trend analysis information system in the Cerenti Health UPTD Area. For more details, see the village/kelurahan data input form figure as follows.

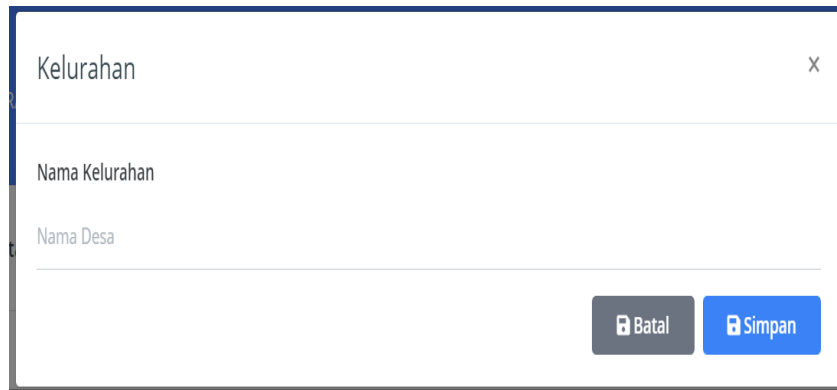


Figure 14. Village Data Input Form Display

Diagnostic Data Input Form Display

This diagnostic data input form functions to record the diseases suffered by patients who seek treatment at the Cerenti Health UPTD so that every disease suffered by the patient is recorded properly and if they come back for treatment, the previous diagnosis data is already in the disease trend analysis information system in the UPTD area. Cerenti Health. For more details, see the figure for the diagnostic data input form as follows.

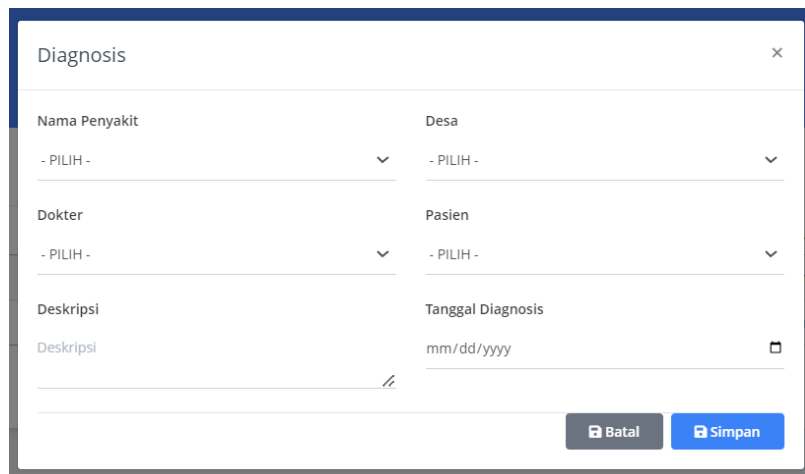


Figure 15. Village Data Input Form Display

Disease Data Form

This disease data form functions to display disease data in the Cerenti Health UPTD area so that every disease that has ever existed in a patient is recorded on this form. For more details, see the disease data form as follows.

Nama Penyakit	Kategori	Deskripsi	Gejala	Penyebab	Pengobatan
1 INFLUENZA	Flu	Flu atau influenza merupakan penyakit yang disebabkan oleh infeksi virus yang dapat menyerang hidung, tenggorokan, dan paru-paru. Kondisi ini sangat umum terjadi di musim pancaroba. Penyakit ini sanga...	Demam. Otot sakit. Menggigil dan berkering. Sakit kepala. Batuk kering yang berkelanjutan (kronis). Sesak napas. Kelelahan dan kelemahan. Hidung meler atau tersumbat. Sakit tenggorokan. Sakit mata. Muntah dan...	Virus influenza menyebar melalui udara dalam tetesan atau percikan liur (droplet) ketika seseorang yang terinfeksi batuk, bersin, atau berbicara. Kamu dapat menghirup tetesannya secara langsung, atau...	Cuci tangan secara rutin, untuk menghindari penyebaran virus flu ke benda atau orang lain. Gunakan tisu untuk menutup mulut dan hidung ketika batuk atau bersin, lalu buang tisu tersebut. Pastikan tubuh...
2 DIABETES	Diabetes	Diabetes atau penyakit gula (gula darah tinggi) adalah penyakit kronis (jangka panjang) yang perlu kamu waspadai. Adapun tanda utama dari penyakit ini adalah meningkatnya kadar gula darah (glukosa) me...	Peningkatan rasa haus. Peningkatan frekuensi buang air kecil. Mudah lelah atau rasa keletihan terus-menerus. Adanya gangguan penglihatan, seperti pandangan yang kabur. Terjadinya infeksi pada tubuh...	kadar gula darah normal yaitu kurang dari 100 mg/dL. Apabila kadar gula darah sudah mencapai 100-125 mg/dL, berarti masuk status prediabetes. Sementara itu, kadar gula darah yang mencapai 126 mg/dL, ke...	Menerapkan pola makan sehat. Rutin melakukan aktivitas fisik
3 FEBRIS	Demam	Febris adalah istilah kedokteran yang lebih dikenal dengan Demam di masyarakat awam, yakni panas suhu tubuh lebih dari 37 derajat celsius.	Banyak berkering. Menggigil. Pusing. Sakit otot. Tidak nafsu makan. Mudah marah. Dehidrasi. Lemas	Infeksi virus, seperti Covid-19, flu, dan hepatitis. Infeksi bakteri seperti tipes, diare, dan keracunan makanan. Keapasan karena terlalu lama terkena terik sinar matahari. Peradangan seperti radang sendi...	Mengonsumsi obat penurun panas yang dalam istilah medis, disebut sebagai antipiretik. Contoh obat antipiretik adalah parasetamol dan ibuprofen. Mengompres tubuh dengan kompres dingin. Banyak minum air pu...

Figure 16. Disease Data Form

This diagnostic data functions to display disease diagnosis data for patients in the Cerenti Health UPTD area so that every patient's disease diagnosis data that has ever existed is recorded on this form. For more details, see the diagnostic data form

Conclusions

The conclusions that the author put forward in research on disease trend analysis information systems in the Cerenti Health UPTD Region are as follows.

1. With the final result of a computerized system, data processing will be more effective and efficient.
2. This computerized system can store data properly and safely so that data damage and loss will be avoided.
3. With this computerized system, it will be easier to find data that has been stored for a long time.
4. With the existence of a computerized system regarding disease trends in the Cerenti Health UPTD area, it will provide classification report results regarding existing disease trends, based on data on patients who have contracted the disease..

Acknowledgments

Praise be to the presence of God Almighty for all His mercy and grace so that this research can be completed well, to the LPPM institution which has provided the facilities and support needed to carry out this research. All parties who cannot be mentioned one by one, but who participated help in the process of this research, Family and friends, for their prayers, moral support, and continuous motivation while the author completes this research.

Reference

- [1] S. D. Yanti, A. Mayansara, N. A. Liadin, and ..., "Literature Review: Tantangan dan Tren Terkini dalam Manajemen Rumah Sakit," *J. Ris. Sains* ..., 2024, [Online]. Available: <https://journal.scitechgrup.com/index.php/jrski/article/view/14>
- [2] N. Sigit and N. D. N. Aini, "Penerapan Metode Structural Equation Modelling Pada Pengguna

- Aplikasi Informasi Kesehatan Pojok Kampung,” *J. Pendidik. Indones. Teor. ...*, 2022, [Online]. Available: <http://jurnal.penerbitwidina.com/index.php/JPI/article/view/211>
- [3] A. Bastian, “Penerapan algoritma k-means clustering analysis pada penyakit menular manusia (studi kasus kabupaten Majalengka),” *J. Sist. Inf.*, 2018, [Online]. Available: https://www.academia.edu/download/96758486/238400_penerapan_algoritma_k_means_clustering_a_97bef344.pdf
- [4] G. Arie, *Pengantar Sistem Informasi Kesehatan*. repository.unas.ac.id, 2023. [Online]. Available: http://repository.unas.ac.id/6531/1/PENGANTAR_SISTEM_INFORMASI_KESEHATAN.pdf
- [5] L. S. AGUSTININGSIH, *Pengembangan Sistem Informasi Klinik Fisioterapi guna Mendukung Monitoring Tindakan Fisioterapi pada Pasien Rawat Jalan di Rumah Sakit Paru Dr. Ario ...* eprints.undip.ac.id, 2011. [Online]. Available: <http://eprints.undip.ac.id/28534>
- [6] J. Y. Mocodompis and F. S. Pabilaya, “Analisis dan Perancangan Sistem Informasi Kesehatan Sebaran Penyakit Berbasis WEB-GIS,” *KLIK Kaji. Ilm. Inform. dan ...*, 2023, [Online]. Available: <http://djournals.com/klik/article/view/811>
- [7] K. Yashmi, A. Harshitha, D. Sumagna, and E. Rukshitha, “Crop Canopy: Empowering Crop Resilience with IoT-Driven Rain Shed Solution,” *International Journal of Research In Science & Engineering*, no. 42. HM Publishers, pp. 27–39, 2024. doi: 10.55529/ijrise.42.27.39.
- [8] S. Saif, W. Widyawan, and R. Ferdiana, “IoT-DH dataset for classification, identification, and detection DDoS attack in IoT,” *Data in Brief*, vol. 54. Elsevier BV, p. 110496, 2024. doi: 10.1016/j.dib.2024.110496.
- [9] S. Golestani and D. Makaroff, “Exploring Unsupervised One-Class Classifiers for Lightweight Intrusion Detection in IoT Systems,” *2024 20th International Conference on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT)*. IEEE, pp. 234–238, 2024. doi: 10.1109/dcross-iot61029.2024.00042.
- [10] D. S. Chaware and M. S. Yadav, “IOT-BASED SECURE VIDEO CONTENT DETECTION SYSTEM FOR STRAY ANIMALS,” *Futuristic Trends in IOT Volume 3 Book 1*. Iterative International Publisher, Selfypage Developers Pvt Ltd, pp. 121–126, 2024. doi: 10.58532/v3bbio1p1ch14.
- [11] J. Limbong, *Pengembangan Sistem Informasi Rawat Inap Pelayanan Penyakit Dalam Guna Mendukung Keputusan Manajemen pelayanan di RSUD dr H Soemarno ...* eprints.undip.ac.id, 2010. [Online]. Available: <http://eprints.undip.ac.id/23743/>
- [12] Y. Dharmawan, *Sistem Informasi Efisiensi Penggunaan Tempat Tidur Unit Rawat Inap Dengan Menggunakan Indikator Grafik Barber Johnson Di Rumah Sakit Pantii Wilasa Citarum ...* eprints.undip.ac.id, 2006. [Online]. Available: <http://eprints.undip.ac.id/15966/>
- [13] A. Arifin, A. Irawan, and N. Hidayah, “Sistem informasi geografis (sig) sebagai media informasi kesehatan tentang Penyakit menular: literature review,” *Proceeding Sari Mulia Univ. ...*, 2020, [Online]. Available: <https://ocs.unism.ac.id/index.php/PROKEP/article/view/130>
- [14] A. N. Azizah, W. G. Azzizah, Y. Syahidin, and ..., “Tata kelola sistem informasi rekam medis berbasis elektronik pada pelaporan morbiditas pasien rawat inap,” ... *J. Sist. Inf.*, 2023, [Online]. Available: <https://journal.unilak.ac.id/index.php/zn/article/view/15046>
- [15] L. Amelia, D. Cahyono, and E. Fitriya, “Systematic Literature Review: Kinerja Sistem Informasi Akuntansi Rumah Sakit Di Indonesia,” *Juremi J. Ris. Ekon.*, 2021, [Online]. Available: <https://bajangjournal.com/index.php/Juremi/article/view/232>
- [16] I. S. Raharja, *TA: Perencanaan Strategis Sistem Informasi Pada Rumah Sakit Islam Jemursari Dengan Metode Ward And Peppard*. repository.dinamika.ac.id, 2017. [Online]. Available: <https://repository.dinamika.ac.id/id/eprint/2619/>
- [17] S. F. P. Rachim, S. Nurcahyati, Jaelani, and STIKes Mahardika Cirebon, “Tinjauan Sistem Informasi Indeks Penyakit Rawat Inap di Rumah Sakit TK III 03.06.01 Ciremai,” *J. Wiyata*, vol. 8, no. 2, pp. 188–196, 2021.
- [18] F. Hidayat, *Konsep Dasar Sistem Informasi Kesehatan*. Deepublish, 2020.
- [19] R. Listyani and P. Oktamianti, “TREN PENELITIAN MANAJEMEN INSTALASI GAWAT DARURAT RUMAH SAKIT DI INDONESIA,” *J. ...*, 2023, [Online]. Available: <http://journal.universitaspahlawan.ac.id/index.php/jkt/article/view/14593>
- [20] F. N. Cahya, N. Hardi, and D. Riana, “Klasifikasi penyakit mata menggunakan convolutional neural network (CNN),” ... *J. Sist. Inf.*, 2021, [Online]. Available: <https://sistemasi.ftik.unisi.ac.id/index.php/stmsi/article/view/1248>
- [21] F. D. Lestari, A. Rachmadi, and N. H. Wardani, “Evaluasi Sistem Informasi Manajemen Rumah

- Sakit Menggunakan Framework Human, Organization, And Technology-Fit (HOT-Fit) Model (Studi Pada RSI UNISMA ...,” ... *Inf. Dan Ilmu Komput.*, 2020, [Online]. Available: <http://j-ptiik.ub.ac.id/index.php/j-ptiik/article/view/7748>
- [22] R. Pranata, *Pegembangan Dashboard Sistem Informasi Rumah Sakit Dengan Metode Pureshare*. dspace.uui.ac.id, 2021. [Online]. Available: <https://dspace.uui.ac.id/handle/123456789/34172>
- [23] Y. L. Baik, “Memanfaatkan Sistem Informasi Guna Mendukung Pengelolaan Laboratorium,” *academia.edu*, [Online]. Available: https://www.academia.edu/download/114050370/Cinta_Kusumawardhani_Memanfaatkan_Sistem_Informasi_Guna_Mendukung_Pengelolaan_Laboratorium.pdf
- [24] A. Supriono, “PEMANFAATAN BUSINESS INTELLIGENCE UNTUK MONITORING TREN PENYAKIT DI RUMAH SAKIT,” ... , *Sist. Inf. dan Teknol. Inf.*, 2024, [Online]. Available: <https://ejournal.cyber-univ.ac.id/index.php/innotech/article/view/40>
- [25] S. A. Gumilar, “Perencanaan Strategis Sistem Informasi/Teknologi Informasi di Rumah Sakit Umum Daerah,” *Progr. Stud. MMT-ITS*, 2019, [Online]. Available: https://repository.its.ac.id/61517/1/09211650053026-Master_Thesis.pdf