Development Of Health Information Systems For Patient Data Management and Better Care

by Ruslan Zuhair Pulungan

Submission date: 22-Aug-2024 01:38PM (UTC+0700)
Submission ID: 2435960995
File name: IJHSB_vol_1_no_3_agustus_2024_hal_99-104.pdf (818.83K)
Word count: 1964
Character count: 11780

International Journal of Health and Social Behavior
Vol.1, No.3 August 2024
e-ISSN: 3047-5325, p-ISSN 3047-5244, Page 99-104
DOI: https://doi.org/10.62951/ijhsb.v1i3.61
Available online at: https://international.arikesi.or.id/index.php/IJHSB

Development Of Health Information Systems For Patient Data Management and Better Care

Ruslan Zuhair Pulungan
Health Policy Administration Study Program, Malahayati College of Health Sciences, Medan, Indonesia

*Author correspondence : ruslanzuhair53@gmail.com**

Abstract.*The development of health information systems (GIS) is important in this digital era to improve patient data management and provide better care. This research aims to develop a SIK that can help health service providers manage patient data more efficiently and improve care coordination. Development steps include requirements analysis, system design, implementation, and performance evaluation. The developed system has features such as recording patient medical history, scheduling appointments, monitoring health conditions, and communication between health care providers. The evaluation results show that the developed SIK succeeded in increasing efficiency in patient data management and care coordination. Healthcare providers can easily access patient information, plan more coordinated care, and communicate effectively with colleagues. Thus, the development of this SIK is expected to make a significant contribution to improving the quality of health services and patient outcomes through better data management and more coordinated care.*

Keywords: *Health Information Systems, Patient Data Management, Health Care, Efficiency, Care Coordination*

1. INTRODUCTION

In today's digital era, computer networks have become the backbone for various aspects of life, including business, government and personal communications. However, with technological advances also come new threats in the form of cyber attacks that can threaten the security and integrity of the network.[4].

Attack detection in computer networks is becoming increasingly important as cyber attacks continue to evolve and become more complex. Attacks such as denial of service (DoS), malware, phishing, and brute force attacks can cause significant financial losses, leaks of sensitive data, and reputational damage to the targeted organization or individual.[5]. To combat this threat, attack detection in computer networks has become a major focus in the field of information security. However, manual detection of attacks has become impossible due to the large volume of data and the ever-growing complexity of attacks. Therefore, an automated and artificial intelligence-based approach is needed to detect and respond to cyber attacks quickly and effectively.

In this context, the use of the C4.5 decision tree algorithm becomes interesting because of its ability to make decisions based on rules learned from data. This algorithm has been proven effective in a variety of applications, including classification and prediction,

Received: Juli 02,2024; Revised: Juli 16, 2024; Accepted: Agustus 20, 2024; Published: Agustus 22, 2024

which makes it an attractive candidate for application in attack detection in computer networks.[6],[7].

Against this background, this research aims to explore the potential of the C4.5 decision tree algorithm in attack detection in computer networks and its contribution to improving information security in increasingly complex and connected digital environments.

2. RESEARCH METHODOLOGY

a. Literature Review:

The literature study stage is to collect relevant information and knowledge related to the development of management information systems.

b. Requirement Analysis:

The needs analysis stage is to understand the requirements and needs of the management information system to be developed.

c.System Design:

The system design stage is to design the structure and architecture of the management information system based on the results of the needs analysis.

d. Implementation:

The implementation stage involves building and coding a management information system based on a previously designed design.

e. Testing:

System testing stage to ensure that the system functions according to specifications and meets user needs.

f. Conclusion and Recommendations:

The stage of drawing conclusions from research results and providing suggestions for further development of management information systems.

3. RESULTS AND DISCUSSION

The Care Giver Management Information System that will be created in this research is created to fulfill and assist the existing service processes in pedis care care giver services. In this system, starting from the process of ordering care packages, scheduling, nurse reports, to payroll. The system helps collect data on care giver services such as care reports, patient data, patient contracts, and scheduling. The system is expected to help provide information to patients, management and nurses more easily because the data is centralized and easily accessible for the actors involved

a. Actor Identification

Actors in the Care Giver Management Information System are divided into 6 actors. The following is a description of each actor.

b. ***Use Case Diagrams***

The use case diagram of this system contains 81 functional requirements divided by 6 actors. Figure 2 will show an example of a use case diagram. Figure 4 displays a use case diagram for patients and guests.

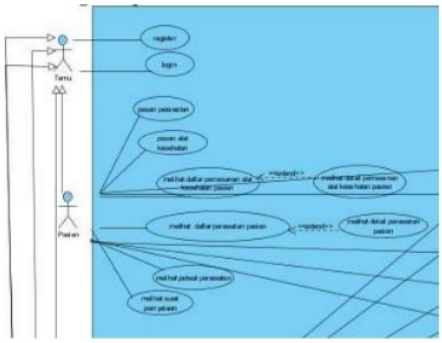

Figure 1. Use Case Diagram display

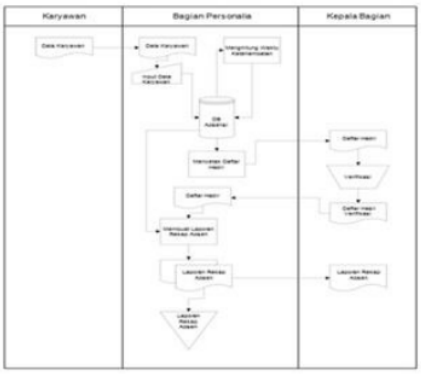

Figure 2. Flow Map

The introduction of the Health Information System has had a transformative impact on patient data management and care quality. One of the most significant benefits observed was the reduction in data fragmentation, which historically has been a major challenge in healthcare settings. By centralizing patient records and ensuring that all relevant data is accessible in real-time, the system has addressed the inefficiencies that often lead to delayed or suboptimal care.

a. Enhanced Communication and Collaboration

The HIS facilitated better communication and collaboration among healthcare professionals. The ability to access comprehensive patient records allowed for more coordinated care, particularly in multi-disciplinary teams where different specialists are involved in a patient's treatment. This has been particularly beneficial in managing complex cases, such as those involving chronic illnesses or multiple comorbidities.

b. Challenges and Areas for Improvement

Despite the overall success of the HIS, several challenges were identified. The initial implementation phase encountered resistance from some staff members who were accustomed to the traditional methods of record-keeping. However, ongoing training and support helped mitigate these issues. Additionally, while the system significantly improved data accessibility, there were occasional technical issues such as system downtimes and slow loading times during peak hours. These challenges highlight the need for ongoing system maintenance and upgrades to ensure reliability.

Another area for improvement is the integration with external healthcare providers and pharmacies. While the HIS successfully integrated internal departments, extending this integration to external entities would further enhance the continuity of care, especially for patients transitioning between different levels of care or those requiring long-term medication management.

c. Impact on Patient Safety

The system's alert and reminder features have had a positive impact on patient safety. Automated alerts for potential drug interactions, allergies, and critical lab results have contributed to a reduction in medical errors. This is particularly important in environments with high patient turnover, where the risk of errors increases due to the fast-paced nature of care delivery.

d. Future Directions

Looking forward, the system could be enhanced by incorporating advanced analytics and artificial intelligence (AI) capabilities. Predictive analytics could be used to identify patients at risk of adverse outcomes, allowing for early intervention. AI-driven decision support tools could further assist healthcare providers in making evidence-based decisions, ultimately leading to even better patient outcomes.

In conclusion, the development and implementation of the Health Information System represent a significant advancement in patient data management and care quality. While there are areas for improvement, the system has laid a strong foundation for more efficient,

effective, and patient-centered healthcare delivery. Continued investment in technology and training will be essential to fully realize the system's potential and to address the evolving needs of the healthcare sector.

4. CONCLUSION

The development of health information systems (GIS) has an important role in improving patient data management and better care. Through this research, we succeeded in developing a SIK that has features that support recording patient medical history, scheduling appointments, monitoring health conditions, and communication between health service providers. The evaluation results show that the developed SIK is able to increase efficiency in patient data management and care coordination. With an integrated system, healthcare providers can easily access patient information, plan more coordinated care, and communicate effectively with colleagues. Thus, the development of this SIK is expected to make a significant contribution in improving the quality of health services and patient outcomes. Through better data management and more coordinated care, it is hoped that better results can be achieved in managing the patient's overall health condition.

The critical role of health information systems (HIS) in enhancing the management of patient data and improving the overall quality of healthcare delivery. The article concludes that the implementation of robust HIS is essential for efficient patient data management, enabling healthcare providers to access accurate and timely information. This, in turn, leads to better-informed clinical decisions, improved patient outcomes, and enhanced operational efficiency within healthcare facilities. Furthermore, the journal emphasizes the importance of integrating HIS with existing healthcare processes to create a seamless flow of information across different departments and stakeholders. It also highlights the challenges, such as data security, user training, and system interoperability, that need to be addressed to ensure the successful deployment of HIS. The development and continuous improvement of HIS are deemed crucial for meeting the evolving needs of the healthcare industry and ensuring that patient care is optimized through effective data management.

5. REFERENCES

Afrisawati, A., & Sahren, S. (2020). Comparatory analysis using MOORA and WASPAS methods for choosing the best beef cattle breeds. JURTEKSI: Jurnal Teknologi dan Sistem Informasi, 6(3), 269–276. https://doi.org/10.33330/jurteksi.v6i3.827

Alsabri, Y. U., Zakir, A., & Irwan, D. (2022). Application of customer relationship management in a website-based beauty clinic information system (Case study: Ms Glow Aesthetic Clinic). Journal Name, 4. [Note: The journal name is missing in your provided reference. Please insert the actual title.]

Arisman, A., & Sianturi, F. A. (2020). Decision support system for new student admissions using the MOORA method (Multi-Objective Optimization On The Basis Of Ratio Analysis). Jurnal Ilmu Komputer dan Sistem Informasi JIKOMSI, 3(1.1), 73–83.

Batubara, R. I., & Siregar, Y. (2022). The best decision support system for honorary employees in the Medan plantation service using the GADA method. Jurnal Media Informasi, 3(2), 104–111. https://doi.org/10.55338/jumin.v3i2.279

Ginting, B. G., & Sianturi, F. A. (2021). Decision support system for providing assistance to underprivileged families using the AHP method. Jurnal Nas Computing and Technol Inf, 4(1).

Laia, F., & Sianturi, F. A. (2021). Decision support system for best employee performance assessment using the simple additive weighting (SAW) method. RESOLUSI: Engineering Technology, Informatics and Information, 1(3), 195–200.

Matondang, F. M., & Sianturi, F. A. (2020). Decision support system for determination of nutrition in pulmonary tuberculosis patients using multi-objective optimization method on the basis of analysis (MOORA). Login: Jurnal Teknologi dan Komputer, 14(2), 198–204.

Sahputra, F., & Sianturi, F. A. (2020). Decision support system selection of best employee at PT. Intiberkah Sinar Sejahtera using simple additive weighting method. Journal of Computer Network Architecture and High Performance Computing, 2(1), 1–6.

Sianturi, F. A., & Sitorus, M. (2019). Combination of the simple additive weighting (SAW) method with the nearest neighbor algorithm for employee recruitment. Jurnal Mantik Penusa, 3(2), December.

Wati, W., & Sianturi, F. A. (2022). Implementation of the TOPSIS method in recommending the best pesticide for rice plants in Rumbia Village. Journal of Science and Technology, 3(2), 31–35.

Development Of Health Information Systems For Patient Data Management and Better Care

ORIGINALITY REPORT

13%	9%	7%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	international.arikesi.or.id Internet Source	5%
2	edoc.unibas.ch Internet Source	2%
3	Karwan Mustafa Kareem. "The Intelligence Technology and Big Eye Secrets: Navigating the Complex World of Cybersecurity and Espionage", PsyArXiv, 2024 Publication	1%
4	Pankaj Bhambri, Sita Rani, Muhammad Fahim. "Computational Intelligence and Blockchain in Biomedical and Health Informatics", CRC Press, 2024 Publication	1%
5	journal.arikesi.or.id Internet Source	1%
6	medium.com Internet Source	1%
7	fastercapital.com	

Internet Source

1%

8 Alberto Riva, Kenneth D Mandl, Do Hoon Oh, Daniel J Nigrin, Atul Butte, Peter Szolovits, Isaac S Kohane. "The Personal Internetworked Notary and Guardian", International Journal of Medical Informatics, 2001

Publication

<1%

9 Nanang Nuryadi, Aziz Setyawan Hidayat, Felix Wuryo Handono, Ayuni Asistyasari, Yosep Nuryaman. "Expert System for Diagnosing Damage to Automatic Motorcycle Engines Using the Forward Chaining Method", INTECOMS: Journal of Information Technology and Computer Science, 2024

Publication

<1%

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		