

Literature Review: Overview of Integrated Health Information System Management in Hospitals

Dinda Fidia Ardiani, Daniel Happy Putra, Adi Widodo, Noor Yulia

Medical Record and Health Information Study Program, Esa Unggul University, Jakarta
Jl. Arjuna Utara 9, Kebon Jeruk, Jakarta 11510, Indonesia
dindafda@gmail.com, daniel.putra@esaunggul.ac.id, a_widodo75@yahoo.com,
noor.yulia@esaunggul.ac.id

Article Information

Submitted: 25 February
2022

Accepted: 12 March
2022

Online Publish: 20
March 2022

Abstract

The Health Information System was developed primarily to support health management. The information system used is more focused on a computer-based information system supported by a medical record unit. Electronic Medical Record is the use of information technology devices for collecting, storing, processing and accessing data stored in patient medical records in hospitals in a data-based management system that collects various medical data sources. Method types the research method used is literature study or literature review. Literature review comprehensive overview related to research that has been carried out on certain scientific-based topics. The process of implementing the management of information systems in this study can be divided into five things based on 12 selected journals from 15 journals, Technology and Information with various systems with the world producing many innovations and advancement. A computer-based medical record information system will be able to help improve the health service process to the community because this process is much faster and more practical when compared to the manual process. The development of electronic medical records in health services has three assessment parameters, namely the readiness of human resources, culture and leadership governance, infrastructure in the fairly ready category. The highest value is in the human resource parameter.

Keyword: System; Information management; Electronic;

How to Cite

DOI
e-ISSN/p-ISSN
Publish by

Dinda Fidia Ardiani, Daniel Happy Putra, Adi Widodo, Noor Yulia/ Literature Review: Overview of Integrated Health Information System Management in Hospitals. Vol. 1, No. 6, March 2022
<https://doi.org/10.54543/kesans.v1i6.68>
2808-7178 / 2808-7380
Rifa'Isntitute

Introduction

Hospital is a health service institution in which services are handled by doctors, nurses, and other medical personnel. Based on the Law of the Republic of Indonesia Number 44 of 2009. Hospital is a health service institution that provides complete individual health services that provide inpatient, outpatient, and emergency services (Fitriana and Pratiwi 2018).

Based on the Regulation of the Minister of Health of the Republic of Indonesia Number 82 of 2013 it is explained that every hospital is obliged to implement a hospital management information system (SIMRS). Hospital Management Information System is a computer system that processes and integrates all health service process flows in the form of networks, reporting, and administrative procedures to obtain information quickly, precisely, and accurately. Currently, the hospital computer-based Management Information System is a very important supporting facility to support the operational management of hospitals, various hospitals that still survive using the administrative system show that there are many lost opportunities due to weak coordination between departments and lack of fast, accurate, and timely information support. accurate, and integrated (Handiwidjojo 2015).

Article 63 of the Health Law Number 23 of 1992 explains the need for the development of a good Health Information System in order to fully support the implementation of health management and efforts by using technology from simple to sophisticated at all levels of health administration. The Health Information System was developed primarily to support health management. The information system used is more focused on computer-based information systems (Mubarak et al. 2016). The computer-based information system is supported by the organization of a medical record unit.

Regulation of the Minister of Health Number 269/Menkes/Per/III/2008 article 1 states that medical records are files containing records and documents regarding patient identity, examination, treatment, actions, and other services that have been provided to patients. Medical records contain data on all medical service activities. If this data is processed quickly and accurately, it will be very useful for hospital management to improve and develop the quality of service in order to provide diagnoses and medical actions for a patient that are recorded both in writing and electronically. If the storage is electronic, it will require a computer by utilizing database management (Ismail 2020).

In managing to produce information quickly and precisely, electronic media is needed as a tool to help process information data. A structured system is able to accommodate all the required information that can answer the challenges faced (Lily Widjaya and Siswati 2014). Seeing the importance of a medical record file in a hospital, it is time for all hospitals in Indonesia to use electronic medical records.

Electronic Medical Record (RME) is the use of information technology devices for collecting, storing, processing, and accessing data stored inpatient medical records in hospitals in a database management system that collects various medical data sources (Fauziah, Djamil, and Supriyana 2021). To support the electronic medical record data collection system is growing in the world of technology.

Technological developments have contributed a lot to improving the health services provided to patients more effectively. Included in the activities of managing health information, several health service agencies have begun to implement an electronic health information system so that the management of patient health data can

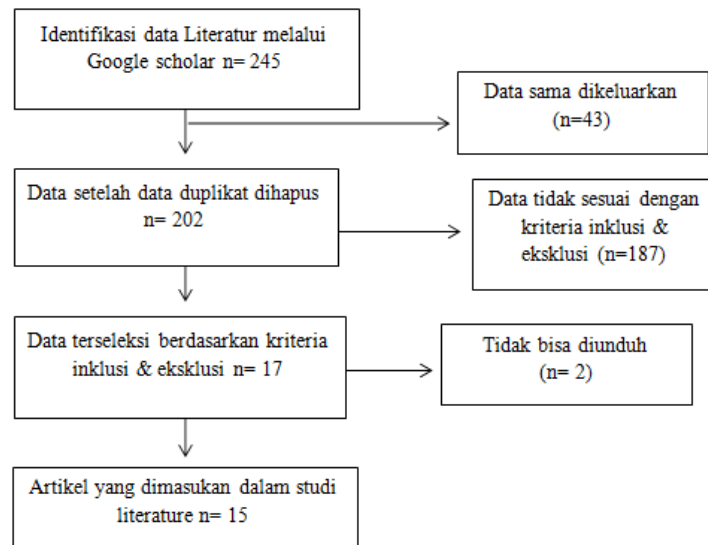
be carried out more effectively. The patient health information management system is only carried out independently, at each health service agency. Health information aims to collect, store and make patient health information available and easily accessible when needed. So that by managing patient health information that is carried out electronically and integrated, it can help every health service officer in providing better health service activities to patients (Laily 2017). To determine the quality of health services in hospitals, an assessment system for quality health services is needed.

One of the parameters for the quality of health services in hospitals is data or information from good and complete medical records. One aspect that plays a significant role in determining the quality of hospital medical records is the medical record officer. Based on the survey at the hospital, it was found that the percentage of filling in the status on the medical record form that was not filled out completely was 34.1%, the return of medical records that were not in the right place was 59.03%, and filling out the status on the medical record that was not correct was 56.13%. This type of research is an explanatory survey to determine the relationship between the motivation of medical record officers (intrinsic and extrinsic) with the performance of medical record officers in hospitals. The results of this study indicate that 53.3% of medical record officers have high intrinsic motivation in terms of achievement, responsibility, opportunities for advancement, and job satisfaction. As many as 93.3% of medical record officers have high extrinsic motivation in terms of compensation, work security and safety, working conditions, work procedures, and interpersonal relationships. As much as 53.3% of the performance of medical record officers is in the sufficient category (Anggraini 2007).

Research Method

Method type the research method used is literature study or literature review. Literature review comprehensive overview related to research that has been carried out on certain scientific-based topics. The collection of research results will obtain some known or unknown information so that researchers can determine new topics for further analysis by conducting actual studies and attaching them in the form of a literature review. Literature studies can be obtained from various sources, both journals, books, documentation, the internet, and libraries (Kusuma D, 2012). Study selection and data quality are shown in Figure 1 as follows:

Table 1. Study Selection and Quality Assessment



Inclusion and Exclusion Criteria

Based on the results of article searches using databases such as Google Scholar, 245 journals were found. Then, the inclusion criteria were filtered such as full text, 2011-2020, and studies related to the management of information systems. So it was found the same data as many as 43 articles. After the duplicate data was removed 202 articles were found. After conducting a review, each data did not match the inclusion & exclusion criteria of as many as 187 articles. Selected data based on exclusion criteria obtained 17 articles and 2 articles could not be downloaded. So that the remaining 15 articles were included in the literature study.

Result and Discussion

Table 1
Characteristics of Data Literature

No	Author (Year)	Journal Name, Volume, no	Title	Method	Result
1.	Nuzlil Laily Nur Azizah & M. Very Setiawan 2017	Indonesian Journal of Health Information, Vol.4 No. (3)	Integrated Management of Health Information to Maximize Health Services to Patients in Hospitals	Descriptiv e, qualitative approach, Observatio n retrieva	The management of a health information system that provides access to patient data in digital format, is expected to enable medical staff to be able to track patient data from time to time in facilitating the exchange of health information. So that by managing patient health

					information that is done electronically, it can help every health service officer in providing better health service activities to patients. In the management of information systems, human resources also act as users of information, namely medical officers and patients.
2.	Irawan and Novita 2017	Journal of Technology Acceptance Model, Vol. 2 No. (1)	Management Information System at Harapan Bunda Pringsewu Lampung Hospital	Descriptive, qualitative approach, Observation retrieval	Information systems are one of the biggest needs in hospitals, to solve problems that usually occur in hospitals such as patient data that is not well organized, errors in queue numbers, wrong drug prescriptions, and so on. By using an information system, it is hoped that these problems can be overcome at a minimum, which will certainly have an impact on improving the quality of hospital services as a whole.
3.	Emy Budi Susilowati and Purnama 2017	Journal Speed Sentra Research of Engineering and Education, Vol.3, No.4	Analysis and Design of Patient Information Systems at Nirmala Suri Sukoharjo General Hospital	Descriptive, qualitative approach, Observation retrieval	One of the service industry companies that requires computers for the processing and presentation of information data is the hospital. Hospitals are one of the service industry sectors that provide services to patients. The quality of service to patients is the main thing that is the central point of every health service industry, such as polyclinics.
4.	Setiatin and Syahidin 2017	Indonesian Journal of Health Information Management Computer, Vol.5, No. (2)	Design of Electronic-Based Medical Record Storage Information System in Hospitals	Descriptive, qualitative approach, Observation retrieval	Information system Management of medical records as well as identifying data, input, output, and appropriate interfaces to support health services. So that the ability of information system managers to be able to take advantage of information systems properly.

5.	Frenti Giyana 2012	Journal of Public Health, Vol. 1, No. (2)	Analysis of the Inpatient Medical Record Management System at the Semarang City Regional General Hospital.	Descriptive, qualitative approach, Observation retrieval	In integrated patient health information management activities, it is necessary to have a policy regarding information management. In addition to providing policies regarding data management, hospitals must also have access to the data provided.
6.	Alexander Harsono 2015	Journal of Informatics Exploration, Vol. 5, No. (1)	Analysis of the Implementation of Integrated Regional General Hospital Management Information Systems (SIM-RSUD) in West Kalimantan Province.	Descriptive, Qualitative Approach, taking observations, interviews	The medical data information system is accessed from the patient's diagnosis, this is important for data privacy and security. To be able to meet these demands, medical officers synchronize patient data in hospitals so that it is real-time, precise, and accurate.
7.	Manik Mahendra Sari & Guardian Yoki Sanjaya, Andreasta Meliala 2016	Journal of the National Seminar on Information Technology Indonesia, Vol.1 No. (1)	Evaluation of Hospital Management Information System (SIMRS)	Descriptive, Qualitative Approach, taking observations, interviews	Information System to encourage increased efficiency and effectiveness of services in hospitals. To improve this, the agency can perform a data security system with passwords that may only be opened by certain officers.
8.	Dedy Setyawan 2016	Indonesian Journal on Computer and Information Technology, Vol.1 No. (2)	Analysis of Hospital Management Information System Implementation (SIMRS) at Kardinah Hospital Tegal.	Descriptive, Qualitative Approach, taking observations, interviews	In carrying out data security on the hospital management information system, important support is needed to create an integrated implementation of health information management..
9.	Evy Hariana 2013	Indonesian Journal of Health	The Use of Hospital Management Information	Descriptive, Qualitative Approach	The use of information systems by implementing systems to help obtain health information in hospitals. Many hospitals are

		Information, Vol.2, No. (1)	Systems in DIY		starting to use health information systems that are used for various purposes because some hospitals use the operating system (OS) on different PCs to make it easier to provide access to health information.
10.	Mohamad Topan & Hans F. Wowor 2015	Informatics Engineering E-journal, Vol.6, No. (1)	Web-Based Hospital Management Information System Design.	Descriptive, Qualitative Approach, taking observations, interviews	Information systems can manage health data so that the selection of an appropriate information system can represent all agencies. In managing health data in hospitals, the validity of patient data must also be considered. This is because the information managed is incomplete due to loss or so on.
11.	Sri Wahyuningsih Nugraheni 2017	IJMS – Indonesian Journal on Medical Science, vol. 4, No. (1)	Evaluation of the Medical Record Information System at the Surakarta City Hospital in Supporting Electronic Health Records.	Descriptive, qualitative approach, Observation retrieval	The existence of a health information system in hospitals can help health service providers. To obtain electronic medical records, obtain data sources with the integration of entry so that health information is in real-time.
12.	Sintak Gunawan 2020	Indonesian Journal of Medical Ethics Medical, Vol. 4, No. (1)	Record/Electronic Health (RMKE): Health System Integration	Descriptive, qualitative approach, Observation retrieval	With access and data integration in managing integrated patient health information, integrating patient health information can be done in various ways, such as integrating information systems in several hospitals, through a central health information system.
13.	Muhammad Hamdani Pratama, Sri Darnotom 2017	Indonesian Journal of Health Information, Vol. 5, No. (1)	Strategy Analysis of Electronic Medical Record Development in Outpatient Agencies of	Descriptive, qualitative approach, Observation retrieval	The development of RME will depend on human resources (HR) as RME users and as policymakers in hospitals. Information systems are used to provide information that supports the operations, management, and decision-

			Yogyakarta City Hospital.		making of staff participating in an organization.
14.	Gunawan Susanto, Sukadi 2011	Indonesian Journal of Health Information, vol.3, No.4	Medical Record Information System at the Pacitan Regional General Hospital (RSUD) Web Base	Descriptive, qualitative approach, Observation retrieval	In the development of the medical record information system, culture has an important role from this aspect, it can be seen how the RME users will respond in accepting the system development with leadership governance. The leader's role in RME development is at the highest level in decision-making. The area assessment and governance component of leadership consists of leader support, strategy, and management.
15.	Clara Pusparani, Bayu Priyambadha, Achmad Arwan 2019	Journal of Information Technology Development and Computer Science, Vol. 3, No. (2)	Development of an Electronic Medical Record Application System and Web-Based Online Patient Registration	Descriptive, qualitative approach, Observation retrieval, Interview	Developing an electronic medical record system for this requires readiness in terms of infrastructure and budget. RME development is related to the budget for information technology in hospitals tends to be limited. This shows that with the existence of electronic medical records, there is an increase in hospital investment. Seeing this, in the future in the process of developing electronic medical records in health services.

Management of Electronic Medical Record Information Systems in Hospitals

The process of managing patient health information is important so that several medical service providers in the activities of exchanging and sharing patient health information, in improving the quality of health services that can facilitate the exchange of health information. The process of implementing the management of information systems in this study can be divided into five things based on 12 selected journals from 15 journals, namely:

1. Human Resources,
2. Policies and institutions,
3. System implementation,
4. Data and management,
5. Access and data integration.

Human resources (HR) as users of information, namely medical officers and patients. In this process, the patient will register through the office by providing personal biodata about matters relating to him, which include: name, address, telephone number, date of birth, age, and gender. After that, the data will be validated by officers who aim to check the patient's status when the patient goes to the hospital. Patient identity data is very necessary for hospitals to avoid unwanted things from happening. After the patient data is validated, the patient will get a patient-id (Tanjung and Sukrianto 2017).

The existence of a policy regarding an integrated information management process between all parts of the agency will create a system using a username and password. The use of usernames and passwords can avoid security breaches, but users are advised to change passwords periodically. The password used must not have any meaning to the user, such as the date of birth. This is done to prevent guessing passwords easily. Furthermore, a security technique that can be done is to provide a hide to regulate what RME data can be displayed or hidden from parties who have different authorities. Then, the data security technique used is to apply access control to RME data. This access control can be in the form of a password that can limit access to information. Access control contains the extent to which users are allowed to synchronize RME data. For example, user A is given access to read and execute data, then user B is given access to read data and enter patient data (Tanjung and Sukrianto 2017).

Application of information systems to computerize enterprise systems. In this case, the system can coordinate the main internal processes of the hospital, integrating data from all units such as front office, inpatient services, outpatient services, polyclinics, laboratories, finance, human resources, investment, and supplies. The integrated computerization of each existing unit allows managers to know the objective conditions of the hospital as a whole and per unit through reports that can be prepared quickly and accurately at any time (Laily 2017).

In managing health data, hospitals can also manage patient data in the form of summaries or grouped data on certain things, such as patient health data. So, this can make it easier for medical staff to understand the available information. So that it is not too late in making reports for each medical service unit because each report will be printed and sent automatically (Medika 2017).

By managing information, medical staff will be able to quickly access records, wherever and whenever needed. Integrating medical staff information can be done in various ways, such as integrating information systems in several other agencies, through health information management systems. In its implementation, we can take advantage of certain applications or software. To provide access to information, this system can provide a portal, so that only certain users can access patient health information (Handiwidjojo 2015).

The development of Electronic Medical Records in health services

Technology and Information with various systems with the world producing many innovations and advancements, technological and information advances in the health system is the development of electronic medical/health records in the development of information systems related to the application of electronic medical records are as follows:

- 1) Human resource readiness
- 2) Leadership culture and governance
- 3) Infrastructure

The development of electronic medical records requires human resources as a process of analyzing the readiness for the application of RME to determine and provide an overview of the Electronic Health Record. The process of readiness analysis before implementing RME can be seen from several organizational readiness, structural readiness, cultural readiness, management and leadership readiness, operational readiness, government readiness, technical readiness (Pratama and Darnoto 2017).

Culture has an important role because it is a behavioral reference. From this aspect, it can also be seen how electronic medical record users respond in the organizational work culture aspect, there are several components that are assessed with patient involvement and workflow readiness assessment. Patient involvement is seen by evaluating the services provided to patients. According to the respondent's view, the patient's interaction with RME is considered only as evaluation material. A readiness assessment is also carried out on the workflow of the electronic medical record process. The workflow of this process involves clinical administration processes including estimates of patient and staff requirements. However, the estimated staff needs have not been developed particularly for the implementation of RME (Setyawan D 2016).

The infrastructure that needs to be prepared is related to the development of hospital management information systems. The development of the SIMRS needs to start with the support of human resources who are quite familiar with computers and must be followed by providing socialization related to work culture. Reliable capabilities without a good work support culture will not support change. Achieving technical readiness is not enough to support successful implementation. The development of electronic medical records related to infrastructure for information technology in hospitals, it tends to be limited due to the commitment of the management that has been stated in the hospital's mission (Pratama and Darnoto 2017).

Conclusion

The process of managing this electronic medical record information system can provide convenience for the hospital in storing, updating, accessing, and searching for complete and accurate patient medical records and supports the performance of

doctors in providing accurate patient data. A computer-based medical record information system will be able to help improve the health service process to the community because this process is much faster and more practical when compared to the manual process. The development of electronic medical records in health services has three assessment parameters, namely the readiness of human resources, culture and leadership governance, infrastructure in the fairly ready category. The highest value is in the human resource parameter.

References

- Anggraini, Sandra Sri. 2007. "Hubungan Motivasi Dengan Kinerja Petugas Rekam Medis Di Rumah Sakit Umum Daerah Dr. Djasamen Saragih Pematang Siantar Tahun 2007."
- Fauziah, Rizke Amalia, Masrifan Djamil, and Supriyana Supriyana. 2021. "Development Model of Digital-Based Dental Health Recording and Reporting Service System in Public Health Center." *Journal of Social Science* 2(4): 464–82.
- Fitriana, Yuni, and Kurniasari Pratiwi. 2018. "Pelaksanaan Patient Safety Di Rumah Sakit Umum Daerah Dan Rumah Sakit Umum Swasta Bantul Berdasarkan Ketentuan Undang-Undang Nomor 44 Tahun 2009 Tentang Rumah Sakit." *Jurnal Kebidanan* 7(1): 28–39.
- Giyana, Frenti. 2012. "Analisis Sistem Pengelolaan Rekam Medis Rawat Inap Rumah Sakit Umum Daerah Kota Semarang." *Jurnal Kesehatan Masyarakat Universitas Diponegoro* 1(2): 18739.
- Gunawan, T Sintak, and Gilbert Mayer Christianto. 2020. "Rekam Medis/Kesehatan Elektronik (RMKE): Integrasi Sistem Kesehatan." *Jurnal Etika Kedokteran Indonesia* 4(1): 27–31.
- Handiwidjojo, Wimmie. 2015. "Sistem Informasi Manajemen Rumah Sakit." *Jurnal Eksplorasi Karya Sistem Informasi dan Sains* 2(2).
- Hariana, Evy. 2013. "PENGUNAANSISTEM INFORMASI MANAJEMEN RUMAH SAKIT (SIMRS) DI DIY."
- Harsono, Alexander. 2015. "Analisis Implementasi Sistem Informasi Manajemen Rumah Sakit Umum Daerah (SIM-RSUD) Terintegrasi Di Provinsi Kalimantan Barat." *Jurnal Eksplora Informatika* 5(1): 11–22.
- Irawan, Dedi, and Siska Novita. 2017. "Sistem Informasi Manajemen Rumah Sakit Harapan Bunda Pringsewu Lampung." *Jurnal TAM (Technology Acceptance Model)* 2: 47–52.
- Ismail, Ravilka Yustitia. 2020. "Penerapan Prinsip Indemnitas Terhadap Penolakan Klaim Asuransi Atas Tidak Terpenuhinya Rekam Medis Dihubungkan Dengan Kuhd Jo Permenkes Nomor 269/Menkes/Per/Iii/2008."
- Laily, Nuzlil. 2017. "Integrated Health Information Management to Maximize Health Services to Patients in Hospitals." *Jurnal Informasi Kesehatan Indonesia* 4.
- Lily Widjaya, S K M, and S K M Siswati. 2014. "TINJAUAN DUKUNGAN SISTEM INFORMASI RUMAH SAKIT TERHADAP PELAYANAN UNIT KERJA REKAM MEDIS DI RUMAH SAKIT SUKMUL SISMA MEDIKA." *TINJAUAN DUKUNGAN SISTEM INFORMASI RUMAH SAKIT TERHADAP PELAYANAN*

UNIT KERJA REKAM MEDIS DI RUMAH SAKIT SUKMUL SISMA MEDIKA.

- Medika, Sri Wahyuningsih Nugraheni-APIKES Citra. 2017. "Evaluasi Sistem Informasi Rekam Medis Di RSUD Kota Surakarta Dalam Mendukung Rekam Kesehatan Elektronik." *IJMS-Indonesian Journal on Medical Science* 4(1).
- Mubarak, Zulfikar Yusya et al. 2016. "Perancangan Sistem Informasi Layanan Kesehatan Masyarakat Desa Jangrana Kabupaten Cilacap." *Data Manajemen dan Teknologi Informasi (DASI)* 17(4): 50–55.
- Pratama, Muhammad Hamdani, and Sri Darnoto. 2017. "Analisis Strategi Pengembangan Rekam Medis Elektronik Di Instalasi Rawat Jalan RSUD Kota Yogyakarta." *Jurnal Manajemen Informasi Kesehatan Indonesia (JMIKI)* 5(1): 34–45.
- Pusparani, Clara, Bayu Priyambadha, and Achmad Arwan. 2019. "Pembangunan Sistem Aplikasi Rekam Medis Elektronik Dan Pendaftaran Pasien Online Berbasis Web (Studi Kasus: Klinik Medis Elisa Malang)." *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer e-ISSN 2548: 964X*.
- Sari, Manik Mahendra, and Guardian Yoki Sanjaya. 2016. "Evaluasi Sistem Informasi Manajemen Rumah Sakit (SIMRS) Dengan Kerangka HOT - FIT." *Jurnal Seminar Nasional Sistem Informasi Indonesia* 1(1): 204–7.
- Setiatin, Sali, and Yuda Syahidin. 2017. "Perancangan Sistem Informasi Penyimpanan Rekam Medis Rawat Inap Berbasis Elektronik." *Jurnal Manajemen Informasi Kesehatan Indonesia (JMIKI)* 5(2): 181–94.
- Setyawan D. 2016. "Analisis Implementasi Pemanfaatan Sistem Informasi Manajemen Rumah Sakit (Simrs) Pada Rsud Kardinah Tegal." *Indonesian Journal on Computer and Information Technology* 1(2): 54–61.
- Setyawan, Dedy. 2016. "Analisis Implementasi Pemanfaatan Sistem Informasi Manajemen Rumah Sakit (SIMRS) Pada RSUD Kardinah Tegal." *IJCIT (Indonesian Journal on Computer and Information Technology)* 1(2).
- Susanto, Gunawan. 2011. "Sistem Informasi Rekam Medis Pada Rumah Sakit Umum Daerah (RSUD) Pacitan." *Jurnal Informasi Kesehatan Indonesia* 3(4): 18–24.
- Susilowati, Emy Budi, and Bambang Eka Purnama. 2017. "Analisis Dan Perancangan Sistem Informasi Pasien Rumah Sakit Umum Nirmala Suri Sukoharjo." *Speed-Sentra Penelitian Engineering dan Edukasi* 3(4).
- Tanjung, Irwandi, and Darmanta Sukrianto. 2017. "Perancangan Sistem Informasi Rekam Medis Terpadu Dalam Upaya Meningkatkan Pelayanan Rumah Sakit Jiwa Tampan Prov. Riau." *Jurnal Intra Tech* 1(1): 43–54.
- Topan, Mohamad. 2015. "Perancangan Sistem Informasi Manajemen Rumah Sakit

Berbasis Web Di Rumah Sakit TNI AU Lanud Sam Ratulangi.” *E - journal Teknik Informatika* 6(1): 1–6.

Copyright holder:

Dinda Fidia Ardiani, Daniel Happy Putra, Adi Widodo, Noor Yulia (2022)

First publication right:

KESANS: International Journal Health and Science