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Health Information System Development Strategy at Gimpu Community Health Center, Sigi District

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ABSTRACT

The strategy for developing a health information system at the Gimpu Health Center, Sigi Regency aims to improve efficiency in managing patient service information, which has so far been done conventionally. The recording process that has not been computerized often causes duplication of information and takes a long time to process information. In addition, the manual recording system also has risks to information security, because it is prone to loss or damage. The information system designed in this study is in the form of a software application equipped with an information base (database), which functions as a center for storing information and a tool for entering, processing, and accelerating the preparation of reports. The forms available in the system are designed according to user needs to make them easier to use. Not only does it increase ease of operation, this system is also designed with a high level of security to ensure the accuracy and protection of patient information. The design of this system was developed by implementing the stages in the System Development Life Cycle (SDLC). The implementation of this information system is expected to be a solution to various obstacles faced by the Gimpu Health Center, Sigi Regency in the service process, especially related to recording and managing patient information. The information recorded in the system includes patient visit information, such as date of visit, patient identity (name, place and date of birth, name of head of family), gender, level of education, occupation, domicile area (district/city, sub-district, address/hamlet), and payment method for health services.

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1. INTRODUCTION

Community Health Centers are first-level health service facilities that play an important role in bringing health services closer to the community. According to Law of the Republic of Indonesia Number 36 of 2009, health service facilities are facilities used to implement promotive, preventive, curative, and rehabilitative health efforts that can be organized by the government, local governments, or the community. In the national health service structure, Community Health Centers occupy a strategic position as the spearhead of services that directly reach the community at the village and sub-district levels. Community Health Centers not only provide curative services, but are also responsible for managing public health through counseling activities, fostering a healthy environment, and monitoring infectious and non-infectious diseases.

However, despite its vital function, many Community Health Centers still experience obstacles in terms of information management and service recording. One common problem is manual patient data recording which is still applied in various regions, including in rural and remote

areas. This conventional recording system is prone to causing duplication of information, loss of patient data, and delays in the preparation of service reports. In fact, patient data is an important component in supporting the medical and managerial decision-making process. Irregular recording often complicates the process of searching for patient data, increases the administrative burden of officers, and hinders the timeliness of reporting to the health office.

This situation is exacerbated by the limitations in the use of available information technology devices. Although some health centers already have computers, their use is still limited to administrative purposes such as the preparation of official letters. The absence of an integrated information system causes the information needed for monthly reports to not be compiled efficiently, thus hampering communication and coordination between health centers and local governments in handling health problems. To answer these challenges, the implementation of a health information system is an urgent need, especially to ensure efficiency, accuracy, and data security in primary health services.

Efforts to develop a health information system have also become a concern of the central government. The Ministry of Health through the Decree of the Minister of Health No. 511/Menkes/SK/V/2002 has established a strategy for developing the National Health Information System. In addition, Policy No. 128/Menkes/SK/II/2004 also states the need for effective Puskesmas management to support the implementation of various community-based health programs (Thenu et al., 2016). The existence of a decentralization policy in health services also strengthens the need to develop a reliable and integrated information system so that Puskesmas can meet the demands of service quality more optimally (Kirana & Nugraheni, 2022).

As an institution that has a primary function in public health development, the Community Health Center needs to have an information system that is able to support the entire cycle of activities, from planning, implementation, to program evaluation (Lubbna & Lane, 2020). A good information management system can improve the efficiency of organizing services, strengthen coordination between units, and synchronize operations with service quality standards. In the study of Yani Restiani Widjaja et al. (2024), it was stated that effective organization and system integration are important factors in increasing the responsiveness and efficiency of patient services. The implementation of an information system also allows the preparation of consistent SOPs, accelerates the exchange of information, and provides accurate data for health policy planning.

This study develops a health information system in the form of a software application equipped with a database for managing patient information. This system allows recording of patient visits, complete identity, medical history, payment methods, and disease reports that can be accessed and compiled automatically. This system was developed by following the stages in the System Development Life Cycle (SDLC), starting from needs analysis, design, software development, to testing and implementation (Sukamto & Shalahuddin, 2020). The goal is to create an information system that is easy to use, safe, and can answer the operational needs of the Health Center specifically.

With the implementation of this information system, it is expected that the Health Center will be able to improve its performance as a whole. Not only accelerating services in the registration section, this system is also expected to reduce errors in data input, accelerate the preparation of reports, and increase public satisfaction with the services provided. This study aims to formulate a strategy for developing a health information system that can be implemented effectively at the Gimpu Health Center, Sigi Regency. The results of this study are expected to contribute not only practically in improving the quality of services at the Health Center, but also theoretically in the development of a health service management information system at the primary level.

2. RESEARCH METHODS

This study uses a qualitative descriptive approach with the aim of gaining a deep understanding of the health information system development strategy at the Gimpu Health Center, Sigi Regency. This approach was chosen because it allows researchers to explore and describe contextually how the information system is designed, developed, and implemented in the field according to real conditions and needs. Qualitative descriptive research also focuses on the subjective meaning given by informants to the process, challenges, and impacts of the development of the information system,

without manipulating variables or experiments. Therefore, this approach is very relevant to be used to comprehensively examine the practice of health information management in the scope of basic services.

The location of this study was the Gimpu Health Center, South Kulawi District, Sigi Regency, Central Sulawesi Province. This health center was selected purposively because it represents primary health facilities that face limitations in implementing information systems. The research was conducted between February and March 2025. The research subjects consisted of key informants who were directly involved in the planning, development, and use of information systems at the Health Center. The selection of informants was carried out using a purposive sampling technique, namely based on the role and relevance of informants in the system implementation process, including the head of the health center, administrative staff, registration officers, and system operators who had undergone training related to the use of the application.

Data collection techniques in this study were carried out through three main methods, namely observation, in-depth interviews, and documentation studies. Observations were carried out directly on patient service and recording activities to obtain a factual understanding of the workflow that was running before and after the implementation of the information system. In-depth interviews were conducted in a semi-structured manner to explore perceptions, experiences, and responses from informants regarding the effectiveness of the system developed. Documentation studies were used to obtain secondary data such as organizational structure, training modules, internal policies, and system documents used in service operations. These three techniques were used triangulatingly to increase the validity and reliability of the data obtained.

Data analysis was conducted interactively by referring to the stages of the Miles and Huberman model, namely data reduction, data presentation, and drawing conclusions. Data reduction was carried out by sorting and grouping the information obtained based on the theme and focus of the research, such as the stages of system development, obstacles faced, and the impact of implementation on work efficiency. Data presentation was carried out in the form of a descriptive narrative that explains the main findings in the field in a coherent and systematic manner. Furthermore, conclusions were drawn reflectively by identifying important patterns that emerged, linking the findings to relevant theories, and answering research questions. This process was carried out repeatedly so that the resulting interpretation was in-depth and contextual.

To ensure the credibility of the results, this study used member check strategies, peer debriefing, and source and method triangulation techniques. Member checks were conducted by reconfirming the interview results and data interpretations with informants to ensure the appropriateness of meaning. Discussions with colleagues were conducted periodically to obtain input and avoid subjective bias from researchers. Meanwhile, triangulation was used to compare data from various sources and methods so that the findings produced were more accurate and reliable. With this systematic method, it is hoped that the research results can provide meaningful contributions to the development of health information systems in Community Health Centers and similar institutions in other regions.

3. RESULTS AND DISCUSSION

The results of this study were obtained through a combination of direct observation, in-depth interviews with key informants, and documentation analysis conducted during the development and implementation of the health information system at the Gimpu Health Center. This study aims not only to see the impact of system implementation on service efficiency, but also to understand the processes and strategies used in designing and overcoming various technical and non-technical challenges in the field. Information obtained from various sources was then analyzed thematically to reveal the initial conditions of the data management system, the application development strategies implemented, and the obstacles faced during the implementation process. In addition, the results also show the impact of the system on service quality and provide recommendations that can be used for further development. The following section will explain in detail the research results and discussions based on the five main themes found in this study.

Initial Condition of Information System at Gimpu Health Center

Observation results show that before the system development, patient information recording at the Gimpu Health Center was still done manually using a register book and paper forms. Each new patient is required to fill in identity data which is then re-recorded by officers. This often causes data duplication, writing errors, and slow medical record searches. There is no centralized storage system so that data is not properly documented. In addition, most staff have not had training in the use of computer-based information systems.

This situation shows the weakness of information technology infrastructure and low digital literacy in the Puskesmas environment. Other identified obstacles are the absence of standard SOPs related to data management and minimal technical support in the use of available devices. This is in line with the findings of Kirana & Nugraheni (2022) that many Puskesmas in remote areas experience limited access to technology and trained human resources.

Application Based Information System Development Strategy

The system development was conducted through the System Development Life Cycle (SDLC) approach, which includes the stages of needs analysis, design, development, implementation, and evaluation. Interview results showed that user involvement in the early stages was very helpful in designing an application interface that meets needs. The system developed uses a centralized database and provides features for recording patient visits, demographic data, treatment history, and automatic periodic reports.

This application is equipped with a data input menu that complies with the Health Service report format, thus facilitating the administration and reporting process. The Health Center acknowledged that this system speeds up service time in the registration section and increases the accuracy of patient data. In addition, this system has a fast search feature, automatic backup, and encrypted data security. This is in accordance with good health information management standards according to Lubbna & Lane (2020).

Challenges in System Implementation

Although the system development has gone well, the implementation still faces challenges, especially in terms of human resources. Some staff have difficulty using the application because they are not used to working with computers. In addition, the limited internet network is a separate obstacle, especially when data synchronization is carried out or when the server needs an update. The documentation results show that some of the computers used are still old specifications and often experience technical problems.

This condition shows that the success of the information system is not only determined by the technological aspect, but also by the readiness of the organization and ongoing training support. As explained by Patton (2002), the success of program implementation is greatly influenced by the psychological readiness and operational skills of the field implementers. Therefore, a continuous training and mentoring strategy is needed so that all officers are able to utilize the system optimally.

Impact of System Use on Service Efficiency

Based on the analysis results, the implementation of the information system has had a significant impact on service efficiency. The average patient waiting time at the registration section has decreased drastically because patient data that has visited can be directly accessed without the need for refilling. In addition, monthly reporting to the Health Office has become easier to compile because the data has been stored systematically in the application. This also reduces the risk of losing important documents that were previously prone to occur in manual systems.

The Head of the Health Center stated that this information system has helped management in making data-based decisions. Information on disease trends, visit volumes, and patient segmentation by region can now be easily accessed for the benefit of public health programs. This finding supports the study by Widjaja et al. (2024) which states that digital-based information systems can improve the quality of decision-making and coordination across health programs.

Implications and Recommendations

The findings of this study indicate that the development of information systems in Puskesmas requires not only strong technical aspects, but also organizational change strategies that include training, adaptation of digital work culture, and internal policy support. Therefore, in its implementation, system development must be accompanied by the formation of an internal technical team, the preparation of new SOPs, and the integration of digital literacy training programs for all staff.

The recommendation from the results of this study is the need for collaboration between the Health Center, Health Office, and system developers in building an integrated information ecosystem. In addition, it is important to conduct periodic evaluations of system performance and user responses so that the system remains relevant to service needs. Thus, the health information system is not only an administrative tool, but also a strategic foundation in realizing fast, accurate, and sustainable health services.

4. CONCLUSION

This study shows that the development of an integrated health information system has a significant contribution in improving service efficiency, data recording accuracy, and reporting speed at the Gimpu Health Center, Sigi Regency. The initial condition of manual information management has been proven to cause various problems, such as duplication of patient data, delays in services, and difficulties in preparing reports. The information system developed with the System Development Life Cycle (SDLC) approach has succeeded in answering these problems through the design of a centralized data-based application, an interface that suits user needs, and security features that support the protection of patient information. The implementation results show that this information system is able to streamline service time, minimize recording errors, and accelerate the monthly reporting process to the Health Office. In addition, the system supports data-based decision making for Puskesmas management, especially in mapping trends in visits and community service needs. However, the success of the system is not only determined by the quality of the technology used, but is also influenced by the readiness of human resources, internal policy support, and infrastructure limitations. Thus, it can be concluded that the development of a health information system must be carried out comprehensively, involving the process of HR training, the preparation of digital SOPs, and periodic system evaluation and improvement. This strategy is important to ensure that the system can run sustainably and provide maximum benefits for improving the quality of health services at the Puskesmas level, especially in areas with limited resources such as Gimpu. The results of this study are expected to be a reference for the development of similar systems in other areas, as well as providing practical and theoretical contributions in the field of health information management.

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