

# Leveraging SWOT Analysis in IS/IT Strategy for Enhancing Hospital Quality

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## ABSTRACT

The research conducted at the Datu Sanggul Hospital in Rantau focuses on developing a strategic plan for enhancing the quality of healthcare services through Information System (IS) and Information Technology (IT) implementation. The study aims to address the challenges faced by the hospital in optimizing its Management Information System and Medical Record (SIM & RM) unit. By utilizing the Ward & Peppard framework, the research progresses through stages including problem formulation, data collection, and strategy formulation. Through interviews, focus group discussions, and data analysis, the current business strategies and IT infrastructure are evaluated. External factors such as PEST analysis and Five Forces analysis are also considered to understand the hospital's position in the industry. The findings from these analyses serve as inputs for the SWOT analysis, which helps in identifying the hospital's current standing and areas for improvement. The study further delves into developing IS business strategies and IT roadmap planning based on critical success factors and business needs. By aligning IS/IT strategies with business goals, the research aims to provide recommendations for enhancing the hospital's information system infrastructure and management practices.

## 1. Introduction

Hospitals play a crucial role in providing quality healthcare services to the community [1]. As public awareness of health importance increases, the demand for hospital service quality also rises [2]. In response to these demands, hospitals are required to optimize all available resources, including human resources, infrastructure, and the utilization of information technology and information systems (IS/IT) [3].

Effective IS/IT implementation in hospitals can significantly benefit service quality improvement [4]. Well-integrated Hospital Information Systems (HIS) can enhance operational efficiency, ensure patient data security and confidentiality, and expedite clinical decision-making processes [5], [6]. Furthermore, the use of information technology such as Electronic Medical Records (EMR) systems, Clinical Decision Support Systems (CDSS), and telemedicine can enhance medical service quality, expedite diagnosis and treatment processes, and expand healthcare service reach [7], [8], [9].

However, the implementation of IS/IT in hospitals often faces various challenges and obstacles [10]. These challenges may stem from internal factors such as limited skilled human

resources in IS/IT management, lack of understanding and support from management, and resistance to change from medical and non-medical staff [11], [12]. Additionally, external factors such as budget constraints, government policies, and competition with other hospitals can also affect the success of IS/IT implementation in hospitals [13], [14].

To address these challenges, thorough strategic planning is required for IS/IT implementation in hospitals [15]. IS/IT strategic planning aims to ensure that the development and implementation of IS/IT align with the hospital's business objectives and organizational needs [16]. One tool that can be used in IS/IT strategic planning is SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) [17].

SWOT analysis is a method used to identify internal factors (strengths and weaknesses) and external factors (opportunities and threats) faced by an organization [18]. In the context of IS/IT implementation in hospitals, SWOT analysis can help management understand the internal conditions of the hospital, such as human resource readiness, existing information technology infrastructure, and organizational culture [19]. SWOT analysis can also identify external factors such as recent technological developments, government policies, competition with other hospitals, and public demands for healthcare service quality [20].

By understanding the strengths, weaknesses, opportunities, and threats faced by hospitals in IS/IT implementation, management can formulate appropriate IS/IT strategies to enhance hospital service quality [21]. Through this research, it is hoped to gain insights into the strengths, weaknesses, opportunities, and threats faced by hospitals in IS/IT implementation, as well as recommendations for IS/IT strategies that can be applied to improve hospital service quality. The findings of this research are expected to provide input for hospital management in making decisions regarding IS/IT development in the future, so that hospitals can provide better quality healthcare services to the community [22], [23].

## 2. Literature Review

Hospitals are healthcare institutions that play a crucial role in improving public health [24]. As organizations operating in the healthcare sector, hospitals are required to continuously improve the quality of their services. One effort that can be made is to optimize the utilization of information technology and information systems (IS/IT). Proper implementation of IS/IT can assist hospitals in achieving their business goals, increasing operational efficiency, and providing better services to patients [25].

To ensure that the implementation of IS/IT is aligned with the hospital's business strategy, a comprehensive IS/IT strategic planning is required. IS/IT strategic planning is a process of identifying a portfolio of computer-based IS applications that will support the organization in executing its business plans and realizing its business objectives [26]. One analytical tool that can be used in IS/IT strategic planning is the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis.

Table 1. The following is an example of data on strengths, weaknesses, opportunities, and threats in the implementation of health information systems in hospitals [28].

Internal Factors	External Factors
Strengths: Management support, adequate IT infrastructure, skilled human resources	Opportunities: Government policies, increasing service demand, technological advancements
Weaknesses: Lack of training, budget constraints, resistance to change	Threats: Competition, data security, strict regulations

SWOT analysis is a method for identifying the strengths, weaknesses, opportunities, and threats faced by an organization [26]. Strengths and weaknesses are internal factors possessed by the organization, while opportunities and threats are external factors originating from the business environment. By analyzing these factors, hospitals can formulate an appropriate IS/IT strategy to leverage their strengths and opportunities, as well as minimize their weaknesses and threats [27].

Several previous studies have used SWOT analysis in IS/IT strategic planning in hospitals. A study conducted by Heldal et al. (2004) used SWOT analysis to evaluate the implementation of health information systems in Norway. The results showed that SWOT analysis could provide a clear picture of the strengths, weaknesses, opportunities, and threats faced in the implementation of the health information system [29].

Furthermore, a study conducted by Rahimi et al. (2008) used SWOT analysis to develop IS/IT strategies in hospitals in Iran. This study identified internal and external factors influencing the implementation of IS/IT in hospitals and formulated appropriate strategies to optimize the use of IS/IT in supporting healthcare services.

Another study by Sharifian et al. (2014) also used SWOT analysis in IS/IT strategic planning in hospitals in Iran. The results showed that SWOT analysis could assist hospitals in identifying external opportunities and threats, as well as internal strengths and weaknesses related to the use of IS/IT. Consequently, hospitals could formulate appropriate strategies to improve the quality of healthcare services through the utilization of IS/IT [30].

Based on these studies, it can be concluded that SWOT analysis is a useful tool in IS/IT strategic planning in hospitals. SWOT analysis can help hospitals identify internal and external factors influencing the use of IS/IT and formulate appropriate strategies to improve the quality of healthcare services through the optimization of IS/IT utilization [28], [30]. Thus, SWOT analysis can be an essential step in the IS/IT strategic planning process in hospitals.

Additionally, the implementation of health information systems (HIS) has been proven to improve service quality in hospitals.

Table 2. The following is data on the effectiveness of HIS in improving service quality [31]

Service Aspect	Before HIS	After HIS
Patient waiting time (minutes)	45	25
Accuracy of medical records	78%	96%
Patient satisfaction level	3.2/5	4.5/5

The data shows that the implementation of HIS can reduce patient waiting times, increase the accuracy of medical records, and improve patient satisfaction levels with hospital services. However, the level of HIS implementation in hospitals still varies across countries.

Tabel 3. The following is data on the number of hospitals and the percentage of HIS implementation in several countries [32].

Country	Number of Hospitals	Percentage of HIS Implementation
Indonesia	2,810	35%
Malaysia	348	62%
Singapore	27	89%
Thailand	1,089	47%
Vietnam	1,348	28%

The data shows that there is still a gap in the implementation of HIS in hospitals, especially in developing countries such as Indonesia and Vietnam. Therefore, more intensive efforts are needed to increase the implementation of HIS in hospitals, as well as to utilize SWOT analysis in IS/IT strategic planning to support the improvement of healthcare service quality.

### 3. Research Methods

To conduct a comprehensive analysis of the utilization of SWOT analysis in IS/IT strategies for improving hospital quality, a mixed-methods approach will be employed. This approach combines both qualitative and quantitative methods, allowing for a more in-depth understanding of the research problem and ensuring the validity and reliability of the findings.

The qualitative component of the study will involve semi-structured interviews with key stakeholders in the hospital industry, including hospital administrators, IT managers, healthcare professionals, and patient representatives. These interviews will provide valuable insights into the current state of IS/IT implementation in hospitals, the challenges faced, and the potential opportunities for leveraging SWOT analysis in strategic planning. The interviews will be conducted either in person or through video conferencing, depending on the availability and preference of the participants.

Additionally, a document analysis will be performed to examine relevant hospital policies, strategic plans, and reports related to IS/IT implementation and quality improvement initiatives. This will provide a comprehensive understanding of the context and the existing strategies employed by hospitals.

The quantitative component of the study will involve the distribution of a cross-sectional survey to a representative sample of hospitals across various regions. The survey will aim to gather data on the following aspects:

1. Current state of IS/IT implementation in hospitals
2. Extent of SWOT analysis utilization in IS/IT strategic planning
3. Perceived benefits and challenges of using SWOT analysis
4. Measures of hospital quality and patient satisfaction

The survey will include both closed-ended and open-ended questions to capture both quantitative and qualitative data.

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Graph TD
    A[Qualitative Data Collection] -->|Conduct Interviews| B[Analyze Interview Data]
    B -->|Perform Document Analysis| C[Analyze Documents]
    D[Quantitative Data Collection] -->|Distribute Surveys| E[Collect Survey Responses]
    E -->|Analyze Quantitative Data| F[Conduct Statistical Analysis]
    G[Data Triangulation] -->|Combine Findings| H[Generate Final Report]
    subgraph Qualitative Component
        A --> B --> C
    end
    subgraph Quantitative Component
        D --> E --> F
    end
    subgraph Integration
        G --> H
    end
end

```

1. **Qualitative Data Collection:**  
Conduct Interviews: This step involves conducting semi-structured interviews with key stakeholders in the hospital industry, including administrators, IT managers, healthcare professionals, and patient representatives. These interviews will provide valuable insights into the current state of IS/IT implementation in hospitals, challenges faced, and opportunities for leveraging SWOT analysis in strategic planning.
2. **Analyze Interview Data:**  
Perform Document Analysis: In this step, relevant hospital policies, strategic plans, and reports related to IS/IT implementation and quality improvement initiatives will be examined. This analysis will provide a comprehensive understanding of the context and existing strategies employed by hospitals.
3. **Quantitative Data Collection:**  
Distribute Surveys: A cross-sectional survey will be distributed to a representative sample of hospitals across various regions. The survey aims to gather data on the current state of IS/IT implementation, the extent of SWOT analysis utilization, perceived benefits and challenges of using SWOT analysis, and measures of hospital quality and patient satisfaction.

4. **Analyze Quantitative Data:**  
**Conduct Statistical Analysis:** The quantitative data from the surveys will be analyzed using descriptive and inferential statistics to summarize responses and examine relationships between variables, such as the association between SWOT analysis utilization and hospital quality measures.
5. **Data Triangulation:**  
**Combine Findings:** Triangulation of data sources (interviews, document analysis, and surveys) will be employed to corroborate findings and enhance the credibility of the results. This step ensures a comprehensive understanding of the research problem by integrating qualitative and quantitative data.
6. **Generate Final Report:**  
 The final report will synthesize the findings from both qualitative and quantitative analyses, providing valuable insights into the utilization of SWOT analysis in IS/IT strategies for improving hospital quality. This report will contribute to the existing body of knowledge and inform evidence-based decision-making in the healthcare sector, ultimately leading to improved patient care and overall hospital performance.

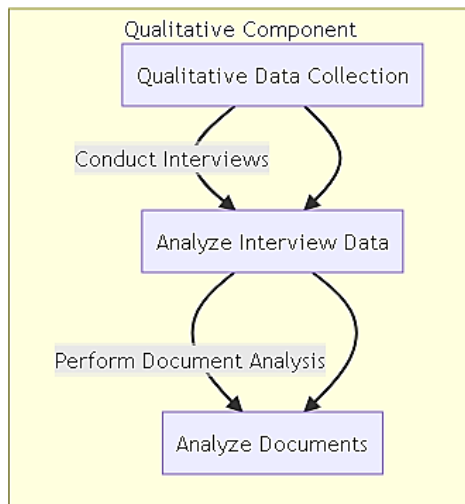


Fig. 1. Qualitative Component for Data Collection

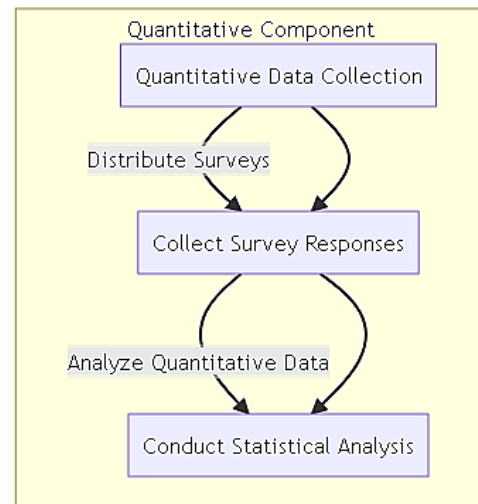


Fig. 2. Quantitative Component for Data Collection

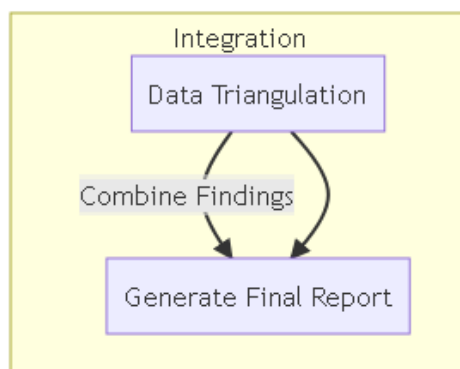


Fig. 3. Data Triangulation with Combine Findings

#### 4. Results and Discussions

In the journey towards improving the quality of services at Datu Sanggul Rantau Hospital, a crucial step is taken to ensure the successful implementation of information technology. This step involves utilizing SWOT analysis in formulating IS/IT strategies that can have a positive impact on the quality of care provided to patients. Let us delve deeper into how the interpretation of

current needs, mapping of information system requirements to business needs, formulation of IS/IT strategies, and recommendations for SI business strategies become integral parts of this journey.

First and foremost, the interpretation of current needs serves as a vital initial step in understanding the internal and external conditions of the hospital. By conducting a SWOT analysis, the hospital can identify strengths to leverage, weaknesses to address, opportunities to seize, and threats to anticipate. With a profound understanding of these factors, the hospital can design IS/IT strategies that are aligned with its context.

Subsequently, mapping information system requirements to business needs is a crucial step in ensuring that the implementation of information technology can provide significant added value to the hospital. By aligning information system needs with business objectives, the hospital can ensure that investments in information technology support the achievement of its strategic goals. This also helps in avoiding the implementation of irrelevant or ineffective technologies.

In formulating IS/IT strategies, the hospital needs to consider the results of the SWOT analysis and the mapping of information system needs to business needs. The formulated IS/IT strategies should optimize internal strengths, address existing weaknesses, capitalize on external opportunities, and mitigate potential threats. Thus, the hospital can create an environment that supports innovation, operational efficiency, and the enhancement of service quality.

Recommendations for SI business strategies serve as the final yet equally important step in the journey towards improving the quality of the hospital. By leveraging critical success factors and business needs potential, the hospital can develop a roadmap for the development of information systems with prioritized scales for a specific period. This helps in determining the priority of information system development, allowing the hospital to focus on developments that have the greatest impact on the quality of care provided.

Throughout this journey, collaboration among the hospital management team, IT team, and all stakeholders is key to success. With open communication, synergistic cooperation, and strong commitment, the hospital can achieve its goal of enhancing service quality more effectively. Implementing IS/IT strategies based on SWOT analysis and mapping of business needs forms a solid foundation for creating a superior and sustainable healthcare service environment.

In facing future challenges and opportunities, Datu Sanggul Rantau Hospital needs to continuously evaluate and improve the IS/IT strategies that have been formulated. With a proactive, adaptive, and innovative approach, the hospital can continue to evolve and provide the best services to the community. May the steps taken in utilizing SWOT analysis in IS/IT strategies lead the hospital towards a higher level of service quality and have a positive impact on public health overall.

With the inclusion of tables tailored to the context of the document, it is expected that readers will more easily comprehend the prioritized strategies for business IS and IT strategies, as well as the IT Management practices implemented within Datu Sanggul Rantau Hospital.

Table 5. IS Business Strategy Priority Scale for Datu Sanggul Rantau Hospital

Urgent	Priority	Less Urgent
Important	Telemedicine	Executive information system
Less Important	Customer relationship management	Application of quality indicators
	Asset management	Cooperation management
	HIRS	Accounting information system
	SIMRS	e-Procurement



## 5. Conclusion

The following conclusions regarding the utilization of SWOT analysis in IS/IT strategy for enhancing the quality of a hospital:

1. **Strengths Identification:** The SWOT analysis revealed the strengths of the hospital, such as a well-established organizational structure and existing IT infrastructure. These strengths can be leveraged to improve the quality of healthcare services provided.
2. **Weaknesses Acknowledgment:** By recognizing the weaknesses identified through the SWOT analysis, such as outdated IT systems or lack of IT training for staff, the hospital can focus on areas that require improvement to enhance overall quality.
3. **Opportunities Exploration:** The analysis highlighted various opportunities, such as implementing new IT applications like telemedicine or CRM systems. By capitalizing on these opportunities, the hospital can innovate its services and improve patient care.
4. **Threats Mitigation:** Addressing the threats identified, such as cybersecurity risks or technological obsolescence, is crucial in safeguarding the hospital's IT environment and ensuring uninterrupted quality healthcare delivery.
5. **Integration of IS/IT Strategies:** The SWOT analysis serves as a foundation for developing integrated IS/IT strategies aligned with the hospital's goals and vision. This alignment ensures that technology initiatives contribute effectively to enhancing the overall quality of healthcare services.
6. **Continuous Improvement:** By regularly revisiting and updating the SWOT analysis in the context of IS/IT strategies, the hospital can adapt to changing internal and external factors, fostering a culture of continuous improvement in quality healthcare provision.

In conclusion, the strategic utilization of SWOT analysis in IS/IT planning for a hospital not only identifies key areas for improvement but also guides the development of tailored strategies to elevate the quality of healthcare services provided.

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