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Information technology strategic plan for hospital using Ward and Peppard model

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Abstract
Purpose: This study aims to identify IS/IT strategic plans, managerial activities, and operational activities in hospitals that can be used as proposals for IS/IT development in hospitals.
Methodology/approach: The approach used in this research is the strategic planning of Ward and Peppard, who conduct an analysis of the internal and external environments at the hospital using various analytical tools such as SWOT, CSF, PEST, Value Chain, and McFarlan Strategic Grid.
Results: The final result of this research is comprehensive strategic planning at the strategic, managerial, and operational levels, which are expected to be in line with the business objectives of the hospital.
Conclusion: The findings highlight that systematic strategic planning enables hospitals to align IS/IT with organizational goals, improve efficiency, support decision-making, and enhance service quality. This approach ensures that IS/IT initiatives are not only technically feasible but also strategically sustainable in addressing the dynamic healthcare challenges.
Limitations: The limitation of this research is the mapping of application proposals that are in accordance with the business objectives of hospitals.
Contribution: The final result of this research can be used as a basis for developing IT at hospitals, which is expected to help in developing IT at hospitals in the future.

Keywords: *Information Systems, Portfolio, Strategic Planning, Ward and Peppard*

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1. Introduction

Hospitals are organizations engaged in the health sector that provide health services to the community (Hidayati & Sari, 2021). To meet the needs of each patient and provide services to them, the use of information systems is one of the supporting facilities for hospitals in recording and reporting hospital activities. In its development, the implementation of IS/IT is carried out partially and ad hoc, only to meet current needs, urgent activities, or the existence of laws that require them to be fulfilled (Prasetyo, 2016). One of the effects is the unplanned growth of applications, hardware and software. For example, until now, 61 applications have been built, and 50% of them are the same; the difference is the name, features, and developer. Likewise, hardware grows without considering costs with future planning; one of the reasons for this is that there is no IS/IT implementation plan that can guide policymakers in determining IS/IT investments to be made (Winter et al., 2023).

Based on the description above, an information system plan is needed to find a proposed strategy that is expected to help achieve the development of an information system business strategy that fits the needs. The strategic planning used is the Ward and Peppard method with analytical techniques such as SWOT and CSF, with several process stages such as introduction, understanding current conditions, and opinion of future needs (Girinata & Suryani, 2019). This method discusses the strategic planning of information systems in terms of business and information technology in accordance with the business

processes being carried out. Digital transformation in the healthcare sector has become a global trend that significantly influences hospital operations. In many countries, hospitals are required to adopt advanced information systems to ensure accuracy, efficiency, and transparency in health services (Kristiyani, Marlissa, & Urip, 2025; Pali, Marlissa, & Hutajulu, 2025). The World Health Organization (WHO) emphasizes that digital health solutions are critical for achieving universal health coverage, particularly in developing countries, where service gaps remain wide. In this context, hospitals in Indonesia are also challenged to align with the national digital transformation agenda, which focuses on integrating health data, improving service quality, and supporting evidence-based policymaking (Saydullayevich, 2025). However, despite these efforts, many hospitals still struggle with fragmented systems and ad-hoc implementations that are not guided by comprehensive strategic planning (Torab-Miandoab, Samad-Soltani, Jodati, & Rezaei-Hachesu, 2023).

One of the main issues is the proliferation of such redundant applications. As mentioned earlier, the hospital currently has more than 61 applications, with approximately half of them overlapping in function. Such redundancy leads to inefficiencies, higher maintenance costs, and confusion among users (Siyam et al., 2021). Moreover, the lack of standardization across these systems hampers data integration, resulting in duplication of patient information, difficulties in generating comprehensive reports, and potential errors in clinical decision-making (Brunner, Cannedy, McCoy, Hamilton, & Shelton, 2023). Hardware procurement often follows the same unplanned pattern, where purchases are made reactively rather than based on long-term investment strategies. This not only increases costs but also creates sustainability challenges when outdated equipment must be replaced. The absence of a well-defined IS/IT strategy contributes to these issues. Without a strategic roadmap, decision-makers tend to rely on short-term fixes, often driven by urgent needs or regulatory requirements (Garde et al., 2007; Mahmoud, Balachandran, & Altayyar, 2024). For example, some applications are developed solely to comply with government reporting standards without considering interoperability with other hospital systems. While such initiatives may solve immediate problems, they fail to create long-term value for the organization itself. Furthermore, without proper guidance, hospital management faces difficulties in prioritizing IT investments, allocating budgets effectively, and ensuring alignment between technology adoption and business goals (Walker et al., 2023).

To address these challenges, hospitals require a strategic planning framework that is both comprehensive and adaptable. The Ward and Peppard model offers such a framework, as it emphasizes analyzing both the internal and external environments of the organization before formulating IS/IT strategies (Septiana, Mulyani, Kurniadi, & Arifin, 2020). By using analytical tools such as SWOT, CSF, PEST, Value Chain, and the McFarlan Strategic Grid, hospitals can identify critical factors that influence their operations, map current and future application portfolios, and align IT initiatives with overall business objectives (Kamarudin, 2024). This structured approach reduces the risk of ad hoc decision-making and provides a clear roadmap for sustainable digital transformation. From a policy perspective, the Indonesian government has already provided several regulations to encourage better hospital management practices. Law No. 44 of 2009 concerning hospitals establishes the legal foundation for health service delivery, requiring hospitals to continuously improve quality and accessibility (Handrean et al., 2025). In addition, the Ministry of Health's Strategic Plan (Renstra) 2020–2024 highlights the importance of digitizing health data and integrating health information systems at all levels of service, from primary health centers to referral hospitals. The establishment of the Digital Transformation Office further demonstrates the government's commitment to building a unified health-data ecosystem. For hospitals, this means that IS/IT strategic planning is no longer optional but a mandatory requirement to remain competitive and compliant with national health policies (Aisyah et al., 2024).

Previous studies also underscore the importance of IS/IT strategic planning in hospitals. Research conducted at South Tangerang Hospital (2019) found that data duplication and human error were common problems that could be addressed through a well-defined application. A study at Palembang BARI Hospital (2016) highlighted the need to align IS/IT strategies with business strategies to improve efficiency. Other studies using the Ward and Peppard model have shown that hospitals can categorize their applications into strategic, operational, high-potential, and support portfolios, which serve as a

basis for long-term planning. These findings indicate that hospitals facing similar challenges can benefit from adopting structured frameworks like Ward and Peppard. In addition to addressing operational challenges, IS/IT strategic planning has broader implications for hospital performance. Efficient information systems can enhance patient satisfaction by reducing waiting times, improving the accuracy of medical records, and facilitating better communication between healthcare providers and patients. For hospital staff, integrated systems reduce administrative burdens, allowing them to focus more on patient care. At the managerial level, access to accurate and timely data supports evidence-based decision-making, which is crucial in the dynamic healthcare environment. Furthermore, strategic IS/IT investments can strengthen hospitals' competitive advantage by enabling them to offer innovative services, such as telemedicine, electronic medical records accessible to patients, and digital payment systems.

Academically, this study contributes to the body of knowledge on IS/IT strategic planning by providing empirical evidence from a hospital context in Indonesia. It also validates the applicability of the Ward and Peppard model in the healthcare sector, demonstrating how theoretical frameworks can be translated into practical solutions (Janaputra, Samopa, & Sukmono, 2021). For policymakers, the findings can serve as input for designing guidelines that encourage hospitals to adopt structured approaches to information systems/information technology (IS/IT) development. For hospital practitioners, this study offers practical recommendations on how to identify priorities, allocate resources, and implement strategies that align technology with organizational goals. In conclusion, the background of this research reflects the urgent need for hospitals to move beyond fragmented and ad hoc IS/IT implementations. By adopting comprehensive strategic planning using the Ward and Peppard model, hospitals can ensure that their IS/IT initiatives are aligned with business strategies, are responsive to environmental changes, and are capable of delivering long-term value. This study not only provides a roadmap for the hospital under investigation but also offers insights that can be applied to other hospitals facing similar challenges in Indonesia and beyond.

2. Literature review

Previous research can be used for hypotheses and can be a temporary answer in this study, and it can also be used as a source of comparison with the research that the author is working on. The following is a previous study that is close to the title of similar research and can be used as a reference in writing this research:

Table 1. Previous research

1	**Research Title**	Strategic Planning of Information Systems at South Tangerang Hospital
	Year	2019
	Results	Based on the analysis obtained, some problems often occur such as data duplication, human error, and incomplete data. From the results of IS/IT strategic planning, a proposed portfolio of applications that can support the needs of health applications in hospitals is obtained as well as an estimate of the budget to be issued.
2	**Research Title**	Strategic Planning of Information Systems at Palembang Hospital BARI
	Year	2016
	Results	Based on the analysis, it was found that the business strategy, IS/IT management strategy, and also the application portfolio that is in line with the business in the hospital as well as the proposed addition of divisions for IT management.

3	**Research Title**	Strategic Planning of Information Systems at RSUD Dr. H. Ibnu Sutowo Baturaja Using the EAP Method (Enterprise Architecture Planning)
	Year	2017
	Results	Based on the analysis carried out, we get a portfolio of applications for hospitals and also a schedule for application work based on a set plan.
4	**Research Title**	Strategic Planning of Information Systems in Hospitals with Price Waterhouse Approach
	Year	2017
	Results	Based on the analysis obtained from the hospital, the case study is an application portfolio that is in line with the hospital's vision and mission and is mapped into the McFarlan Strategic Grid then a roadmap for application development in the next few years is obtained based on the highest total project score.
5	**Research Title**	Information Systems Strategic Planning for Healthcare Organizations Using Ward and Peppard Model
	Year	2020
	Results	Based on the analysis results obtained, a portfolio of health applications has been mapped into four parts of the McFarlan Strategic Grid which is divided into Strategic, Key Operational, High Potential, and Support.
6	**Research Title**	Ward and Peppard Model for Strategic Planning of Hotel Business Information Systems
	Year	2021
	Results	Based on the analysis that has been done, an idea and business plan are obtained to support the organization's vision and mission that have been mapped into the future application portfolio of McFarlan Strategic Grid.
7	**Research Title**	Ward and Peppard Method Approach for Strategic Planning of Information Systems DISPERINAKER Salatiga City
	Year	2021
	Results	Based on the analysis obtained, a proposal is obtained which produces 18 proposed information systems that can improve the quality of organizational services in the application of IS/IT in supporting the achievement of the vision and mission of the Salatiga City DISPERINAKER which can be implemented within the next 4 years.
8	**Research Title**	IT Strategic Planning in IS Development Public Service (Case Study: Prosecutor's Office of South Sumatra)
	Year	2021

	Results	Based on the results of the analysis carried out, a solution is obtained that supports the business vision and mission at the South Sumatra High Court based on SWOT, CSF, and Value Chain analysis.
9	**Research Title**	Information System Strategic Planning at PT EP-TEC Solutions Indonesia
	Year	2019
	Results	Based on the analysis that has been mapped into the McFarlan Grid table, solutions and recommendations are obtained in the form of applications for learning and discussion forums, and CRM applications that support decisions to be made.
10	**Research Title**	Information Technology Strategic Plan at PT XYZ with Ward and Peppard Framework
	Year	2018
	Results	Based on the analysis of the internal environment and external analysis using tools such as SWOT, PEST and CSF, the proposed development of information systems to expand market reach such as the Customer Relationship Management System application is obtained.

The studies presented in Table 1 demonstrate a wide variety of approaches to strategic information system planning in the healthcare sector and other related industries. Although the specific contexts of these studies differ, ranging from hospitals to government agencies and private companies, the underlying concern remains consistent: organizations face challenges in aligning IS/IT strategies with their business goals. This alignment is essential to avoid duplication, inefficiencies, and wasted resources, as highlighted in the case of the South Tangerang Hospital, where problems such as data duplication and incomplete information frequently occurred. The proposed solution, an application portfolio supported by budget estimations, illustrates the importance of structured planning in mitigating such recurring issues. When compared with the 2016 study of Palembang BARI Hospital, it becomes clear that strategic planning must address both technological and managerial dimensions. This research not only focused on IS/IT portfolios but also recommended organizational restructuring, specifically the addition of divisions responsible for IT management. This indicates that effective IS/IT planning cannot be separated from the institutional governance. Organizational structures must be adapted to ensure accountability, sustainability, and clarity in the development of ISs and IT.

The RSUD Dr. H. The study by Ibnu Sutowo Baturaja using the Enterprise Architecture Planning (EAP) method provides another perspective. The EAP method emphasizes structured and phased planning and generates both application portfolios and development schedules. This method is valuable because it links technical requirements to the organizational timelines. However, it can be rigid and may require significant resources that smaller hospitals might not be able to provide. Thus, although EAP provides precision, its implementation can be challenging in resource-constrained environments. Another interesting case is the Price Waterhouse approach applied in hospitals (2017) (Chen et al., 2023). This research succeeded in mapping hospital applications into the McFarlan Strategic Grid and produced a roadmap based on project scores. The strength of this method lies in its quantitative assessment of project value, allowing hospitals to prioritize projects based on measurable criteria. However, reliance on scoring systems may overlook qualitative aspects, such as user satisfaction or cultural readiness for change, which are equally critical in healthcare contexts (Janaputra et al., 2021).

A 2020 study on healthcare organizations using the Ward and Peppard model provides direct relevance to the present research. By dividing application portfolios into four categories—Strategic, Key Operational, High Potential, and Support—the model demonstrates a comprehensive framework that

balances current operational needs with future opportunities (Septiana et al., 2020). The strength of this framework is its flexibility and adaptability across sectors, as seen in later research on hotel businesses and government agencies. However, its limitation lies in its dependency on thorough environmental analyses (SWOT, PEST, CSF), which require accurate and reliable data. In contexts where data are incomplete or fragmented, the effectiveness of the model may be reduced (Desyana & Sitokdana, 2022). Studies from 2021, such as the Salatiga City DISPERINAKER case and the South Sumatra Prosecutor's Office, further illustrate the model's applicability to public sector organizations. These cases demonstrate how Ward and Peppard's methodology can generate practical proposals, ranging from 18 new systems to solutions that support vision and mission alignment. Importantly, these findings highlight that the model is suitable not only for healthcare but also for broader organizational settings. This versatility reinforces its value for hospitals that face diverse challenges, from clinical operations to administrative efficiency (Nugraha & Manuputty, 2022).

Private sector cases, such as PT EP-TEC Solutions Indonesia (2019) and PT XYZ (2018), provide lessons on how strategic planning supports competitiveness and market expansion. The CRM applications proposed in these studies illustrate that IS/IT can extend beyond internal efficiency to customer engagement and service innovation topics. Similar lessons can be applied to hospitals to improve the patient experience, such as through customer satisfaction systems or electronic medical records accessible to patients. Taken together, these studies reveal several consistent themes. First, the absence of strategic planning leads to fragmented systems, inefficiencies and missed opportunities. Second, successful IS/IT planning requires the integration of technological, managerial, and organizational aspects. Third, methodological frameworks such as EAP, Price Waterhouse, and Ward & Peppard provide useful tools, each with unique strengths and limitations. Finally, the growing application of IS/IT planning across sectors underscores its importance as a universal requirement in modern organizations.

Despite these contributions, a clear research gap remains. Many previous studies provide technical solutions, such as application portfolios or project roadmaps; however, few have explored the integration of these strategies with broader business goals in dynamic healthcare environments. In particular, little research has focused on hospitals where IS/IT systems have grown in an ad hoc and fragmented manner, leading to duplication and inefficiencies. Furthermore, while methodologies such as Ward and Peppard are widely applied, there is limited empirical evidence from Indonesian hospitals regarding their effectiveness in aligning technology with business objectives. This study seeks to fill this gap by applying the Ward and Peppard model within the hospital context in Indonesia. This builds on previous research and extends the literature by providing empirical evidence of how structured IS/IT planning can resolve issues of duplication, inefficiency, and misalignment. This study also contributes to policy discussions by offering insights that can inform national health digitalization agendas, such as those outlined in the Ministry of Health's strategic plan. Academically, this study enriches the discourse by comparing multiple planning methodologies and highlighting the practical relevance of Ward and Peppard in healthcare.

In summary, the literature review underscores the importance of structured IS/IT strategic planning in diverse organizational contexts. This review also identifies key challenges, methodological insights, and research gaps that justify the present study. By situating this research within the broader academic and practical discourse, it ensures that the study is not only relevant to the specific hospital under investigation but also contributes to the ongoing development of IS/IT planning frameworks in Indonesia and elsewhere.

3. Research methodology

At this stage, theories related to research methods and some of the tools that will be used in conducting this research are discussed.

3.1 Research Methods

According to Ward and Peppard (2002), strategic planning is the process of identifying IS application portfolios that can support the organization in carrying out its business activities and goals. IS/IT strategic planning also uses various tools and frameworks to align IS/IT strategically with businesses that are expected to seek new opportunities to implement innovative technology. The following is the Ward and Peppard version of the methodology approach, where strategic planning is focused on the technology that will be used.

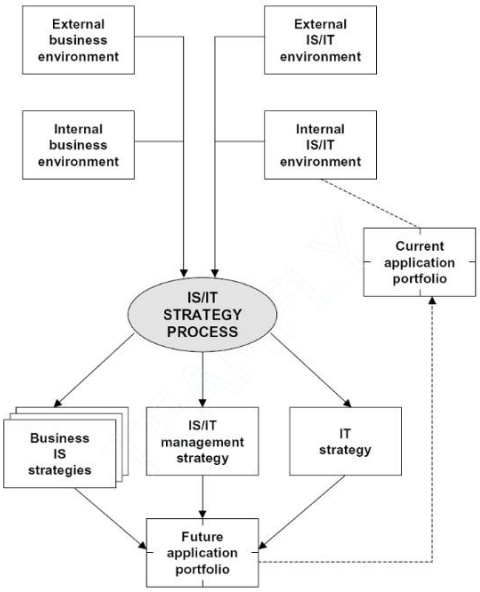

Figure 1. Ward dan Peppard Methodology
Source: Strategic Planning for Information Systems from Ward and Peppard (2002)

According to Shukla et al. (2021), strategic thinking is important because it directly affects the growth of an organization by considering market trends, strengths, and weaknesses compared to competitors. Strategic thinking also requires the ability to respond to changes in environmental conditions that occur because environmental changes can become new opportunities or threats to the organization (Gerald et al., 2020).

3.2 Research Stages

The stages of research used in this research are to do a qualitative approach. According to Ahyar et al. (2020), a qualitative approach is to conduct interviews and direct observations to understand the ongoing business processes more deeply. An interview was then conducted with the supervisor of the hospital's SIMRS section, who discussed the existing technology infrastructure in the hospital at that time. The following is an overview of the stages of this research (Rambe, Lubis, Ritonga, & Purba, 2025).

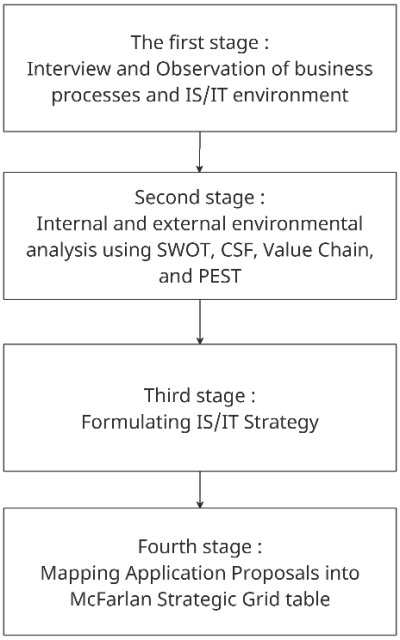

Figure 2. Research Stages

This study was conducted in several interrelated stages.

1. The first stage was to identify the problems that existed in the hospital by conducting interviews and observations with the hospital's IT team.
2. The second stage is to analyze the existing business processes in the hospital, such as strengths, weaknesses, threats, and opportunities that exist in the hospital. In this stage, researchers will use SWOT, CSF, Value Chain, and PEST because this stage is the main step in knowing the problems in the organization so that they can provide suggestions that are expected to help business processes run well.
3. The third stage involves developing an IS/IT strategy based on the analysis obtained in the previous stage.
4. The fourth stage is to map out the proposed application to be implemented in the next four years.

3.3 Theories Related to Research Tools

In this section, we discuss the meaning of the analytical tools used in this study.

3.3.1 SWOT (Strength, Weakness, Opportunity, Threat)

SWOT analysis is used to identify internal factors consisting of strengths and weaknesses, and then external factors, namely opportunities and threats from the resources owned by the hospital.

3.3.2 CSF (Critical Success Factor)

Critical Success Factor is an analytical tool that considers several critical factors in the organization or company environment to define the key factors for hospital success.

3.3.3 Value Chain

The value Chain includes activities such as obtaining raw materials, designing products, building production facilities, marketing products, developing cooperation agreements, and providing customer service.

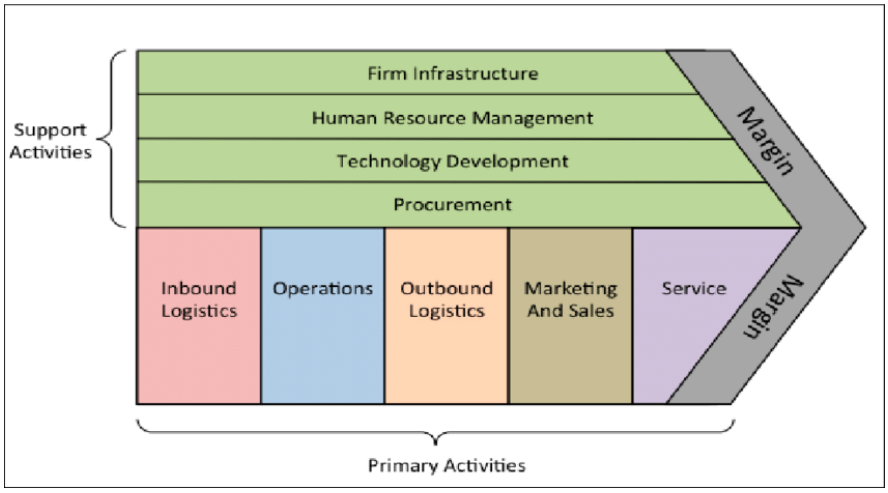

Figure 3. Value Chain Model

3.3.4 PESTEL

PESTEL is a tool used by industries to understand the macroeconomic and social context broadly, such as conducting an assessment of several organizational external influence factors that can guide strategic decision-making.

a. Political Factor
   These factors include government policies, legal issues, and formal and informal rules from the external environment.
b. Economic Factor
   Economic factors include all factors that affect the purchasing power of customers and the business climate.
c. Social Factor
   Social factors include all factors that can affect the needs of customers and the size of the existing market share.
d. Technology Factor
   Technological factors are the result of all that can help in dealing with business challenges and support the efficiency of hospital processes.
e. Environment Factor
   Environmental factors include all aspects of the ecology and environment surrounding a company.
f. Legal Factor
   Legal factors cover all legal aspects related to business.

3.3.5 McFarlan Strategic Grid

McFarlan Strategic Grid is a tool to map applications that need to be used by an organization by looking at their role for the organization. Mapping on the McFarlan Strategic Grid consists of four quadrants: strategic, high potential, key operational, and support.

STRATEGIC	HIGH POTENTIAL
- Applications that *are critical to* sustaining future business strategy	- Applications that *may be important* in achieving future success
- Applications on which the organization *currently depends* for success	- Applications that are *valuable but not critical* to success
KEY OPERATIONAL	SUPPORT

Figure 4. McFarlan Strategic Grid

4. Results and discussions

The following are the results of an analysis of the internal and external business environments through observing and analyzing the results of interviews obtained from the hospital. It is hoped that this analysis will become a proposal that can be considered in the development of hospitals in the future.

4.1 SWOT Analysis

From the results of the internal and external analyses, the strengths, weaknesses, opportunities, and threats that can affect the organization were obtained.

a. Strengths (S)
   The hospital has government support, a strategic location in the city center, a national referral hospital, and complete facilities.
b. Weakness (W)
   There is no strategic plan for IT development, and data for each installation have not been integrated.
c. Opportunity (O)
   The amount of government support to achieve goals in the field of health services. new medical personnel continue to increase.
d. Threats (T)
   The emergence of new competitors in the health sector and increasingly expensive medical devices.

Table 2. SWOT Analysis

Internal / **External**	**Strength**	**Weakness**
	1. Government support. 2. Strategic location in the city center. 3. National referral hospital. 4. Complete facilities.	1. There is no strategic plan for IT development. 2. The data for each installation has not been integrated.
Opportunity	**Strategy SO**	**Strategy WO**
1. The amount of government support to achieve goals in the field of health services. 2. The increasing number of new medical personnel.	1. Utilize government assistance to improve the development of health support infrastructure in hospitals. 2. Provide training to medical personnel to improve the quality standard of health services in hospitals.	1. Develop strategic planning of information systems for hospitals. 2. Development of a service system for the registration of patients for treatment to integrated drug payments.

	3. Develop information technology to support hospital services.	
Threat	**Strategy ST**	**Strategy WT**
1. The emergence of new competitors in the health sector. 2. Medical devices are getting more expensive.	1. Creating new innovations for health services. 2. Increase the budget for development in the field of procurement of medical equipment for hospitals.	1. Improving services more effectively and efficiently and minimizing errors. 2. Improving customer complaint service technology in order to re-evaluate the quality of service in hospitals.

4.2 CSF Analysis (Critical Success Factor)

CSF analysis is used to identify the factors that determine organizational success with goals and benchmarks.

Table 3. CSF Analysis

Goals	Benchmark	CSF
To become an independent and trusted national referral hospital.	1. Provide complete hospital medical service facilities. 2. Provide comfort and friendliness to patients being treated.	1. Provide completeness of specialist and sub-specialist doctors. 2. Provide services in accordance with applicable operational standards.
- Provide a comfortable, clean, and friendly place to patients. - Improving medical personnel who are superior and have a work culture and are certified. - Improving and maintaining the quality of hospital services	No complaints from patients.	1. Improving the service of medical personnel 2. Provide training to medical personnel to improve their expertise in their respective fields

4.3 Value Chain Analysis

Value chain analysis is conducted to detail the workflows that are used to become strategic activities relevant to understanding business processes from start to finish.

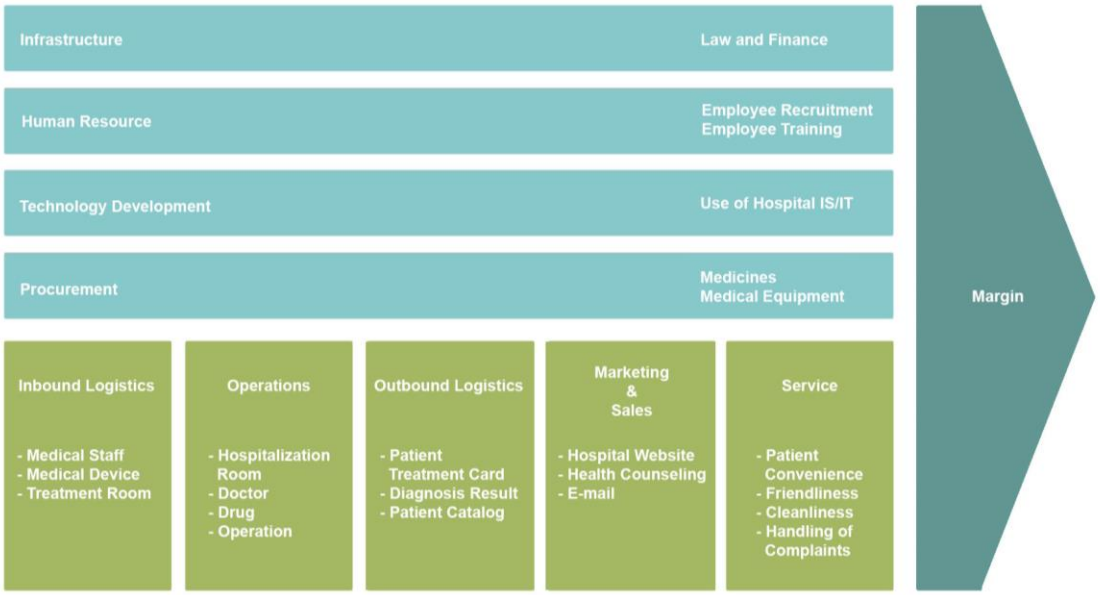

Figure 4. Analysis Value Chain

The following is an explanation of the activity classification.

a. Primary Activity

The main activities of the hospital are as follows:

1. Medical Personnel, Medical Equipment, Nurse Room
   This activity consists of the main supporting units.
2. Nursing Room, Doctor, Medicine, Surgery
   This is the main operational activity at the hospital.
3. Patient treatment card, Diagnostic results, Patient catalog
   This is the main output activity of the hospital.
4. Website, Health Socialization, Email
   This activity disseminates information and promotions that exist in hospitals, and e-mail is used for digital correspondence with hospital partners and hospital patients.
5. Patient comfort, Friendliness, Cleanliness, Complaint handling
   This activity is a service activity where the hospital provides comfort, friendliness, cleanliness, and receives complaints from patients.

b. Support Activity

The supporting activities of the hospital are as follows:

1. Law and Finance
   This support activity is important for the hospital to continue to develop in accordance with its vision and mission, as well as the goals to be achieved so that it can continue to compete with other hospitals.
2. Employee recruitment, Employee training
   Provide training for employees so that they can have competencies and abilities that are in accordance with the main tasks performed. Recruiting competent employees also increases the quality of hospital services.
3. Use of hospital IS/IT
   Having IT and IS at the hospital can help simplify work, such as employee attendance, online patient registration, and recording reports at the hospital. In addition, the presence of IT/IS in hospitals can help them maintain competitiveness with other hospitals.
4. Medicines, Medical Equipment
   Cooperating with other vendors to supply medicines and medical equipment to make it easier for hospitals to carry out their operational activities.

4.4 PESTEL Analysis

PESTEL analysis was used to analyze the environment from the hospital's social perspective. This analysis is hoped to describe the environment that affects hospital growth.

a. Political Factor
   The political foundation of the hospital's external factors that guide the organization's vision, mission, and goals is legislation no. 44 of 2009, which was approved by the DPR RI and the President of the Republic of Indonesia regarding hospitals. As stated in the law, the hospital is a health service institution for the community with its own characteristics that are influenced by the development of health science, technological advances, and the socio-economic life of the community, which must continue to be able to improve services that are more qualified and affordable by the community in order to achieve this. the highest degree of health possible. This basis is also the application of service standards in hospitals. In addition, there are policies from the government through the Digital Transformation Office team to digitize health data in Indonesia, which is focused on improving the quality of health policies based on accurate and complete data and efficiency in providing health services at the public health center, clinic, and home levels. sick for society.
b. Economic Factor
   From an economic perspective, financial assistance from the central and local governments greatly affects business processes, such as the maintenance and purchasing of medical equipment to support health services in hospitals.
c. Social Factor
   The health education and counseling program carried out by XYZ Hospital aims to increase public knowledge about health and increase awareness and maintain environmental health.
d. Technology Factor
   The government supports a strategic plan for digital health transformation to increase health service innovation and support services with better technological innovations for hospital operational activities.
e. Environment Factor
   The environment around the hospital is a metropolitan environment located in the center of the city, where there are shopping centers, entertainment centers, offices, and others.
f. Legal Factor
   Legal aspects are inseparable from hospital operational activities because the law plays a role in regulating hospital operational activities to ensure that they run properly and safely. Therefore, the activities of handling public health services can run smoothly and do not harm the parties involved. The following are the laws and regulations related to hospital management in Indonesia:
   1. Law No. 44 of 2009 concerning Hospitals.
   2. Regulation of the Minister of Finance number 129 of 2020 concerning Guidelines for BLU Management.
   3. Regulation of the Minister of Health number 21 of 2020 concerning the Strategic Plan of the Ministry of Health for 2020-2024.

The main purpose of using the PESTEL tool is to reach scenarios that are significant for decision-makers and shape different futures (Vesali et al., 2022). These factors are important because they are considered ideas for a more comprehensive planning process.

4.5 Identification of IS Strategy

The information system strategy is used to propose information system requirements for hospitals, and it is hoped that this proposal can improve reporting efficiency and simplify hospital operational activities.

Table 4. SI Strategy Identification

Name	Function	Status	Suggestion
Hospital Website	As a medium of notification, promotion,	Available	-

	information, and news about the Hospital.		
IS Customer Satisfaction	As a measuring medium for the level of customer satisfaction.	Available	-
IS Staffing	As a media to store and manage data on Hospital employees.	Available	Upgrade
IS Employee Performance Monitoring	As a medium for employee performance assessment.	Available	Upgrade
IS Ambulance Tracking	As a media manager of hospital vehicles.	Not Available	New system
IS Business Planning	As a medium of business planning information.	Available	-
IS Procurement	As a media to manage the needs of the patient's household appliance.	Not Available	New system
Single Sign System On	A system that provides access to application resources using one account.	Not Available	New system
IS Logistics	As a storage media and manager of goods management in the warehouse.	Available	Upgrade
IS Pharmacy	As a medium for managing and storing drug data in hospitals.	Available	Upgrade
IS Laboratory	As a data storage medium from a study or examination.	Available	Upgrade
IS Radiology	As a medium for storing patient radiological examination data.	Available	Upgrade
IS Registration	As a storage medium and management of patient data registered.	Available	-
IS Billing	As a medium for storing patient payment data.	Not Available	New system
IS Claim	As a medium for management of insurance data in hospitals.	Not Available	New system
IS Outpatient Patient	As a medium for managing outpatient data.	Available	Upgrade
IS Patient Inpatient	As a medium for managing inpatients.	Available	Upgrade

IS Blood Sample	As a medium for data management of patient blood tests.	Not Available	New system
IS Medical E-Record	As a medium for the management of patient data electronically and can be accessed by the patient.	Not Available	New system
IS Data & Terminology	As a medium for management of health science research data.	Not Available	New system
IS Budget	As a media manager of the Budget Plan in the Hospital.	Not Available	New system
IS Finance	As a financial management media in hospitals.	Available	Upgrade
IS Audit SI/IT	As a medium for management of hospital equipment examination data.	Not Available	New system

4.6 Application Proposal Development

Future application development proposals are mapped to the McFarlan Strategic Grid application portfolio table, and these applications are expected to produce information needed by hospitals in the future.

Table 5. McFarlan Strategic Grid Portfolio

Strategic	**High Potential**
Hospital Website IS Customer Satisfaction IS Staffing IS Employee Performance Monitoring IS Audit IS/IT	IS Budget IS Finance IS Data and Terminology
Single Sign System On IS Procurement IS Logistics IS Pharmacy IS Laboratory IS Radiology IS Registration IS Billing IS Claim IS Outpatient Patient IS Patient Inpatient IS Medical E-Record IS Blood Sample	IS Ambulance Tracking IS Business Planning
Key Operational	**Support**

4.7 Strategic Development Roadmap

In the next stage, the proposed application development flow is determined based on the McFarlan Strategic Grid.

Table 6. Strategic Development Roadmap

Application Development Roadmap			
2022	**2023**	**2024**	**2025**
Single Sign System On IS Procurement IS Logistics IS Pharmacy IS Laboratory IS Radiology IS Registration IS Billing IS Claim IS Outpatient Patient IS Patient Inpatient IS Medical E-Record IS Blood Sample	Hospital Website IS Customer Satisfaction IS Staffing IS Employee Performance Monitoring IS Audit IS/IT	IS Budget IS Finance IS Data and Terminology	IS Ambulance Tracking IS Business Planning

4.8 Future Organization Proposal

According to Rahman Khan (2020), effective and productive human resources can make a strong contribution to organizational development. It is proposed to create a unit called the Computer Security Incident Response Team (CSIRT), which is tasked with preventing, managing, and responding to incidents related to cyber security. It is hoped that this unit will be able to manage cybersecurity incidents and maintain personal data in hospitals in the future. The skills required by the *CSIRT* unit are experience and understanding of computer security issues, such as viruses and cyberattacks, as well as an understanding of computer security software.

5. Conclusion

Based on the results of the research conducted, at this stage, it will be closed with conclusions and recommendations. We hope that this research will be useful to readers.

5.1 Conclusion

1. From the results of the strategic planning of the information system at the hospital, it is possible to formulate application requirements in the form of an application portfolio that has been divided into four parts: Key Operations, Strategic, High Potential, and Support.
2. The results of this portfolio analysis are expected to be used as a reference in the development of IS/IT in the future by various health parties and IS/IT strategic planning in hospitals. It is hoped that this can become a benchmark for the implementation of technology in community health services.

5.2 Suggestion

1. For the implementation of IS/IT strategic planning, it is recommended that it be announced to all parties involved in policymaking so that they can provide input, especially on planned costs and budgets.
2. Further research using better research with other analytical methods is needed.
3. Further similar research is expected to help understand the business processes that occur and the tasks of each part of the organization. It is important to ask what is being done or what plans are being worked on because that can be a clue and help the organization.

5.3 Limitations and Study Forward

This research can be used as an example of IT strategic planning for a hospital; however, it takes a lot of time to implement the developed application, so it is recommended to discuss its development again with the parties involved.

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