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THE IMPLEMENTATION OF THE INFORMATION TECHNOLOGY SYSTEM TO IMPROVE HEALTH SERVICE

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Abstract: The improvement of information technology in health services can improve health services in hospitals. In the long term, information technology will increase hospitals' efficiency, effectiveness, and productivity in achieving the hospital vision. This study aimsto obtain the most appropriate information technology system in the private hospital in Central Java, Indonesia. This study involved a case study method by conducting Focus Group Discussion (FGD), documentation study, and interview in stages to find out the right strategy as a part of the strategic plan for the years 2021-2025. FGD participants were the work unit managers who are members of the Hospital Strategic Plan Team. The result pointed out that the hospital hadimplemented a technology information system to provide services to patients from registration, electronic medical records specifically for pediatric and neurological polyclinics to the billing system. Information and communication technology will be implemented until the next five years consisting of an online human resource (HR) management information system, an online financial management information system, an onlineoperational management system, and Electronic Medical Records for all policlinics.

Keywords:Hospital Management Information System, Strategic Planning

Jel Classification: D2, D22 Firm Behavior Empirical Analysis

INTRODUCTION

Information technology plays a significant role in every health care system and can be adopted to improve the quality of the health care system. Implementing information technology in several health care systems means changing the health care system to become more efficient and innovative. Currently, the improvement of information and communication technology cannot be denied anymore. In addition, due to the advancement of information and communication technology, many health care facilities adopted the hospital information system to improve the quality of the health care system (Kuo et al., 2018). Moreover, adopting the hospital information system will also support the health care system to achieve sustainable success (Cantiello et al., 2016).

Nowadays, many hospitals have implemented information technology-based services to achieve the hospital vision. A hospital information system is a set of components and procedures established to gain the information technology to improve the health care system (Asangansi, 2012). Hospital information system becomes the essential tools that realize the health reforms. This system is believed to be a critical tool to manage administration, financing, and clinical data in health care organizations (4). Therefore, an appropriate hospital information system can determine the effectiveness of the health care system (Bogale, 2021).

Currently, a private hospital in Central Java, Indonesia,is compiling the strategic plan for 2021-2025. Developing IT-based health services in strategic planning aims to achieve the hospital vision through the strategic plan and several efforts. One of the efforts is by implementing information technology integrated into hospital management information systems. Thus, this study purposes of gaining the most appropriate model of the information technology system to the hospital. Thus, the hospital's efficiency, effectiveness, and productivity in achieving the hospital vision can be achieved.

MATERIALS AND METHODS

This study adopted a qualitative approach using a case study as the design of the study. The researchers conducted this study in a private hospital in Central Java, Indonesia. The application of information and communication system technology was not discussed separately but was part of preparing the Hospital Strategic Plan 2021 - 2025. Researchers were looking at applying specific information and communication technology as challenges and opportunities for success in the era of digitalization 4.0. The Strategic Plan Team consisted of the team leader, the two deputy directors, and ten hospital managers. Also, to find the most appropriate model of the information technology system to be applied in the hospital, the Focus Group Discussion (FGD) in stages involved as the data collecting method. After collecting the data through FGD, the researchers conducted the data analysis to attain the results. The researchers also useddata from the 2016 - 2020 Hospital Strategic Planning document as a comparison and analysis material. They verified the informants about the development of the Management Information System in the hospital.

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RESULTS

The results based on the 2016-2020 Hospital Strategic Plan documentation study stated that the construction of buildings and Management Information Systems was not yet optimal. The structure of buildings and hospital management information systems owned by local governments continued, and private hospitals were located close to the research hospitals. This building and its management information system have beenrunning well.

This hospital of the four hospitals was ranked third forits building facilities and management information systems. In the analysis of the hospital'sstrengths and weaknesses in the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, one weakness of the hospital's Strategic Plan 2016-2020 is that the hospital's Management information System is not optimal. Hence, it still does not play a full role in decision-making. The staff has not fully understood the hospital's Vision and Mission. Strategic Planning is only a block plan. Therefore, the direction of hospital development is still unclear. The result of information technology and a large and broad market share are opportunities.

In contrast,under the hospitals, negative promotions and information disclosure through cyberspace are threats. The hospital's strategic position in the SWOT analysis in the 2016 - 2020 Strategic Plan lies between strengths and opportunities, using strengths to seize opportunities. One of the main strategies is to take chances from the development of information technology for online imaging. Alternative activities 1. Marketing via website, web blog, and other social media (supported by superior service); 2. Realizing a green, environmentally friendly hospital and imaged outward; besides one of the main strategies, one alternative strategy isoptimizing the Hospital Management Information System. The strategy for optimizing management information system technology has not been further elaborated into strategic targets, key performance indicators, and work programs for the next five years, so the results cannot be measured.

In preparing the 2021-2025 Strategic Plan, developing information, technology-based health services are the SWOT analysis opportunity. Among the eight strategic opportunity factors, the development of information technology-based health services obtained a score of 0,227 or 11 percent of the total opportunity score of 2,061. When viewed from the order of magnitude of the opportunity score, the opportunity to develop information technology-based health services was on the fifth. The first order (most excellent opportunity) was BPJS-Health and employment insurance financing, while the second was to increase the number of insurance partnerships. The third order was a market share thatcould still be increased (retirees, babies, immigrants). The fourth was operational cooperation offers (tools, applications, marketing, etc.); The other three opportunities in a row from chance six to opportunity eight were: philanthropy funding, with a score of 0.152 or seven percent; the educational institutions in the hospital environment (hospital SDI development)with ascore of 0.121 or six percent; and the opening of the establishment of vocational education with a score of 0.074 or four percent.

In the external environment, apart from providing strategic factors in opportunities, hospitals also faced some threats. The total threat score was 1,628. The development of medical technology, information, and communication, with a score of 0.175 or 11 percent of the total score, ranked fifth as a threat to the hospital. In addition, increasing public knowledge about information technology was also a threat in sixth place with a score of 0.118 or seven percent. Other threats unrelated to technology, information, communication, and medical technology were high public demands for direct services and supporting facilities (score 0.380 or 23 percent). The second threat was establishing new hospitals and other expanding hospitals (score 0.284 or 17 percent), while the third was regulations of the government and the Social Security Implementing Agency - Health that frequently changed (score 0.284 or 17 percent). The fourth threat was public understanding of health and law increases (score 0.279 or 17 percent).The seventh and eighth threats involved pandemics, the geographical location of the mountains with the possibility of disaster (score 0.69 or four percent), and Increased District Minimum Wage (score 0.040 or two percent).

The internal environment of the hospital consists of strengths and weaknesses. The strategic strength factor does not contain information and communication technology and medical technology, with a total strength score of 1,552. This strategic strength factor is critical to improve weaknesses, seize opportunities, and face hospital threats. The strengths are sequentially based on the magnitude of the score: 1—a large area of land score 0.346 or 22 percent; 2. The majority of human resources are in productive age. On average, they are young, enthusiastic about developing, and committed to progress, afternoon 0.282 or 18 percent; 3. A good relationship with hospital stakeholders obtained a score of 0.186 or 12 percent; 4. Hospital commitment with high quality (Accreditation based on National Hospital Accreditation Standards/SNARS and Sharia) received a score of 0.171 or 11 percent; 5. Hospital management independence received a score of 0.169 or 11 percent; 6. Hospital finance supports hospital development obtained a score of 0.166 or 11 percent; 7—a good name and reputation in specific market segments got a score of 0.127 or eight percent; and 8. Hospital management was solid and firmly committed, with a score of 0.105 or seven percent.

Meanwhile, from the strategic factors of the threats with a total score of 2,424, the first (the most threatening) threat was the high public demand for services, direct services, and supporting facilities (the score

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was 0,465 or 19 percent). Second, the establishment of new hospitals and other hospitals expanded (with a score of 0,384 or 16 percent). Third, Public understanding of health and law increases (with a score of 0,342 or 14 percent). Fourth, regulations from the government and Social Security Administering Agency- Health were changed frequently (the score was 0,311 or 13 percent); and fifth, the development of medical technology, information, and communication (with a score of 0,270 or 11 percent). There are three other weaknesses in order from the sixth to the eighth weakness, the need for a common perception between hospital owners and management (with a score of 0,247, or 10 percent); Lack of specialist and sub-specialist human resources (with a score of 0.217 or 9 percent); and Lack of close relationship between expert doctors and hospital management (0.188 or 8 percent).

The weakness is that information technology is still limited to outpatient registration and electronic medical records for pediatric and neurological clinics. The results of the SWOT analysis of the hospital's strategic position are between opportunities and weaknesses. Thehospital must improve its weaknesses with its strengths to seize opportunities. The main strategies in the hospital's strategic plan for 2021 - 2025 include developing technology-based services.

Information and communication technology that will be implemented until the next five years consists of an online human resource (HR) management information system, online financial management information system, and all Electronic Medical Records. The hospital has had a Special Unit (Department) for Management Information Systems since 2014, Development of Online Clinical Service Applications since 2018. The currently available applications outpatient registration, including Electronic Medical Records for Children's Clinic and Neurology Clinic, while medical records for other specialty polyclinics still use paper, not using electronic medical records. If all clinical services and hospital management are integrated into a system that uses information and communication technology, the hospital can get the latest ISO 20071.2013 certification.

DISCUSSION

In the 4.0 era, digitalization, interconnected tools, artificial intelligence, data storage in the cloud, and the Internet of Think (IoT) are increasing. Therefore, data and information security are essential in building customer trust. ISO provides international certification for security in the management of a company's information under the name ISO 27001 Certification since 2005. The requirements that must be met for ISO 27001 Certification are building, implementing, maintaining, and continuously improving information security management systems, assessment, and treatment of information security risks tailored to the organization's needsfollowing established international standards. It is to reduce the risk of fines or compensation for violating the law. The research hospital cannot apply for the latest ISO 27001.2013 certification until all requirements are met. Therefore, the hospital continues to develop its information and communication technology sustainablyfollowing the needs and developments of science and technology. Hospital management in this study has realized the threat of possible lawsuits against hospitals because people are increasingly aware of their rights. After all, understanding of health and law has increased,as shown in the third threat strategic factor: Public understanding of health and law increases.

Organizations should implement information and communication technology to improve service quality and adapt to market needs. Organizational management withexcellent knowledge of information and communication technology realize that the department of information and communication engineering not only provides computers, technical support, building computerized systems but also integrates various levels of leadership, administration, finance, technical, education, information security, and productivity (Khawan, 2019). This study indicates that the hospital already has a Department of Information and Communication Systems. Still, it has to continue developing information and communication technology until all clinical and managerial services are integrated into one system. Experts stated that health information technology could improve the efficiency and quality of health services(Chaudhry et al., 2006; Jaana et al., 2011).

The results indicate that the hospital has included a plan for using information and communication technology in the past 2016 - 2020 Strategic Plan and the 2021-2025 Strategic Plan, which is still being drafted. The best way to develop organizational capabilities is to use information and communication technology strategies. It makes it easy to track and support the programs of the organization's strategic planning. However, the challenge is aligning the information and communication technology strategy with the organization's strategy. Services using information and communication technology are beneficial in making different decisions in various fields and levels by providing accurate, fast, and perfect data (Khawan, 2019).

Every industry, including hospitals, must innovate and invest in new technologies to grow sustainably in the face of a changing market. But the success of innovation with new technology cannot be managed generally with traditional controls (Kurhekar & Ghoshal, 2010). To maintain and increase market share, hospitals and progressive hospital health care managers are well-positioned in their service areas. The market has prompted hospitals to diffuse new technologies into healthcare. A favorable financial position can be achieved with hospital decisions based on information from technology adoption in particular patient care. Collaboration between hospital management and their medical staff is urgent for hospitals to quickly identify

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and implement new technologies suited to the patient care environment. This joint effort is critical. Such collaborative efforts are required to ensure the healthy integration of clinical values and goals with the hospital's strategic business plan (Veluchamy & Alder, 1989). In the hospital, sixth and eighth weakness strategic factors should be improved by equating perceptions between hospital owners and management, also developing a close relationship between expert doctors and hospital management.

Currently, information technology has taken off. Medical technology innovations have fundamentally changed the health care system. Various electronic methods are used to manage health and medical care information for both individuals and groups of patients. It is used as a reference for health information technology that involves designing, developing, manufacturing, using, and maintaining information systems for hospitals as a health industry (Laal, 2012).

A study on the adoption of information technology by the health care industry uses a SWOT analysis, namely an analysis of strengths, weaknesses, opportunities, and threats. SWOT analysis is a popular strategic analysis tool. The SWOT analysis results found internal strengths, including support for further investment in information technology, improved patient safety, more efficient operational activities, and investment support for more robustinformation technology infrastructure improvements. In addition to these internal strengths, internal weaknesses were also identified, including the existing information system being less integrated, resistance to the use of new technologies and processes, and slow adoption of information technology. An external opportunity that can be seized is the increased use of the internet, a nationally profitable environment. The threat is increasing demands for industry standards, legal compliance, losses from a declining patient trust, and the high cost of using information technology (Helms et al., 2008). The result also identified that the existing information systemwas less integrated to the management information system, services to patients ranging from online registration, electronic medical records (only for new children's polyclinics and neurology), to the billing system. Human Resource Management and financial management have not used information system technology.

Problems taken into consideration in using information technology include the relatively high cost of introducing new technology. The latest information system has its complexity. To support the program also requires service fees and updating costs, implementation costs new module, linking existing database with newly created database (Varga, 2015). The result confirms where the opportunities, threats, and weaknesses related to medical information technology and management from the SWOT Analysis are not on the priority, but on the third and fifth priority.

CONCLUSION

The researched hospitals have implemented information and communication technology for outpatient registration systems and electronic medical records, but only in pediatric and neurology polyclinics. In contrast, medical records for other polyclinics still use paper and do not use electronic medical records. The 2021-2025 strategic plan uses information and communication technology for human resource management, financial management, andhospital operational management. The hospital already has a Special Department for Management Information Systems, both for clinical management and hospital management. Unique strategic plans for management information systems aligned with hospital strategic planning will make it easier for hospitals to control and support programs set in strategic planning. Various studies have shown that information and communication technology have become a strategy to achieve high efficiency, effectiveness, and productivity in achieving the hospital's vision and mission. Also, the researchers suggest that further researchers examine the strategic plan and its implementation specifically for the Department of Management Information System in hospitals and its contribution to the hospital strategic plan and hospital performance.

Ethical Declaration:

This research has received ethical approval from the Health Research Ethics Committee of Universitas 'Aisyiyah Yogyakarta. The approval of this research is No.1455/KEP-UNISA/II/2020. This research has been declared ethically appropriate based on 7 WHO standards: Social Values, Scientific values, Equitable Assessment and Benefits, Risk, Persuasion/ Exploitation, Confidentially and Privacy, and Informed Consent, referring in the 2016 CIOMS Guidelines.

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