



## EVALUATION OF THE HOSPITAL BILLING SYSTEM'S IMPLEMENTATION IN RECORDING OUTPATIENT AND INPATIENT PAYMENTS USING THE PIECES METHOD

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### Abstrak

Penagihan elektronik menyederhanakan dan mempercepat penagihan pasien. Studi ini akan mengevaluasi kinerja sistem, informasi, ekonomi, kontrol/keamanan, efisiensi, dan layanan (PIECES) menggunakan model analitis. Studi ini meneliti sistem penagihan rumah sakit PIECES RSU Royal Prima Medan dalam pencatatan pembayaran pasien rawat jalan dan rawat inap. Penelitian ini menggunakan metodologi campuran yang melibatkan metode kuantitatif dan kualitatif. Studi ini mengambil sampel 200 pasien secara kuantitatif dan tujuh informan secara kualitatif. Analisis data kuantitatif menggunakan analisis univariat, sedangkan analisis data kualitatif menggunakan triangulasi. Studi ini menemukan bahwa sistem penagihan rumah sakit RSU Royal Prima Medan untuk pembayaran pasien rawat jalan dan rawat inap memiliki kinerja yang baik dalam hal kinerja, informasi, ekonomi, kontrol, efisiensi, dan layanan. Tantangannya termasuk masalah jaringan yang jarang terjadi. Studi ini menyimpulkan bahwa sistem penagihan rumah sakit PIECES RSU Royal Prima Medan untuk pembayaran pasien rawat jalan dan rawat inap berjalan dengan baik. RSU Royal Prima Medan sebaiknya mengembangkan sistem ini untuk digunakan dengan baik di masa depan dengan melatih petugas, mengevaluasi mereka, dan mengawasi mereka untuk mengurangi kesalahan dan memaksimalkan perawatan pasien.

**Kata Kunci:** Sistem penagihan, Implementasi, Evaluasi, Pembayaran

### Abstract

*Electronic billing simplifies and speeds up patient billing. This study will evaluate the system's performance, information, economics, control/security, efficiency, and service (PIECES) using the analytical model. This study examines RSU Royal Prima Medan's PIECES hospital billing system's outpatient and inpatient payment recording. A mixed-methodologies study uses quantitative and qualitative methods. This study sampled 200 patients quantitatively and seven informants qualitatively. Quantitative data analysis employed univariate analysis, while qualitative used triangulation. This study found that RSU Royal Prima Medan's hospital billing system for outpatient and inpatient payments performed well in performance, information, economics, control, efficiency, and service. The challenges include rare network problems. This study found that RSU Royal Prima Medan's PIECES hospital billing system for outpatient and inpatient payments is working well. RSU Royal Prima Medan should develop the system to properly use it in the future by training officers, evaluating them, and supervising them to reduce errors and maximize patient care.*

**Keywords:** billing system, implementation, evaluation, payment

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## INTRODUCTION

Health is one of society's basic needs, so health is a right for every citizen protected by the Constitution [1]. Every country recognizes that health is the greatest capital for achieving prosperity. Therefore, improving health services is an investment in human resources to achieve a prosperous society [2], and patients are satisfied with the medical, nursing, and management services provided at the hospital [3].

As public service units, hospitals must continually improve the quantity and quality of services they provide to the community because community satisfaction will impact public trust. The quality of service must start by fulfilling the community's needs and end with a positive perception of the hospital's quality by the community or patients [4]. A hospital is a unique and complex organization with characteristics and functions because it contains various professions involved in producing medical service products. In its development, science and technology must be able to see multiple aspects that can influence the organization's ability to provide health services [5]. Hospitals improve human health by providing inpatient, outpatient, and emergency services [6]. Many crucial decisions, like the design of new patient rooms, the determination of suitable service rates, the selection of a billing administration system, and the budgeting of business costs, need hospital managers to think strategically about the marketing of their hospitals [7], [8]. Hospitals need an electronic health information system to process data and improve patient and environmental services [9]. Community-accepted knowledge and technology require superior hospital services, prioritizing quality, and upholding standards. Everyone who wants optimal health needs quality health care. If the inpatient and outpatient billing system is not optimal, inpatients and outpatients will wait more than two hours after the doctor decides to send them home to get their service charge [10].

The hospital information system is an integrated system designed to manage administration, such as human resources and data management; financing processes, such as inventory, purchasing, and accounting; and patient care, such as scheduling appointments, examinations, operations, and treatments [9]. One of the applications of the Hospital Information System (HIS) is the billing system. The billing system is an electronic-based billing system that simplifies and accelerates the patient billing system. Starting from registration and health services to patients going home, with this billing system, the hospital can obtain information about the number of patient visits and the amount of hospital income from the hospital's services [9], [10].

The inpatient and outpatient billing systems are part of the management information system application that finances hospital health services for

implementing and developing the system, which is an expensive investment [11], [12], [13]. However, a costly investment sometimes results

in a quality system meeting the organization's expectations. The success of system implementation is influenced by a variety of complex factors. In contrast, system implementation failure usually occurs because the system is different from the business processes and information needed by the organization [14].

This research was conducted at Royal Prima Medan Hospital because, based on the results of a pre-survey conducted by researchers, Royal Prima Medan Hospital has implemented a billing system for recording payments for outpatients and inpatients. The process is like this: all patients (General/ASKES/BPJS/JAMKESMAS) must register at the counter, and then the patient goes to the required room. The patient brings medical services in the form of paper containing data on actions and health services provided to the patient to the billing section to be immediately inputted into the finance section to be checked. The data arrives at the accounting section, where the accounting officer will match the data from medical services with the computer data inputted by the billing officer. However, its implementation still needs to be fully integrated based on the results of interviews conducted with medical officers and patients at Royal Prima Medan Hospital.

According to the background description, this study concerns how RSU Royal Prima Medan's hospital billing system records outpatient and inpatient payments using the parts technique. This study examines how RSU Royal Prima Medan implements the hospital billing system to record outpatient and inpatient payments using the parts technique.

## METHOD

Quantitative research is a method based on positivist philosophy that is used to study a particular population or sample. Data is collected using research instruments and quantitative or statistical analysis to test the established hypothesis [15]. This type of research is called mixed-methods research (combination method) because it combines quantitative and qualitative methods to be used in a research activity to obtain more comprehensive, valid, reliable, and objective data [16].

This research will be conducted at the Royal Prima Medan Hospital at Jl. Ayahanda No. 68A, Sei Putih Tengah Village, Medan Petisah District, Medan City, North Sumatra Province. This research was conducted from when the author conducted a pre-survey until completion from March 2023 to December 2023. The population is the studied research subject or object [17]. This study's population consists of two parts: the population for qualitative methods, which can be interpreted as informants, and the quantitative population used, which is the entire management of RSU Royal Prima Medan. The quantitative population used is the outpatients and inpatients at RSU Royal Prima Medan in the last three months, totaling 1,285 patients.

A sample is part of the population number and attributes. Sample size determines the size of a study's sample, but qualitative research samples are

often called informants [16]. Research informants give situational and background information. Study informants are people who know the issues. Seven informants— inpatient cashiers, outpatient cashiers, inpatient billing officers, and outpatient billing officers—were questioned in this study.

The quantitative method employed RSU Royal Prima Medan outpatients and inpatients with unintentional sampling since the researcher handed questionnaires to everyone. Incidental sampling, or accidental sampling, uses any patient who unintentionally meets the researcher as a sample if they are suitable data sources [16]. In this study's questionnaire, respondents met these criteria: the patient is not in an emergency, awake, inpatient, or outpatient, and if the patient is a child, his parents or family care for him during treatment. The patient speaks well, and the researcher understands. The patient will answer the questionnaire if he cannot communicate adequately, and his family can represent him.

The sampling used in this study was adjusted based on the theory of Hair et al., which suggests a sample size provision of 100–200 for the maximum likelihood (ML) estimation technique to meet the criteria for the minimum number of samples [18]. So, researchers will use 200 samples. Researchers collect primary and secondary data to draw quantitative conclusions. The primary data for research are interviews and questionnaire responses from informants and respondents. Researchers directly observe RSU Royal Prima Medan's conditions and criticize its management. The questionnaire will be presented to RSU Royal Prima Medan outpatients and inpatients.

Quantitative data analysis involves gathering data from questionnaire sheets, validating their completeness, providing codes for the variables researched, and transforming respondent names into numbers. The researcher enters each respondent's coded answers into SPSS to evaluate univariate. Meanwhile, for activities in qualitative data analysis, the Miles and Huberman model method is used, where data analysis in qualitative research is carried out when data collection takes place and after data collection is completed within a certain period. Activities in qualitative data analysis are carried out interactively and continue continuously until complete so that the data is saturated [16].

**RESULT AND DISCUSSION**

**Quantitative Research Results**

Patients participated in the quantitative research component of this study. Here is the breakdown of the respondent's attributes.

Table 2. Frequency Distribution of Respondents

Patients		N = 100	%
Gender	Male	75	37.5
	Female	125	62.5
Age	≤ 25 years old	9	4,5
	25-40 years old	163	81,5
	44-55 years old	28	14,0

Table 2 explains the gender distribution of respondent attributes. A total of 200 people participated in this study: 75 (or 37.5%) male and 125 (or 62.5%) female. These data clearly show that women comprised most of the study's respondents. Table 2 shows how the respondent characteristics are distributed by age. The study included 200 participants, with 9 individuals (4.5%) falling into the under-25 age group, 163 individuals (81.5%) in the 25–40 age group, and 28 individuals (14.0%) in the 41–55 age group. As can be seen from these findings, the bulk of the participants in this survey were between the ages of 25 and 40.

**Validity & Reliability Test Results**

The questionnaire statement is valid if the value of  $r_{count} \geq r_{table}$  is positive [23]. The questionnaires for the validity test were distributed to 200 patients at RSU Royal Prima Medan. With  $n = 200$ ,  $df = n - 2 = 200 - 2 = 198$  then at  $\alpha = 0.05$   $r_{table} = 0.139$  is obtained. According to the findings of the validity test in this study, as shown in Table 3, all questions related to performance, information, economics, control, efficiency, and service have  $r_{table}$  values greater than 0.139 at alpha 0.05. This indicates that all the questions are considered valid. Similarly, the reliability test results suggest that all Cronbach Alpha values for performance, information, economics, control, efficiency, and service are more significant than 0.70. This implies that the questionnaire used in this study has achieved satisfactory reliability.

**Univariate Analysis Results**

Table 3. Respondent's Answers Regarding PIECES Aspect Level Implementation

Implementation of PIECES	Respondents' Answers	N = 200	%
Performance Aspect	Effective	172	86,0
	Not effective	28	14,0
Information Aspect	Effective	173	86,5
	Not effective	27	13,5
Economic Aspect	Effective	180	90,0
	Not effective	20	10,0
Control Aspect	Effective	174	87,0
	Not effective	26	13,0
Efficiency Aspect	Effective	167	83,5
	Not effective	33	16,5
Service Aspect	Effective	171	85,5
	Not effective	29	14,5

The implementation of PIECES, shown in Table 5, states that the results of respondents' answers to the hospital billing system in recording payments for outpatients and inpatients at Royal Prima Medan Hospital showed that the majority answered that it was effective, able to support the billing system's performance, and proved to be objective as assessed by its users.

**Qualitative Research Results**

Table 4. Research Informant Data

Informant	Job Position	Age	Gender	Education	Working Duration
Informant 1	Inpatient Cashier	42 years old	Female	Bachelor	12 years
Informant 2	Inpatient Cashier	37 years old	Female	Bachelor	3 years
Informant 3	Outpatient Cashier	35 years old	Female	Bachelor	5 years
Informant 4	Outpatient Cashier	32 years old	Female	Bachelor	4 years
Informant 5	Inpatient Billing Officer	38 years old	Female	Bachelor	6 years
Informant 6	Inpatient Billing Officer	36 years old	Male	Bachelor	5 years
Informant 7	Outpatient Billing Officer	37 years old	Female	Bachelor	7 years

**Implementation of PIECES (Performance) Aspect Level of Hospital Billing System in Recording Outpatient and Inpatient Payments at Royal Prima Medan Hospital**

The study on the performance of the hospital billing system for recording payments for outpatients and inpatients at RSU Royal Prima Medan found that it has been working well. The system's performance aligns with what is needed, making it easy for users to access it quickly and easily. This aligns with what informants said about how the menus and navigation in the billing system for recording patient payments make it easy to use the program.

Informant 1: *"Yes, it makes things easier."*

Informant 2: *"It makes things easier because the menu choices are complete and according to needs."*

Informant 3: *"Yes, it makes things easier because the menus are adjusted to needs."*

Informant 4: *"Yes, the current menu choices and navigation are helpful."*

Informant 5: *"Yes, it makes things easier."*

Informant 6: *"It makes things easier and easier because the complete menu choices make work effective and efficient."*

Informant 7: *"Yes, menus and navigation are available."*

The respondents' answers indicate that the hospital billing system does an excellent job of keeping track of outpatient and inpatient payments. The menus and navigation make it easy for users to navigate and record patient payments. Speed: The performance part of the

PIECES billing system has also worked well. This is supported by the fact that most people interviewed about the speed of billing access said it was good.

Informant 1: *"Good."*

Informant 2: *"Good."*

Informant 3: *"Very good."*

Informant 4: *"The speed is good."*

Informant 5: *"The speed is good."*

Informant 6: *"Very good."*

Informant 7: *"Yes, good."*

These results suggest that implementing the PIECES (Performance) aspect level of the hospital billing system to record payments for outpatients and inpatients at RSU Royal Prima Medan has been effective.

**Implementation of PIECES (Information/data) Aspect Level of Hospital Billing System in Recording Outpatient and Inpatient Payments at Royal Prima Medan Hospital**

An investigation into the use of the PIECES (Information) level of the hospital billing system to record payments for outpatients and inpatients at RSU Royal Prima Medan found that the information worked. This was in line with what the people who were interviewed for the study said: the information shown on the billing system for recording patient payments was clear, complete, reliable, and easy to understand. The insider's answers about the quality of the information shown in the billing system for keeping track of patient payments back up these results, as the informant said:

Informant 1: *"Yes, the quality of the information is very good and easy to understand."*

Informant 2: *"It's good enough."*

Informant 3: *"Very good."*

Informant 4: *"Overall, it's good enough."*

Informant 5: *"Good."*

Informant 6: *"The quality is good."*

Informant 7: *"It's good."*

These results suggest that implementing the PIECES (Information) aspect level of the hospital billing system to record payments for outpatients and inpatients at RSU Royal Prima Medan has been effective.

**Implementation of PIECES (Economic) Aspect Level of Hospital Billing System in Recording Outpatient and Inpatient Payments at Royal Prima Medan Hospital**

The study on the use of the PIECES (Economic) level of the hospital billing system to keep track of payments for both outpatients and inpatients at RSU Royal Prima Medan shows that the economy works. This is supported by the study's findings, which show that having a billing system for keeping track of patient payments makes programs more accessible to finish, information on how to submit files or follow service procedures is precise and quick, helps the hospital run each program better, and lowers the costs of running each program. This is backed up by the answers of informants, who mostly agreed with what was said

earlier.

Informant 1: *"Very beneficial."*

Informant 2: *"Of course, because the billing system is designed to be beneficial in implementing hospital programs."*

Informant 3: *"Yes."*

Informant 4: *"Of course, the system helps run work more effectively and efficiently."*

Informant 5: *"Very beneficial."*

Informant 6: *"Yes."*

Informant 7: *"I think it will benefit the hospital."*

These results suggest that the implementation of the PIECES (Economic) aspect level of the hospital billing system in recording payments for outpatients and inpatients at RSU Royal Prima Medan has been effective.

#### **Implementation of PIECES Aspect Level (Control) of Hospital Billing System in Recording Outpatient and Inpatient Payments at Royal Prima Medan Hospital**

One of the most important things to consider when setting up a control system is that it needs to be well-controlled to work as expected. The same applies when setting up a hospital billing system at RSU Royal Prima Medan to record payments for outpatients and inpatients. This system must also be well-controlled to keep data safe so no one else can use it. It also needs to be easy to use and effective. The study's results show that the hospital billing system at RSU Royal Prima Medan has reasonable control over how outpatients and inpatients pay. This is supported by the informant's statement about system security, which says that the data shown in the billing system for recording patient payments cannot be easily changed by people outside the hospital.

Informant 1: *"No, because in recording, data or information is stored in the system."*

Informant 2: *"No, because each user has their password, which aims to minimize data manipulation."*

Informant 3: *"No, in using this system, only officers with passwords can use or open this system."*

Informant 4: *"No, as far as I know, there is a security system."*

Informant 5: *"No, because the security on the system is very tight where only officers can access it."*

Informant 6: *"Yes."*

Informant 7: *"No, because access is limited."*

All informants said the quality of the security of the billing system for recording patient payments is good, in line with the informant's answer. The following are

statements from informants in this study.

Informant 1: *"Yes."*

Informant 2: *"So far it is."*

Informant 3: *"Yes."*

Informant 4: *"Yes."*

Informant 5: *"It's good."*

Informant 6: *"So far, it's good. Hopefully, it can be maintained and improved."*

Informant 7: *"So far, it's good enough."*

These results suggest that implementing the PIECES (control) aspect level of the hospital billing system to record payments for outpatients and inpatients at RSU Royal Prima Medan is effective.

#### **Implementation of PIECES (Efficiency) Aspect Level of Hospital Billing System in Recording Outpatient and Inpatient Payments at Royal Prima Medan Hospital**

Efficiency is all about how to get the most work done with the least effort. When RSU Royal Prima Medan put a hospital billing system in place to keep track of payments for outpatients and inpatients, the PIECES aspect level in the efficiency category was met and was effective. This means that the hospital billing system for outpatients and inpatients can give clear information about what to do, be used most effectively in patient care, speed up work, be easy to use, and produce output that matches the time and materials needed. This conclusion is supported by the answers given by sources in interviews with the statement: Is the way the billing system for recording patient payments used to carry out a program?. The statements from each informant show that the billing system for recording patient payments gives results that align with the time and materials needed.

Informant 1: *"Yes."*

Informant 2: *"Yes."*

Informant 3: *"Yes."*

Informant 4: *"Quite appropriate."*

Informant 5: *"Yes."*

Informant 6: *"Yes."*

Informant 7: *"Yes."*

The answers from all informants who answered yes indicate that the efficiency dimension in implementing the hospital billing system level in recording payments for outpatients and inpatients at Royal Prima Medan Hospital has been fulfilled. From these results, it can be concluded that implementing the PIECES (Efficiency) aspect level of the hospital billing system in recording payments for outpatients and inpatients at Royal Prima Medan Hospital has been effective.

#### **Implementation of PIECES (Service) Aspect Level of Hospital Billing System in Recording Outpatient and Inpatient Payments at Royal Prima Medan Hospital**

When running a system, service is one of the most important things to look at. The hospital billing system level is also used to keep track of payments for both outpatients and inpatients at RSU Royal Prima Medan. The service in this study shows that the billing system has an easy-to-understand

operational guide, that the information in the billing system for recording patient payments is easy to get to, that each menu in the billing system for recording patient payments is easy to get to, that the billing system has a filter feature for searching, and that the program in the billing system for recording patient payments has an automatic correction system (autocorrect) for the keywords. The billing system service at RSU Royal Prima Medan clearly shows that the current service can help users. This is supported by the informant's statement that the billing system for keeping track of patient payments is straightforward and effective.

Informant 1: *"The billing system for recording patient payments is straightforward and efficient."*

Informant 2: *"Yes, because in its implementation, officers are always given training to maximize the use of the billing system for recording payments."*

Informant 3: *"Yes"*

Informant 4: *"I feel that using the billing system is easy and efficient."*

Informant 5: *"Yes."*

Informant 6: *"Very easy and efficient."*

Informant 7: *"Yes, easy and efficient."*

These results suggest that implementing the PIECES (Service) aspect level of the hospital billing system in recording payments for outpatients and inpatients at RSU Royal Prima Medan has been effective.

The study on the Implementation of the PIECES (Information Aspect) level of the hospital billing system for recording payments for outpatients and inpatients at RSU Royal Prima Medan showed that among patients who answered the quantitative questions, 173 (86.5% of those surveyed) said that the implementation of the PIECES (Information Aspect) level of the hospital billing system for recording payments for outpatients and inpatients at RSU Royal Prima Medan was practical. In comparison, 27 (13.5%) said it was ineffective. It's clear from these results that most of the people who answered said it worked well to use the PIECES (Information Aspect) level of the hospital billing system to keep track of payments for both outpatients and inpatients at RSU Royal Prima Medan.

This result is in line with the research results of Muslih et al. (2021), who found that the PIECES system used by the company has many advantages and strengths that support the running of the company's business [24]. Research by Risqullah et al. (2023) in Dr. R. Soedarsono Regional Hospital, Pasuruan City, East Java, found that the billing system for recording patient payments is clear, complete, by applicable provisions, reliable, and easy to understand so that the PIECES application (Information Aspect) runs well and is beneficial for the hospital [25]. From these results, it can be concluded that implementing the PIECES

(Information Aspect) level of the hospital billing system in recording payments for outpatients and inpatients at Royal Prima Medan Hospital has been effective.

The study examined how the PIECES (Economic Aspect) aspect level of the hospital billing system recorded payments for outpatients and inpatients at the Royal Prima Medan Hospital. The respondents were patients, and 180 said the system worked well, which is 90% of the total. Twenty people said it didn't work, which is 10% of the total. It's clear from these data that most of the people who answered said it worked well for the Royal Prima Medan Hospital to use the PIECES (Economic Aspect) level of the hospital billing system to keep track of payments for both outpatients and inpatients.

This result aligns with the research result at RSUPN by Dr. Cipto Mangunkusumo (2020), which shows that the hospital service uses a management information system that makes it relatively easy for users to do their jobs [22]. This research is different from the research conducted by Alfiansyah et al. (2022) for the economic variable, which is 67.3%, and it was found that four variables affect user satisfaction: content, format, timeliness,

and ease of use. In contrast, the accuracy variable does not affect user satisfaction [26]. In this study, implementing the PIECES (Economic Aspect) aspect level of the hospital billing system in recording payments for outpatients and inpatients at RSU Royal Prima Medan showed that the economy was effective. It is proven by the results of the study show that with the billing system for recording patient payments, programs are more accessible to complete, information on submitting files or service procedures is clear and fast, provides benefits in the implementation of each program that will be run by the hospital, saves operational costs for each program, where the statement is justified by the answers of informants who mostly agree with the statements that have been described previously. From these results, it can be concluded that implementing the PIECES (Economic Aspect) aspect level of the hospital billing system in recording payments for outpatients and inpatients at RSU Royal Prima Medan has been effective.

A study was done on implementing the PIECES (Control Aspect) level of the hospital billing system for recording payments for outpatients and inpatients at RSU Royal Prima Medan. The respondents were patients, and 174 (87%) said implementing the PIECES (Control Aspect) level of the hospital billing system for recording payments for outpatients and inpatients at RSU Royal Prima Medan was effective. Only 26 people (13%) said it could have been more effective. It's clear from these results that most of the people who answered said it worked well for RSU Royal Prima Medan to use the PIECES (Control Aspect) level of the hospital billing system to keep track of payments for both outpatients and inpatients.

This result differs from the research conducted by Heriani et al. (2022) for the PIECES control aspect; implementing a management information system has yet to control the

information displayed to each user [27]. However, management information systems can facilitate improving outpatient registration services in hospitals [26], [27], [28]. In this research, control in the hospital billing system in recording outpatient and inpatient payments in Royal Prima Medan Hospital is effective; this is reinforced by the informant's statement regarding system security about data presented in the billing system for recording patient payments cannot be easily changed by an outside party. Implementing the control system is one of the important things that must be considered because of good control. The system will run well and according to our expectations. also, in implementing a hospital billing system for recording outpatient and inpatient payments in Royal Prima Medan Hospital, there must be good control, such as guaranteed data security. The system cannot be used by anyone, and its use is effective and easy to access. From this result, it can be concluded that implementing the PIECES level (control aspect) of the hospital billing system in recording outpatient and inpatient payments in Royal Prima Medan Hospital is effective.

A study was done on implementing the PIECES (Efficiency aspect) level of the hospital billing system for recording payments for outpatients and inpatients at RSU Royal Prima Medan. The respondents were patients, and 167 (83.5% of the total) said implementing the PIECES (Efficiency aspect) level of the hospital billing system for recording payments for outpatients and inpatients at RSU Royal Prima Medan was effective. Only 33 said it wasn't effective, which is 16.5%. The results show that most of the people who answered said it was compelling that the RSU Royal Prima Medan hospital billing system was set up at the PIECES (Efficiency aspect) level to record payments for outpatients and inpatients.

This finding relates to what Risqullah et al. (2023) and Ambarita (2021) found: using an information system can help an organization's different tasks work together better [25], [29]. This differs from the study by Nugraha et al. (2021), which found that PIECES can cause trouble in some areas [30]. As a result of this study on the Royal Prima Medan Hospital's implementation of the hospital billing system level for recording payments for outpatients and inpatients, the PIECES aspect level in the efficiency category has been met or is effective. This means that a hospital billing system can provide relevant information with clear rules, be used optimally for inpatient services, speed up job completion, be easy to use, and produce output that aligns with the time and materials needed. It was clear from the yes answers that the speed requirement for the Royal Prima Medan Hospital's hospital billing system has been met when keeping track of payments for outpatients and inpatients. In conclusion, these data show that the PIECES level of the hospital billing system has been successfully implemented at RSU Royal Prima Medan to record payments for outpatients and inpatients.

The study examined how the PIECES level (Service aspect) of the hospital billing system was used to record payments for outpatients and inpatients at RSU Royal Prima Medan. The respondents were patients, and 171 of them (85%) said it worked, while only 29 (14%) said it didn't. The results show that most of the people who answered said it worked well for RSU Royal Prima Medan to use the PIECES level (Service aspect) of the hospital billing system to keep track of payments for both outpatients and inpatients.

This finding fits with other studies that have found that using modern information technology has greatly helped and is useful for sorting institutional problems, opportunities, and the goals of information systems for agencies to carry out different operational tasks [9], [14], [20], [22], [31], [32]. The study's results show that the billing system has an easy-to-understand operational guide, that

the information in the billing system for recording patient payments is easy to get to, that each menu in the billing system for recording patient payments is easy to get to, that the billing system has a filter feature for searching, and that the program in the billing system for recording patient payments works automatically to correct keywords that are typed. Based on the services offered by the RSU Royal Prima Medan billing system, it's clear that the current service can help users. This is supported by the informant's statement that the billing system for keeping track of patient payments is straightforward and effective. Based on these results, the PIECES level (Service aspect) of the hospital billing system has worked well at RSU Royal Prima Medan in tracking payments for both outpatients and inpatients.

## CONCLUSSION

Based on the study's results, it can be concluded that the implementation of PIECES in the management information system at RSU Royal Prima Medan has been implemented well. However, several aspects of the system need to be improved to improve system performance. Among them are the still low level of information services from the hospital, their lack of accuracy in the hospital billing system, which is considered expensive, their weak control over complaints from several patients, and the billing system for outpatients and inpatients still needs to be improved.

The study results found that system users are effective in helping with tasks and have utility because they are integrated with other departments to improve and develop the management information system. System users feel they are given convenience when providing health services such as searching for patient files, making bills, and making reports.

There are some suggestions for how the management of Royal Prima Medan Hospital can improve the system so that it works better and is easier to use in the future. For example, officers should be trained, evaluated, and supervised to reduce mistakes made when using the system so patients can get the best care possible. Hospital officers should keep learning how to run the system,

especially for IT officers, to learn how to get the most out of nurses in the system and on the network. This way, people can use the system even better in the future without dealing with network errors. For future research, several other variables, such as service quality and patient satisfaction, can be combined.

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