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Analysis of User Needs in Designing Boarding House Accounting Information Systems Using the PIECES Framework

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A B S T R A C T

The boarding house X has 93 rooms with different facilities so that it is necessary to design a boarding house accounting information system to manage the business process. Before designing a system, it is necessary to analyze system needs as a framework that can help solve problems and categorize needs. The PIECES Framework method (Performance, Information and Data, Economics, Control and Security, Efficiency, Service) is useful for measuring the functional and non-functional needs of the accounting information system to be built. The results of this study show the overall average value of the importance of the six PIECES framework domains is 4.45 with the predicate VERY IMPORTANT. The data was obtained from 50 respondents who were residents of boarding house for daughter X. From this data, it can be concluded that it is necessary to design a boarding house accounting information system.

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INTRODUCTION

Migrants and nomads from outside the area to study or work are driving the demand for housing or temporary housing is high. One option chosen is to rent a room in a boarding house building. A boarding house is a home-based business that offers a place or room for rent to those who need it (Budiman et al., 2019). Boarding houses have several advantages, namely facilities at more affordable prices than hotels or inns (Sanjaya &; Hesinto, 2018). Boarding houses are more familiar to use as temporary residences, because most of them are rented for a long period of time.

Quoted from the boarding house marketplace website, namely Mamikos.Com, there are around 3,299 boarding houses available in Malang City. As a city of education, there are at least 59 universities established in Malang City (Malang City Government, 2022). If it is estimated that all new students from both public and private universities, there are more than 100 thousand new students who will come to Malang City in 2023 (Fikyansyah, 2023). From these data, it can be seen that the need for temporary housing such as boarding houses will definitely increase every year.

With the huge potential of the boarding house business, boarding house owners try to complete the best facilities and services in order to compete with other boarding houses. As a boarding house owner, of course, he wants to have loyal residents so that the survival of his boarding house can be guaranteed. Therefore, boarding house owners must have a strategy, one of which is to master data and information. The purpose of the boarding house information system is to provide complete information about the availability of rooms, locations and facilities of boarding houses in accordance with the criteria desired by prospective boarding house residents and to facilitate reservations and payment of boarding house rent (Handayani &; Lubis, 2014).

The X Boarding House which is strategically located near the campus area in Malang City. The boarding house has 93 rooms that really need a tool to manage the boarding business so that it can run effectively and efficiently. The absence of archiving records of room rental payments, data on the availability of boarding rooms, the absence of records of boarding house bill expenditures, frequent loss of boarding house occupant data forms and boarding facility complaint services that are still limited to whatsapp groups. Manual archiving can compromise a business's financial data (Haseeb et al., 2019). Because a business or business must constantly monitor and update its financial activities (Mikesell, 2018). This causes the owner to be unable to see the progress or track the finances of the boarding house business. The development of an accounting information system tool is needed to be able to support the boarding house business.

This information system can produce evidence-based information that is used as an effort to increase business competitiveness for both boarding house entrepreneurs and services to boarding house tenants. Systems can help prospective tenants monitor occupied, damaged, or unallocated rooms, can help tenants pay rent, and can help landlords with financial reporting (Mursid & Arman, 2021).

The first step in developing a system is to analyze system requirements (Allan et al., 2020). System requirements analysis is used as a framework that can help solve problems and categorize needs (Supriyatna, 2019). The PIECES Framework method is useful for measuring the functional and non-functional requirements of the accounting information system to be built (Wahyuni et al., 2021). The framework uses six domains used to analyze information systems, namely from the aspects of Performance, Information and Data, Economics, Control and Security, Efficiency, and Service. This study aims to analyze the need for boarding house information systems in The X Boarding House using the PIECES Framework.

LITERATURE REVIEW

Boarding House / Rumah Kost

The origin of the word "Kost" is from the Dutch "In de Kost". In the Big Indonesian Dictionary (KBBI) the word "Kost" means indekost. The definition of "In de Kost" is actually "eating in" but if the phrase is interpreted further, it can also mean "living and eating" in the house where the hitchhiker lives. Over time, Indonesian people called the term "in de kost" abbreviated to "Kost". According to Law No. 1 of 2011 concerning housing and residential areas in Article 1 paragraph 8 it is stated that this boarding house refers to a commercial house. The meaning of a commercial house is a house that is organized with the aim of obtaining profits (President of the Republic of Indonesia, 2011).

Boarding houses are places that can be rented by migrants who migrate to the area within a certain period of time, migrants from various regions come to other cities with specific purposes such as studying or working (Yudhanto et al., 2016). Boarding house residents pay rental fees, so that the owner will generate business profits from the rental service (Setiawan et al., 2021). Boarding house owners can generate income from the cost of renting each room, making it a potential investment or passive income.

Information System

The word system comes from Greek and Latin in that it refers to an entity consisting of parts or elements that are connected to allow information, resources, or energy to flow to achieve a goal. A system can be understood as an organized set or collection of elements or domains that interact and depend on each other. The system is designed to improve information processing (Agustin, 2018). The purpose of building an information system is to assist the management of the organization in making choices and producing the right information (Steven & Christianto, 2021).

So before developing a system, you must know the differentiator between parts or elements. Here are the characteristics of a system (Hutahaean, 2014):

1. Boundary, or the boundary of a component or components that are both inside and outside the system. System limits reveal the extent of the system.
2. Environment, which refers to anything outside the system and offers assumptions, limitations, and inputs to the system.

3. Input, or input that refers to resources (data, raw materials, equipment, and energy) that are fed into the system from outside.
4. Resources or items (information, reports, documents, computer screen displays, finished goods) generated and provided by system actions to the system environment.
5. Components or system components, especially actions or procedures that convert inputs into semi-finished products (outputs).
6. Interface, or liaison is the point of interaction between the system or component parts with each other
7. Storage, which is a space that is regulated for use to store raw materials, energy, information, and other things.
8. System Objectives are the inputs that the system needs and the outputs that the system will produce are actually determined by its objectives. If a system achieves its mission, it is said to be successful (difference in goals and objectives) around it.

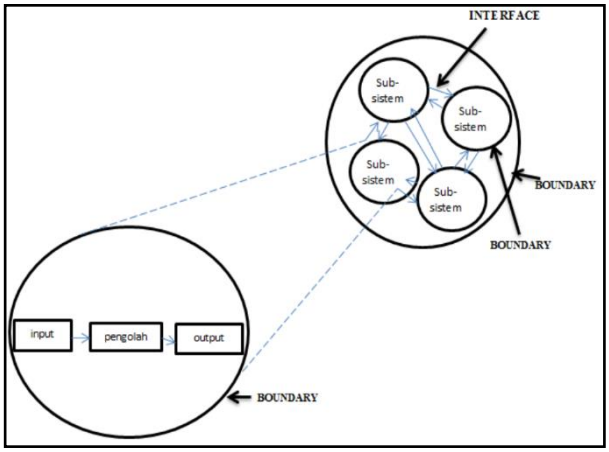

Figure 1. Characteristics of a System
Source: Hutahean, p. 5 (2014)

Accounting Information System

Accounting Information System (AIS) is processing financial transactions and non-financial transactions that have a direct impact on the processing of financial transactions (Hall, 2011). AIS can be interpreted as a system that collects, records, stores and processes data to produce information for decision makers. AIS includes people, a number of procedures and instructions, data, software, information technology infrastructure, and controls and security measures (Romney; et al., 2014). From this understanding, it can be concluded that the accounting information system is a set of sub-systems that are interrelated with each other that provide information to manage all organizational activities such as making forms, managing procedures, records and reports, processing transactions, internal control, the use of information technology, and the development of information technology needed for decision making.

Benefits of implementing AIS according to Faiz (2021). AIS automation can store and retrieve business data without the need for physical documents.

As long as all transactions have been inputted into a system. In addition, according to the main objective of AIS implementation is to create internal control institutionalized in a healthy management culture (Suarn, 2018). AIS is also useful for:

1. Collect and store data on business operations and financial activities
2. Process data into information that can be used in making business decisions
3. Exercise control over all aspects of the business

PIECES Framework

The PIECES framework is a method used to categorize problems, opportunities, and instructions included in the scope definition analysis and system design sections. (Tullah & Hanafri, 2014). The PIECES Framework analyzes information systems using six domains, namely:

1. Performance
   Determining whether a system is working well, the speed, accuracy, and number of data findings generated are measured. There are two components that should be considered according to Supriyatna (2019) as a reference or guide when evaluating the performance of a system.
   - Can the system successfully execute multiple commands within a certain period of time without failure?
   - To what extent can a system respond quickly or slowly to commands or transaction requests
2. Information and Data
   Determine how much and how clearly information is generated from a search. Factors to consider when evaluating systems related to data and information include:
   - Output, the extent to which the system can produce results, including the presentation of information needed by the business.
   - Input, how reliable the system is in collecting data and then processing the data until it becomes useful information.
   - Data Storage, the reliability of the system in storing and accessing data on storage media.
3. Economics
   Determine the success of system implementation in terms of finance and costs incurred. From an economic point of view, there are two components to consider when evaluating a system:
   - Cost is an assessment of the level of expenditure required after a company uses or implements the use of an information system.
   - Profit, is an assessment of the ability to use information systems to provide benefits to the business so that the business can develop in a better direction.
4. Control and Security
   To know the extent of supervision and control carried out so that the system can function properly. Therefore, it is necessary to control and security of information systems by taking into account problems related to system control and security, in particular:
   - The control and security system is too weak.

- System controls and security are too sophisticated or complicated.

5. Efficiency
   The information system used must certainly have greater value than using the system manually. This advantage lies in the level of operational efficiency of the information system. Reference documents or instructions used to analyze and evaluate a system in terms of its effectiveness compared to using a manual system, specifically:
   - Employees, machines or computers when used will waste too much time or waste in the use of company equipment and equipment.
   - When carrying out a task or job, if the effort required to complete the activity becomes excessive.
6. Service
   Understand how services are performed and the challenges associated with those services. Therefore, some factors that are necessary and considered important to the service are:
   - The system must be able to provide the right information according to user needs.
   - The results obtained from a system must be consistent.
   - The information presented must be trustworthy so that it can trust the information obtained by users.
   - The system built or used must be easy to learn, understand and use by users so that they feel comfortable in using the information system.
   - The system must be flexible and compatible.

Tabel 1. Domain PIECE framework

No.	Domain	Number of Statements
1	Performance	4
2	Information and Data	4
3	Economics	2
4	Control and Security	1
5	Efficiency	2
6	Service	2
	Total	15

METHODOLOGY

This study used descriptive analysis method using quantitative approach. This research will be carried out to tenants at The X Boarding House located in Malang City. The type of data to be used in this study is in the form of quantitative data. Quantitative data in this study are data obtained through questionnaires. A questionnaire is a data collection tool used to collect large amounts of data (Ismail & AlBahri, 2019). This is done by providing respondents with a structured series of questions about their responses to the various domains studied (Muchlis et al., 2019). This study involved 50 correspondents from a total of 93 residents of The X Boarding House, the majority of whom were female students. The statement that will be prepared to determine the needs of boarding house tenants of X Boarding House will later use the PIECES Framework analysis technique.

To calculate the satisfaction percentage index and urgency level, researchers use the following formula by Wibowo in Supriyatna, (2015):

$$RK = \frac{JSK}{JK}$$

With:
RK = Average Questionnaire
JSK = Number of Questionnaire Scores
JK = Number of Questionnaires

After knowing the value of the percentage index of user importance, researchers can draw conclusions about user needs for the system using the Likert scale with value categories, namely:

Tabel 2. Likert Scale of Interest Value

Answer Options	Score
Very Important	5
Important	4
Netral	3
Not Important	2
Very Unimportant	1

Meanwhile, to determine the level of satisfaction using the model defined by Kaplan and Norton in Supriyatna (2015) with the following levels:

Tabel 3. Average Important Rating

Predicate of Importance	Score
Very Important	4,20 – 5,00
Important	3,40 – 4,19
Netral	3,39 – 2,60
Not Important	2,59 – 1,80
Very Unimportant	1,79 – 1,00

RESEARCH RESULT

Analysis of the level of urgency or importance in designing a Website-Based Boarding House information system is formulated with the initials of the PIECES Framework which consists of Performance, Information, Economic, Control, Efficiency and Services. The data obtained was in the form of the results of distributing questionnaires to 50 respondents who submitted statements from the google form. Here are the results of the analysis.

Performance Analysis

The table below explains the statements and results of respondents related to the performance domain with the following details.

Tabel 5. Performance domain-related statements

No.	Domain	Statements
1	Performance	I need a system that makes it easy to access boarding house services quickly

2		I need a way to reserve a boarding room according to my needs
3		I need a system that can respond to cancellation orders and requests for boarding room booking transactions quickly and accurately
4		I need a system that can connect between boarding tenants and boarding house owners/managers.

Data processed (2024) and (Fatoni et al., 2020) modified

Tabel 6. Respondents related to Performance domain

Domain	Statement No.	Total Score
Performance	1	230
	2	226
	3	219
	4	227
		902
	Average	**225,50**
	Average of questionnaires	**225,50 ÷ 50 = 4,51**
	Predicate	**Very Important**

Data processed (2024)

Based on the calculation of the average number of importance levels, a value of 4.51 was obtained in the Performance domain. When combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of need for the design of boarding house information systems is included in the category of VERY IMPORTANT. So, this shows a positive indication that users need a performance that can help in booking boarding rooms in real-time from designing a boarding house accounting information system.

Information and Data Analysis

The table below describes the statements and results of respondents related to the Information and Data domain with the following details:

Tabel 7. Information and Data domain-related statements

No.	Domain	Statements
1	Information & Data	I need information on boarding house rental payment
2		I need service information and boarding house complaints
3		I need information on boarding house rental prices based on certain criteria
4		I need information on the availability of boarding rooms along with the facilities available

Data processed (2024) and (Fatoni et al., 2020) modified

Tabel 8. Respondents related to the Information and Data domain

Domain	Statement No.	Total Score
Information & Data	1	215
	2	207
	3	222
	4	226
		807

Average	**217,50**
Average of questionnaires	**217,50 ÷ 50 = 4,35**
Predicate	**Very Important**

Data processed (2024)

Based on the calculation of the average number of importance levels, a value of 4.35 was obtained in the Information and Data domain. When combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of need for the design of boarding house information systems is included in the category of VERY IMPORTANT. So this shows a positive indication, namely users need information related to data and information such as room reservations, room types and room rental prices from designing a boarding house accounting information system.

Economics Analysis

The table below explains the statements and results of respondents related to the Economics domain with the following details.

Tabel 9. Statement related to the Economics domain

No.	Domain	Statements
1	Economics	I need a rental payment for a boarding house
2		I need an invoice as a sign of a rental payment transaction

Data processed (2024) and (Fatoni et al., 2020) modified

Tabel 10. Respondents related to the Economics domain

Domain	Statement No.	Total Score
Economics	1	212
	2	218
		430
	Average	**215**
	Average of questionnaires	**215÷ 50 = 4,30**
	Predicate	**Very Important**

Data processed (2024)

Based on the calculation of the average number of importance levels, a value of 4.30 was obtained in the Economics domain. When combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of need for the design of boarding house information systems is included in the category of VERY IMPORTANT. So that this shows a positive indication of economic aspects, especially in boarding payments, can be done effectively and efficiently as well as making invoices in real-time for the design of boarding house accounting information systems.

Control and Security Analysis

The table below describes the statements and results of respondents related to domain Control and Security with the following details.

Tabel 11. Pernyataan terkait domain Control and Security

No.	Domain	Statement

1	Control & Security	I want my personal information to be safe if I use an up-to-date system or application

Data processed (2024) and (Fatoni et al., 2020) modified

Tabel 12. Responden terkait domain Control and Security

Domain	Statement No.	Total Score
Control & Security	1	232
	Average of questionnaires	**232÷ 50 = 4,64**
	Predicate	**Very Important**

Data processed (2024)

Based on the calculation of the average number of importance levels, a value of 4.64 was obtained in the Control and Security domain. When combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of need for the design of boarding house information systems is included in the category of VERY IMPORTANT. So that this shows a positive indication with the control and security of personal data information on the design of the boarding house accounting information system.

Efficiency Analysis

The table below explains the statements and results of respondents related to the Efficiency domain with the following details.

Tabel 13. Statement related to the Efficiency domain

No.	Domain	Statements
1	Efficiency	I need a boarding house information system that can be accessed anywhere easily, quickly and accurately
2		I want boarding room reservations to be made in real-time without having to come to the boarding location directly

Data processed (2024) and (Fatoni et al., 2020) modified

Tabel 14. Respondents related to the Efficiency domain

Domain	Statement No.	Total Score
Efficiency	1	231
	2	220
		451
	Average	**225,50**
	Average of questionnaires	**225,50÷ 50 = 4,51**
	Predicate	**Very Important**

Data processed (2024)

Based on the calculation of the average number of importance levels, a value of 4.51 was obtained in the Efficiency domain. When combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of need for the design of boarding house information systems is included in the category of VERY IMPORTANT. So, this shows a positive indication, namely that users are greatly helped, especially efficiency in terms of time on designing boarding house accounting information systems.

Service Analysis

The table below describes the statements and results of respondents related to domain Service in the following details.

Tabel 15. Domain Service-related statements

No	Domain	Statements
1	Service	I need a rental payment system integrated using Bank Transfer service or through other digital wallets
2		I need relevant information and features related to boarding houses that are automated in real-time

Data processed (2024) and (Fatoni et al., 2020) modified

Tabel 16. Service-related domain respondents

Domain	Statement No.	Total Score
Efficiency	1	221
	2	223
		444
	Average	**222**
	Average of questionnaires	**222 ÷ 50 = 4,44**
	Predicate	**Very Important**

Data processed (2024)

Based on the calculation of the average number of importance levels, a value of 4.44 is obtained on the Service domain. When combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of need for the design of boarding house information systems is included in the category of VERY IMPORTANT. So this shows a positive indication, namely that users need services that are accommodated for the design of boarding house accounting information systems.

DISCUSSION

Based on the calculation of the average level of importance given to respondents who are residents of The X Boarding House as users of the design of the boarding house accounting information system. Of the 6 domains contained in the PIECES framework, there is one domain that obtained the highest value, namely the Control and Security domain with a value of 4.64 with the predicate VERY IMPORTANT. Similarly, the other five domains show the title of VERY IMPORTANT with an average value of 4.45. Further details can be seen in table 17 below.

Tabel 17. Recap of respondents' total calculations of analysis results using the PIECES Framework

No.	Domain	Average of questionnaires	Predicate
1	Performance	4,51	Very Important
2	Information and Data	4,35	Very Important
3	Economics	4,30	Very Important
4	Control and Security	4,64	Very Important
5	Efficiency	4,51	Very Important
6	Service	4,44	Very Important
	Average	**4,45**	

Data processed (2024)

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of data calculations and analysis of user needs, in this case boarding house residents with the aim of analyzing what menu or service I can accommodate in the accounting information system of the boarding house to be designed, it can be concluded into several parts, namely:

1. Based on the analysis method of the PIECES framework consisting of Performance, Information and data, Economics, Control and Security, Efficiency, and Service in analyzing user needs for the design of boarding house accounting information systems, the average value of the overall importance of each domain is 4.45 with the predicate VERY IMPORTANT.
2. The boarding house accounting information system based on the PIECES framework can provide an overview of user needs in this study are boarding house residents
3. The PIECES framework can be used to analyze the level of user needs, making it easier for researchers to design boarding house accounting information systems.
4. The results of calculations and analysis that have been carried out show that the boarding house accounting information system already has a general idea related to the menus and services needed by users can be accommodated in a system, but further information is needed to the needs of other users such as boarding house owners or boarding house management to improve the design of the system to be built

ACKNOWLEDGMENT

This study has limitations, namely only taking one boarding house object in analyzing user needs to design a boarding house accounting information system. Due to time constraints, several research objects are needed to perfect the analysis of the needs for the design of an information system.

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