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ANALYSIS OF NAGARI MANAGEMENT INFORMATION SYSTEM EVALUATION (SIMNAG) USING PIECES AND UAT METHODS

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ABSTRACT
SIMNag (Nagari Management Information System) Kamang Mudiak is an information system in the nagari Kamang Mudiak. The SIMNag includes the Andalas University Service Team's web-based nagari management information system. The SIMNag menu includes a Nagari Profile, which includes information about the nagari symbol, vision and mission, organizational structure, government history, nagari history, maps of the nagari, nagari achievements, legal products, and nagari potential wealth. Furthermore, information about public information is provided, specifically nagari news related to the 11 pillars of Nagari Tageh, which include tags for health, education, food, economy, faith, bundo kanduang tags, mudo paga nagari tags, and information-based tags Digital bills, disaster bills, security and social disease bills, and law bills are all examples of bills. The developer of this application's distinctive feature, in addition to the nagari tageh feature, is the convenience feature for nagari residents to input or update their own personal and family data online. As a result, data on nagari Kamang Mudiak residents will always be updated without the need to wait for the nagari apparatus to do so. Furthermore, residents at this SIMNag can file complaints with the nagari government about anything that occurs in the vicinity of the population. It is necessary to assess the SIMNag. It is necessary to evaluate the SIMNag that has been built in order to determine the feasibility of the SIMNag application in facilitating community services. This research employs two approaches: PIECES (Performance, Information/Data, Economy, Control, Efficiency, and Security) and UAT (User Acceptance Testing). The research results in an evaluation of the system that was built, namely the nagari information system (SIMNag) in the Nagari Kamang Mudiak.

Keywords : *SIMNAG, Management Information System, Evaluation System, PIECES , UAT*

1. Introduction

Governments all over the world want to provide the best possible service to their citizens. As a result, they provide a form of digital government for their citizens, allowing them to access information, communicate with government agencies, and participate in digital transactions as well as activities to advance their village or *nagari* in order to improve the welfare of the *nagari* people. E-government is the process of digitally connecting citizens with their government in order for them to gain access to information and services provided by government agencies (Farida et al., 2020; Saragik et el., 2018; Darmayunata et al., 2021).

The advancement of information technology has had a significant impact on public services in meeting the community's need for the speed and accuracy of services provided by the nagari. This advancement is thought to make human work easier in comparison to the manual process that is currently carried out by the *nagari* (Rahmania et al., 2020; Alfath et al., 2022).

Because of new developments such as Government to Business (G2B) and Government to Citizen (G2C), the development of the World Wide Web has drawn public attention to government (G2C). Historically, the government was viewed as a bureaucratic, slow, and immutable administrative process. As a result, at its core, e-government is about changing relationships with citizens, businesses, and other parts of government in order to improve the efficiency and effectiveness of public-sector services. E-government also makes public services more efficient because they no longer require face-to-face communication (Twizeyimana & Andersson, 2019; Mensah, 2022; Hooda et al., 2022; Mensah et al., 2020).

SIMNag (Nagari Management Information System) Kamang Mudiak is an information system in the *nagari* Kamang Mudiak. The SIMNag includes the Andalas University Service Team's web-based *nagari* management information system. The SIMNag menu includes a *nagari*

profile, which includes information about the *nagari* symbol, vision and mission, organizational structure, government history, *nagari* history, maps of the *nagari*, *nagari* achievements, legal products, and nagari potential wealth. Furthermore, information about public information is provided, specifically *nagari* news related to the 11 pillars of *Nagari Tageh*, which include health tags, education tags, food tags, economy tags, faith tags, *bundo kanduang* tags, *mudo paga nagari* tags, and information-based tags. Digital bills, disaster bills, security and social disease bills, and law bills are all examples of bills.

The developer of this application's distinctive feature, in addition to the *nagari tageh* feature, is the convenience feature for *nagari* residents to input or update their own personal and family data online. As a result, data on *nagari* Kamang Mudiak residents will always be updated without the need to wait for the *nagari* apparatus to do so. Furthermore, residents at this SIMNag can file complaints with the *nagari* government about anything that occurs in the vicinity of the population.

Depending on the purpose of the evaluation, information systems can be evaluated in a variety of ways and at various levels. Evaluation is useful for determining how a system's implementation was carried out. There are several types of evaluations that can be performed on information, including pre-implementation evaluation, implementation review evaluation, and operational evaluation (Eka Apriyanti, Siti Nurhayati, 2014). The evaluation is carried out to define how well the system can run: (1) assess the technical capabilities of the entire information system, and (2) assess the success and failure of the information system's operational implementation (Tullah & Hanafri, 2014). SIMNag implementation is evaluated by determining user satisfaction with the management information system, which can be determined using references such as the PIECES method, which includes performance, information, economics, efficiency, control, and service (Pradanthi et al., 2020). Each PIECES method category has several indicators, which are as follows: 1) performance (throughput, response time, audibility, communication prevalence, completeness, consistency, and fault tolerance); 2) information/data (accuracy, relevance of information, presenting information, and data flexibility); 3) economic (reusability and resources); 4) control (integrity and security); 5) efficiency (usability and maintainability); 6) service (accuracy, reliability, and simplicity) (Pradanthi et al., 2020; Purwati et al., 2021).

By employing PIECES as a system analysis tool, a detailed and comprehensive system will receive special attention, allowing the system's strengths and weaknesses to be identified and used as a reference for the company's future progress (Supriyatna, 2015).

UAT (User Acceptance Testing), also known as beta or end-user testing, is the process of testing software by users or clients to determine whether it is acceptable. After the functional, system, and regression tests have been completed, this is the final test. This test's primary goal is to validate the software against business requirements. End users who are familiar with the business requirements perform this validation. This testing is critical in determining whether all business requirements have been met before releasing the software to the market (Otaduy & Diaz, 2017; Wulansari et al., 2022; Rahmadoni et al., 2022).

2. Literature Review

Management information system (MIS) is a planning system that is part of a business's internal control and includes the use of people, documents, technology, and procedures by management accounting to solve business problems such as the cost of products, services, or a business strategy (Hariyanto, 2018). A management information system is a unit or agency that is specifically tasked with gathering news and converting it into information for organizational managerial needs using system principles. It is said to use the system principle because news in various forms is collected, stored, processed, and processed by one body before being formulated into information. The Management Information System contains the physical elements required for the system's smooth operation, namely computer hardware, software, specifically general system software, general applied software, and application programs. In addition, the MIS contains a database and procedures for implementing the company management system, as well as the officers who operate all of these systems (Giustin et al., 2022).

A management information system has the following goals:

1. Provides information for decision-making.
2. Provide information for planning, controlling, evaluating, and continuously improving.
3. Provide information for management to use in calculating the cost of products, services, and other purposes.

Process Administration Process management can be interpreted as activities or activities, for example:

a) Planning is a management activity that involves detailed formulation in order to achieve a specific end goal. As a result, planning creates the conditions for setting goals and identifying methods for achieving those goals.
b) Control, the management process has only reached the halfway point. Once a plan has been developed, it must be carried out. The plan must then be monitored by managers and employees to ensure that it is being carried out properly.
c) Decision Making, defined as the process of selecting a decision from a set of alternatives. This managerial position serves as a link between planning and control. The manager must have the vision, skills, and methods to carry out the chosen objectives.

An evaluation process is required to determine whether the components of the information system are functioning properly. The PIECES and UAT methods are two of them. The PIECES method is a tool for analyzing computer-based information systems that consists of key points that serve as guidelines or references while analyzing the system. Meanwhile, UAT presents software demos to customers/consumers (Otaduy & Diaz, 2017). The following components should be considered when evaluating a data and information system:

a. Outputs, the extent to which a system can produce output, particularly in presenting the information required by the company.
b. Input, the degree to which a system's reliability in entering data is then processed to produce useful information for the company.
c. Data stored, the degree to which a system's reliability in storing data into storage media and accessing the data (Supriyatna, 2015).

3. Research Methods

The PIECES evaluation method is used in this study. The PIECES evaluation method is a framework for classifying problems, opportunities, and directions in systems analysis and design (Lonnie D. Bentley, 2007). System performance (performance), information presented (information/data), system economics (economic), system control and security (control/security), practical (efficiency), and facilities are the components of the PIECES method (service). Each PIECES method category has several indicators, including: 1) performance (throughput, response time, audibility, communication prevalence, completeness, consistency, and fault tolerance); 2) information/data (accuracy, relevance of information, presenting information, and data flexibility); 3) economic (reusability and resources); 4) control (integrity and security); 5) efficiency (usability and maintainability); and 6) service (accuracy, reliability, and simplicity).

Furthermore, the User Acceptance Test (UAT) method is used, which includes usability testing based on five components, namely learnability, efficiency, memorability, safety to use or low error rates, and a high level of satisfaction (Laven, 2018)

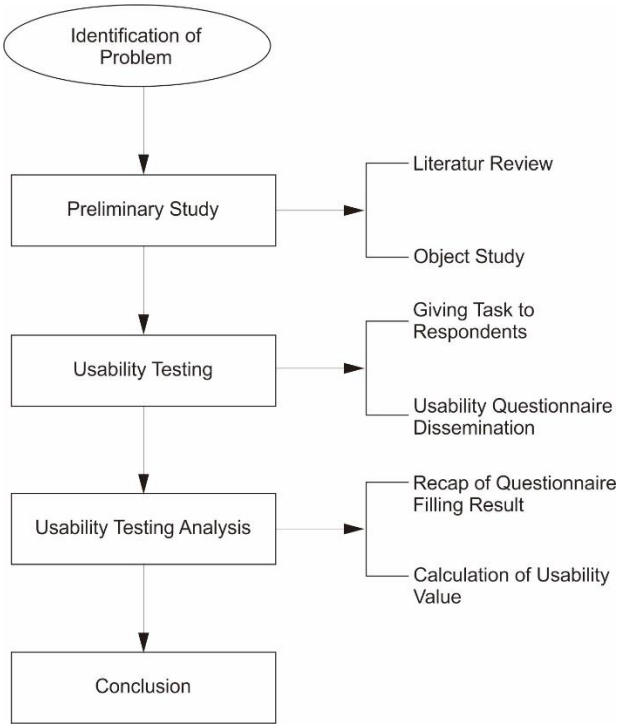

Fig. 1. UAT Research Methods(Agustina & Suprianto, 2018)

The population in this study in evaluating this information system consisted of all users in the application (residents and village administrators), namely 2,384 people. As for the sample in this study using the Slovin formula, namely n = N / (1+(N*e^2)). In determining the sample, the margin of error is set at 5%. So the number of samples (n) = 2384 / (1+(2384*0.052) = 342.52 then rounded up to 343 samples. The study was carried out in Kamang Mudiak, Kamang Magek District, Agam Regency, West Sumatera Province. The variables observed are the SIMNag application variables as a whole. Data collection methods used included interviews and data collection at research sites.

4. Results and Discussions

To analyze the SIMNag application using the PIECES (Performance, Information, Economic, Security, Efficiency, and Service) method as a foundation for obtaining a clearer and more specific analysis of this application; this is also expected to aid in the SIMNag application's development. The PIECES method is as follows:

1. Performance Analysis

The ability to complete business tasks quickly so that targets can be met immediately is referred to as performance analysis. A system's performance is measured by its output (throughput) and response time (response time). The amount of output (throughput) is the amount of work that can be completed in a given amount of time. Response time is the result of a performance analysis conducted by the author of the simnag application:

a. Overall output (Throughput)

The throughput generated by SIMNag is very high because the process of storing information about SIMNag activities is dynamic, providing information that can be accessed at any time and from any location, but from a design standpoint, there are too many links that use images of excessive size, which appears to be a waste of the design page itself.

b. SIMNag response time is an extremely effective medium for communicating information from various aspects of SIMNag to the entire community in general. The response time (speed) in accessing SIMNag is also quite short, and the main display overall is quite good. SIMNag is used by the larger community to obtain data in the village, such as: a). SIMNag information and history, and b). Discover what facilities SIMNag has. The Website Speed Test and Pingdom are two online tools that provide services for speed tests, weight measurement, and website loading. This tool is

used to assess the speed or loading of large websites. The SIMNag response time is being measured to determine the performance of this application site. Because this application is too large, loading and opening SIMNag will take a long time, reducing the number of visitors to the SIMNag. After measuring SIMNag's response time with the Website Speed Test. As a result, when accessing the application, Telkomsel is one of the cellular telecommunications operators in Indonesia has the fastest response time.

2. Information Analysis

Information is evaluating whether current procedures can be improved so that the quality of the information produced improves. Better information is defined as being more relevant, accurate, reliable, and complete, as well as being presented in a timely manner. To address opportunities and deal with problems that arise, the SIMNag website's ability to produce useful information must be evaluated. In this case, increasing the amount of information will not improve the quality of information because too much information will create new problems. The author's analysis on the SIMNag website yielded the following results: a. Useful information/data The SIMNag website will greatly assist the public in obtaining the information they require about SIMNag, as illustrated in the figure below.

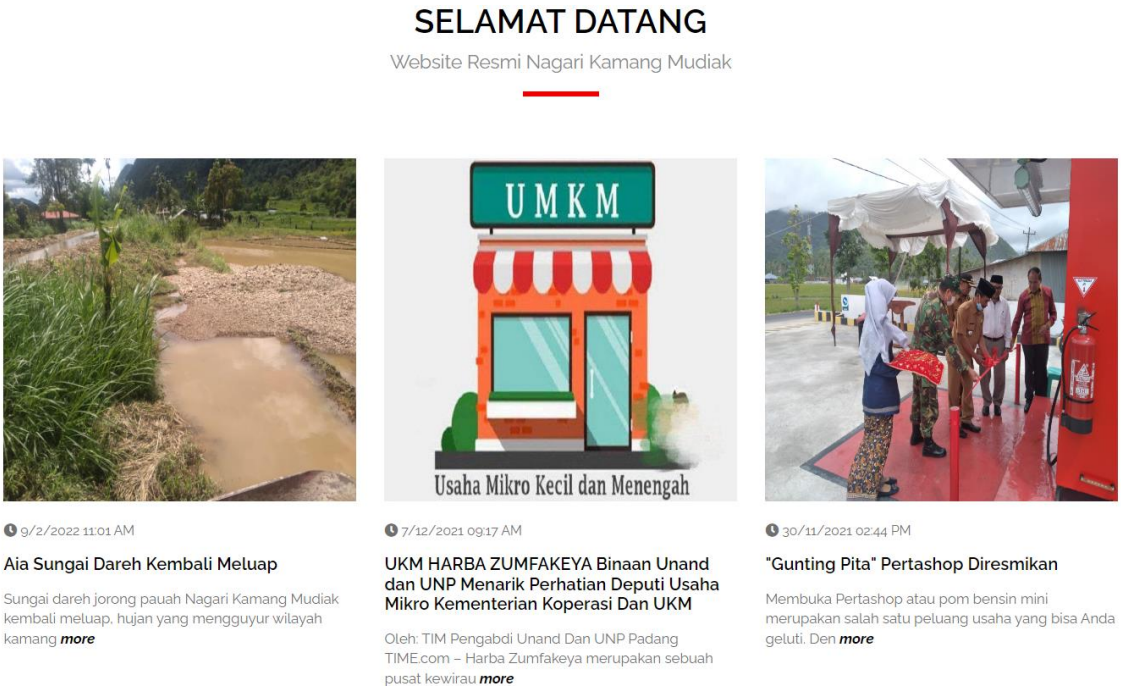

Fig. 2. The Information About SIMNAG

b. The accuracy of information.

The SIMNag website contains information on all village activities. Beginning with information intended to be used as a means of communication in the form of village-related announcements or news.

JUMLAH PENDUDUK MENURUT AGAMA

Nama Jorong	Islam	Kristen	Hindu	Buddha
Pauh	2472	0	0	0
Durian	1470	0	0	0
Padang Kunyit	1168	0	0	0
Halalang	746	0	0	0
Babukik	825	0	0	0
Bansa	539	0	0	0
Pakan Sinayan	2308	0	0	0
Aia Tabik	934	0	0	0

Fig. 3. Population by Religion

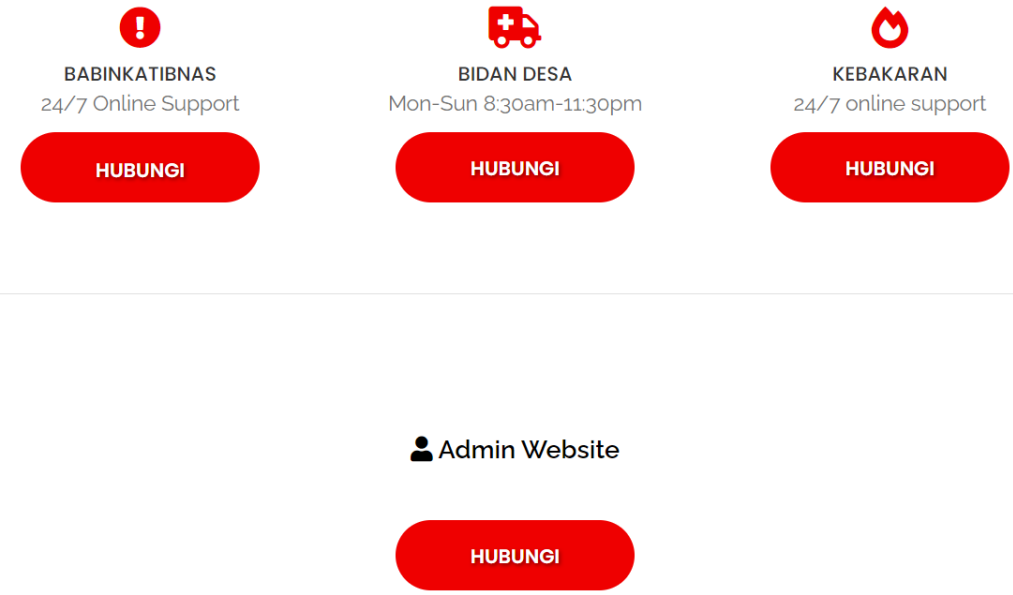

Fig. 4. Contact Person *Nagari*

The SIMNag website presents information in its entirety, beginning with the presentation of Kamang Mudiak's profile, facilities, news, and so on. So that it can help website visitors get complete information about *nagari* Kamang Mudiak. And will provide information about SIMNag, particularly for general students. A link is also provided that provides information about the full SIMNag address as well as a phone/email number that can be contacted to ask additional questions.

c. dependability

In terms of information transmission function, the SIMNag website provides easy access for anyone who needs it, no matter where they are. So that the primary goal of an appropriate information medium can be realized.

3. Security Analysis

Security analysis is the process of improving controls in order to detect and correct errors and deficiencies that may occur. Control in the system is critical for avoiding and detecting system abuse or errors, as well as ensuring data and information security. All performance issues can be quickly resolved with security. The following are the findings of the author's security analysis on

the SIMNag website: 1. The error prevention process is quite effective and practical; the SIMNag website, which is currently operational, undoubtedly greatly facilitates control or control for SIMNag, because the SIMNag academic data management section manages the delivery of information and publications on the SIMNag website. So that any information or publication errors on the SIMNag website can be corrected as soon as possible. 2. Input validation activities and output processes are adequate; the SIMNag website is an extremely effective medium for communicating information to ensure the continuation of SIMNag activities. As a result, ensuring security in controlling data and information from a SIMNag-owned website is a top priority in order to prevent misuse of the website.

5. Efficiency Analysis

In contrast to the economy, efficiency analysis is an increase in operational efficiency. If economics is concerned with inputs, efficiency is concerned with how resources are used so that waste does not occur. The system is said to be efficient or successful if it can achieve the desired results while consuming minimal time and employee labor. This is related to the system running on SIMNag. With the availability of additional information media, such as the SIMNag website, it is hoped that the quantity of information conveyed will increase, and the time for delivery will be short and clear. As a result, employees in the SIMNag environment save a lot of time.

6. Service Analysis

Service analysis is an expansion of the system's services. SIMNag's current system aims to improve service performance in delivering information to the public and students regardless of space and time, and information can be received optimally.

Because they do not have to come directly to SIMNag to get information, the SIMNag website has been an effective medium for the community or students in providing information services. So that, despite the limited number of employees, it does not keep interested people and students waiting, which will harm SIMNag's image.

The SIMNag website does not incur high costs in terms of information delivery. This will be very different if you continue to use print and electronic media to communicate SIMNag information to the general public. The SIMNag website is expected to help improve the image of excellent service. So that people will feel helped because they have been spared the bureaucracy that always seems to complicate things.

Software testing is performed by using user acceptance testing (UAT) techniques and distributing questionnaires to test the system against its specifications. System testing focuses on testing the system from a functional system standpoint, determining whether the system functions as expected and whether the results produced are as expected. SIMNag users totaling 35 respondents will participate in the testing. The UAT and questionnaire are designed to determine how far the SIMNag system has been implemented in order to aid the community service process.

1. Test Cases

The following are examples of test cases performed on SIMNag using black box testing techniques to ensure that the system meets its specifications.

a. Login Test

login test results

Fig. 5. Login Page

Login into the system by entering test data other than login data 1 and then determining whether or not it can enter the system. Furthermore, the test results show that the input data cannot enter the system because it does not match the SIMNag database.

b. User Data Processing Evaluation (Admin)

Insert population data, edit population data, and delete population data.

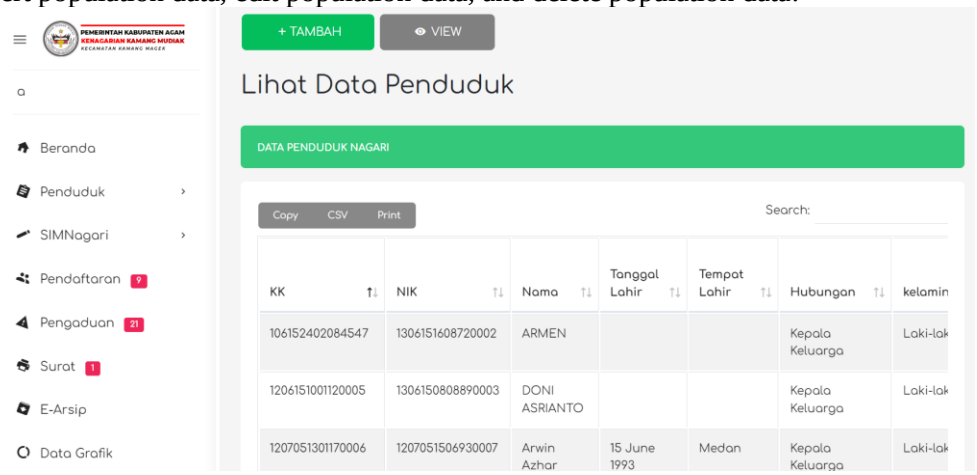

Fig. 6. SIMNAG Identity

According to the test results, adding identity was a success.

c. Results of Quantitative Analysis

The results of the tests indicate that the application developed meets the functional requirements. However, errors are still possible during the process. The system that has been built is capable of producing the expected output. The data obtained from the questionnaire results is then sorted based on the answers and then summed up in percentage form by multiplying the total answers of each item by 100 and then dividing by the number of respondents (students). The percentage of each answer can be searched using the data from the questionnaire results. The end result is as follows:

Table 1 - Questionnaire Results

Variables	Questions	Answer Frequency				
		SS	S	K	TS	STS
Design	P1	0	0	6	23	6
	P2	0	3	15	15	2
	P3	0	1	8	20	6
Easy	P4	5	22	7	1	-
	P5	7	21	7	-	-
	P6	1	14	20	-	-
	P7	9	21	5	-	-
Efficient	P8	5	20	10	-	-
	P9	4	22	9	-	-
	P10	4	21	10	-	-
Total		35	145	97	59	14

The highest and lowest values can then be calculated using the answers from the 35 respondents mentioned above:

Highest possible score = 35 x 10 x 5 = 1,750 (supposing all answer SS). Lowest possible score = 35 x 10 x 1 = 350 (supposing all answered STS).

Based on the calculation, the highest value is 1,750, and the percentage is as follows:

$$\frac{169}{250} \times 100\,\% = 67,6\%$$

Based on the percentage obtained, it can be seen that the teacher's response to the SIMag system based on the level of acceptance is strong, with a percentage of 67.3%. These results are in accordance with the theory put forward by Riduwan (2008), if the percentage results obtained

reach 61% - 80%, the test results are considered strong. The rating scale in Figure below demonstrates this.

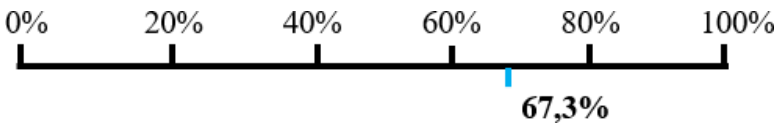

Figure 7. Rating Scale Questionnaire

5. Conclusion

The PIECES evaluation method (Performance, Information/Data, Economic, Control/Security, Efficiency, and Service) was used to analyze the evaluation of the system built, namely the nagari information system (SIMNag) in the Kamang Mudiak nagari that the application runs normally and well. It also employs the UAT (User Acceptance Testing) method. As a result of these findings, the SIMNag in nagari Kamang Mudiak can be continuously implemented and improved as needed.

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