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Digital village system transformation to increase the potential of Sidemen Village Karangasem Bali

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ABSTRACT

Sidemen Village is one of the villages in Karangasem Regency. The most famous products from Sidemen Village are songket cloth and lontar comics. Seeing the potential in Sidemen Village, developing a Digital Village in Sidemen Village, Karangasem is necessary. Digital villages will help improve communication between village officials, fellow villagers, and residents. The research method uses the SDLC method, which includes planning, analysis, design, implementation, and testing stages. Data is collected at the planning stage, which will later be used in the analysis process. At the analysis stage, functional requirements are analyzed as a basis for the Digital Village website design process. At the design stage, the design of the Digital Village website is carried out in the form of database design to show what data is processed on the website. Implementation is carried out in the form of website page implementation at the implementation stage. At the testing stage, data is collected through questionnaires and testing using the TAM method using the SPSS application. The system produces ten features on the website: Admin Login, Village Resident Login, Village Information, Village Information Dashboard, Land Dashboard, Correspondence Dashboard, Assistance Dashboard, Financial Dashboard, Village Resident Dashboard. Based on the results of hypothesis testing from the proposed model, it is known that there is only 1 hypothesis that is accepted, namely the influence of PEOU on ATU, which means that the belief that the application can be easily understood and used influences acceptance or rejection of the use of the application as a result when someone uses an application in a particular job or activity.

1. Introduction

Karangasem has much potential in agriculture, coastal development, and tourism [1]. In the agricultural sector, Karangasem has the potential to develop peanuts, coffee, snake fruit, corn, and rice [2]. Karangasem has the potential to develop fisheries cultivation in the marine coastal sector. Meanwhile, Karangasem has three potential tourist areas in the tourism sector: Tulamben, Ujung, and Candidasa. Karangasem is also famous for its woven cloth, which has its characteristics and is a product of the creative economy. Karangasem's potential is capital for the Karangasem Regency government to carry out development, especially in the tourism sector, both nationally and internationally. According to data from the Karangasem Regency Central Statistics Agency, the level of domestic and foreign tourist visits in 2018 and 2019 reached 1,005,825 tourists [3], [4]. The number of visits increased by almost 100% compared to data on tourist visits in 2017. This shows that domestic and foreign people increasingly recognize tourism in Karangasem Regency.

Sidemen Village is one of the villages in Karangasem Regency. Sidemen Village has an area of approximately 3.86 km2 and a population of approximately 4,243 people, according to 2016 data. Most Sidemen Village residents use rice fields and gardens as their main livelihood. The most famous products from Sidemen Village are songket cloth and lontar comics. Sidemen songket cloth has distinctive characteristics, especially in the appearance of its motifs and colors. The cloth is woven using gold thread or silver thread. This sidemen songket cloth has been marketed in Bali and outside Bali. As for lontar comics are a craft of carving on palm leaves using a puppet theme depicting Balinese Hindu cultural stories.

Seeing the potential in Sidemen Village, it is necessary to develop a Digital Village in Sidemen Village, Karangasem [5]. Digital villages are a concept that combines information and communication technology in public services and economic activities in villages. [6], [7] Digital villages will help improve communication between village officials, fellow village officials, and residents [8]. The digital village will also make it easier for residents and people outside Sidemen Village to access information, especially those who want to know more about developments in Sidemen Village [9]. Digital services will encourage improvements in public services in Sidemen Village [10], [11]. In this research, the Sidemen Karangasem Village Digital Village was implemented using a website that can become an information and management system for Sidemen Village [8], [12], [13].

After the implementation stage, user acceptance of the newly implemented system is measured. Measurements were carried out using the TAM (Technology Acceptance Model) method [14]–[16]. This method uses questionnaire data as a testing data source [17]. The results of data collection were analyzed using SPSS. The TAM method was tested by examining the influence on four research constructs: PEOU, PU, ATU, and ACC [18], [19]. Tests were carried out to find the correlation coefficient value and the significance of the relationship. A significance test determines whether the correlation obtained can explain the relationship between variables [20], [21]. The significance of a hypothesis is determined by looking at the significance value resulting from the SPSS program. From the test results, which constructs are correlated with each other will be concluded.

2. Method

The research method for implementing and testing this digital village uses the SDLC method, which includes planning, analysis, design, implementation, and testing stages as show in Fig. 1 [1], [2].

Fig. 1. Research Method

- Planning

  Data is collected at the planning stage, which will later be used in the analysis process. The data collection carried out is as follows:

  - Observation Method. In this case, what will be done is to look at and study the problems in Sidemen Village, the potential in the village, and the needs needed to create a Digital Village website.
  - Interview Method. In this method, the activities carried out are conducting questions and answers with village officials and village residents, both of whom will later act as users on the Digital Village website.
  - Literature Study Method. The method will be used by looking for materials that support the definition of problems through books and the internet, closely related to the Digital Village.

- Analysis

  At this stage, an analysis of functional requirements is carried out as a basis for the Digital Village website design process. Functional requirements will later contain the functions that must be present on the Digital Village website.

- Design

  At this stage, the design of the Digital Village website is carried out as a database design to show what data is processed. Technology design was also carried out to run the Digital Village website in Sidemen Karangasem Village.

- Implementation

  At this stage, implementation is carried out in the form of website page implementation based on the results of previous planning, analysis, and design.

- Testing

  At this stage, data is collected through questionnaires and testing using the SPSS application's TAM method [14].

3. Results and Discussion

In this section, we will discuss the results of planning based on the results of observations and interviews. Sidemen Village has a lot of potential in the fields of rice fields and plantations because the area is mountainous and rich in springs. This potential makes Sidemen Village a place many domestic and foreign tourists visit. Sidemen Village also has many exciting tourist attractions to visit. In the field of government, Sidemen Village also has a clear organizational structure. However, the Sidemen Village government still has shortcomings in administrative management, such as population administration, land management, and finance. Everything in the administrative sector is still done manually using paper records. Tourists from outside Sidemen Village also cannot see information regarding the latest developments occurring in Sidemen Village. For this reason, a website is needed as a forum for digitizing Sidemen Village. The website must be able to resolve village administration and information problems.

The following is a discussion of the results of the analysis. Before entering the website design stage, it is necessary to analyze functional requirements first. Functional requirements that must be met in creating a digital village:

- Admin Login: The system displays a form to log in as admin
- Villager Login: The system displays a form to log in as a villager
- Village Information: The system displays village information in the form of the latest articles, population, village map, and website visitor statistics.
- Admin Dashboard: The system displays information that the Admin can access in the form of village information, land, correspondence, and social and financial assistance.
- Village Information Dashboard: The system displays information related to the village in the form of village identity, village area, village government, village institutions and village status.
- Land Dashboard: The system displays information in the form of parcels, namely the location of the land in its division.
- Correspondence Dashboard: The system displays information in the form of setting letters that village residents can submit, letter requests that have been received, processing letters, and printing letters.
- Social Assistance Dashboard: The system displays information in the form of data on the types of social assistance available in the village and the residents who can receive this assistance.
- Financial Dashboard: The system displays information in the form of village budgets and realization.
- Village Resident Dashboard: The system displays information as a village resident who can print biodata, print family cards, submit letter requests, and save documents.

Based on the analysis results, a system design is designed that is adapted to the analysis results. In Fig. 2, you can see the architecture of technology design in developing a digital village.

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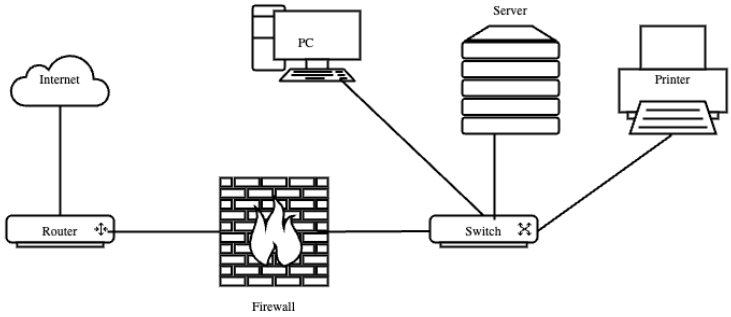

Fig. 2. Digital Village Technology Design

By using the support of the technological architecture that has been described, a database design was designed to show the data processed on the website, as seen in Fig. 3. In Fig. 3, it can be seen that the data processed on the website includes village data, population data, family data, article data, data on land, financial data, letter data, and aid program data.

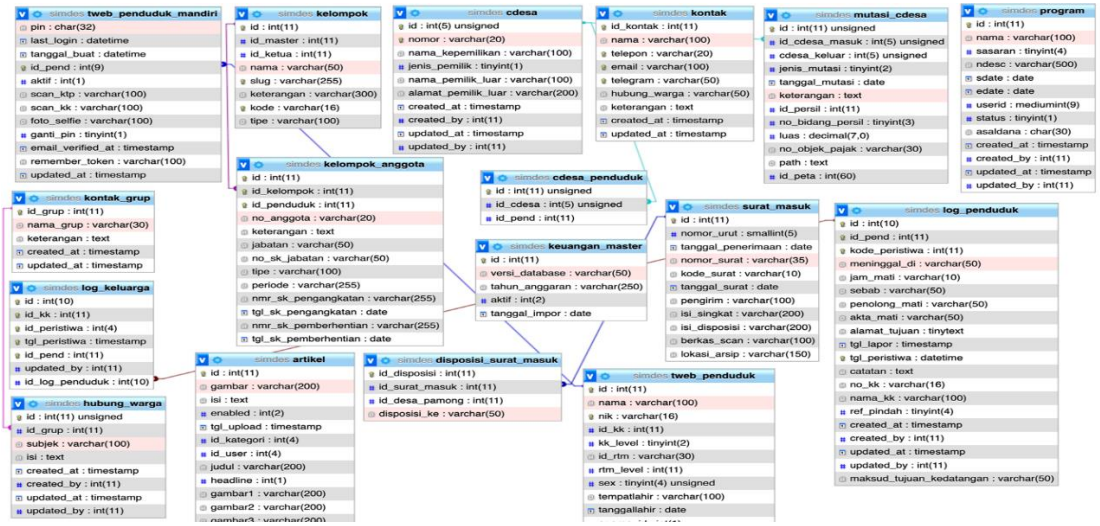

Fig. 3. Database Design

From the design that has been produced, the implementation of the system that has been produced is discussed in this section. After designing the database at the design stage, the data is implemented in a Digital Village website, as seen in Fig. 4 to Fig. 6. In Fig. 4, you can see the initial appearance of the website if the website is opened by a user who is not a village official or a village resident. Users can see the latest articles on Sidemen Village, village maps, and statistics on visitors and population.

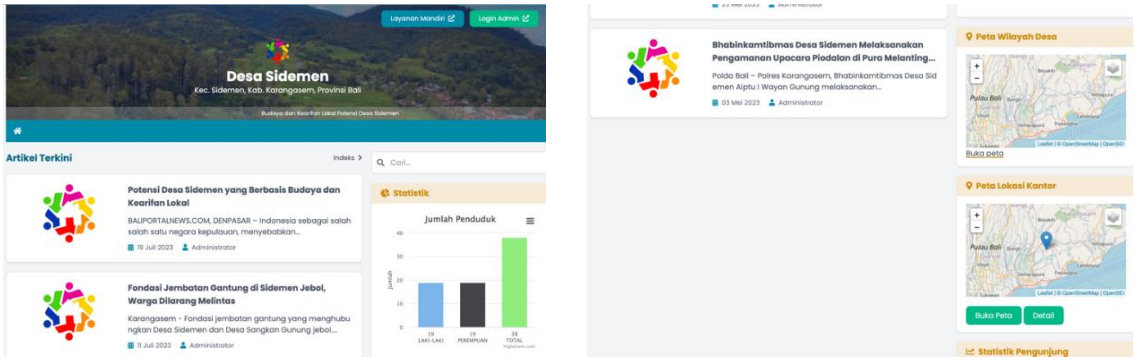

Fig. 4. Sidemen Digital Village Website User Display

Apart from website users, admins can log into the system as village officials, as shown in Fig. 5. Admins can access village information, land, correspondence, and social and financial assistance.

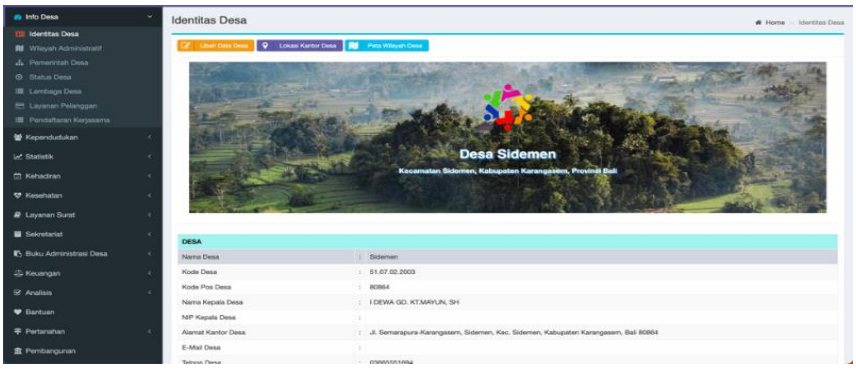

Fig. 5. Sidemen Digital Village Website Admin Display

In Fig. 6, you can see admin access to village information. Admins can manage data in the form of village identity, village area, village government, village institutions, and village status.

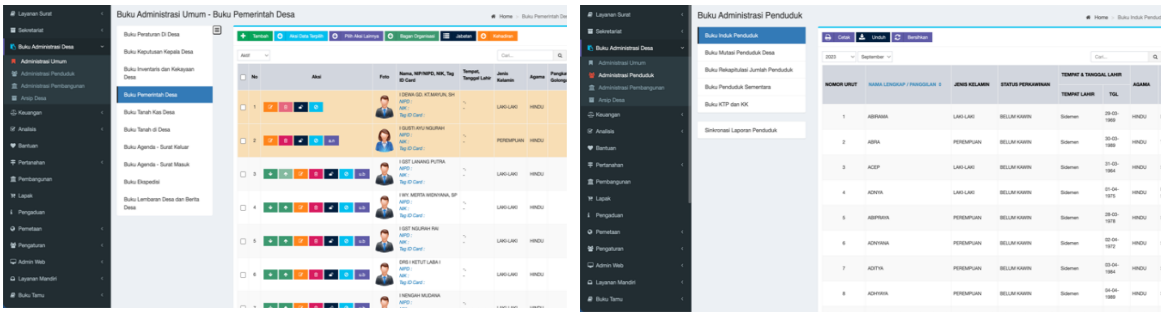

Fig. 6. Village Information Display

After the implementation of the website, we will describe the results of testing the questionnaire distributed for data collection, consisting of a section containing the identity of the respondent, a section containing instructions for filling in, and the final section containing some structured statements regarding research constructs including PEOU, PU, ATU, ACC [22]. The population in this research is comprised of village officials and village residents who are involved in using the Digital Village website. One hundred questionnaires were obtained from 15 village officials and 85 village residents, with details. The research construct can be seen in Table 1.

Table.1 Research Construct

No	Construct	Indicator
1	PEOU	Ease of learning
		Ease of achieving goals
		Clear and easy to understand
		Flexible
		Free from trouble
		Ease of use
2	PU	Work gets done faster
		Makes work easier
		Develop job performance
		Increase productivity
		Increase effectiveness
		Useful
3	ATU	Attitude of acceptance towards the system
		An attitude of rejection of the system
4	ACC	Motivation to keep using
		Frequency of use
		Satisfaction of use

Next, a questionnaire was prepared based on the items contained in the research construct and adapted to the research object, namely the digital village website of Sidemen Karangasem village. Alternative answers to the questionnaire consist of 4 answers in the following order: 1) Strongly Agree, 2) Agree, 3) Disagree, and 4) Strongly Disagree. The measurement scale for each alternative answer uses a Likert scale, commonly used to measure a person's attitudes, opinions, and perceptions [4]. Hypothesis testing was carried out using SPSS. Tests were carried out to find the correlation coefficient value and the significance of the relationship. A significance test determines whether the correlation obtained can explain the relationship between variables. The hypothesis is significant if the correlation value is below 0.05. One significant influence of the hypothesis can be seen in Fig. 7, namely, the influence of PEOU on ATU.

Correlations

Correlations

		PEOU	ATU
PEOU	Pearson Correlation	1	-.247*
	Sig. (2-tailed)		.013
	N	100	100
ATU	Pearson Correlation	-.247*	1
	Sig. (2-tailed)	.013	
	N	100	100

*. Correlation is significant at the 0.05 level (2-tailed).

Fig. 7. Correlation of PEOU to ATU

All hypothesis results can be seen in Table 2 [23], [24].

Table.2 Testing Hypothesis Correlation Value

No	Hypothesis	Correlation	Conclusion
1	Influence of PEOU on PU	0.382	Rejected
2	Influence of PEOU on ATU	0.013	Accepted
3	Influence of PEOU on ACC	0.926	Rejected
4	Influence of PU on ATU	0.505	Rejected
5	Influence of PU on ACC	0.673	Rejected
6	Influence of ATU on ACC	0.497	Rejected

In Table 2, it can be seen that there is one hypothesis that is accepted, namely the influence of PEOU on ATU. The explanation of each hypothesis can be explained as follows:

- The influence of PEOU on PU means that the application is easy to understand and use, influencing a person's belief that the system can facilitate their work. PEOU is the conveniences users feel regarding using a website for various goals to be achieved, while PU is a person's or organization's trust in a system that can facilitate their work. Based on the test results, the correlation value is 0.382, while the hypothesis can be said to be accepted if the correlation value is below 0.05, so it can be said that this hypothesis is rejected. This indicates that there is no relationship between the application's ease of use and the user's confidence in the application's ability to help with work.
- The influence of PEOU on ATU means that the belief that an application is easy to understand and use influences whether an application is accepted or rejected due to someone using an application in a particular job or activity. PEOU is the various conveniences users feel regarding using the website for various goals to be achieved, while ATU is the attitude of acceptance or rejection of the system. Based on the test results, the correlation value is 0.013, while the hypothesis can be said to be accepted if the correlation value is below 0.05, so it can be said that this hypothesis is accepted. This indicates that the more manageable the application is to understand, the more users will accept the use of the application in their work.

- The influence of PEOU on ACC means that the application is easy to understand and use, influencing satisfaction with use and motivation to continue using the application. PEOU is the convenience users feel regarding using the website for various goals to be achieved, while ACC is satisfied with its use and motivated to continue using the application. Based on the test results, the correlation value is 0.926, while the hypothesis can be said to be accepted if the correlation value is below 0.05, so it can be said that this hypothesis is rejected. This indicates that there is no relationship between the application's ease of use and user satisfaction.
- The influence of PU on ATU means that a person's belief that the system can facilitate their work influences whether they accept or reject the use of an application as a result of someone using an application in a particular job or activity. PU is a person or organization's trust in a system that can facilitate their work, while ATU is an attitude of accepting or rejecting the system. Based on the test results, the correlation value is 0.505, while the hypothesis can be said to be accepted if the correlation value is below 0.05, so it can be said that this hypothesis is rejected. This indicates no relationship between the user's trust in the application and the user's acceptance of using the application.
- The influence of PU on ACC means that a person's belief that the system can facilitate their work influences satisfaction with use and motivation to continue using the application. PU is a person or organization's trust in a system that can facilitate their work, while ACC is satisfaction with the use and motivation to continue using the application. Based on the test results, the correlation value is 0.673, while the hypothesis can be said to be accepted if the correlation value is below 0.05, so it can be said that this hypothesis is rejected. This indicates no relationship between user trust in the application and user satisfaction in using the application.
- The influence of ATU on ACC means that the acceptance or rejection of application use due to someone using an application in work or certain activities affects satisfaction with use and motivation to continue using the application. ATU is an attitude of acceptance or rejection of the system, while ACC is satisfaction with the use and motivation to continue using the application. Based on the test results, the correlation value is 0.497, while the hypothesis can be said to be accepted if the correlation value is below 0.05, so it can be said that this hypothesis is rejected. This indicates no relationship between user acceptance and user satisfaction using the application [15].

4. Conclusion

Designing a website as an information and management system for Sidemen Village in village digitalization efforts has been successfully carried out. The system produces ten features on the website: Admin Login, Village Resident Login, Village Information, Village Information Dashboard, Land Dashboard, Correspondence Dashboard, Assistance Dashboard, Financial Dashboard, Village Resident Dashboard. In this research, an analysis of the acceptance of the Sidemen Village digital village website resulted in a TAM model consisting of 6 hypotheses. Based on the results of hypothesis testing from the proposed model, it is known that there is 1 hypothesis that is accepted, namely the influence of PEOU on ATU, which means that the belief that the application can be easily understood and used influences acceptance or rejection of the use of the application as a result when someone uses an application in a particular job or activity. Based on the results of this research, it is hoped that this digital village system can help the village government and residents increase the potential in Sidemen Karangasem Village by improving village administration management. For future research, we can also use ISO 9126 to measure the quality of the website that has been created. ISO 9126 is an internationally recognized standard for software quality. ISO 9126 defines software product quality, models, quality characteristics, and related metrics used to evaluate and establish the quality of a software product.

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