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Implementation of Prototyping Method in Lontara Studio Management Information System Bone Regency

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Abstract

Art studios play an important role in preserving traditional dance as a valuable cultural heritage; however, many still face operational challenges such as limited promotion, manual administrative processes, and unstructured rental services that reduce management effectiveness and public access. This study aims to design a web-based Management Information System (MIS) for Sanggar Lontara in Bone Regency using the prototyping method to support administrative management and service rental activities in accordance with user needs. The system was developed through an iterative prototyping approach involving requirement analysis, design, implementation, evaluation, and refinement with active participation from studio administrators. System evaluation consisted of alpha testing using black-box testing and beta testing through a Likert-scale questionnaire distributed to 32 respondents across six assessment indicators. The developed system includes service catalogs, online booking, payment proof uploads, administrative verification, reporting, portfolio galleries, studio information, and role-based access for administrators, renters, and managers. Alpha testing demonstrated a 100% success rate for core functionalities, while beta testing achieved a user satisfaction index of 88.02%, classified as "Very Good," indicating that the system is feasible for implementation with minor usability improvements.

Keywords: *Prototyping Method, Management Information System, Art Studio, Web-Based System, User Satisfaction*

1. Introduction

Dance is a form of cultural heritage that possesses high social, historical, and aesthetic value and plays an important role in shaping cultural identity and sustainability within society [1]. Art studios serve as the frontline institutions in preserving traditional dance; however, in practice, many studios face operational challenges, such as limited promotional activities, manual administrative record-keeping, and unstructured management of rental services. These conditions have the potential to reduce managerial effectiveness and hinder public access to cultural art services. The rapid development of information technology has increased the demand for systems capable of providing fast, accurate, and integrated information to enhance organizational efficiency [2]. The utilization of information technology has been proven to support administrative processes and service management more effectively and efficiently [3][4]. In the context of art studios, the implementation of a web-based Management Information System (MIS) represents a strategic solution to support administrative management, rental services, and promotional media in a transparent and easily accessible manner for the public [5]. Sanggar Lontara in Bone Regency is an art studio that has actively provided dance services, costume rentals, musical instrument rentals, and makeup services since 2021. However, its operational management is still conducted manually, resulting in issues such as delays in data recording, risks of data loss, difficulties in tracking inventory and usage schedules, and obstacles in report generation. Therefore, an integrated information system is required to systematically manage all operational processes of the studio. This study aims to design a web-based Management Information System for Sanggar Lontara in Bone Regency by applying the prototyping method. The prototyping method is selected because it allows active user involvement throughout the iterative system development process, enabling real user requirements to be effectively accommodated [6]. The problem-solving approach is carried out through several stages, including requirements analysis, system design, prototype implementation, evaluation, and iterative refinement until the system is ready for use. This approach is expected to produce a system that meets the operational needs of the art studio while supporting the promotion and preservation of local cultural heritage through the utilization of information technology [9].

2. Research Methods

This study applies the prototyping method to develop a web-based Management Information System (MIS) for Sanggar Lontara in Bone Regency. The method is chosen due to its iterative nature and direct user involvement, which ensures that the developed system meets the studio's operational requirements.

The research process is conducted through the following stages:

1. Listening to Users
   System requirements are identified through observations and interviews with studio management and users to understand existing problems and determine required features.
2. Building and Refining the Mock-up
   A web-based system prototype is developed, focusing on basic workflows, core functionalities, and interface design. The prototype is continuously refined based on user feedback.
3. User Evaluation and Testing
   The prototype is tested by users to evaluate usability and functionality. Feedback and suggestions are used for iterative system improvement.

The scope of this study is limited to the design and testing of an MIS for rental services and administrative management. The research object is Sanggar Lontara in Bone Regency, which provides dance services, costume and musical instrument rentals, makeup services, and performance packages.

A Use Case Diagram is a representation of the interactions between users and a system. This diagram illustrates how users, external systems, and other related entities interact with the developed system.

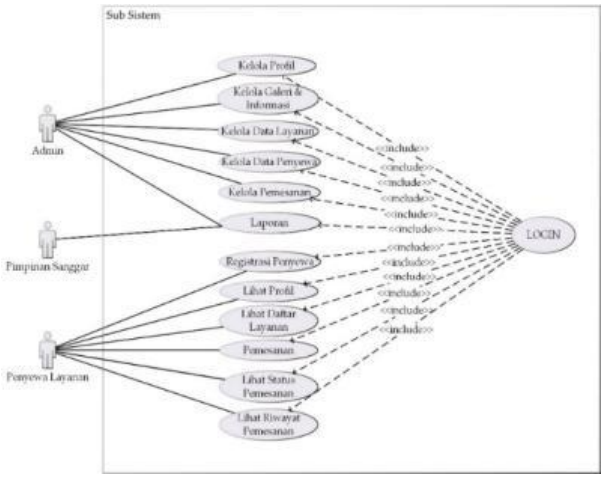

Fig. 1: Use case Diagram

Figure 1 illustrates the proposed system use case, which describes the interactions between the admin, studio manager, and service users in accessing various system functions. All main activities, including data management, service booking, and report generation, require users to complete a login process as an authentication mechanism.

An activity diagram is designed to represent the workflow or activities within a system and serves to illustrate a sequence of actions that may include business processes or use cases [6]. In this system, the activity diagram is presented as shown in the figure below.

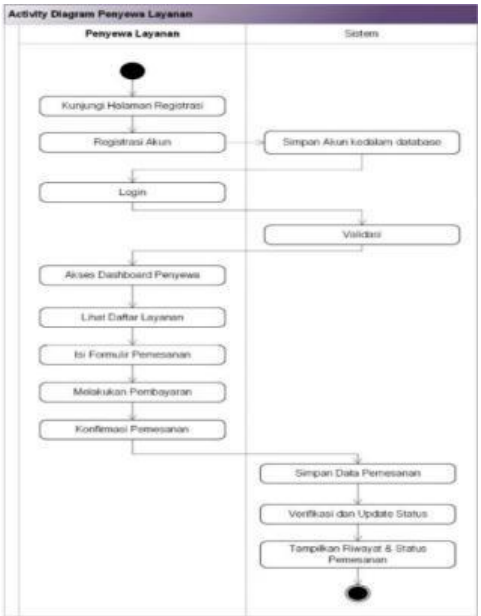

Fig. 2: Activity Diagram Penyewa Layanan

Figure 2 illustrates the workflow of system usage by service renters, starting from account registration and login, followed by viewing available services, making reservations and payments, and ending with confirmation. The system stores and verifies booking data and displays the booking status and history to the renters.

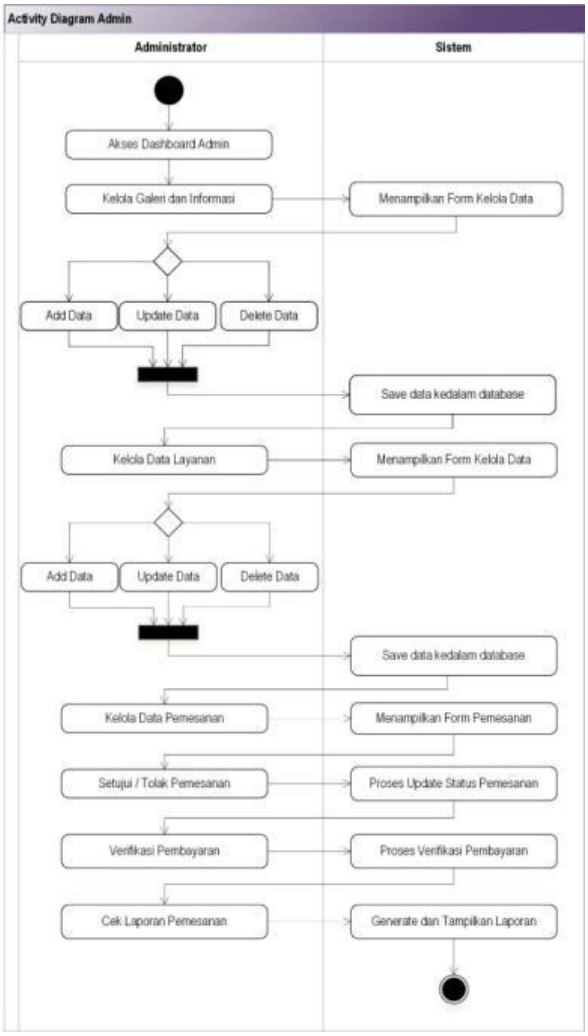

Fig. 3: Activity Diagram Admin

Figure 3 illustrates the administrator's workflow within the system, beginning with accessing the dashboard, managing gallery data, information, and services, and processing reservations. The administrator verifies payments, updates order statuses, and reviews system-generated reports for monitoring and evaluation purposes.

The data collection techniques employed include observation of the studio's administrative processes, interviews with studio management to identify system requirements, and the distribution of questionnaires to users during the beta testing phase to assess user satisfaction with the system.

Data analysis is conducted through two stages of testing. Alpha testing applies the black-box testing method to ensure that all system functions operate in accordance with the specified requirements. Beta testing is carried out by analyzing the results of Likert scale questionnaires completed by 32 respondents to determine user satisfaction levels, which are then calculated as percentages and classified based on predefined evaluation criteria.

3. Result and Discussion

This study resulted in the development of a web-based Management Information System (MIS) to support administrative management and service rentals at Sanggar Lontara in Bone Regency. The system was designed using the prototyping method and evaluated through functional (alpha) testing and beta testing.

The developed system provides key features, including a service catalog, online service booking, payment proof upload and payment verification by the administrator, management of service and inventory data, and transaction reporting. In addition, the system implements role-based access control for administrators, renters, and management, ensuring that each user can access features according to their assigned authority.

Alpha testing was conducted using the black-box testing method to ensure that each system function operates in accordance with the predefined requirements. The testing focused on the main system modules.

Table 1: Alpha Testing

No	Tasted Module	Test Scenario	Result
1	User Login	Input of valid and invalid login data	Success
2	Sevice Data Management	Add, edit, and delete service data	Success
3	Service Booking	Booking process performed by the renter	Success
4	Payment Proof Upload	Uploading payment proof	Success
5	Payment Verifivation	Payment confirmation by the administrator	Success
6	Transaction Report	Displaying and printing trasnsaction reports	Success

The success rate of alpha testing is calculated based on the number of successful test scenarios compared to the total number of tested scenarios, using the following formula:

$$\text{Success Rate}(\%) = \frac{\text{Number of Scenarios}}{\text{Total Tesr Scenarios}} \times 100 \quad (1)$$

In this system, there are 14 test scenarios, all of which were successfully executed. Therefore, the success rate is calculated as follows:

$$\text{Succsess Rate} = \frac{14}{14} \times 100 = 100\% \quad (2)$$

Based on Table 1, the results of system testing using the black-box method indicate that all main system functions operate according to the specified requirements, with no functional errors identified in the tested scenarios. The system achieved a 100% success rate for the evaluated scenarios. This result demonstrates that the system has met the functional requirements and is deemed ready to proceed to beta testing to measure user acceptance and satisfaction.

Beta testing was conducted to determine the level of user satisfaction with the system. This testing employed a Likert scale questionnaire distributed to 32 respondents, using six evaluation indicators: ease of use, clarity of information, user interface design, system functionality, access speed, and system usefulness.

Table 2: Beta Testing

No	Evaluation Indicator	Percentage	Category
1	Ease of Use	87,50	Very Good
2	Information Clarity	88,28	Very Good
3	User Interface Design	86,72	Very Good
4	System Functionality	89,06	Very Good
5	Access Speed	87,80	Very Good
6	System Usefulness	88,02	Very Good
	Average	**88,02**	**Very Good**

Based on Table 2, the results of beta testing using the Likert scale indicate that the system achieved an overall index of 88.02%, categorized as *very good*. This result demonstrates that the system is highly accepted by users and is considered feasible for implementation. The improvement suggestions provided by users are minor and mainly focus on enhancing the user experience in certain parts of the system workflow to improve efficiency and comfort.

The research findings show that the application of the prototyping method in the development of the Sanggar Lontara Management Information System successfully produced a system that meets user requirements. The 100% success rate obtained in alpha testing indicates that all main system functions operate according to the designed specifications, confirming the system's functional feasibility.

The beta testing results reveal a high level of user satisfaction across all evaluation indicators. This indicates that the system not only functions properly but is also easy to use, informative, and provides tangible benefits for studio management. These findings are consistent with previous studies stating that the prototyping method is effective in producing systems that align with user needs due to active user involvement throughout the development process.

Nevertheless, user evaluations also highlight minor recommendations for improvement, particularly related to the ease of system workflow and the consistency of the user interface design. These recommendations serve as a basis for further development to optimize the system. Overall, the developed web-based Management Information System is able to enhance the effectiveness and efficiency of administrative record-keeping and service rentals at Sanggar Lontara, while also supporting the promotion and preservation of local cultural heritage through the utilization of information technology.

4. Conclusion

Based on the results of the system design and development, the following conclusions can be drawn:

1. The design of a web-based management system to support online administrative management and service rentals at Sanggar Lontara has been successfully realized in the form of a web-based Management Information System. The system provides essential features required for studio operations, including service catalog management, service booking, payment proof upload, payment verification by administrators, transaction report management, gallery/portfolio management, and studio information. In addition, the system implements role-based access control for administrators, renters, and management, and is supported by a relational database. As a result, administrative and service rental processes are more structured, transparent, and easily traceable. Alpha testing using the black-box method indicates that all main system functions operate according to the requirements across all tested scenarios.
2. The application of the prototyping method in the development of the Sanggar Lontara management system was conducted iteratively with the active involvement of studio management at each stage, including requirements identification, system design, prototype development, testing, evaluation, and system refinement. This approach enables early validation of user requirements and gradual improvement of the system design to align with the studio's business processes. Beta testing using a Likert scale questionnaire shows that the system achieved an index score of 88.02% (*very good*) from 32 respondents, indicating that the system is highly accepted and feasible for implementation, with minor improvement recommendations related to workflow efficiency and user experience.

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