

PAPER

Design and Development of a Video-on-Demand Information System for Pottery Craft Education Using a Subscription-Based Monetization Model

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ABSTRACT

Advancements in digital technology have driven the adoption of Video-on-Demand (VoD) services across various sectors, including education. However, the application of this technology to pottery-making instruction remains limited. Knowledge transfer typically relies on conventional methods, which are constrained by time, location, and participant reach. Furthermore, there is currently no dedicated platform offering structured and sustainable educational content on pottery making. This research aims to design and develop a VoD information system for pottery education utilizing a subscription-based monetization model. The web-based system incorporates features for video content management, user administration, and subscription services for accessing premium content. The system was developed using the Rapid Application Development (RAD) method, which emphasizes a swift development process comprising requirements planning, system design, construction, and implementation. The project seeks to deliver an information system that presents pottery-making instructional material in a structured, accessible, and interactive manner. Beyond enhancing learning effectiveness for users, the subscription-based model is expected to ensure service sustainability while generating economic value for artisans acting as content providers. Consequently, the developed system can serve as a digital educational tool, supporting both the preservation of the pottery craft and the growth of the technology-driven creative economy.

KEYWORDS

Information System; Video-on-Demand; Pottery Craft; Subscription-Based; Digital Education; RAD

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1. INTRODUCTION

The advancement of digital technology has driven transformation across various sectors, including education and the creative industries. One rapidly evolving technology is Video-on-Demand (VoD), a service that allows users to access video content flexibly anytime and anywhere via the internet.[1]. The use of VoD technology is not limited to the entertainment sector; it is also being adopted as a medium for learning that is more interactive, effective, and accessible to the public. Furthermore, implementing a subscription-based monetization model for digital services can generate sustainable revenue streams and support the continuous provision of educational content. Pottery is a form of cultural heritage that holds significant artistic, cultural, and economic value [2]. However, the process of learning and transferring knowledge regarding pottery making is still largely carried out using conventional methods, such as face-to-face training or direct mentoring by artisans. These methods have several limitations concerning time, location, and the number of participants who can take part in the learning process [3]. Consequently, the dissemination of knowledge regarding pottery craftsmanship has been suboptimal, struggling to reach the general public. On the other hand, the development of video-based learning technology has proven capable of enhancing learning effectiveness by enabling users to learn independently, flexibly, and repeatedly as needed. Through video media, users can grasp the stages of product creation in a more visual and systematic manner compared to conventional learning methods. Therefore, Video-on-Demand technology holds significant potential for application in the field of pottery education [4]. However, there are currently few digital platforms that specifically offer pottery-making educational content in a structured and seamlessly integrated manner. Most learning materials remain scattered across various digital platforms, making it difficult for users to follow a step-by-step learning path [5]. Furthermore, the implementation of monetization models on craft education platforms has not been optimal; consequently, economic support for artisans acting as content providers remains insufficient [6]. This situation limits the development of high-quality, sustainable content. Consequently, there is a need for a Video-on-Demand-based information system to provide educational content on pottery making in a structured and easily accessible manner, thereby supporting a more effective learning process [7]. Furthermore, the implementation of a subscription-based monetization model is expected to generate economic value for artisans while ensuring the sustainability of the

services provided. Therefore, this research aims to design and develop a Video-on-Demand information system for pottery-making education featuring a subscription-based monetization model [8]. The developed system is expected to serve as a digital learning medium that supports the preservation of traditional crafts and fosters the development of a technology-based creative economy [9].

2. METHOD

2.1 System Development Stages

The system development method used in this study is Rapid Application Development (RAD). The RAD method was selected because it offers a relatively fast development process and supports incremental system creation based on user needs [10]. This method is considered suitable for developing a video-on-demand information system for pottery-making education, as the system's design and implementation can be carried out in a more structured and efficient manner. Rapid Application Development (RAD) is a software development method that emphasizes speed in the system development process through stages such as requirements planning, system design, development, and implementation [11]. In this study, the RAD method is used to develop a web-based information system that provides instructional pottery videos using a subscription-based monetization model. The stages of the RAD method employed in this study are as follows:

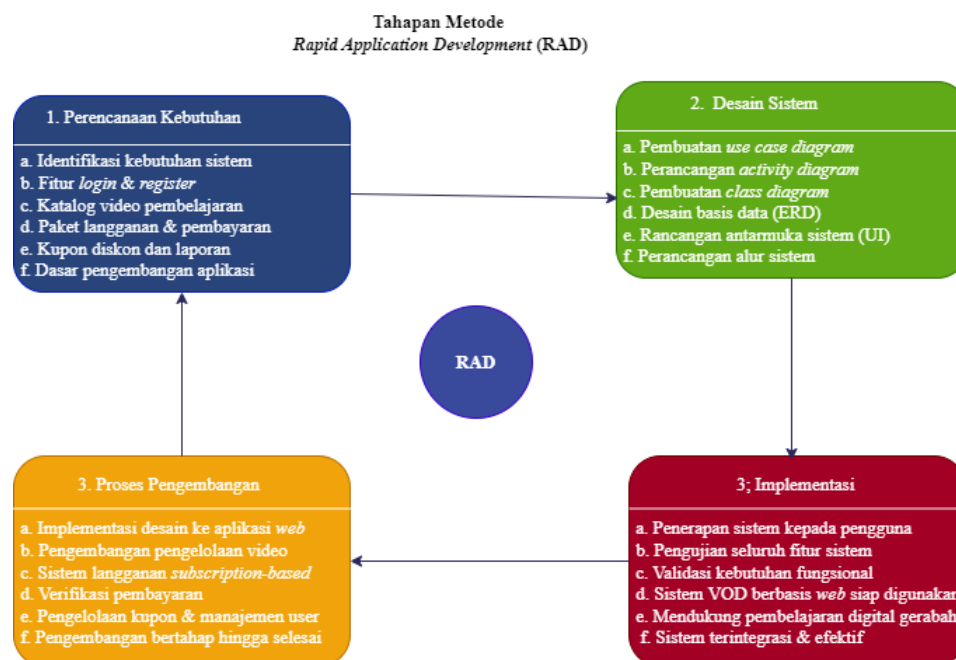


Figure 1. System Development

a. Requirement Planning

This stage involves identifying system requirements based on observation and analysis of the ceramics learning process at Rezeki Bersama. Requirements gathering was conducted through observation and literature review to identify the features needed for a web-based video-on-demand information system. The identified system requirements include user registration and login, ceramics learning video management, material category management, online video playback, subscription packages, a payment system, discount coupons, user data management, and payment and subscription reports. The outcome of this stage is a set of system requirements that serve as the foundation for the application development process.

b. System Design

The system design phase involves designing the layout and structure of the system to be built, in accordance with previously identified requirements. The design process encompasses the creation of use case, activity, class, and sequence diagrams, as well as database and user interface designs. MySQL is used as the database, running via XAMPP as a local server. Key aspects of the design include:

1. User Interface (UI) Design

The interface is designed to be simple, attractive, and user-friendly for both users and administrators. The system layout allows users to easily access the learning videos and subscription features available within the system.

2. Database Design

The database is designed using MySQL with the following main tables:

- a) User
- b) Learning video
- c) Material category

- d) Subscription package
- e) Payment
- f) Discount coupon
- g) Subscription transaction
- h) Payment history
3. System Workflow Design: The system is divided into two primary access levels:
 - a) Admin: Manages instructional videos, material categories, subscription packages, payments, discount coupons, user data, and system reports.
 - b) Users: register an account, log in, select a subscription plan, make a payment, and access and watch ceramic learning videos.
- c. Development

The development phase is carried out in stages following the RAD (Rapid Application Development) methodology. Each developed feature is tested before proceeding to the next phase. At this stage, the system design is implemented into a web-based application using PHP, HTML, CSS, and JavaScript, with Visual Studio Code serving as the text editor. Development activities include:

 1. Create the database structure based on the system design.
 2. Create user login and registration pages.
 3. Develop features to manage instructional videos and material categories.
 4. Create subscription-based package features.
 5. Implement a payment system and verify user payments.
 6. Develop discount coupon and user management features.
 7. Create an admin dashboard and an instructional video playback page.
 8. Develop features for reporting user data and payment transactions.
- d. Implementation

The implementation phase involves deploying the completed system so that it is ready for use. Implementation is carried out by running the web-based application on a local XAMPP server. During this stage, system testing is also performed using the Black Box Testing method to ensure that all features operate according to requirements and the system functions correctly. Implementation activities include:

 1. The system runs on a local XAMPP server.
 2. Ceramic instructional videos are uploaded to the system.
 3. The administrator manages video data, categories, and subscription packages.
 4. Users register for an account and log in to the system.
 5. Users can select a subscription package and make a payment.
 6. Users can access and watch pottery-making instructional videos via the web-based system.

2.2 System Requirements Analysis

The system requirements analysis in this study is divided into two parts: functional requirements analysis and non-functional requirements analysis. This analysis is conducted to determine the requirements for the system to be developed, ensuring it functions in accordance with the research objectives. The following section outlines the functional and non-functional requirements for the web-based pottery-making educational video-on-demand information system [12].

2.2.1 Functional Requirements

Functional requirements analysis is the stage of identifying the key functions a system must possess to operate in accordance with user needs. Functional requirements describe the services, processes, and activities that users and administrators can perform within the system [13]. In this web-based video-on-demand information system for pottery education, functional requirements focus on video-based learning management, subscription and payment systems, user management, and integrated access to digital learning [14]. The following are the functional requirements for the system to be developed.

Table 1. Administrator Functional Requirements

No	Administrator Functional Requirements	Description	Priority
1	<i>Login</i>	The system must provide a login feature for administrators using email and password.	Yes
2	Manage Learning Videos	Administrators can add, modify, and delete pottery-making instructional video data.	Yes
3	Manage Material Categories	Administrators can manage learning material categories to ensure videos are organized in a structured manner.	Yes
4	Manage Subscription Plans	Administrators can add and manage subscription-based packages available in the system.	Yes
5	Manage Payments	Administrators can verify and manage user payment data.	Yes

No	Administrator Functional Requirements	Description	Priority
6	Manage Discount Coupons	Administrators can create and manage discount coupons for users.	Yes
7	Manage Users	Administrators can view and manage user data registered in the system.	Yes
8	Manage Reports	Administrators can view and print payment reports and user subscription reports.	Yes
9	User Activity Monitoring	Administrators can monitor user activity and access to learning videos on the system.	Yes

Table 2. User Functional Requirements

No	User Functional Requirements	Description	Priority
1	<i>Register</i>	The system must provide an account registration feature for users.	Yes
2	Login	The system must provide a login feature using email and password.	Yes
3	Access Video Catalog	Users can view the learning video catalog based on category and learning level.	Yes
4	Watching Educational Videos	Users can access and watch pottery-making instructional videos through the system.	Yes
5	Choosing a Subscription Plan	Users can choose a subscription plan according to their needs.	Yes
6	Subscription Payment	Users can make subscription package payments through the system.	Yes
7	Using a Discount Coupon	Users can use discount coupons before making a payment.	Yes
8	Monitoring Learning Progress	Users can view the progress of videos they have watched.	Yes
9	Payment History	Users can view the history of payment transactions and subscriptions that have been made.	Yes

2.2.2 Kebutuhan Non Fungsional

An analysis of non-functional requirements is conducted to determine the system specifications and quality attributes needed to develop a web-based video-on-demand information system for pottery-making education. Non-functional requirements relate to more than just system features [15], but also with performance, security, usability, and reliability. This stage analyzes hardware, software, and user requirements. The following are the non-functional requirements for the system to be developed [16].

Table 3. Non-functional Requirements

No	Non-functional Requirements	Priority
1	The system must have an intuitive interface so that users can utilize the features without difficulty.	Yes
2	The system must have an intuitive interface so that users can utilize the features without difficulty.	Yes
3	The process of accessing instructional videos and managing data must operate stably and smoothly.	Yes
4	The system must be capable of safeguarding user and payment data by using login authentication.	Yes
5	<i>User and administrator passwords must be stored securely using encryption methods.</i>	Yes
6	The system must be capable of storing and managing video data, categories, payments, and subscriptions in a structured manner within the database.	Yes
7	The system is designed using a program structure that is easy to develop and maintain in the future.	Yes
8	The system must effectively and integrally support a video-on-demand-based digital learning process.	Yes
9	The system must be capable of being used by multiple users, within the limits of the available server capacity.	Yes

2.3 System Design

At the system design stage, the design in this study encompasses several components used to describe the system's processes and workflows [17]. The system design covers the following:

2.3.1 Use Case Diagram

The use case diagram for the web-based pottery-craft education video-on-demand information system is shown in Figure 2 below:

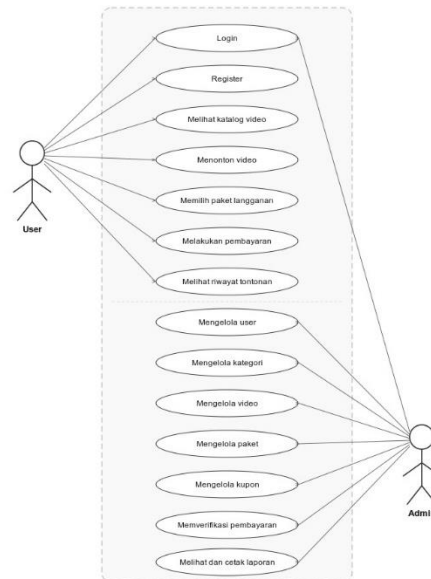


Figure 2. Use Case Diagram

Based on the use case diagram, there are two primary actors: the User and the Admin. The User is an individual who utilizes the application to access instructional video services, while the Admin is responsible for managing data and system settings.

- Users can perform several activities, including logging in, registering, viewing the video catalog, watching videos, selecting a subscription plan, making payments, and viewing their watch history. The Login feature authenticates the user within the system, while the Register feature is used to create a new account. Once logged in, users can browse the video catalog and watch videos available on the application. Additionally, users can select a subscription plan to gain access to premium videos and subsequently make the corresponding payment. The system also includes a watch history feature that allows users to view their past viewing activity.
- Admin: This role involves various system management functions, such as managing users, categories, videos, packages, and coupons; verifying payments; and viewing and printing payment reports. Data management features are used to organize all information within the system, ensuring that the application's operational processes run smoothly and in a structured manner. The use case diagram provides a clearer understanding of the relationships between actors and system functions, as the activities of both users and administrators are depicted in alignment with the business processes of the application being developed.

2.3.2 Class Diagram

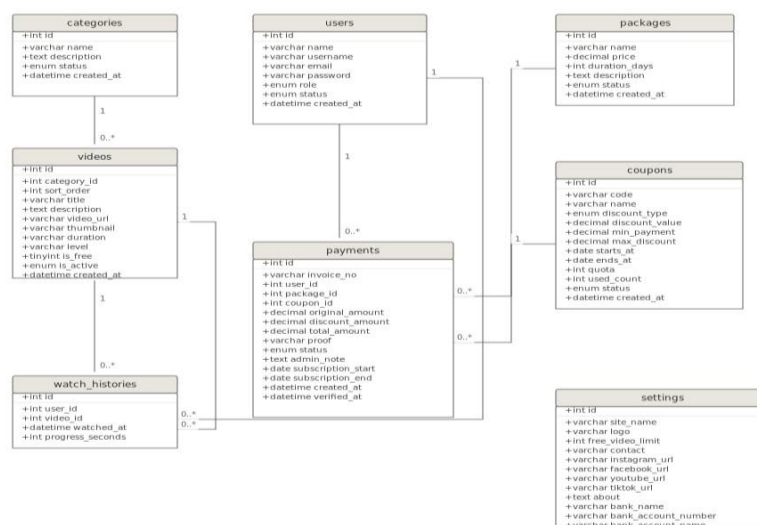


Figure 3. Class Diagram

Based on the class diagram, the system comprises several key classes: Users, Video, Categories, Packages, Payments, Coupons, Watch_Histories, and Settings. Each class possesses attributes designed to store data relevant to its specific function within the system. The Categories class is linked to the Video class via a one-to-many relationship; this indicates that a single category can contain multiple instructional videos, whereas a specific video belongs to only one category.

This structure facilitates the grouping of videos based on the type of learning material. The Users class maintains relationships with the Payments and Watch_Histories classes. Regarding the Payments relationship, a single user can execute multiple subscription payment transactions. In the case of the Watch_Histories relationship, a user can have multiple video viewing records stored in the system. The Packages class is associated with the Payments class; this relationship signifies that a single subscription package can be utilized across multiple payment transactions by different users. Package data is used to define subscription types, pricing, and access duration for premium videos. The Coupons class is also connected to the Payments class, a relationship used to track the application of discount coupons to user payment transactions. This connection enables the system to manage price reductions based on the specific coupon codes used. The Video class relates to the Watch_Histories class, a connection used to store data on user viewing activity, including watch times and playback progress. Meanwhile, the Settings class serves as a repository for core website configurations such as system identity, contact information, social media details, and payment account data. This class has no direct relationships with other classes, as it functions as a centralized hub for general system settings.

2.4 Database Design for Users

The User database is used to store account data for users registered in the system. This table includes information such as user identity, login credentials, access rights, account status, and account creation date.

Table 4. Database design for users

No	Nama Field	Tipe Data	Keterangan
1	id	int(11)	User Primary key
2	name	varchar(120)	Name
3	Username	varchar(80)	Username
4	Email	varchar(120)	User Email
5	Password	varchar(255)	User Password
6	role	enum('admin','User')	User access rights
7	status	enum('active','inactive')	User status
8	created at	datetime	Date data was created

The 'user' table is used to manage user account data within the system. It stores information such as user identity, login credentials, access rights, account status, and account creation timestamps. This table enables the system to authenticate users, assign access levels based on roles, and monitor the status of each registered account.

3. RESULT AND DISCUSSION

3.1 System Implementation Results

The result of this research is a web-based Video-on-Demand (VoD) information system for ceramics education that implements a subscription-based monetization model. The system was developed to facilitate the process of digital ceramics learning by providing structured and easily accessible instructional videos. It features two types of users: administrators and general users. Administrators are responsible for managing instructional videos, material categories, subscription packages, payments, discount coupons, and system reports. Meanwhile, users can register, log in, select subscription packages, make payments, and access instructional videos in accordance with their access privileges.

3.1.1 Home Page

The Home page serves as the main page, displaying information about the system and providing access to key features such as the video catalog, subscription plans, login, and registration.

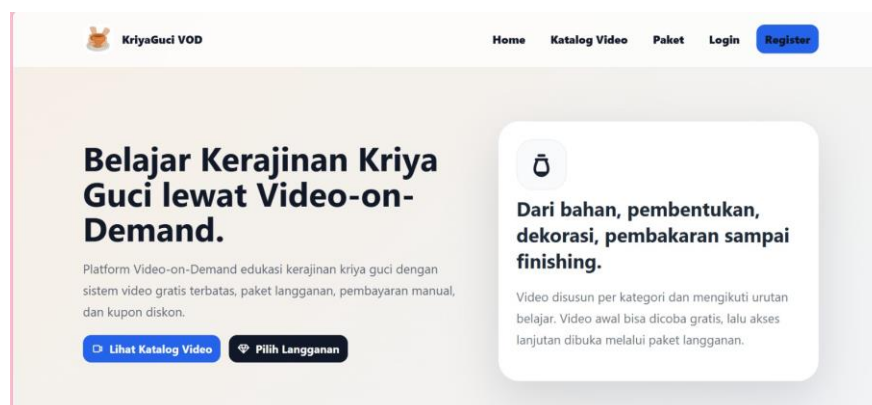


Figure 4. Halaman Home

3.1.2 Login Page

The login page serves as a means for user authentication to access the system. Users are required to enter their registered email address or username and password. Once the data is validated, the system grants access based on the user's access rights.

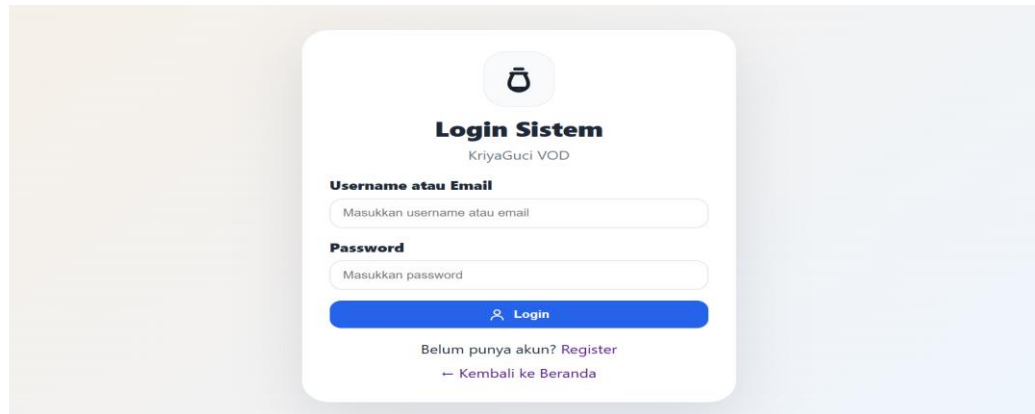


Figure 5. Home Page

3.1.3 Halaman Register

The registration page is used to create a new account. Users can enter the required information, such as their full name, username, email address, and password. Successfully registered data will be stored in the database for use during the login process.

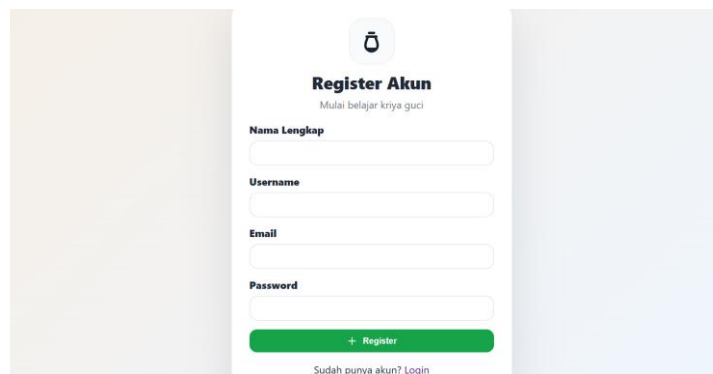


Figure 6. Registration Page

3.1.4 Admin Dashboard Page

The Admin Dashboard displays the KriyaGuci VOD interface, providing a summary of key system information. The top section presents statistics on user counts, total videos, transactions, and approved revenue. Meanwhile, the Recent Payments section displays data on the latest payment transactions, including invoice numbers, users, subscription plans, total payment amounts, and transaction statuses.

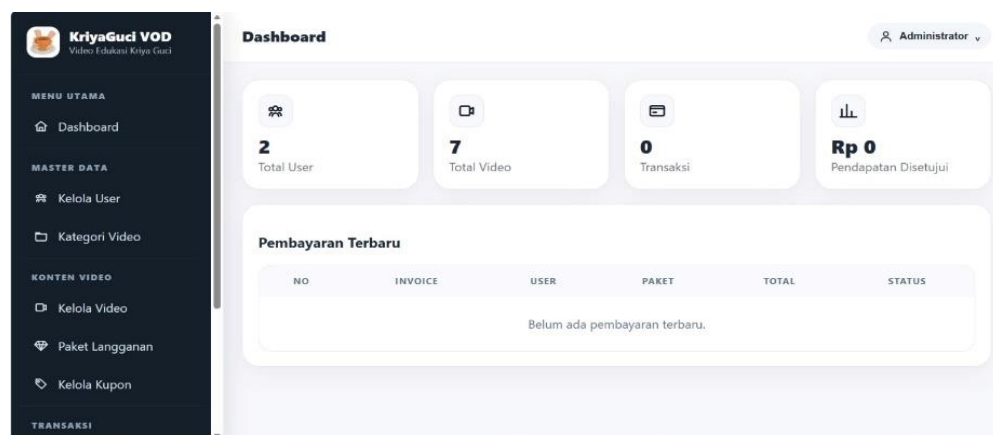


Figure 7. Admin Dashboard Page

3.1.5 Video Catalog Page

The Video Catalog page displays a list of pottery-making instructional videos available in the system. These videos are organized by category and skill level, making it easy for users to select the material that best suits their learning needs.



Figure 8. Video Catalog Page

3.1.6 Subscription Page

The subscription page displays the various subscription plans available in the system. Users can view the price, subscription duration, and benefits of each plan before making a purchase.

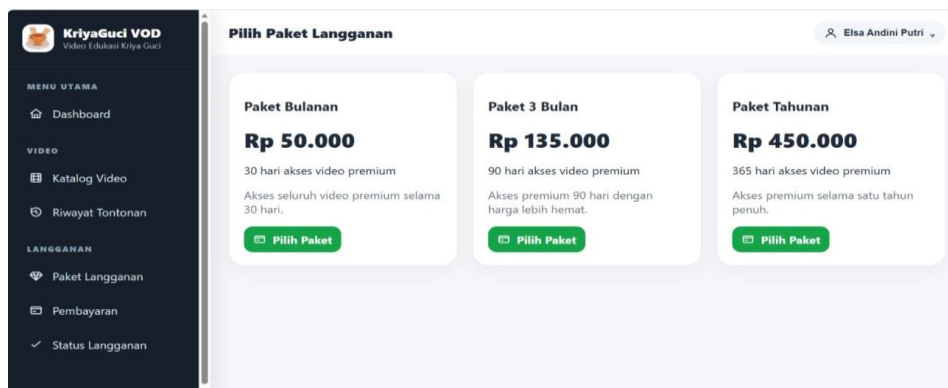


Figure 9. Subscription Page

3.1.6 Payment Page

The Payment page processes user subscription transactions. Here, users can view payment details, confirm payment, and upload proof of payment using the available payment methods.

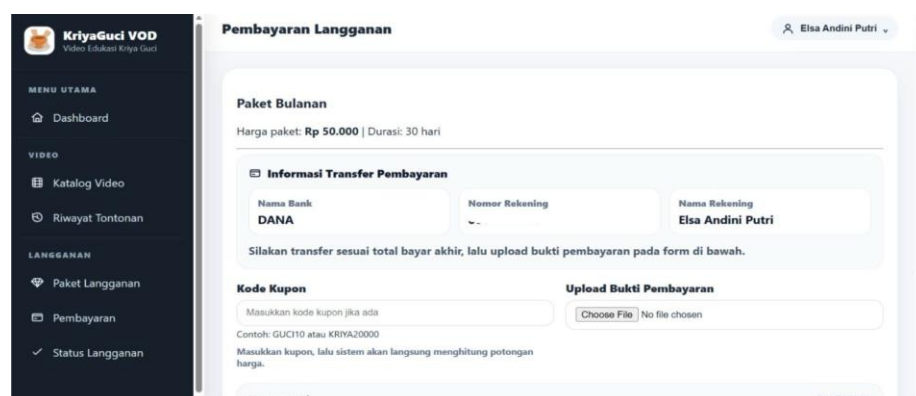


Figure 10. Payment Page

3.2 System Advantages

The Video-on-Demand information system developed for ceramics education offers several advantages over conventional learning methods and previous research, namely:

- The system provides structured video learning materials for ceramics, ranging from beginner to advanced levels.
- The system is accessible anytime and anywhere via a web-based platform, supporting remote learning.
- The system includes a learning progress monitoring feature that helps users track their learning progress.

- d. The system provides integrated content management through features such as material categorization, user management, and instructional video management.
- e. The system implements a subscription-based monetization model that generates economic value for artisans or creators acting as content providers.
- f. The system supports the preservation of ceramics through the use of modern and accessible digital technology.

3.3 Comparison with Previous Studies

Previous research, titled "Interactive E-book Media with a Project-Based Learning Model Incorporating Local Wisdom in Ceramic Vase Making," focused on developing interactive e-book learning media to enhance users' understanding of ceramic crafting materials. Although the content was presented interactively, the study did not provide video-based instruction capable of visually demonstrating the ceramic-making process step-by-step.[18].

Another study, titled "Canva Application Training for Creating Digital Marketing Content for Ceramic Artisans," focuses more on enhancing artisans' skills in creating digital promotional content using the Canva application. This study does not address the development of a digital learning system that could serve as a structured educational medium for ceramic craftsmanship [19].

The study, "Ceramic Craft Course to Prepare Student Community Service Participants in Selogabus Village, Parengan District, Tuban Regency," still employs conventional learning methods involving in-person training. This approach has limitations regarding time, space, and the number of participants who can take part in the learning activities [20].

Unlike previous research, this study develops a web-based Video-on-Demand (VoD) information system that provides structured video-based learning materials on ceramics, ranging from beginner to advanced levels. The system also incorporates features for user management, content categorization, learning progress tracking, and a subscription-based monetization model. These features enable users to learn flexibly anytime and anywhere while offering artisans income-generating opportunities through the provided content. Consequently, the developed system serves not only as a digital learning platform but also supports the preservation of ceramic craftsmanship and the growth of the technology-driven creative economy.

4. CONCLUSION

The KriyaGuci VOD (Video-on-Demand) information system has been successfully designed and built as a web-based application to support the learning of pottery craftsmanship in a digital, structured, and accessible manner. The system offers user features such as registration, login, a video catalog, free and premium video playback, subscription plan selection, payment processing, discount coupon usage, subscription status tracking, and viewing history. For administrators, the system provides tools to manage user data, video categories, instructional videos, subscription plans, discount coupons, payment verification, and transaction reports. The application of the Rapid Application Development (RAD) method facilitated a phased development process comprising requirements planning, system design, development, and implementation. A subscription-based monetization model supports service sustainability while creating economic opportunities for artisans acting as educational content providers. Currently, the system operates on a local server, payment processing requires administrator verification, and the available instructional content is limited. Future development could focus on deploying the system online, integrating a payment gateway, enhancing data security, adding video review and recommendation features, and expanding the range of pottery instructional materials.

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