




Web-Based Grape Seed Information System Using the Agile Methodology for the Cikarang Grape Community

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 <https://doi.org/10.37339/e-komtek.v8i2.2149>

Published by Politeknik Piksi Ganesha Indonesia

Abstract

Artikel Info
Submitted:
30-11-2024
Revised:
23-12-2024
Accepted:
24-12-2024
Online first :
27-12-2024

This research applies the Agile methodology to develop a web-based grape seed information system for the Cikarang Grape Community. This method was chosen to enhance flexibility and responsiveness in development, with active involvement from community members at every stage. The process begins with a needs analysis through surveys and interviews, followed by an iterative user-focused solution design. Development is conducted in sprints, allowing features to be tested and evaluated regularly. The implementation results show that the system improves efficiency in managing and distributing grape seeds and strengthens cooperation among community members. With transparent and real-time data access, the community is better equipped to make informed decisions regarding production and marketing. This research is expected to serve as a model for similar information system development in the future.

Keywords: *Agile Method, Information System, Wine Seeds, Cikarang Wine Community, Web-Based Development.*

Abstrak

Penelitian ini menerapkan metodologi Agile untuk mengembangkan sistem informasi biji anggur berbasis web untuk Komunitas Anggur Cikarang. Metode ini dipilih untuk meningkatkan fleksibilitas dan daya tanggap dalam pengembangan, dengan keterlibatan aktif dari anggota komunitas di setiap tahap. Prosesnya dimulai dengan analisis kebutuhan melalui survei dan wawancara, diikuti dengan desain solusi yang berfokus pada pengguna secara berulang. Pengembangan dilakukan secara sprint, sehingga fitur-fitur dapat diuji dan dievaluasi secara teratur. Hasil implementasi menunjukkan bahwa sistem ini meningkatkan efisiensi dalam mengelola dan mendistribusikan benih anggur serta memperkuat kerja sama di antara anggota komunitas. Dengan akses data yang transparan dan real-time, masyarakat menjadi lebih siap untuk mengambil keputusan yang tepat terkait produksi dan pemasaran. Penelitian ini diharapkan dapat menjadi model untuk pengembangan sistem informasi serupa di masa depan.

Kata kunci : *Metode Agile, Sistem Informasi, Bibit Anggur, Komunitas Anggur Cikarang, Pengembangan Berbasis Web.*



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1. Introduction

Grape cultivation in Cikarang has experienced significant growth in recent years, making it a promising agricultural sector for the community. With substantial economic potential and increasing market demand, grape cultivation improves farmers' incomes and local food security [1]. The Cikarang Grape Seed Community, consisting of local grape growers, focuses on grape seed cultivation and farming while coordinating efforts related to the production and distribution of grape seeds [2]. However, the community still faces several challenges in developing this sector [3][4].

One of the primary challenges is the lack of an integrated and real-time information system to monitor and manage grape seed availability. The absence of accurate data often leads to difficulties in decision-making regarding production, distribution, and marketing. Therefore, a technological solution is needed to address these issues [5] [6] [7]. In this context, developing a web-based Grape Seed Information System is proposed to assist the community in managing stock, improving information transparency, and expanding marketing reach [8].

The Agile methodology ensured that the system was efficiently developed and met user needs. Agile is known for its iterative and flexible approach, dividing the system development into several cycles that allow for rapid adjustments based on user needs or feedback [9] [10] [11] [12]. This approach actively involves community members at every stage of development, from design to testing, ensuring the system is more responsive to real-world needs and changes. Through Agile, system development focuses not only on technical solutions but also on enhancing user experience and operational effectiveness.

The development of this web-based information system is expected to serve as a crucial tool for the Cikarang Grape Seed Community in optimizing seed stock management, improving distribution efficiency, and expanding online market access. Thus, the system helps farmers address stock management challenges while promoting economic growth within the community through appropriate technology applications [13] [14].

2. Method

The stages of this research can be seen in **Figure 1**.

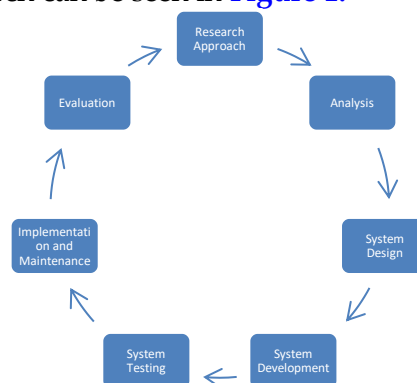


Figure 1. Research Flow

a. Research Approach

This study uses the Research and Development (R&D) method, comprising key stages such as needs analysis, system design, development, testing, implementation, and maintenance [15] [16] [17].

b. Analysis

Data were collected through interviews and observations with community members to understand system requirements related to grape seed management. A literature review comparing similar systems and relevant technological solutions was also conducted.

c. System Design

- **Architectural Design:** Includes flowcharts and use-case diagrams to illustrate workflow and user interactions with the system.
- **UI Design:** Focused on creating a simple and user-friendly interface.

d. System Development

The development process involved coding with HTML, CSS, and JavaScript for the front end and PHP and MySQL for the back end. An iterative approach was applied, with testing conducted at each stage.

e. System Testing

Functional Testing: Ensures that each feature works as designed.

User Acceptance Testing (UAT): Conducted with community users to gather feedback.

Security Testing: Ensures the system is secure from cyber threats.

f. Implementation and Maintenance

After testing, the system was implemented within the community, accompanied by user training and routine maintenance to ensure optimal performance and future adjustments as needed.

g. Evaluation

Evaluation was carried out through questionnaires and in-depth interviews to measure user satisfaction and experience. The results were used for further system development.

The Agile method is an iterative and flexible approach to software development that aims to deliver products more quickly and effectively respond to changes in user needs. [18][19][20] Agile emphasizes close collaboration between development teams and users. The project is divided into smaller development cycles called sprints. Each sprint focuses on completing specific features or functions, which are tested and evaluated before proceeding to

the next stage. This approach allows teams to adapt quickly to user feedback and make necessary improvements or modifications throughout development. Key principles of the Agile method relevant to the development of this Web-Based Grape Seed Information System include:

a. Short and Continuous Iterations

Development is conducted in short cycles (sprints), typically lasting a few weeks. Each cycle delivers features that can be implemented and tested immediately. Short iterations allow the team to see results at every stage and identify issues early, reducing the risk of significant errors.

b. Collaboration with Users

Agile's strength lies in active user involvement at every stage of development. In this project, the Cikarang Grape Community members provided feedback during the development process, ensuring that the system effectively meets their functional and interface needs.

c. Adaptability to Changes

Agile encourages flexibility in responding to evolving needs or specifications during development. For example, community needs may change over time in the grape seed system due to market conditions or technical requirements. Agile accommodates such changes without altering the overall project plan by adjusting at each sprint.

d. Quick and Gradual Delivery of Products

Instead of waiting for the entire system to be completed, Agile allows for the gradual delivery of components ready for use. This enables the community to use developed features while waiting for other features to be completed, providing early operational benefits.

e. Continuous Evaluation and Feedback

Each sprint concludes with an evaluation session where developers and users review progress. User feedback is used to refine or further develop features. This feedback cycle ensures that the system remains relevant and beneficial to its users.

3. Results and Discussion

a. System Testing

Developing the Web-Based Grape Seed Information System for the Cikarang Grape Community followed an iterative and flexible approach using the Agile methodology. Each sprint produced features that were implemented and tested by users. This iterative approach allowed for continuous refinement and adaptation based on feedback from the community.

b. Login and Registration Functionality

The login and registration feature verifies user input, requiring valid email and password entries. New users can register via the registration form. Testing revealed no issues in this functionality. **Figure 2** shows the login display, and **Figure 3** shows the dashboard display.

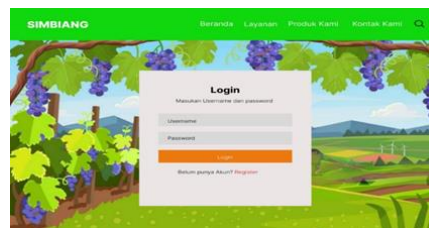


Figure 2. Login Display

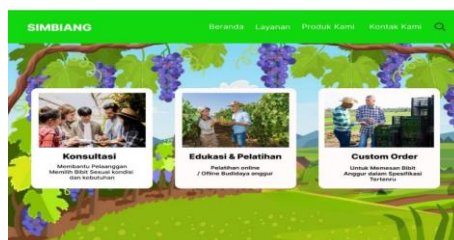


Figure 3. Dashboard Display

c. Services and Products Feature

The services page provides information on offerings such as guides for selecting seeds, maintenance techniques, and seed delivery services. The products page displays available grape seeds, complete with descriptions and pricing. **Figure 4** is a web system display.

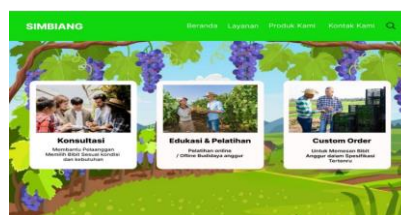


Figure 4. Web System Display

d. Product Search Feature

The system includes a search feature, enabling users to find grape seeds based on their needs. Testing with various keywords confirmed that the feature works efficiently, delivering relevant results without issues.

e. Online Ordering Feature

Users can order grape seeds through the system by completing an order form. Upon placing an order, users receive notifications regarding their order status. Tests demonstrated that the system processes data effectively, with no issues in order confirmations.

f. Admin Dashboard

The admin dashboard monitors user activity and manages the products within the system. Administrators can add new products, edit existing information, or remove unavailable products. Testing confirmed that this functionality operates as intended.



Figure 6. Web System Display

g. System Benefits

The Web-Based Grape Seed Information System delivers numerous advantages to the Cikarang Grape Community, including:

- Efficiency in Seed Management: Real-time access to stock information minimizes errors associated with manual management.
- Ease of Access to Information: The web platform allows users to obtain product details without needing to visit in person.
- Market Reach Expansion: Online access enables broader marketing opportunities, reaching buyers beyond the local Cikarang area.

Table 1. Benefits and Functions of the Menus in the Web Information System

Benefits	Functions
Information Center	Provides complete information about grape seeds, planting techniques, care, and harvesting.
Education	Offers articles, video tutorials, and practical guides for grape farmers.
Community and Networking	Facilitates discussion forums and networking among members of the grape community.
Marketing and Promotion	Provides a platform for promoting grape products and seeds from community members.
Online Ordering	Offers online grape seed ordering services with various payment options.
News and Event Updates	Shares the latest news about grapes, including community events and training sessions.
Customer Service	Provides customer support through live chat or contact information.
Testimonials and Reviews	Displays testimonials and reviews from users who have purchased grape seeds.
Research and Development	Shares the latest research findings and innovations in grape cultivation.
Collaboration with Experts	Provides access to consultations with experts in agriculture and grape cultivation.
Distribution Map and Location	Displays a map of grape seed distribution locations and community vineyards.
Documentation and Archives	Stores and archives document community activities, including photos and videos.
Analytics and Feedback	Uses analytics to measure content effectiveness and gather user feedback.

h. Discussion on System Design and Development

The system design focuses on ease of use and accessibility. Using flowcharts and use case diagrams, the entire process, from user interaction to system administration, is clearly documented.

- System Flowchart

The flowchart illustrates users' process, from logging in to ordering grape seeds. It ensures that each step the user takes in the system runs smoothly.



Figure 7. Web System Flowchart

- Use Case Diagram

This diagram depicts user interactions with the system and its main features. It makes system development more structured and aligned with user needs.

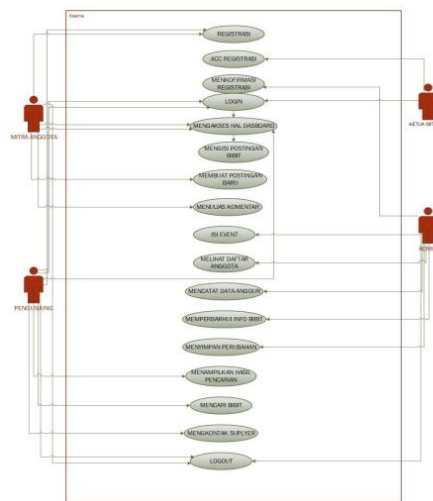


Figure 8. Web system Use Case

Based on the testing and discussion results, this information system has proven to enhance grape seed management and marketing efficiency and effectiveness in the Cikarang Grape Community. The system also offers significant benefits by expanding market reach and providing easier access to information for all community members.

4. Conclusion

Developing the Web-Based Grape Seed Information System for the Cikarang Grape Community has successfully improved marketing and distribution efficiency for grape seeds. Employing the Agile methodology, the system was developed iteratively, involving users at every stage. This approach enabled the development team to respond quickly to user needs and adapt features based on feedback, resulting in a highly adaptive system relevant to real-world requirements. Agile also expedited the implementation process, allowing community members to utilize key features such as online ordering and stock management even before the system's full development was complete. This enabled early system use while additional features were still being developed. Such an approach ensures that the system can evolve dynamically in response to the community's changing needs. Applying Agile methodology has enhanced collaboration among community members, expanded online marketing reach, and optimized real-time stock management. This system supports resource optimization, increases competitiveness, and strengthens the local economy.

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