

# Fish selection recommendation system Based on budget using the rapid Application development method

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## Abstract

This research develops a multiplatform fish selection recommendation system in Bengkalis Subdistrict using a Knowledge Base approach and the Rapid Application Development (RAD) method. The main objective of the system is to help consumers choose fish based on criteria such as budget, price, texture, and taste. The RAD method is used to optimize the system development process according to user needs, while the Knowledge Base approach enables precise fish recommendations. The system is equipped with additional features including fish market location and distance information, providing easy access to routes and travel time. The research results demonstrate that the system successfully simplifies the fish selection process by providing various criteria and location information within a single application.

**Keywords:** Recommendation System, Budget, Rapid Application Development (RAD), Knowledge Base, Black Box.

## 1. Introduction

In today's digital era, the need for fast and accurate information has become very important, especially in the field of food consumption. Fish is one of the excellent sources of animal protein and has many health benefits [1]. However, many consumers have difficulty choosing fish that fits their budget. This causes a lack of information that can help consumers make the right decisions. Therefore, a system is needed that can help consumers choose fish that suits their budget and preferences.

Rapid Application Development (RAD) is one of the system development methods that is relatively short. This method requires completion time of around 30 to 90 days. This model has "high speed" to complete multiplatform-based design and development. RAD can produce a system within a short timeframe because the developed system can reduce redevelopment time after the implementation stage [2].

In addition to using the RAD method, a Knowledge Base approach is also applied in this system. Knowledge Base is an approach that uses data and rules stored in a knowledge base to provide recommendations [3]. In the context of a fish recommendation system, the Knowledge Base will utilize fish price data, user preferences, locations in Bengkalis District, and available budget to provide the most suitable recommendations. Information such as fish names, texture, taste, and prices will be included.

This system will also add cooking method information and fish sales location information available to help users process fish and know the distance from their location to markets or shops, making purchase planning easier. Knowledge Base enables the system to provide more accurate and relevant recommendations by considering various factors and established rules. This will improve the quality of recommendations and user satisfaction.

This system not only helps consumers choose fish that fits their budget but also provides useful information about the fish being consumed, so users can improve the quality of their consumption. The use of Rapid Application Development methods and Knowledge Base approaches in developing this system is expected to provide fast and effective results, as well as enable quick adjustments to changes in user needs and preferences. Thus, this budget-based fish selection recommendation system is expected to be an appropriate and beneficial solution for consumers in choosing fish that suits their budget.

## 2. Literature Review

According to research titled "CCTV Installation Package Selection Recommendation System using Knowledge Based Method at CCTV Center Delanggu", the problem is that users have difficulty choosing the right CCTV installation package because they have to directly consult with the sales team. This requires time and is less efficient for busy users. The solution is to create a web-based CCTV installation package selection recommendation system that can help users get recommendations without having to consult directly [5].

According to research titled "Decision Support System Design for Scholarship Recipient Determination Recommendations Using Rapid Application Development", the problem is that the large number of scholarship applicants becomes a challenge for educational institutions to make the right decisions, then criteria are needed to determine recipients but the large number of applicants and criteria makes the process complicated and requires a system to help determine who is objectively worthy to produce a system that supports objective decision making. The solution is the need for a decision support system to facilitate the process of determining scholarship recipients [6].

According to research titled "Design of Shoe Product Recommendation System Using Knowledge Base Recommendation Method", the problem is that Solo Sepatu Store has many shoe products being sold, so many customers experience difficulties in choosing the desired shoe products. Customers who come to the store do not necessarily have a choice of products to buy, so they will feel difficulty because of the many product choices. There is potential for mismatch between purchased products and customer desires due to subjective selection processes. The solution is to design a shoe product recommendation system using the knowledge-based recommendation method. This system aims to help customers choose shoe products that match the desired criteria such as type, price, material, size, and color [7].

According to research titled "Batik Shirt Type Selection Recommendation System Using Knowledge-Based Method at Batik Amarta", the problem is that customers experience difficulties in choosing batik shirt products sold by Batik Amarta because there are various product variations, such as batik types, colors, materials, quality, and prices. The solution is to build a knowledge-based recommendation system to help customers choose batik shirt products that match their desires and preferences. This system will recommend products based on product attributes and preferences filled in by customers [8].

According to research titled "Computer Assembly Package Selection Recommendation System Using Knowledge Base Method at CV Innovision", the problem is the difficulty of CV Innovision in providing recommendations and customers choosing packages, while the solution is the development of a knowledge base-based recommendation system to facilitate the recommendation process and selection of computer assembly packages for customers. The solution is to develop a computer assembly package selection recommendation system using the Knowledge Base method. Attributes used to recommend products include spare parts, prices, and software installation [9].

According to research titled "Data and Internet Service Selection Recommendation System for BGES Segment with Web-Based Knowledge Base Method at PT. Telkom Surakarta", the problem is the difficulty of consumers in choosing the right service, and the solution is the development of a website and knowledge base-based recommendation system to make it easier for consumers to choose services according to their needs. This system is expected to facilitate both consumers and PT Telkom [10].

### 3. Methodology

The chart below is the stages in making a recommendation system for fish selection based on the budget starting from problem identification, stages of data collection methods, and phase implementation in the Rapid Application Development (RAD) method.

#### a. Problem Identification

Based on observations in the background of the study, we managed to identify the following problems that arose:

1. Consumers find it difficult to choose fish according to their budget.
2. Lack of information on fish characteristics such as (price, texture and taste of fish).
3. Consumers do not know the location of the nearest market or fish stall and the distance.
4. There is no app or system that helps automatically recommend fish.

#### b. Data Collection Methods

Data collection:

1. Observation  
Observation is carried out by making observations and directly participating in the buying and selling process to get the problems carried out in the fish market and fish sales shop.
2. Questionnaire Distribution  
In this method, the author conducted a survey using a questionnaire, which contained several questions that the respondents had to answer.
3. Interview  
An interview was conducted with the Fisheries Service with Mr. Jonny Handoko as the Functional Quality Coach of Marine and Fisheries Products of Bengkalis Regency, to request and validate the data. The data obtained is used for the process of creating the system to be built.

#### c. RAD Method

The RAD (Rapid Application Development) method has 4 stages, including the following:

1. Requirements Planning  
At this stage, solving the problem that is occurring, determining what is needed to create an application system, because it is the first step in the successful creation of the system and can avoid miscommunication between the author and the user. Users are divided into 2, namely general users and admins.

2. User Design  
The stage of making the design that will be proposed is in accordance with needs, runs according to plan and can overcome the problems that are occurring. In this study, the system design described uses Tools Unified Modeling Language (UML).
3. Development Process (Construction)  
The starting stage is creating a system that has been planned, compiling a program code or called coding, to change the design of the system created into an application that has been planned to be used. The views that the author created include: Admin Login, Admin View, User Main Page, Recommendation View, and Location View.
4. Implementation  
In this last stage, the system that has been created will be tested for applications.



Fig.1 : RAD System Development Phases

## 4. Results and Discussion

### 4.1 Use Case Diagram

The Usecase Diagram describes the interaction of each actor on the system, the actor is the user who can use the features in the designed application.

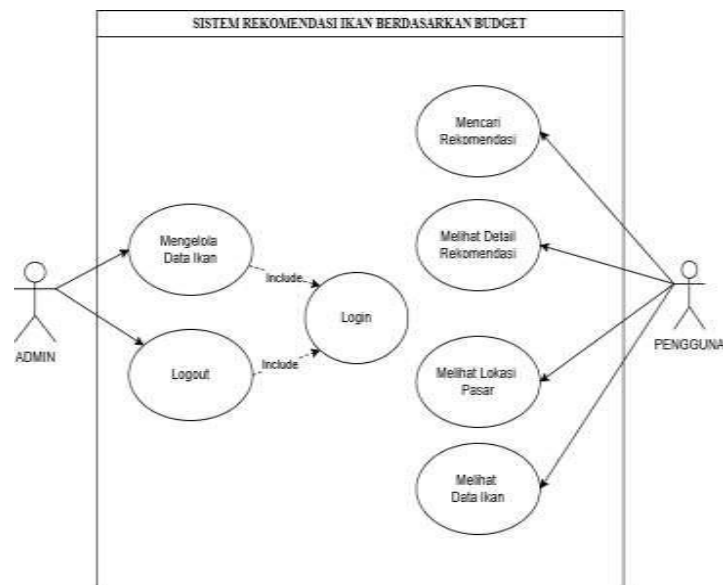


Fig. 2: Use Case Diagram

Description of the use case The creation of this fish selection recommendation system application has two actors, namely Users and Admins. Users can view fish data, search for recommendations, view recommendation details and view market locations, while admins can login, manage fish data, and log out.

### 4.2 Activity Diagram

Activity diagrams describe the flow of activities carried out by the system in the created application.

1. Activity Diagram User Recommendations

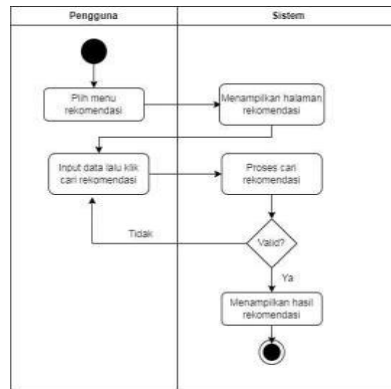


Fig. 3: Activity Diagram Recommendations

In this recommendation activity, the user is on the main page, then the user selects the recommendation menu, clicks get information, then fills in the recommendation form, then selects search, the system will process the recommendation, if it is invalid the system will return to the data input and if it is valid the system will display the results of the recommendation.

4.3 Class Diagram

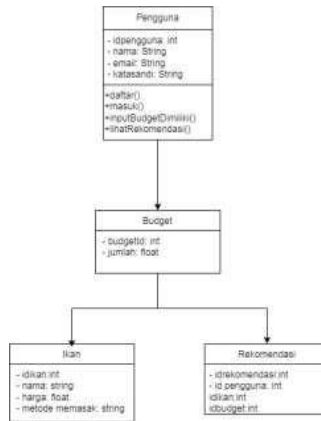


Fig. 4: Class Diagram

4.4 User Interface

4.4.1 User Display

1. Home Page



Fig. 5: Home Page

On the home page, you will see the main page leading to accessible menus. There are three menus on the home page: the home menu, the recommendation menu and *the profile menu*. The home page also displays the name of the application and information for fish recommendations according to *the budget*.

## 2. Recommendation Page



Fig. 6: Recommendation Page

On the recommendations page, you can find fish recommendations and list fish. On the fish list When clicked, a description of the fish will appear such as the name of the fish, the price of the fish, the texture of the fish, the taste of the fish, the method of cooking the fish and the picture of the fish, while looking for the recommendation recommendations will appear on the recommendation input page.

### 3.4.2 Admin View

#### 1. Admin Login View

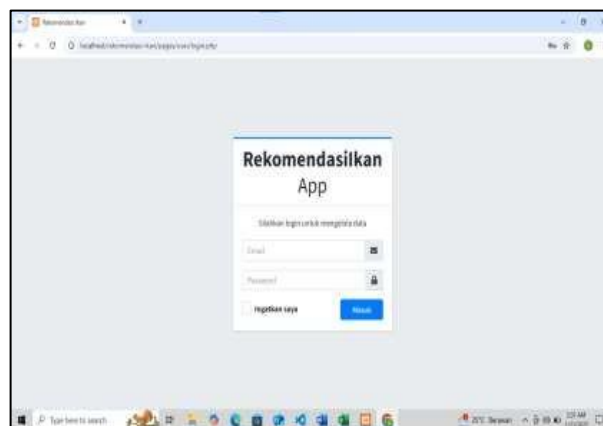


Fig. 7: Admin Login View

This login page is the first page on the Fish Selection Recommendation System Website based on budget. This login page aims to access the website and manage the data on the website. On this page, the admin enters the username and password then click the login button to enter the website.

## 2. Admin Dashboard View

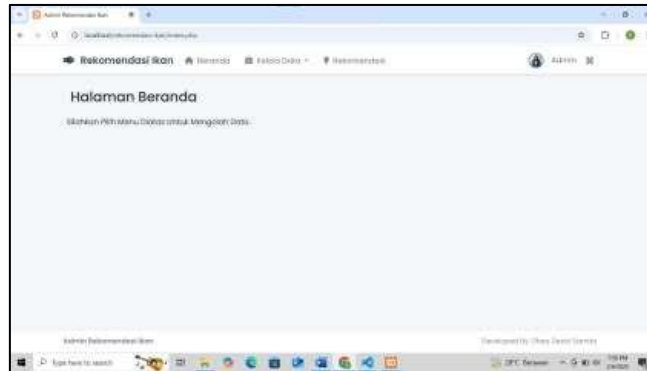


Fig. 8: Admin Dashboard View

This dashboard page is the main page after logging in to the Fish Recommendation System website. On this page, several menus are displayed, namely dashboard, manage data and logout. In data management, admins can manage fish data by adding fish, changing fish, and removing fish.

## 4. Conclusion

The conclusion of this study resulted in a multiplatform-based fish selection recommendation system developed using a knowledge-based approach (Knowledge Base) and the Rapid Application Development (RAD) method in Bengkalis District. The development results show that the system has succeeded in helping consumers choose fish according to their budget, preferences such as price, texture, taste, by using the Rapid Application Development method for the system development process in user needs, and the application of Knowledge Base which shows that the system has succeeded in providing fish selection suggestions that suit the user's wishes. In development, this system is also equipped with location information and distance to the fish market, which helps users know the route and travel time to the purchase location. With this system, the fish selection process becomes easier because users can see various criteria and market location information in one application.

The suggestion of the fish selection recommendation system using the Rapid Application Development method still has several shortcomings so that it is necessary to develop and improve the system to make it better. The researcher hopes for future researchers who want to continue this application with suggestions for adding variations of fish species, market locations, and search history..

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## References

- [1] A. Mulyani, F. Nuraeni, and J. M. Zaelani, "Design and Development of an Application of a Freshwater Fish Disease Diagnosis Expert System Using *Forward Chaining*," *Journal of Algorithms*, vol. 21, no. 1, pp. 47–56, May 2024, doi: 10.33364/algorithm/v.21-1.1420.
- [2] A. Andriyani and E. V. Haryanto, "Design and Build An E-commerce Web For Clothing Products Using The Method Rapid Application Development (RAD) At Store Idola Fashion," *InfoDigit Journal*, vol. 1, no. 1, p. 1, 2023, [Online]. Available on: <http://kti.potensi-utama.ac.id/index.php/JID>
- [3] V. Atina and D. Hartanti, "Knowledge Based Recommendation Modeling For Clothing Product Selection Recommendation System," *Journal of Informatics Engineering (Jutif)*, vol. 3, no. 5, pp. 1407–1413, Oct 2022, doi: 10.20884/1.jutif.2022.3.5.584.
- [4] R. R. Novandra and H. Heryanto, "Designing an Influencer Recommendation System Using *Knowledge-Based Filtering*," *Media Informatika*, vol. 20, no. 3, 2021.
- [5] M. Muhith, D. Hartanti, J. Maulindar, P. First, P. Second, and P. Third, "CCTV Installation Package Selection Recommendation System using the *Knowledge Based Method* at the Delanggu CCTV Center," 2022.
- [6] F. Natsir and R. Abeputra Sihombing, "Designing a Decision Support System for Recommendations for Determining Scholarship Recipients," *Journal of Civilizational Information and Technology Systems (JSITP)*, vol. 3, no. 2, 2022, [Online]. Available on: [www.journal.peradaban.ac.id](http://www.journal.peradaban.ac.id)
- [7] A. D. Safitri, A. Sulami, and J. Safitri, "Designing a Shoe Product Recommendation System Using the *Knowledge Base Recommendation Method*," *Journal of Informatics Student Research and Application (JRAMI)*, vol. 04, 2023.
- [8] N. Saputro, V. Atina, and D. Hartanti, "Recommendation System for Selecting Batik Clothing Types Using *Knowledge-Based Methods* in Amarta Batik," *Fasilkom Journal*, vol. 14, pp. 451–457, Aug 2024.
- [9] R. Dwi Saputra and S. Sumarlinda, "Computer Assembly Package Selection Recommendation System Using The *Knowledge Base Method* at CV Innovision," *Journal of Information Technology and Computer Science (INTECOMS)*, vol. 7, no. 4, pp. 1404–1409, 2024.
- [10] I. Sulistyowati, D. Setyawan, and N. Zuhdi Arzaqi, "BGES Segment Data and Internet Service Selection Recommendation System with *Web-Based Knowledge Base Method* at PT. Telkom Surakarta," *Journal of Information System Management (JOISM) e-ISSN*, vol. 6, no. 1, pp. 2715–3088, 2024.

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- [11] T. Indriyani *et al.*, "Improving the Accuracy of the Sandals Product Recommendation System Using a *Knowledge-Based* Method," *Journal of Computer Science and Education*, vol. 2, no. 4, pp. 679–686, 2024, [Online]. Available on: <https://journal.mediapublikasi.id/index.php/logic>
- [12] D. Adi Pratama and R. Dwi Irawan, "Recommendation System for Website Creation Package Selection Using the *Knowledge Based Recommendation* Method at PT. Spread Digital Creation," *Journal of Information and Communication Technology*, vol. 8, no. 4, pp. 2024, 2024, doi: 10.35870/jti.
- [13] S. Mufthia Sari and T. Pramiyati, Breast Milk Companion Menu Recommendation System (MPASI) Using the *Forward Chaining Method*. 2020.
- [14] F. Salsabila, M. Husna, and S. Faza, "Web-Based Design and Development of the Al-Amin Mosque Information System (SIMIN)," vol. 4, no. 1, pp. 775–786, 2023.
- [15] E. Suharyanto, M. Kom, S. Program, and I. Sistem, "Designing an Android-Based Indonesian Cultural Introduction Application Using the RAD Method," *JIK Journal of Computer Science*, vol. 5, no. 1, pp. 30–39, 2022.
- [16] N. Sofi and R. Dharmawan, "Designing an Android-Based CSM Workshop Application Using the Flutter Framework (Dart Language)," *JTS*, vol. 1, no. 2, pp. 53–64, 2022.