



Camping Equipment Recommendation System Using Content-Based Filtering Method: A Case Study of Berkah Outdoor45

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Abstract: Camping is a favorite activity for various age groups carried out in the open air to enjoy the beauty of nature and get away from the noise of the city. The high cost of camping equipment encourages many people to prefer renting rather than buying, making Berkah Outdoor45 the main choice for nature lovers to rent camping equipment. This study aims to develop a recommendation system for selecting camping equipment using a content-based filtering mechanism with a TF-IDF approach to help users choose equipment that suits their needs. This study uses a waterfall system development model which includes the stages of analysis, design, implementation, and testing. Testing is carried out using the Blackbox method to evaluate the effectiveness of the system. The results showed that from 18 datasets, the system can provide four recommendations with the highest similarity values, namely D11 (0.377), D18 (0.354), D2 (0.320), D5 (0.311), and D1 (0.287) based on a predetermined formula. The recommendation system developed successfully provided accurate recommendations that were in accordance with user preferences, while reducing ordering errors and increasing efficiency in selecting camping equipment.

Keywords: Camping; Content-Based Filtering; TF-IDF.

1. Introduction

Camping is an activity that is popular with all ages. This activity is carried out in the open air, away from the noise of the city and the crowds, and aims to enjoy the beauty of nature [1]. In general, camping tourism involves nature-based tourism activities and is of particular interest. This tourism is closely related to the natural environment and is characterized by the use of flexible, temporary, and movable accommodation facilities, such as tents, recreational vehicles, motor homes, and others [2]. Berkah Outdoor45 provides camping equipment rentals for those who want to go camping. Because of the high cost of camping equipment, many people choose to rent rather than buy, making this place an alternative for nature lovers around the Masaran area to rent camping equipment. Usually, customers who will rent equipment here choose the equipment they need themselves. However, renters often complain about ordering errors, such as the number or type of equipment that does not match their needs, due to limited information about choosing camping equipment.

The recommendation system has 2 main approaches, namely collaborative filtering and CBF which are designed to reduce the possibility of excess or shortage of equipment, which can affect rental costs, and become an alternative in selecting the right equipment to meet user needs. In today's digital era, the many choices of camping equipment often make it difficult for users to choose the type of equipment that suits their preferences. So this recommendation system is able to determine products that suit customer needs [3]. The CBF method is used to identify categories that will be applied in the analysis. This method allows users to select the expected items, so that it can provide recommendations that match the user's expectations [4]. This method is independent of the user, does not depend on whether the item is a new item or not. If a user wants to rent camping equipment in a certain category, the system will recommend camping equipment in a similar category that is available elsewhere, which the user may also like [5]. However, CBF has a weakness, namely the limited recommendations on similar items so that it does not provide the opportunity to find unexpected items.

In this study, the TF-IDF (Term Frequency-Inverse Document Frequency) method is used as an effective and relevant analysis tool, allowing the evaluation of the importance of a word in a collection of words in the context of a larger set [6]. This algorithm presents weight to the presence of a word in a collection of words. This method combines two main concepts: the frequency of occurrence of a word in a particular document and the rarity of the word in other words. The more often a word appears in a collection of certain words, the greater its importance in the document [7]. As research conducted by Resha (2019) on the case study of the Mangan application, which has fewer users and a growing dining menu. This method recommends a number of objects based on the similarity between the selected object and the recommended object. The results of this CBF method can support users in choosing a restaurant based on the similarity of the item profile of the restaurant. Another study conducted by Fajriansyah (2021), where the results of this study obtained the results of a recommendation system using the CBF algorithm by searching for the similarity of the weight of the terms in the bag of words from the preprocessing results of the film synopsis and title, and obtained results for the single query type that produced better recommendations than the multiple seeds query type [8].

The selection of the content-based filtering method in this study was based on its advantages compared to other methods such as collaborative filtering (CF). CBF has advantages in terms of user independence, where the recommendations generated do not depend on other user data or the popularity of certain items [9]. This is very important in the of renting camping equipment, where the variations in the needs of each user are very diverse and cannot always be predicted based on trends or reviews from other users. In addition, CBF is able to work well even with new items that do not have many interactions or reviews, an advantage that CF does not have, which is more dependent on historical user data. The TF-IDF method used in this study provides significant advantages in the analysis and recommendation process. By combining the frequency of occurrence of words in camping equipment descriptions and their rarity across datasets, TF-IDF is able to give proper weight to the terms that are truly important and relevant. This allows the system to be more accurate in assessing the relevance of a particular equipment to the user's needs, especially when the equipment descriptions vary widely. Thus, TF-IDF provides a solid foundation for generating more precise and relevant recommendations for users [10].

This system uses the CBF method which is able to create recommendations in the form of user independence, so that it can be used in berkah outdoor 45 as an information provider for camping equipment renters who are developing, the results of this study are that there are several recommendations that bring up similar names and prices that are sourced from user preferences.

2. Research Method

2.1 Calculation Method

In this phase, the researcher applies the Content-Based Filtering (CBF) method utilizing the Term Frequency-Inverse Document Frequency (TF-IDF) approach to calculate the similarity between items in the camping equipment database. The process begins with tokenization or stopword removal, where the item documents in the database are broken down into individual tokens (separate words). Stopwords are common words that do not carry significant informative value and are removed to enhance the accuracy of the calculations. Examples of stopwords include "and," "that," "in," "for," and similar terms, which can clutter the analysis and lead to less relevant results. Following tokenization, the TF (Term Frequency) formula is employed to measure how often a particular word (term) appears in a document relative to the total number of words in that document. This is expressed mathematically as:

$$TF(term) = \frac{\text{number of occurrences of "term" in the document}}{\text{total number of words in a document}}$$

This formula helps in understanding the importance of a term within a specific document, allowing for a more nuanced analysis of its relevance. Next, the IDF (Inverse Document Frequency) formula is used to assess the uniqueness of a term across the entire set of documents. The underlying principle is that the rarer a term is across multiple documents, the higher its IDF value. This is calculated using the formula:

$$idf(term) = \log\left(\frac{\text{total number of documents}}{\text{number of items containing "term"}}\right)$$

By combining TF and IDF, we derive the TF-IDF score, which serves to weigh words (term weight) in such a way that it highlights the most relevant terms in a given context. The formula for TF-IDF is:

$$idf(term) = \log\left(\frac{\text{total number of documents}}{\text{number of items containing "term"}}\right)$$

This scoring mechanism enables the identification of terms that are not only frequent in a specific document but also unique across the entire dataset, thus providing a clearer picture of their relevance. To evaluate the similarity between items in the database, Cosine Similarity is calculated using the TF-IDF values. This metric assesses the cosine of the angle between two non-zero vectors in a multi-dimensional space, allowing for a comparison of the direction of the vectors rather than their magnitude. The formula for cosine similarity is:

$$\text{Cosine Similarity} = \frac{\sum(A_i \times B_i)}{\sqrt{\sum A_i^2} \times \sqrt{\sum B_i^2}}$$

This calculation is crucial for determining how closely related different items are based on their TF-IDF scores.

2.2 Development Methods

For the system development aspect, the Software Development Life Cycle (SDLC), commonly referred to as the waterfall model, is utilized. This methodology is characterized by a linear progression, where each phase must be completed before the next one begins, ensuring a structured approach to system development [11]. The waterfall method is structured as illustrated in Figure 1.

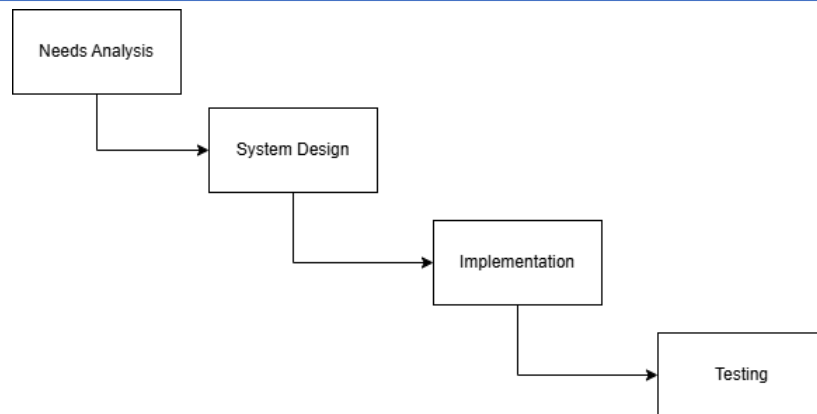


Figure 1. Waterfall Method [12]

The stages in the waterfall method for this research include:

- 1) **Requirements Analysis**
This initial stage focuses on identifying the specific system requirements necessary to address the challenges faced by Berkah Outdoor45. Engaging with stakeholders to gather accurate and comprehensive requirements is essential for the success of the project.
- 2) **System Design**
Based on the analysis results, the system is designed using Unified Modeling Language (UML), which encompasses Use Case Diagrams and Activity Diagrams. These diagrams provide a visual representation of the system's functionality and workflows. Following this, the user interface (UI) is developed to ensure an intuitive user experience.
- 3) **Implementation**
The website for this research is developed using the PHP programming language, utilizing the Laravel framework. This choice of technology facilitates robust application development, allowing for a scalable and maintainable codebase.
- 4) **System Testing**
In this final stage, thorough testing is conducted to ensure that the information system operates effectively and meets the specified requirements. Any errors or issues identified during testing are addressed and corrected to enhance system performance and reliability.

3. Result and Discussion

3.1 Results

This system is used to select Camping Equipment designed by applying the CBF method with the TF-IDF approach [13]. This method works based on user preferences for items contained in the database. This system can provide recommendations for camping equipment that match user preferences, using information contained in the description column.

3.1.1 Dataset View

This dataset contains 18 camping equipment data in the form of a MySQL database.

id	Nama	Harga	Deskripsi
1	Tenda single layer kap 2	15000	Tenda single layer dengan kapasitas 1 sampai 2 orang, cocok untuk berkemah di daerah dengan cuaca yang stabil dan tidak terlalu ekstrem dapat digunakan.
2	Tenda dome kap 4-5 bentuk	20000	Tenda dome dengan kapasitas 3 sampai 4 orang, memiliki desain berbentuk topi yang memberikan stabilitas lebih baik saat angin kencang. Ideal untuk ke...
3	Tenda dome kap 5-6 bentuk	37000	Tenda dome dengan kapasitas 5 sampai 6 orang, dilengkapi dengan area teras untuk ruang ekstra. Sangat cocok untuk berkemah dengan kenyamanan ekst...
4	Tas Carrier	15000	Tas Carrier dengan kapasitas besar, ideal untuk membawa peralatan dan perlengkapan berkemah. Tas ini dirancang untuk distribusi beban yang merata dan...
5	Kompor Portabel	8000	Kompor portabel yang ringan dan mudah digunakan, sangat cocok untuk memasak saat berkemah. Cocok digunakan untuk berbagai kegiatan outdoor dan...
6	Sleeping bag	8000	Sleeping bag untuk gunung, dirancang untuk memberikan kehangatan dan kenyamanan di suhu dingin. Ideal untuk digunakan dalam kondisi cuaca ekstrem...
7	Nesting	10000	Nesting untuk umum, set peralatan masak yang praktis dan mudah dibawa, cocok untuk berbagai jenis kegiatan berkemah dan outdoor.
8	Tracking pole	9000	Tracking pole untuk gunung, membantu memberikan stabilitas dan dukungan ekstra saat mendaki di medan yang berat. Terbuat dari bahan ringan namun k...
9	Matras	3000	Matras untuk umum, memberikan kenyamanan ekstra saat tidur di tenda. Mudah digulung dan dibawa, cocok untuk berbagai kegiatan outdoor.
10	Cover bag	5000	Cover bag untuk umum, melindungi tas Anda dari hujan dan debu. Cocok digunakan dalam berbagai kondisi cuaca.
11	Lamp camp	5000	Lamp camp untuk umum, memberikan penerangan yang cukup di area perkemahan. Mudah dipasang dan digunakan.
12	Headlamp	5000	Headlamp untuk gunung, memberikan penerangan yang kuat dan tahan lama. Cocok digunakan saat mendaki di malam hari atau dalam kondisi minim cah...
13	Sepatu	18000	Sepatu untuk umum, dirancang untuk kenyamanan dan perlindungan kaki dalam berbagai jenis kegiatan outdoor. Tahan lama dan memiliki grip yang baik.
14	Jaket	15000	Jaket untuk umum, memberikan kehangatan dan perlindungan dari angin. Cocok digunakan dalam berbagai kondisi cuaca.
15	Flysheet	10000	Flysheet untuk umum, digunakan sebagai penutup tambahan untuk tenda atau sebagai pelindung dari hujan dan sinar matahari. Mudah dipasang dan dibaw...
16	Meja & Kursi lipat	10000	Meja dan Kursi lipat untuk pantai, ringan dan mudah dibawa. Cocok untuk bersantai di pantai dengan kenyamanan ekstra.
17	Hammock	6000	Hammock untuk pantai, memberikan kenyamanan maksimal untuk bersantai. Mudah dipasang antara dua titik penyangga.
18	Gas	6000	Isi ulang gas untuk umum, cocok untuk kompor portabel. Memberikan sumber bahan bakar yang stabil dan mudah digunakan.

Figure 2. Camping Dataset

3.1.2 Content Based Filtering Calculation

At this stage, the calculation is done based on the camping equipment dataset that has gone through the stopword process. The following is the dataset after the stopword process which is used as a reference for CBF calculations:

Table 1. Stopwords Results

Document	Description
D1	Single layer tent capacity...its portability, ensuring a comfortable and practical camping experience.
D2	Dome tent with a capacity of 3-4 people...provides the ideal combination of shelter space.
D3	Dome tent capacity 5-6 people...groups need space.
D4	Large capacity carrier bag, designed for comfort during long trips.
D5	A lightweight, easy-to-use portable stove...efficiency for every camping trip.
D6	Sleeping bag specially designed for mountaineering...providing comfortable sleeping.
D7	A practical, easy-to-carry cooking utensil set...a practical solution for your camping cooking needs.
D8	Tracking poles are designed to provide... fatigue during climbing.
D9	Mattress design provides extra comfort...sleep comfortably on the field.
D10	The bag cover is designed to protect the bag...additional protection for your belongings.
D11	The camp lamp provides sufficient lighting...your campsite is comfortably bright at night.
D12	Headlamp provides strong lighting...comfort and safety for night activities.
D13	Durable shoes designed to provide...optimal comfort protection during travel.
D14	Jackets provide warmth and protection...keeping body temperature stable.
D15	Additional flysheet use cover...during camping in various weather conditions.
D16	Lightweight easy folding table and chairs...comfortable outdoor relaxation.
D17	Hammock designed to provide comfort...rest comfortably and relax.
D18	Refill gas design use...practical efficient fuel needs.

The user's desired requirements are 4 people, with general terrain, a budget of IDR 2,000,000 and several days of 2. Based on these requirements, the query "number of people 4 with general terrain and a budget of IDR 200,000 and a number of days of 2" can be taken to obtain the similarity value between the tenant's wishes and the CBF calculation by calculating TF-IDF and then calculating the cosine similarity.

Table 2. TF-IDF calculation results

Document	Day	Terrain	...	Person	General
D1	0.280	0.141	...	0.142	0.149
D2	0.280	0.141	...	0.142	0.149
...	...	...	...	...	...
D17	0.235	0	...	0.239	0
D18	0.337	0.166	...	0.168	0.176

After getting the tf-idf value, the next step is to calculate the cosine similarity. The calculation of cosine similarity is based on a previously determined formula.

Table 3. Cosine Similarity Calculation Results

Document	Cosine Similarity
D1	0,287
D2	0,320
D3	0,172
D4	0,226
D5	0,311
D6	0,214
D7	0,266
D8	0,195
D9	0,286
D10	0,252
D11	0,377

D12	0,284
D13	0,250
D14	0,283
D15	0,224
D16	0,224
D17	0,108
D18	0,354

Based on the results of the similarity calculation of the 18 data above, the items that match user preferences are D11 (0.377), D18 (0.354), D2 (0.320), D5 (0.311) and D1 (0.287), with the items Camp Lamp, Gas, 4-person hood tent, portable stove, and 2-person hood single layer tent. System Implementation

3.1.3 System Implementation

In Figure 3. It is a use case, there are 2 actors, namely the Owner and the Renter. The owner is the owner of berkah outdoor45 who can access the administration page by entering the username and password that have been created, while the renter himself is the person who accesses the berkah outdoor45 website who can see the tools available at the place and can access the recommendation page to get recommendations for camping tools with user preferences [14].

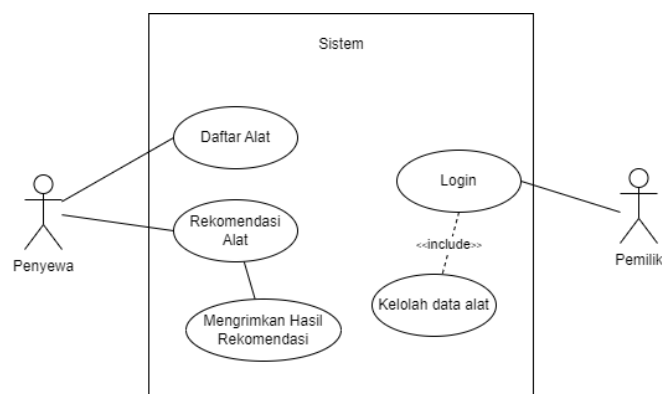


Figure 3. Use Case Diagram

Table 4. Actor Identification

No	Actor	Explanation
1	Owner	- Access the data processing page with login requirements with username and password - Input camping equipment data
2	Tenant	- Access the tool list page - Access the recommendations page

Activity Diagram is a visual representation of the system workflow to understand the processes that occur in this application. This diagram is like a flowchart because both are models that describe the transition of some activities to others. The difference is that the flowchart is used as a description of the system workflow, while the activity diagram is used to represent activities that can be done by actors [15]. In Figure 4, is the owner's activity diagram when logging in, if the unique name & password are correct, it will be redirected to the Dashboard page. Then Figure 5, is the owner's activity diagram when he wants to manage data and the system also returns data according to the input entered by the owner. In Figure 6 is the tenant's activity diagram when he wants to access the tool list page. And in Figure 7 is the tenant's activity diagram when he is going to make a recommendation, the system also returns results according to the input given by the tenant.

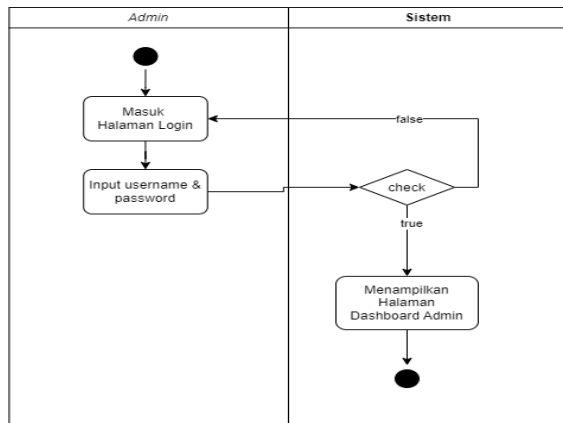


Figure 4. Activity diagram of Login Owner

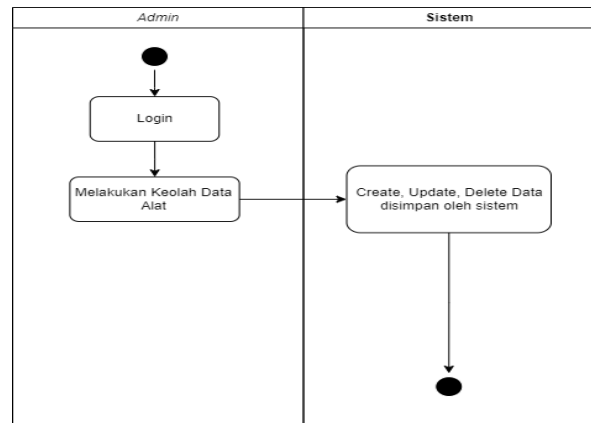


Figure 5. Data processing owner with Activity diagram

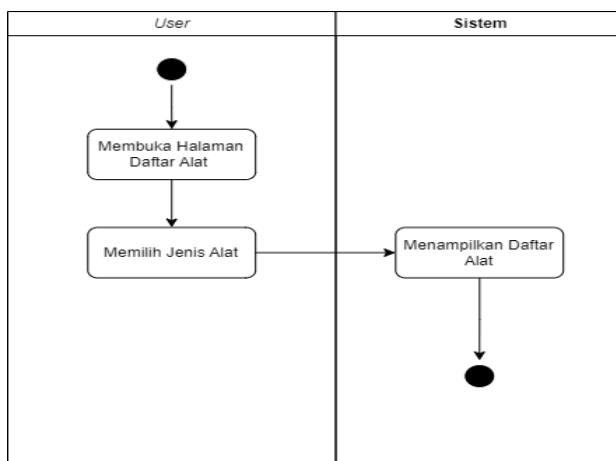


Figure 6. tenant looking for the Activity diagram tool

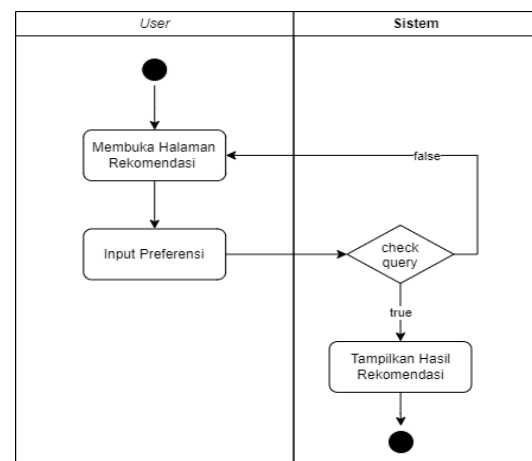


Figure 7. Tenant recommends Activity diagram

The display results that have been made to make it easier to read the dataset in the database and then perform calculations faster and more practically and in accordance with user preferences which are references from manual calculations, here are some of the displays. On the Main Page is the initial display of the outdoor45 blessing website, which contains the general profile and address of the store and then there are 3 navigations, namely Tools, Recommendations, and Login (specifically for owners).

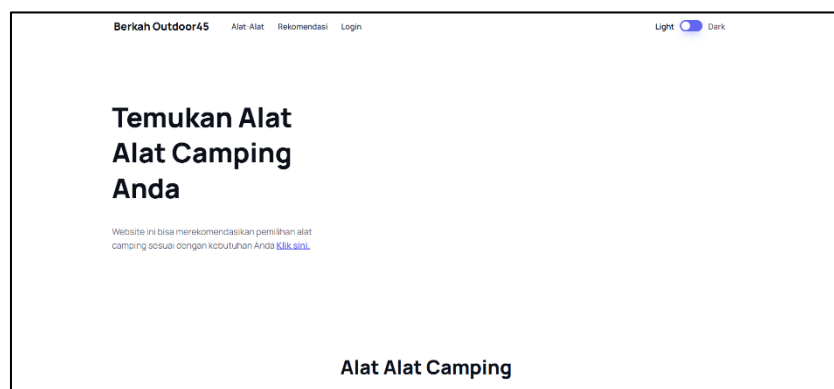


Figure 8. Home Page

Then on the product page which contains the products that are available and can be rented.

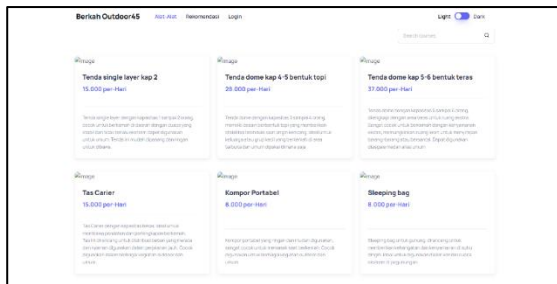


Figure 9. Product Page

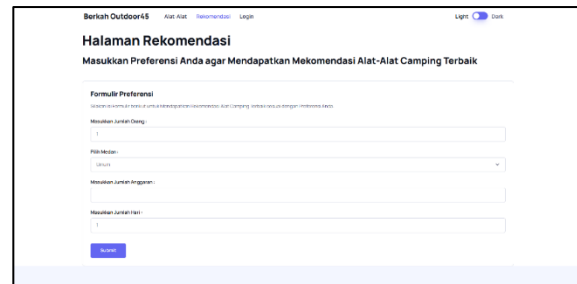


Figure 10. Recommendations Page

Pada Halaman Rekomendasi berisi formulir input untuk pengguna yang harus memilih berdasarkan beberapa kriteria seperti jumlah orang, medan yang ditempuh, anggaran yang disiapkan, dan durasi penyewaan. Setelah penyewa menginputkan preferensinya maka dia mengklik tombol dapatkan rekomendasi lalu akan mendapatkan hasil rekomendasi yang sesuai dengan preferensi mereka.

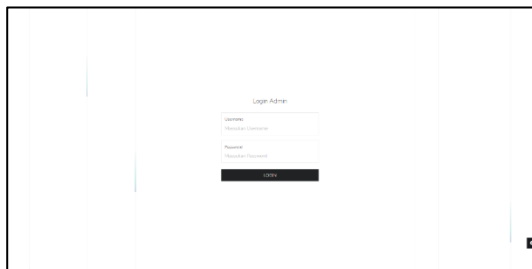


Figure 11. Login Page

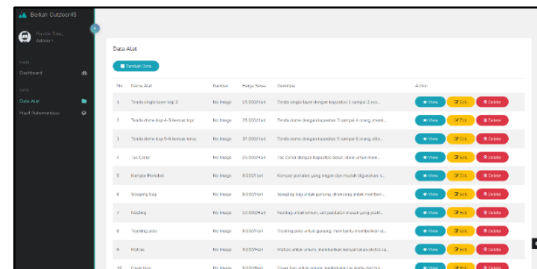


Figure 12. Dashboard page

On the Login Page (owner) is access for the owner to enter the dashboard page to manage data. On the Dashboard Page is a preview for the owner to be able to process data such as create, edit, and delete data.

3.1.4 System Testing

Black Box Testing is a system test that aims to find functional errors in the system being developed. This test is very important to do because it ensures whether the quality of the software or system being built can run well or not [16]. In this test, data is taken randomly with the aim of getting the expected results. For example, if data cannot be added to the database during testing, then it is considered a failure. Conversely, if data is successfully added to the database, then the results are considered as expected [16].

Table 5. System Test Results

Function	Condition	Output	Status
Login	Unique name and correct password	Login successful	Valid
	Unique name and incorrect password	Login failed	Valid
Add Rental Data	Filling all forms (name, image, price, and description)	Data addition successful	Valid
	Not filling all forms (name, image, price, and description)	Data addition failed	Valid
Modify Rental Data	Filling all or any of the forms (name, image, price, and description) that have been added	Data modification successful	Valid
Delete Rental Data	Deleting one of the added data	Data deletion successful	Valid
Input Recommendation	Inputting all requirements correctly	Recommendation successful	Valid
	Inputting one of the requirements incorrectly	Recommendation failed	Valid
Send Recommendation Result	Recommendation result according to preferences will be sent to the owner's WhatsApp	Data sent successfully	Valid

3.2 Discussion

Selection of camping equipment system: Content-based Filtering(CBF) Technique with Term Frequency-Inverse Document Frequency(TF-IDF). It utilizes the preferences of the user to retrieve suitable camping gear from a database, in harmony with structure of item descriptions extracted using a methodology dependent on information found in the items themselves [7]. The dataset is given as 18 camping equipment entries that they have in MySQL database as shown by figure 2. The dataset was processed by tokenization, stemmed and four common English words (stop words) were removed into the training set. Post this processing step, the rest of the data is what we use for calculating TF-IDF, which will help us find how relevant an item is with respect user's preferences. It starts with user defined criteria in CBF, including 4 of people, general terrain, budget (200,000) and a rental duration of 2 days for the equipment. Based on these requirements, a query is generated to compare the user comparison to the TF-IDF calculated scores of the camping equipment. It involves the TF-IDF of every term associated with items in Table 2, as shown in The computation results are to show the degree to which each term stands related to the context of the documentation.

After the TF-IDF calculation another one step step is to calculate the cosine similarity between the users' criteria and item descriptions. This allows the system to quantify how different they are, so it can then make a prediction of which items are the most relevant after relevant feature engineering. Table 3 1 shows their similarity scores, this can lead to the conclusion of what the user wants and even what is most suited with their title D11 (Lamp Camp), D18 (Gas), D2 (A Tent for 4 people), D5 Portable Stove) and D1 (Single Layer Tent) are the ones that showed the greatest similarity score which means they fit the user needs best. Components of system implementation (With the application of AceretM, it includes UCD Diagram And Activity diagrams etc) Use Case diagram (Fig. 3) indicates that there are two actors of system — Owner or Renter. The Three primary actors of Owner, he is permitted to manage the camping gear data as well as Renter would be able browse available items and getting it recommended at the same time. Such rigid separation of roles means that roles are divided for both users and owning a system interface. Activity Diagrams are used to give flow charts of the workflow within the system, how a user will have to navigate through different functional. In particular, the Owner gets logged and is directed to Dashboard (to manage data) while Renter can view product list and get some data based on Owner input criteria.

That interfaces look / user interface design to improve usability and provide a great experience for the both Owner and Renter. The main page (Figure 8) provides important information on the store, including navigation through equipment and recommendations. In the Product page (Figure 9) this listed the available items, whereas Recommendation Page (Figure 10) will let user enter their preference and get personalized suggestins. We conducted Black Box Testing to validate the functionalities of system. This test approach tests the system behavior without looking inside. This (Table 5) gives the results in summarized form which implies that the system as expected works conditioner. Successful login and data added shows the system compliance for quality as well as. Issues indicated by test failures, such as not being able to insert data into the database are obvious defects. The developed system, with the integration of our new algorithm for CBF to TF-IDF successfully give personalized recommendations on how to use the provided camping equipment. Testing the user interface design was critical, this led to the ensure best experience for user side and making it user friendly with a high test. Future work may include the enhancement of the recommendation algorithm and dataset to better facilitate the accuracy of the quality assessment system.

4. Related Work

Different disciplines have been given the task of creating recommendations systems to make the experience for a user smoother and more predictive. This part of the thesis contains the pertinent work for the camping equipment recommendation system that design and implement campsite to recommend useful items based on content based filtering method like in CBF,hybrid-approaches, topical usage, user-centered design,and evaluation metrics. Content-Based Filtering (CBF) is the most well-known recommendation system approach that concentrates on the properties of items for similarity in recommendation based on user preferences. With CBF item descriptions and its features, customized recommendations to each user that suits their favorite is done by optimizing personalized. That method works best when we have "delcoc" user preferences, this way, the system can give hyper relevant suggestions from the things an item might/thoroughly inhabit specific features in [16]. Research in different settings has shown that CBF can have a big effect, recommending items that are very similar to users preferences [17]. Nevertheless, it must be noticed that CBF may encounter a set of problems, such as cold start, as new users or items have seldom data in order to make accurate recommendation [18].

Hybrid recommendation systems that combine CBF with collaborative strategies have been proposed to resolve these limitations. Combining hints can produce more accurate, and user happy recommendations by taking both the content(quential itmes) and the user-interactions [19]. Hybrid systems are especially useful in dealing with the cold start problem and diversity of recommendable things beyond user likes/don't-likes [20]. As research shows, hybridisation can lead to substantial improvements across recommendation systems across various domains including e-commerce and entertainment [21]. Case in point, a study showed that hybrid approaches could yield better performance (than single methods) by integrating user feedback and contextual aspects [22].

Other studies concentrated closely domain-specific application of recommendation systems (particularly in outdoor and recreational contexts). Outdoor equipment recommendation systems that employ user reviews and item features or pay close attention to contextual information, like terrain type and number in party [23]. These background elements are important to deliver targeted recommendations that fit the users. Moreover, the incorporation of user-centric factors in designing these systems have flourished the user experience for recommendations as actionable and related [24].

Another major area of study is the design of recommendation systems user interfaces. Usability is essential as it allows the users to interact with the system seamlessly. The usability of a user interface allows for easier and more effective navigation enhancing the user experience [23][25]. Studies have demonstrated that user-centric evaluation frameworks significantly add value to recommendation systems by incorporating both user satisfaction and engagement in addition to traditional accuracy metrics [26]. It highlights the requirement of development systems that will not just deliver correct suggestions but also make the propitious engagement withit [27]. Considering how importance of recommendation systems cannot be understated; therefore critical evaluation on their performance is needed. Common Precision, recall and F1-score are some of the metrics that are used for recommendations quality [28]. These metrics help it measure whether or not, the system satisfies user expectations and provides meaningful suggestions. In the system, cosine similarity macro is chosen as item similarity metric, reflecting an exhaustive evaluation on recommendations accuracy. In recent literature, the need for more comprehensive assessment methods capturing both user satisfaction and engagement has been highlighted to provide a broader perspective on overall system performance [29]. Recent related works ensure a strong base for constructing the recommendation system of camping equipment. Utilizing previously established approaches (CBF) and conducting experiments with possible hybrid models, this work delves into a perspective direction towards achieving the next stages of successful recommendation systems for outdoor and recreational clothing. Design and implementation of current meanwhile system are influenced by results of previous experiments which are means to provide users more and more personalized recommendations.

5. Conclusion and Recommendations

By using the CBF method with the TF-IDF approach, the recommendation system developed has successfully recommended camping equipment that matches the user's wishes or preferences based on the product description. The use of the Waterfall method in the system development process ensures that each stage from needs analysis to maintenance is carried out properly, so that the results of this system's recommendations can meet user needs in selecting camping equipment. Although CBF with TF-IDF has shown satisfactory results, further research can explore other methods such as hybrid filtering that combines content-based and collaborative filtering approaches to improve recommendation accuracy. The system can be improved by integrating other user preferences, such as preferences for certain brands, user reviews, or previous borrowing history, to provide more personalized recommendations. Future research can apply this system to different contexts, such as renting other outdoor equipment or products that require customization based on specific user preferences.

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