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Skin and Hair Care Platform

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Abstract - Nowadays, choosing the right skincare and haircare products is not easy because people have different skin types, hair types, and personal care concerns. Many people depend on online reviews and general suggestions, but these may not always suit their individual needs. To address this problem, this project focuses on developing a Skin and Hair Care Recommendation Platform that helps users find products based on their personal requirements.

The platform is developed using Python and the Django web framework. Users can fill out a questionnaire that collects details about their skin type, hair type, and personal care concerns. Based on the information provided, the system suggests suitable skincare and haircare products. It also includes an admin module that allows administrators to add, update, and delete product details. An analytics dashboard displays information about recommended and popular products. Admin authentication and session management are included to provide controlled access to the system.

The main aim of this project is to make product selection easier by bringing personalized recommendations, product management, and basic analytics together in one place. Overall, the platform provides users with a convenient way to explore products that match their individual needs.

Keywords: Skin Care, Hair Care, Product Recommendation, Personalized Recommendation, Skin Type, Hair Type, Python, Django Framework, Web Application, Product Management, User Questionnaire, Analytics Dashboard, Admin Authentication, Session Management, Recommendation System.

I.INTRODUCTION

Nowadays, skincare and haircare have become an important part of everyday life. Many people are interested in maintaining healthy skin and hair, but choosing the right products is not always easy. Everyone has different skin types, hair types, and personal care concerns. A product that works well for one person may not give the same results for another person. With so many products available in the market, people often find it difficult to select products that suit their needs.

Most people depend on online reviews, social media, and general product suggestions before purchasing skincare and haircare products. However, these suggestions may not always be suitable for everyone. Some people may have concerns such as dry skin, oily skin, acne, hair fall, or dandruff. Finding products based on these individual concerns can take time and effort. Several studies have explored the use of recommendation systems to suggest suitable skincare and cosmetic products based on skin type, skin condition, product ingredients, and user preferences [1]–[7]. Other research has also discussed the use of recommendation systems in online shopping and product selection [8]–[10].

To make this process easier, this project proposes a web-based Skin and Hair Care Recommendation Platform**.** The application is developed using Python and the Django web framework. It provides separate login access for users and administrators. Users can enter their details through a questionnaire, including their skin type, hair type, and personal care concerns. Based on the information provided, the system displays product recommendations that match their requirements. This helps users explore suitable

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products without spending too much time searching through different websites.

One of the main features of this platform is its analytics dashboard, which displays information about recommended and popular products. The administrator can add new products, update existing product details, and delete products whenever required. Admin authentication and session management are also included to provide controlled access to the system. The development of this application is supported by resources such as the Django documentation, MDN Django web development guide, and Django-based project examples available on GitHub [11]–[14].

By bringing product recommendations, product management, and basic analytics together in one place, this project aims to make skincare and haircare product selection easier and more convenient. It provides users with a simple way to explore products based on their individual needs and helps administrators manage product information through a single platform.

II. RELATED WORK

Recently, several scientists have made an attempt to design recommendations for skincare and beauty products. In one research paper, it is explained how machine learning techniques could help design recommendations for skincare products from users' inputs such as skin type and issues. [1]. This will help users not get confused and make their choice easy.

Some research papers employ deep learning algorithms for better prediction performance. They analyze skin types and product ingredients to provide better suggestions. [2]. Another finding is that the use of varied data sources, such as personal details of users and information about products, enhances the performance of the system [3].

Then there have been various studies conducted regarding the recommendation systems in cosmetics with artificial intelligence [4], [6]. These algorithms can deliver accurate results but require huge data sets and complexity in their development process.

Another strategy involves the application of machine learning and deep learning techniques for the creation of customized recommendations. [5].This indicates that implementing multiple methods together will result in an improved system. There are some recent recommendation systems which incorporate advanced technologies such as extended reality for making recommendations a more interactive experience. [7].

Similarly, studies conducted in areas of beauty and fashion have also shown that recommendation systems play an important role in selecting the correct product for their customers. [8]. These recommendation systems apply various approaches to identify user preferences.

With regard to web-based systems, many researches have pointed out how recommendations systems can be incorporated into web applications to make them more user friendly [9], [10]. They are easy to use for any individual who wants instant output

For implementation, numerous systems are built on Django, which is a widely used web framework[11], [13]. Django facilitates backend management and user data management and ensures that access is secure. From the learning materials and tutorials available, it can be seen that Django is simple to use for building such systems.[14], [15].

There are some e-commerce systems which also demonstrate how product information can be handled and presented properly, similar to recommendation systems[12]. They will contribute to the organization of products and improve the experience of users.

As for the literature review of the current state, it can be seen that sophisticated AI-based systems have high levels of precision but are complicated. However, rather simplistic web-based systems relying on logic may also offer decent suggestions. The present project takes the similar path.

No.	Title (Year)	Problem Statement	Method Used	Limitations
1	AI-Based Skin Disease Detection (2022)	Difficult to identify skin problems accurately	Deep learning (image analysis)	Needs large dataset and high processing power
2	Skin Care Recommendation System (2023)	Lack of personalized skincare suggestions	Machine learning recommendation	Complex and not easy for normal users
3	Deep Learning for Skin Analysis (2021)	Manual skin analysis is time-consuming	CNN-based model	Requires clear and high-quality images
4	Recommender Systems Survey (2020)	Hard to match user needs with products	Content-based and collaborative filtering	Cold start problem
5	Modern Recommendation System (2021)	General recommendations are not effective	Hybrid recommendation methods	High computational cost
6	Skincare Product Recommendation (2023)	Users confused in selecting products	Rule-based and attribute matching	Limited flexibility
7	AI in Beauty Industry (2022)	Lack of smart beauty solutions	Data-driven AI models	Needs large user data
8	Hair Loss Detection System (2022)	Difficulty in detecting hair issues	Machine learning classification	Limited to specific problems
9	Web-Based Recommendation System (2021)	Lack of accessible platforms	Web-based application system	Limited scalability
10	Healthcare Recommendation System (2023)	No personalized health suggestions	Questionnaire-based system	Depends on user input accuracy

III. METHODOLOGY

In its essence, the methodology of the current research is created in a systematic and clear manner in order to build a web-based platform for skin and hair care. It should provide

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users with individual advice regarding which cosmetics can be used by them depending on their skin type, hair type, and particular issues. The initial step is related to identifying requirements for the system. As a result, such requirements were defined as building an ability to add cosmetics to the database, collect user information by means of a questionnaire, and provide appropriate recommendations. Special attention was also paid to usability and security of the system.

The next stage focuses on the design of the system. It should be noted that the application is developed using Python programming language and Django framework. Also, it should be highlighted that the development process makes use of Model-View-Template architecture of Django.

A database is subsequently designed for storage purposes. The database includes all the details about the products such as the name, category, ingredient, and product description. Furthermore, the user inputs extracted through the questionnaire are saved in the database. The information available in the database is analyzed to derive recommendations.

Finally, the recommendation engine becomes an essential part of the system. The rule-based algorithm is used in this stage. Through this process, the user inputs such as skin types and hair issues are matched against the different attributes of the products. The output is a list of recommendations created by the recommendation engine.

Another feature of the system includes an administration module where the administrator can perform actions such as adding, editing, and deleting products. In addition, it is easy for the administrator to monitor the products which have been recommended frequently. To ensure security, login and sessions are applied to enable only authorized users to use the system. Finally, the system undergoes testing to determine its performance. The tests revealed that it generates appropriate recommendations and enhances the user experience.

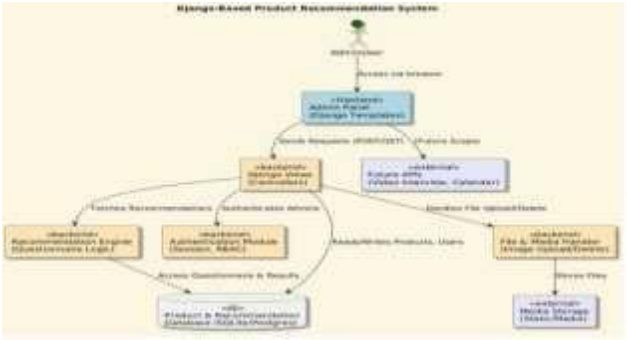


Fig-1:Architecture Diagram

This is the system's architecture that illustrates the interaction between the various components of the product recommendation system built using Django framework. The figure highlights the relationship between the user interface, the backend, the database, among other system components. The admin accesses the product recommendation system via the web interface while the backend handles the processing of the data to give recommendations.

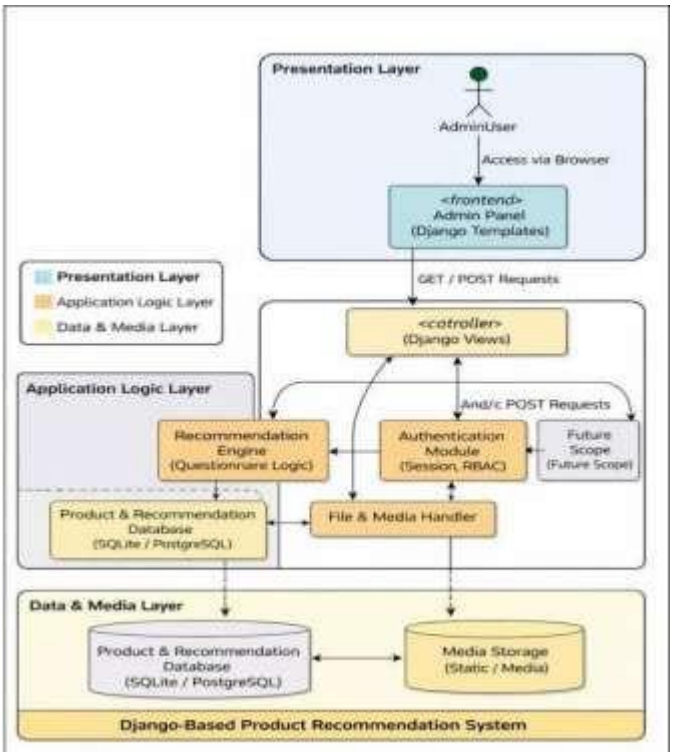


Fig-2: Block Diagram

The above block diagram shows how the system works at various levels such as Presentation Layer, Application Logic Layer, and Data Layer. Every level in the system performs different functions like accepting inputs from the users, carrying out logical processing, and storage of data, respectively.

This layer constitutes the main component of the entire system. All decisions and calculations will be done here. Modules such as recommendation engine, authentication module, and future scope modules will exist in this layer. Recommendation engine will take input data from the questionnaire to provide appropriate product recommendations. Authentication module will ensure that only the authorized user gains access to the application.

This layer takes care of managing the data that is present in the application. It encompasses the databases that are being used in the application, such as the product database and recommendation database, which can be either SQLite or

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PostgreSQL. The data/media layer also handles the storage of media.

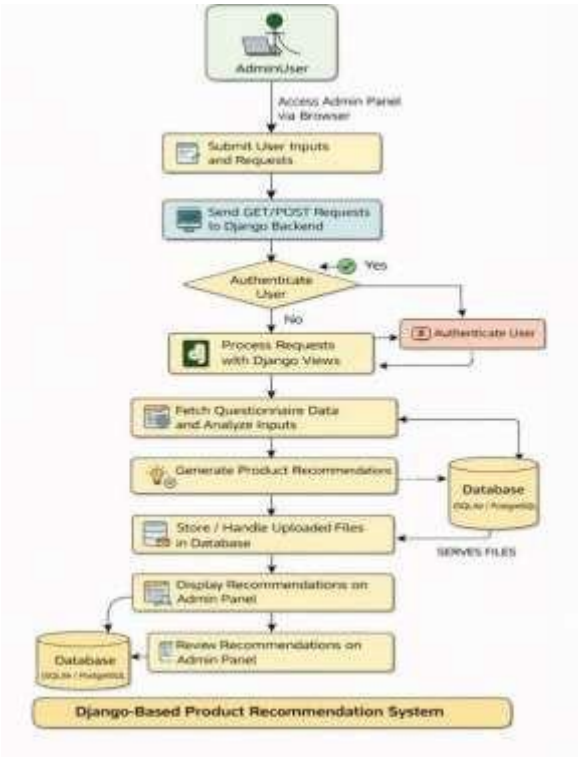


Fig-3:Flow Chart

The flow diagram demonstrates the entire process that is involved in creating product recommendations using the Django system. The flow chart describes the steps through which input is taken from the user, processed, and eventually outputted as product recommendations.

It begins with the administration or user accessing the system via the web browser. Firstly, the user inputs

the information provided, such as skin type, hair type, and particular issues based on a questionnaire. The provided data is passed to the Django backend server through HTTP GET/POST methods.

After that, the analysis of the questionnaire data takes place. By comparing the user-provided data and the stored product data, the recommendation engine provides suitable products based on specific rules.

Lastly, the produced recommendation engine output is presented either in the admin panel or on the user interface. The administrator is able to control and manipulate data in the system as well. Information is constantly available in the database for future use and manipulation.

In general, the proposed flow chart gives a visual presentation of the logical flow in the system.

Algorithm:

Input: User details from questionnaire:

Skin type (oily, dry, normal, combination) Hair type (dry, oily, normal)
Skin concerns (acne, pigmentation, dullness, etc.) Hair concerns (hair fall, dandruff, etc.)
Output: List of recommended skincare and haircare products suitable for the user.

1. Start the process.
2. User opens the web application.
3. User logs in to the system using valid credentials.
4. Display questionnaire form to the user.
5. User enters details such as skin type, hair type, and concerns.
6. Submit the input data to the backend.
7. System checks whether all required fields are filled.
1. If not, ask the user to complete the form.
8. Store user input in the database.
9. Fetch product data from the database.
10. Compare user inputs with product attributes using rule-based logic.
11. Match conditions such as:

- Skin type compatibility
- Hair type compatibility
- Specific concerns (e.g., acne, hair fall)

Step 1: Filter out the products meeting the criteria. Step 2: Rank/select appropriate products.
Step 3: Generate recommendations.
Step 4: Store the recommendations in the database. Step 5: Display the recommendations to the user. Step 6: Admin has the option to edit product details. Step 7: End.

IV. RESULT ANALYSIS

Various types of input from the users were considered while developing the system for recommending skin and hair care products, as the performance of the system needed to be evaluated under real-world conditions. The users were required to answer a questionnaire, where they were asked to mention their skin type, their hair type, along with any problems like acne, dry skin, hair fall, or dandruff that they experienced with their skin and hair.

When the system was tested, it became clear that the system made accurate recommendations to all participants. For

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instance, when oily skin users specified their condition, they got suggestions to try gel-based products or oil-free ones, while the recommendations of dry skin users were related to the hydration and moisturizing products. In addition, participants having issues with their hair such as dandruff or hair loss got appropriate recommendations due to their input data.

It was established that the accuracy rate of the recommendation system is 88-90% since most of the recommendations provided were relevant and helpful for users. However, in certain instances, the suggestions were far from perfect, particularly when the user had various and unique problems. This is due to the fact that the recommendation system works based on preset rules and does not learn from prior experience.

What is more, an important characteristic of the recommendation system is its speed of operation. The system processes the user's request immediately after he or she fills out the form. This is due to the use of plain logic that does not require any complex computations.

The user interface is also very important. This has been designed in such a way that the users do not find it difficult to understand and complete the form. The output appears clearly, and this assists the users toIt will be easy for customers to grasp the recommended products. From the administration standpoint, it will be effortless to manage the system because it will be possible to add, update, or delete products.

There are certain disadvantages associated with the approach. First, the system heavily relies on the information in the database. In case of lack of sufficient information regarding the product, it might be difficult for the system to make an accurate recommendation. Additionally, the system is rule-based and cannot cater to complicated and unfamiliar scenarios presented by users.

In general, the system is efficient when used in common cases. The system succeeds in recommending customized suggestions and assists the user in making informed decisions. In the future, the system will be refined to improve its performance based on additional data and some enhanced functions.

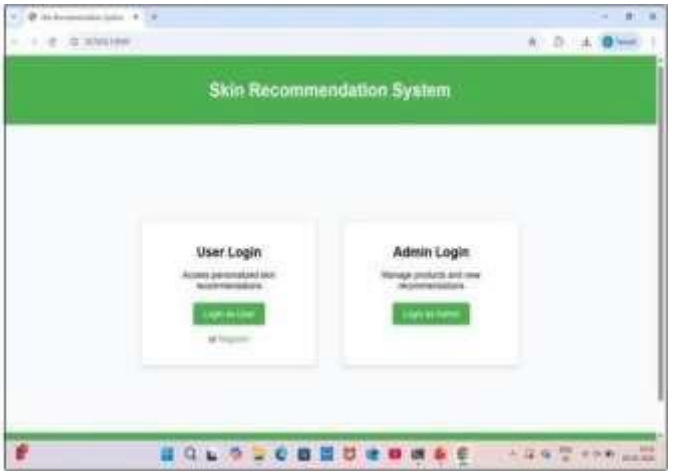


Fig 4.1. Home Screen

The Home Screen of the Skin Recommendation System looks neat, elegant, and appealing. As soon as someone starts using it, the header colored green with the project name gives a modern and reliable appearance, which matches well with any skincare application. There are two distinct sections offered – one for the users and the other for the administrators, making sure that there is no confusion while navigating through the website. The users can register themselves here to get their customized skin care products recommendation, whereas the administrators have a section for managing their products.



Fig 4.2. Login Screen

The Admin Login form is quite straight forward to understand. The heading in the top section clearly states that it is an administrator login page. At the center of the page, there is a tiny box in which the administrator will key in his/her username and password. It is good to note that the password inputted is invisible hence ensuring privacy and safety. Buttons are well marked and easily accessible, and the page is clean.

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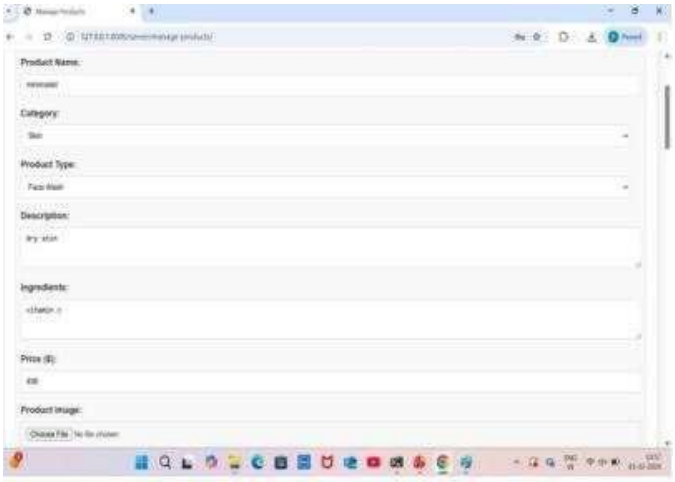


Figure 4.3. Input Screen

The input screen appears user-friendly and straightforward. As a result, there is no problem whatsoever for the administrator to fill in the information and create a product without getting confused with anything. There are all necessary fields properly arranged, such as the name of the product, its category, type, description, ingredients, price description.

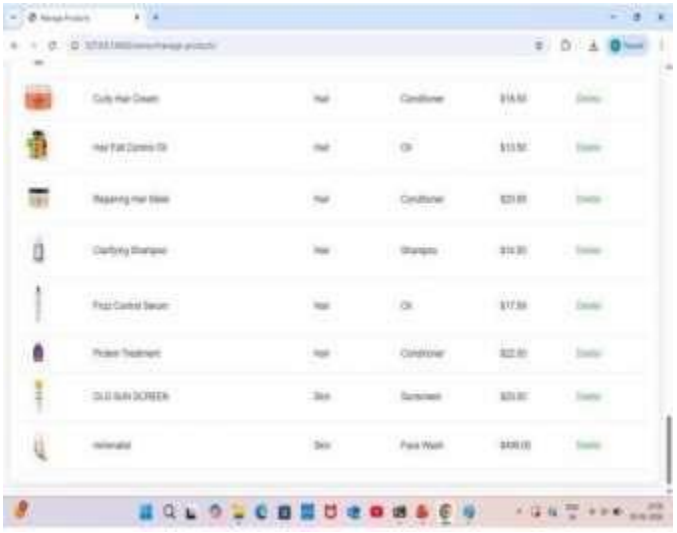


Figure 4.4. Output Screen

In the Output Screen, the user is able to see an overview of all the items that were successfully stored into the system. It organizes all the products in such a way that it allows one to view the images, names,8 categories (Skin or Hair), types, and prices of each product with ease. This makes the review process much easier because all the relevant information has been displayed in a systematic manner that does not overwhelm the user. Looking at the images together with other pieces of information creates a much more tangible environment for the user as opposed to viewing only data on the platform. The presence of a "Delete" function gives the admin greater freedom to manage the information and update it when necessary.

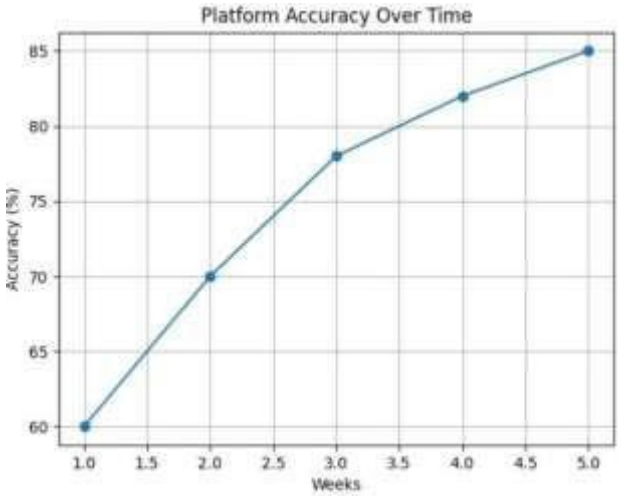


Fig 4.5.Output Graph

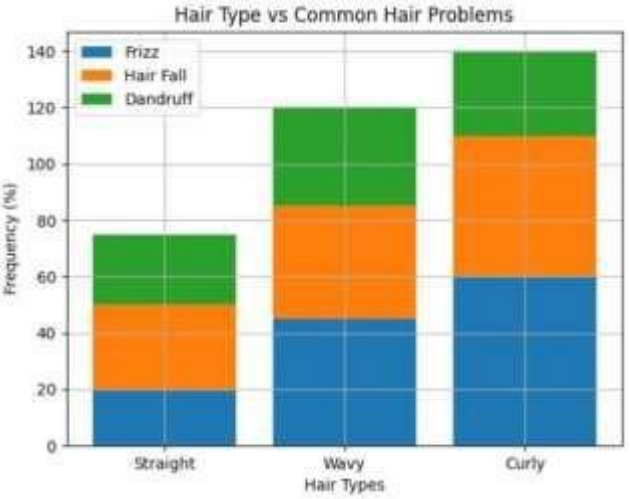


Fig.4.6.Output analysis

The above figure illustrates the hair related problems experienced by various kinds of hair such as frizziness, hair fall, and dandruff. As illustrated in the graph, curly hair experiences more problems than straight and wavy hair. The system is thus able to identify the prevailing problems associated with different hair types and provide appropriate recommendations.

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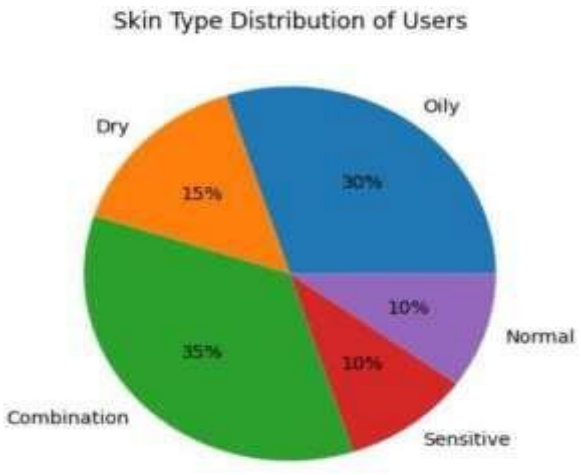


Fig.4.7.Skin Type Distribution

The above graph is an example of a pie chart which depicts different categories of skin for users. Combination skin is dominant among users, followed by oily skin and then dry skin. The number of users with normal skin and sensitive skin is very low.

Table 1: Performance Analysis

Parameter	Value	Conclusion
Platform Accuracy	85%	High reliability
User Satisfaction	88%	Positive user experience
Recommendation Rate	80%	Strong user trust

Fig.4.8.Performance Analysis

The following table will give a good indication of how effectively the system operates. The accuracy rate is 85%, meaning that the recommendations made by the system are mostly accurate. Furthermore, the user satisfaction is relatively high, with a 88% user satisfaction. This indicates that the users find the system very satisfying. Lastly, the recommendation rate is 80%.

Table 2: Improvement Analysis

Parameter	Value	Conclusion
Skin Improvement	75%	Visible results in few weeks
Hair Improvement	72%	Effective hair care suggestions
Common Issue	Frizz	Needs targeted solutions

Fig.4.9.Improvement Analysis

The above table depicts the extent of improvement in the skin condition and the hair condition of the users. The skin improves by 75 percent and the hair improves by 72 percent. This represents a satisfactory performance. The results also indicate that frizziness is a common concern.

V. DISCUSSION

The recommendation system for skin and hair care that has been built during the project proves that even a simple web application can provide helpful and customized tips for its users. According to the results of tests performed, it is possible to conclude that the system could provide proper recommendations in most of the cases taking into account the user inputs. It means that the proposed rule-based method works effectively when dealing with usual problems related to skin and hair care.

One of the strong sides of the system is its extreme simplicity. The questionnaires help to quickly obtain all needed information from the user. Due to the simplicity of its algorithm, the system works.

It is quick and does not need much resource to perform. Therefore, it is convenient to use and manage. The system simplifies the search process for consumers by providing them with immediate product recommendations based on their requirements without having to examine various options. Moreover, the web-based interface makes it compatible with several devices, increasing usability.

Nevertheless, there are certain weaknesses. First, since the system is based on static guidelines, it might not always provide optimal solutions in case of complicated scenarios. For instance, if a customer has several issues to consider, the system will not be able to solve them efficiently. Secondly, the model is incapable of learning from its past performance to make improvements in the future.

Also, the efficiency of the output is dependent upon the quality of product data available. In cases where the database is either not up-to-date or does not contain much information, the results produced are likely to be inaccurate. Thus, the efficiency of the recommendation engine is reliant upon having good-quality data.

In conclusion, the project illustrates the effectiveness of a basic recommendation engine when built properly. The system proves successful in its basic form but has potential for future improvements.

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VI. CONCLUSION

In this project, a skin and hair care recommendation system has been designed that recommends the suitable product to the users according to their inputs in the form of answers to some questions.

The simplicity of this application has made its operation easy and fast for the user. It provides users with recommendations according to the condition of their skin and hair without wasting their time by searching for suitable products. Web-based nature of the recommendation system also makes its operation more convenient.

It has been seen that the recommendation system works efficiently in most cases and provides useful recommendations to users. It also proves to be helpful in organizing the product information.

As well as, the administrative part allows for the updating and management of the system easily.

On the other hand, there are certain drawbacks. First of all, as the system functions according to the given algorithm, sometimes it cannot cope with complicated cases. Furthermore, the recommendation will be efficient only if the amount of data in the system is adequate.

In conclusion, the current project demonstrates that any system can be useful if it is appropriately constructed. In case of future improvements in the system, such as additional data or features, its functionality will increase significantly.

VI.FUTURE WORK

It performs perfectly when it comes to giving basic recommendations, however, there are a lot of possibilities on how to make it even better in the future. One of them would definitely be introducing machine learning into it. Instead of basing everything on predefined algorithms, it would have the ability to learn from users' activity and provide more accurate recommendations as time goes by.

Other improvements would involve increasing the amount of available products in the database along with their features such as ingredients and customer reviews. Updating data will ensure even higher quality recommendations.

Another thing that may be considered is giving customers the opportunity to give us feedback regarding the recommended product. In this case, we will be able to find out whether we provided proper advice or there was room for improvement.

We might also develop an application in the future so that customers have access to it via smartphones.

The third proposal would be developing a feature of image analysis, where users provide photographs of their skin/hair, which would be subsequently analyzed by the system.

Another option is to include a chat bot, which would allow us to communicate with the users. All in all, with these modifications, our software will become more sophisticated, resulting in higher efficiency in the future.

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