

RECOMMENDER SYSTEM FOR CLASS SELECTION IN SENIOR SECONDARY SCHOOL

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ABSTRACT

Recommender system for subject selection is a computerized system to deal with day to day operations taking place in school that helps student choose wisely and correctly what part or way to follow concerning what field they intend venturing into, whether in the science, commercial or art, based on their grades or how well they have done in Junior school. This paper aimed at designing a system which is a subclass of information filtering system that seeks to predict what the student might likely fall under to assist in making decision, because making good choices may require considerable effort and expertise, designing “intelligent” components that can make informed recommendations about solution development will play a valuable role in realizing the full potential of the student.

Keywords: *Recommender System, Knowledge Based System, Information Filtering System*

1. INTRODUCTION

Recommender system is a subclass of information filtering system that seeks to predict the “rating” or “preference” that a user would give to an item with ability to offer something similar to it. It has the ability to predict whether a particular user would prefer an item or not based on the users profile or activities. In a recommender system, there is an aspect of cased based reasoning that is broadly construed, which the process of solving new problems based on the solutions of similar past problems. A cased based reasoning is the act of developing solutions to unsolved problems based on pre-existing solutions of a similar nature that has occur in the past and using it in judgment for the current situation. The goal of a recommender system is to generate meaningful recommendations to a collection of users for items or products that might interest them.

2. LITERATURE REVIEW

A recommender system is a software system that proposes a path to a user based on the previous activities or task carried out. A recommender system traditionally just like any computer system has been most adept in accepting data, processing and then recording the results typically to a searchable database. Also, according to Barkat (2015) he sees recommender system as a system that produces individualized recommendations as output or has the effect of guiding the user in a personalized way to interesting objects in a larger space of possible options.

In general, recommender methods are usually grouped into four broad categories, based on how recommendations are made. Collaborative system approach, Content-based, knowledge based and Hybrid recommender approaches. An excellent survey of different recommender systems for various applications can be found in pure content-based recommender methods typically propose items to a target user based on affinity between items’ contents and the user profile, ignoring data from other users.

On the other hand, in pure collaborative recommender methods, items are recommended to a target user based on similarities with other users’ preferences (example: purchase histories and user ratings), ignoring items’ features. The greatest strength of collaborative techniques is that they are completely independent of any machine-readable representation of the objects being recommended and work well for complex objects where variations in taste are responsible for much of the variation in preferences. Collaborative filtering is based on the assumption that people who agreed in the past will agree in the future and that they will like similar kind of objects as they liked in the past (Barkat, 2015)

Kaut (2008) Knowledge-based methods use deep knowledge about features of items rather than users' ratings. Knowledge-based recommender methods exploit inferences, often adopting techniques from artificial intelligence, to deduce a match between user and item. In this type of system, the algorithm takes into consideration existing knowledge about individuals and tries to match an item with such individual based on existing preference. The knowledge base consist of history and activities of individuals stored over a period of time, this is then used to predict or recommend a type of service or item to a user of the system, based on inference drawn. Furthermore, the knowledge based recommender system also takes into cognizance the behavior and pattern of interest of such individuals and its affinity.

Hybrid Recommender System is the approach in which any two systems are combined in a manner that suits a particular situation. This is approach is mostly used by many companies as it combines the strengths of more than two Recommender system and also eliminates any weakness which exist when only one recommender system is used. There are several ways in which the systems can be combined, such may include but not limited to Weighted Hybrid Recommender, Switching Hybrid Recommender and Mixed Hybrid Recommender.

3. METHODOLOGY

- I. **Inference Engine:** The inference engine is used for logical deduction, starting from the inputs facts, intermediate facts with encoded deduction rules that works on knowledge base.
- II. **Functional Knowledge:** This is about how a particular item meets a particular user needs
- III. **User Model:** The system was designed based on the affinity between students and subjects taken from junior school with Junior WAEC as the final metric used. The subjects taken at each level is stored in knowledge base and each scores for various subjects is evaluated to test the strength of the student with aggregate recorded. The results is then compared to the Junior WAEC result to determine the option of the class such student would be placed

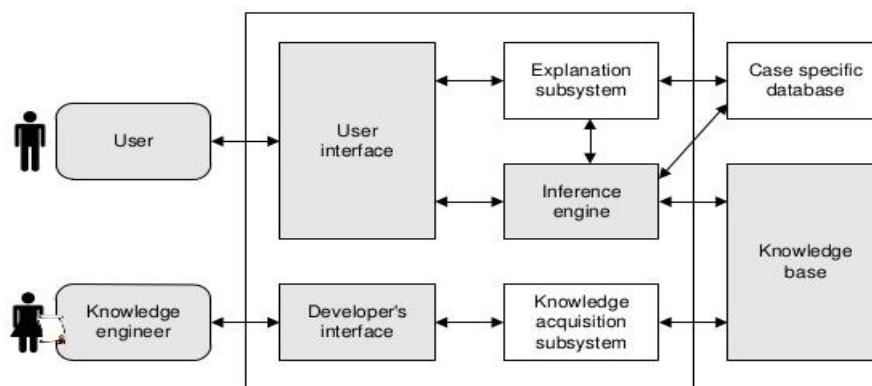


Figure 1: Proposed System Architecture

The proposed architecture is interlinked with a knowledge base that contains all the data generated by the students and also case specific database where all the inference drawn from data is stored. Data flow through the system from knowledge engineer with inbuilt subsystem with capability to clean the data before been stored in knowledge base. The inference engine works with predefined logic rules to the data drawn from knowledge base of the system and display the information to the user interface.

It is expected that with the introduction of the new system, a lot of positive changes will be noticed. In the design of the software, conscientious effort is made to create an effective knowledge based system which would be successfully implemented into the workflow, providing the staff with the necessary support in their yearly activity of recommendation. The system will significantly improve staff and workers performance and improve students outcome hence allowing them work hard to want to get to their desired department since it's a system that decide for them.

The use case diagram shows the interaction between the administrator and the Guidance Counselor with the system.

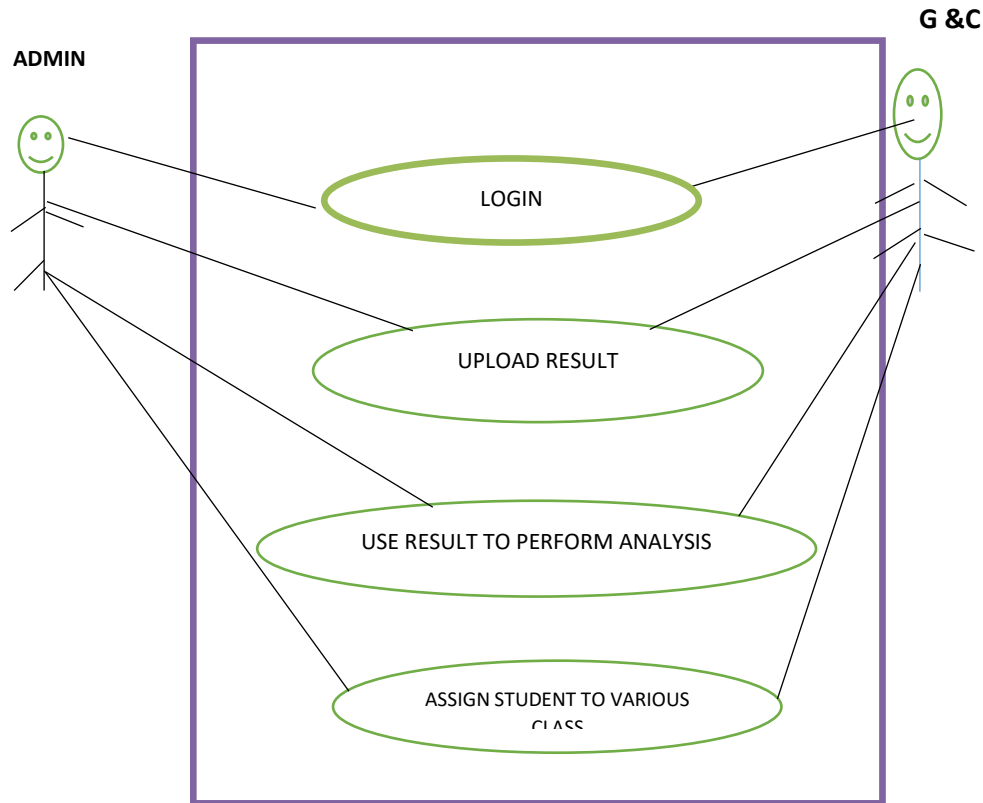


Figure 2: Use case diagram of the proposed system

4. RESULT AND DISCUSSION

LOGIN PAGE: Figure 3 shows the page that allows the ADMIN to login into the software so as to be able to register the student. Also it is the entering of information into a system by a user in order to access that system.

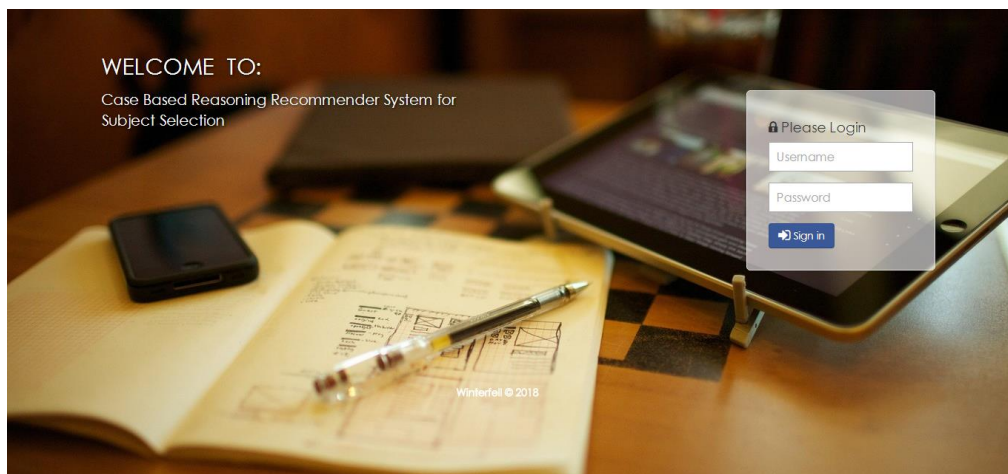


Figure 3: Login page/splash screen

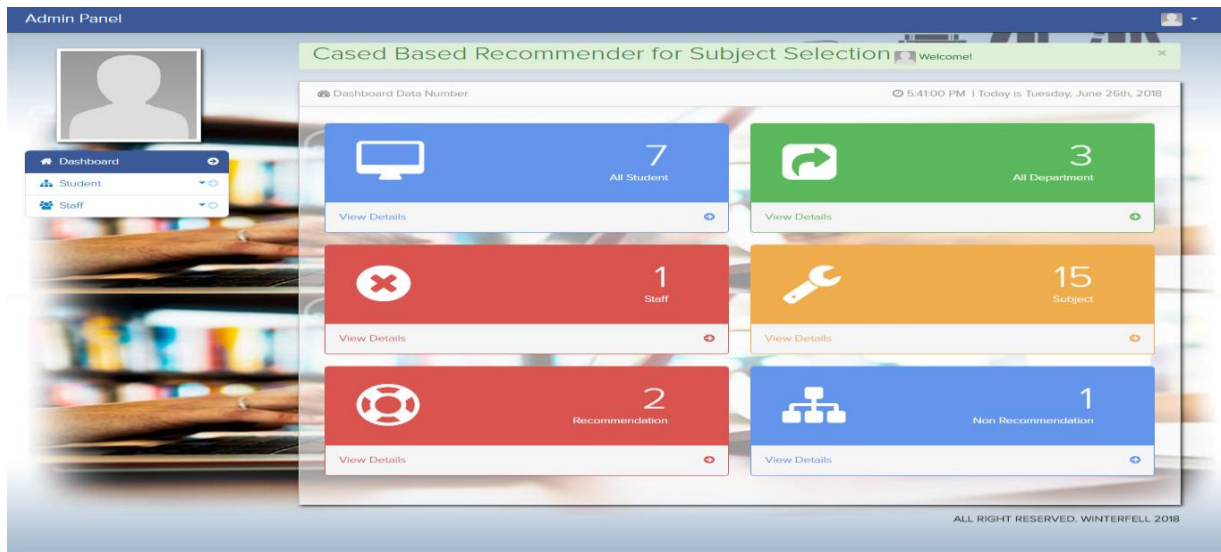


Figure 4: Dashboard

REGISTRATION FORM: Figure 5 is the form that allows the input into the database. The staff fills in the details of the student and save it for processing.

Figure 5: Registration form

RESULT PROCESSING FORM: The figure 6 displays the result of grades filled in.

Figure 6: Result processing form

RESULT (OUTPUT) FORM: The result the form that shows the output of the processed data (grade) of the student. It shows the percentage of the performance of the student in hierarchy.

Then the guidance counselor can see what department (art, commercial or science) the student is most likely to fit in.



Figure 7: Result output form

5. CONCLUSION

The program aids an easier record keeping of students for quick access process, update, retrieval and storage of records for use and future reference. In terms of speed, the program gives faster access to any data and aids in the improvement of the standard of decision making. Also, the reliability of the program is well guaranteed due to the fact that data entered interactively to the computer are saved in files and duplicated to other external disk at choice, meanwhile records can be adjusted by authorized bodies. The system also allowed reports and forms to be printed. Most importantly every student knows he or she has to make a particular grade to be in a particular department he or she prefers but now that a system is having to decide for them, it would make them be eager to learn and work hard. The system is recommended for department selection of student at the senior class level of secondary school in Nigeria as well as the Ministry of Education at both State and Federal levels.

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