



Advancement in Information Retrieval Module for Retrieving Learning Materials Based on Online Examination System

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Abstract—The retrieval module retrieves the web page which contain the required learning material according to the student's category. Personalized search for student at helping student to find relevant information according to their preferences. Information retrieval technique of the system, which uses the knowledge of student's requirement and understanding level to identify the relevant documents from web. We present a system basically designed for student's, which retrieve study material understandable to them from its repository and also provide facility of accessing the relevant study material from the web.

The World Wide Web is revolutionizing the way people access information, and has opened up new possibilities in areas such as education, general and scientific information dissemination and retrieval. The web is a potentially large digital library. The revolution that the web has brought to information access is not so much due to the availability of information (huge amounts of information has long been available in libraries and elsewhere), but rather the increased efficiency of accessing information

on-line, which can make previously impractical tasks practical. The computer based education systems can be made more useful and flexible by incorporating access of educational material from web apart from its own repository.

Keywords:— cluster, data set, association rule, support, vector etc.

1. INTRODUCTION:

Search engines are the basic tool of the internet, from which related information can be collected according to the specified query or keyword given by the user, and are extremely popular for recurrently used sites [6].

The remarkable development of information on the Web has forced new challenges for the construction of effective Retrieving Learning Materials Based on Online Examination System for student. Generally The input to the search engine is the keyword and it searches the whole World Wide Web to provide the relevant information to the user [21].

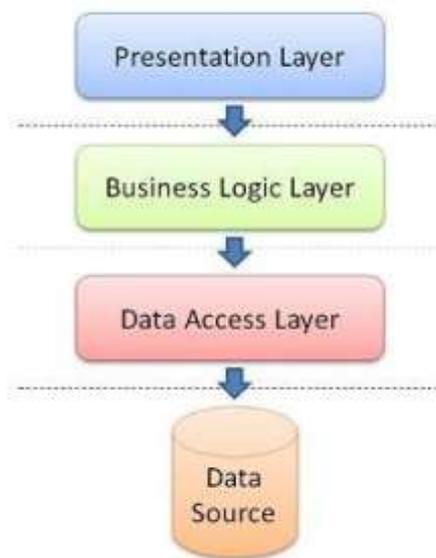


Figure 1: various access layers in data storage

Fundamentally, in studying how a search can be personalized, the most significant thing is to accurately identify student's requirement. Most of student's are likely to use only a few keywords to convey their information requirements, and thus the search queries usually do not correspond to what the student want specifically. In addition, with the huge development of the information presented on the Web, it is very complicated for a search engine to satisfy the user information requirement only with a short ambiguous query. To overcome such a basic difficulty of information retrieval, personalized search for student, which is to provide the customized search results to each student, is a very promising solution [2].

One way to know the knowledge level to take examination. The Student's will appear in the examination and the knowledge level of the student can be judged based on the examination result. Information is retrieved from www (world wide web) according to the requirement and knowledge level of student's [15]. We have developed a system which provide learning material from world wide web (WWW) according to the knowledge level of students. The system consists of a online examination module and a retrieval module. The examination module takes examination and the examination result reflects the

student's knowledge level based on the knowledge level, the student is categorized. The knowledge level categories are :-

1. Advanced
2. Intermediate
3. Basic

Based on the category search in made and search results are provided to the student knowledge level. Examination Module of the system can be independently be used for taking online examination [10].

Aim and applications:

The main aim of this project is to help the student to assess his/her performance in particular subject and searching learning material from the web. This system can be user in large organization or institute as an examination purpose where it is not feasible to do manual work[18].

2. RELATED WORK

To access information if a student use general purpose search engine, in response to a given query, it retrieves documents based on the keywords present in the query and in many cases it comes up with many documents that contain the keywords but are not relevant to the student's interest.



Figure 2: various knowledge level in data modeling

Features:

Secure: allow only valid users to access the system obtained based on the knowledge level of the student.

Easy to use: Provides a user-friendly testing environment.

Reliable and accurate: should work effectively in tremendous rush and must give the perfect calculation and perfect score in kind of damn situation

No need of examiner: with online testing, to take online examination and no need of any examiner. There is Personalized searching provide personalized Search results.

Objective and Goal:

The main objective of this work is to provide easy assessment tool and personalize search.

These are the following objective of this work:

- To develop conceptual, logical and physical model for the system .
- To implement the physical model.
- To develop Graphical User Interface (GUI) as per convenience of the user.
- To document our efforts and analysis in a proper comprehensible manner.

The main goal of this work is as follow:

- To make a responsive, easy to operate, fast and efficient retrieval of information as per the students requirement
- To make a database that is consistent, reliable and secure.
- To perform a thorough analysis of working of the whole System.
- To provide correct, complete, ongoing information.
- To develop a well-organized information storage system.
- To make good documentation so as to facilitate possible future

enhancements.

Flexibility:

System is flexible enough to incorporate new features and set of rules in future implementations. The user is facilitated to view and make entries in the forms. Validations are provided in each field to avoid inconsistent or invalid entry in the databases. Some forms consists Hyper Links, which provides further details. Reports screen contains text boxes and drop down lists, so that reports can be produced[24].

Security:

Application will allow only valid users to access the system. Access to any application resource will depend upon user's designation. There are two types of users namely Administrator and Student. Security is based upon the individual user ID and Password.

Maintainability:

The installation and operation manual of the developed system will be provided to the user.

Availability:

Web project, it is easily available to all the users of the system and they can access it from various locations.

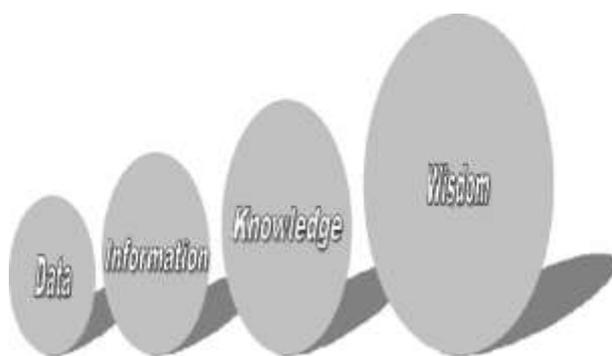
Reliability:

Information Retrieval Module For Retrieving Learning Materials Based on Online Examination System should be reliable. It should keep secure all the information regarding to Student, search, Questions and Results. The system must give the perfect calculation and perfect score in kind of damn situation. The Particular score must be listed in to the particular user only; there should not be any kind of data integrity or other problem between Administrator, and Student.

Efficiency:

Information Retrieval Module For Retrieving Learning Materials Based on Online Examination System should be efficient enough to meet all kinds of requirements as required by the Administrator and Student. The system should not hang or lose its efficiency in any kind of worse conditions. It should provide the correct output in all manners.

Online examination, Once students register for the test, it will be held at the set time answers will be stored for each student in the database System. Tests will be conducted in a strict time constraints and the time duration of the test for a student will depend upon the set time duration [9] .



The value chain concept is central to Knowledge Management. Knowledge is seen as a superior element in a value chain, where the perception of value is based on applicability to problem-solving and decision-making or on the element's value as an asset. An important objective of Knowledge management is leveraging data and information to create knowledge.

Figure 3: Subsequent development of knowledge in stages

During the online examination student's will be able to select and answer questions one by one. They can also revisit a question and can change previously given answer within the time duration of the test or before submitting the test answers. Once students submit the test answers, they are stored into a database for evaluation.

Scope:

Scope of this project is very broad. Few of them are:-

This can be used in educational institutions.

Based on the test result, searching of learning material from web is obtained.

The Personalized Search has following features

1. Analysis will be very easy in proposed system as it is automated Result will be very precise and accurate and will be declared in very short span of time.
2. Calculation and evaluations are done by the simulator itself.
3. The logs of appeared candidates and their marks are stored and can be backup for future use.

System Overview:

The system has following stages

- Login
- Test
- Result
- Searching
- Uploading

Student detail like,

- Name
- Class
- Subject, which he is interested to study.
- Topic, which he is interested to study.

Login: Interface has been developed. A user can login using user ID and password. Once a user logged into the system, the system will ask about the very simple graphical user login window.

Test: Test page is the most creative and important page in this project. It consists of 2 modules namely:

Subject selection: From the given choices the candidate can select his field (like C, C++ and JAVA etc) for taking on with the test.

Utilities: It includes Skip and come back to the question afterwards if needed. Gives the list of attempted and unattempted questions and can go to any question directly and can either attempt or change the answer of the already attempted question.

3. PROPOSED WORK

Information of knowledge structure:

Knowledge level: before the student loads the system, the system set a multiple choice exam test which will evaluate the student's knowledge level. The result of online test is the grade of student's knowledge level.

Based on the score student is categorized as

1. Beginner
2. Intermediate
3. Advance

Based on classification we help a student use the resources better.

Extractable features:

We normalize the data before classification

1. Total number of correct answers.
2. Getting the problem right on the first try.
3. Total time spent on the problem regardless of whether they got the correct answer or not (Difference between time of the last submission and the first time the problem was examined).

It is an effective way to evaluate a student's skill or knowledge level compared to the expected skill or knowledge. Our goal is to design such a student model which should be able to provide the system with all the required information.

4. PROPOSED ALGORITHM

Student categorization (student_id,x,y,z)

{

X=number of question corrected in first attempt.

Y=number of question corrected in second attempt.

Z=number of question corrected in third attempt.

Where

$X \leq 50$, $y \leq 50 - x$ and $z \leq 50 - x - y$

Classification:

If($m \geq 200$) then student will be put under advance category

Else

If($m \geq 150$) then student will be put under intermediary category

Else

Student is categorized beginner

}

Example:

Let there are total 50 questions are to be asked and 5 marks awarded if it is attempted in first attempt.

3 marks awarded if it is attempted in second attempt.

1 marks will be awarded if it is attempted in third attempt.

Total marks $m = 5 * x + 3 * y + 1 * z$

There we can also consider the time taken by the student to solve the test and according to that some marks can also be awarded such that student who taken less time

can be awarded some more marks over the student who taken more time.

Assuming time taken by several students are $T_1, T_2, T_3, \dots, T_{100}$

Let there are 100 students

Average time = $T_1 + T_2 + T_3 + T_4 + \dots + T_{100} / 100$

Tavg.time =

$\sum_{i=1}^n \frac{T_i}{n}$ Now calculating standard deviation for student's

$$\sigma_1 = \text{Tavg time} - T_1$$

$$\sigma_2 = \text{Tavg time} - T_2$$

$$\sigma_3 = \text{Tavg time} - T_3$$

$$\sigma_n = \text{Tavg time} - T_n$$

Assuming there $\sigma_n = \text{Tavg time} - T_n$ is a marks factor

Let

$\Delta = 10$ Now marks awarded to particular student according to time taken by solving the question = $\sigma_n / \text{Tavg time} * \Delta$

Now marks awarded into first student = $\sigma_1 / \text{Tavg time} * \Delta$

Marks awarded into second student = $\sigma_2 / \text{Tavg time} * \Delta$

Marks awarded into third student = $\sigma_3 / \text{Tavg time} * \Delta$

Now total marks awarded to first student = marks obtained according total number of question solve + marks obtained according to time taken solve the question

$$(5 * x + 3 * y + z) + \sigma_n / \text{Tavg time} * \Delta$$

Example: $T_1, T_2, T_3, T_4, T_5, \dots, T_{100}$

Total 50 question and each question awarded into 5 marks = $50 * 5 = 250$ marks

Total allocate time in test = 50 minutes

Example: $T_1, T_2, T_3, T_4, T_5, \dots$

Case1:

X=20 correct in first time try

X=10 correct in second time try

X=5 correct in third time try

Total time taken(assume)=35 minutes solve these question

$$\text{Marks} = 20 * 5 + 10 * 3 + 5 * 1$$

$$= 135 \text{ marks}$$

Case2:

X=15 correct in first time try

X=10 correct in second time try

X=5 correct in third time try

Total time taken(assume)=30 minutes solve these question

$$\text{Marks} = 15 * 5 + 10 * 3 + 5 * 1$$

$$= 110 \text{ marks}$$

Case3:

X=10 correct in first time try

X=10 correct in second time try

X=5 correct in third time try

Total time taken(assume)=25 minutes solve these question

$$\text{Marks} = 10 * 5 + 10 * 3 + 5 * 1$$

$$= 85 \text{ marks}$$

Case 4 :

X=20 correct in first time try

X=20 correct in second time try

X=5 correct in third time try

Total time taken(assume)=45 minutes solve these question

$$\text{Marks}=20*5+20*3+5*1$$

$$T_{\text{avg.time}}=40+25+30+45/4$$

$$=140/4$$

$$=35$$

$$\sigma_1=T_{\text{avg time}}-T_1$$

$$\sigma_1=35-40$$

$$\sigma_1=-5(10)=-50+135=130 \text{ marks (beginner student)}$$

O n l i n e	Beginner	Intermediate	Advance
Marks (m)	m<150	m>=150	m>=200

It is an effective way to evaluate a student's skill or knowledge level. Our goal is to design such a student model which should be able to provide the system with all the required information.

The comparison of the average score and students score indicate the students knowledge level or skills.

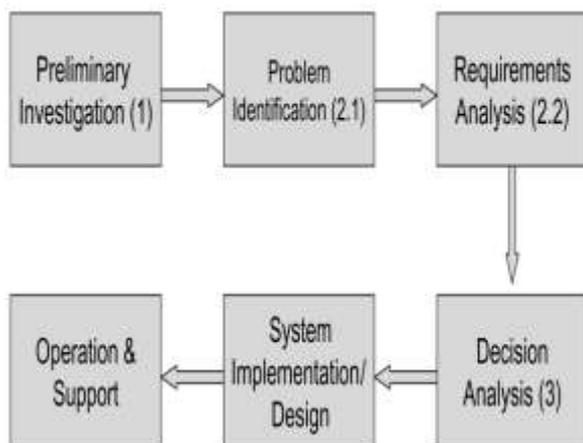


Figure 4: Flow Chart of Knowledge Retrieval

4. CONCLUSION

Information Retrieval Module For Retrieving Learning Materials Based on online examination process by automating various activities in an examination. These all activities depend upon a online test which is structured

collection of questions and it is used for selecting questions for a test and evaluation of the answers given to the students.

5. FUTURE WORK

The personalized search for student created for taking examiner test and searching has following features:

- In comparison to the present system the proposed system will be less time consuming and is more efficient.
- Analysis will be very easy in proposed system as it is automated
- Result will be very precise and accurate and will be declared in very short span of time because Calculation and evaluations are done by the simulator itself.

REFERENCES:

- [1] Brijesh Kumar Baradwaj, Saurabh Pal, "Mining Educational Data to Analyze student's performance (IJACSA)", International Journal of Advanced computer Science and Applications, Vol.2, No.6, 2011
- [2] Behrouz Minaei-Bidgoli, William F, Punch, "Genetic Algorithms Research and Applications Group(GARAGE)", International Journal of Computer Science and Telecommunications volume 2, Issue 8, November 2011.
- [3] Devshri Roy, Sudeshna Sarkar, Sujoy Ghose, "A personalized information retrieval module for retrieving learning materials", international workshop on technology for education(T4E), Aug4-6, 2009, Bangalore.
- [4] Zhaochengling, Sunzhimei, Liu Quingtang Shang Chaowang & Shen Dandan, "Research on initializing student model", Information Technology department, Central

- China Wuhan, Hubei Proceedings of the fifth IEEE international conference on Advanced Learning Technologies ('ICALT' 05)
- [5] Magdi Z. Rashad, Mahmoud S. Kandil, Ehmed E. Hassan and Mahmoud A. Zaher, "An Arabic Web-Based Exam Management System" International Journal of Electrical & Computer Sciences IJECS-IJENS vol:10 NO. 01
- [6] Dongming Xu, Huaiqing Wang and Kaile Su, "Intelligent student profiling with fuzzy models", proceedings of the Hawaii international conference on system sciences-2002
- [7] A Novel Web-based Online Examination System for Computer Science Education ASEE/IEEE Frontiers in Education Conference November 5-8, 2003, Boulder, CO
- [8] Yuemin Ding, Xiong Zhang online tests, "Performance is a determinant of final grades", 2010 second international conference on information technology and computer science.
- [9] Sergey and Lawrence Page, "The Anatomy of large-scale Hypertextual Web Search engine" IEEE [2002]
- [10] Alenka Kavic, Jesus Cirl-Sueiro, Angel-Vazquez, "Fuzzy student model in intermediautor platform", international conference information technology interfaces ITI 2004, June 7-10, 2004 Cavtat, Croatia.
- [11] Samba Siva Rao, P. Harshita, S. Dedeepya and P. Ushashree, "Analysis of Enhanced Approach for Secure online Exam process plan N". IEEE [2002]
- [12] Roberto Oboko, Peter W. Wagacha & Elijah Omwenga, Comparison of Different Machine Learning Algorithms for the initialization of student knowledge level in a learner module-based Adaptive E-learning system International Journal of computing and ICT Research, vol 3 no.1, June 2009.
- [13] Boumedyen, Kaneez Rafael, Victor Birkut-ul-mauz, Nizwa, "An Effective pedagogical for learning", International Journal of Innovative Technology & creative Engineering vol.1 No. 4 April 2011, Sultanate of Oman
- [14] Juhua Zhang, Yan Ma, Ning Song, "A Research on student model based on intelligent computer Assisted instruction e-Business, e-management and e-learning", [2010] international conference on e-Education,
- [15] Wen-chih Chang, Sheng-li Chen, Mao-Fan Li, Jui-Yu Chiu, "Information and control Integrating IRT to clustering student's Ability with K-means", [2009] Fourth International on Innovative computing,
- [16] Bariah Yusob, Siti Mariyam Hj Shamsuddin, Nor Bahiah Ahmad, "Intelligent Systems Design and Applications Developing student model using Kohonen Network in Adaptive Hypermedia Learning system", [2009] IEEE, Ninth International conference
- [17] Zhong-Hong Sun, Qing-Tang Su and Jing-Lian, "Study of student model Based on improved genetic algorithms", WANG 2009 First international workshop on Education Technology and Computer Science
- [18] Dongming Xu, Huaiqing Wang and Kaile Su, "Intelligent student profiling with fuzzy models proceedings", Hawaii international conference on system sciences- [2002] IEEE
- [19] Victoria Tsiriga, Maria Virvou, "Initializing the student model using stereotypes and Machine learning", IEEE [2002]

- [20] Heikki Manila, "Data Mining Machine learning statistics and databases", IEEE [1996]
- [21] Peter Saloun, Zdenek Velart, "web intelligence and intelligent Agent Technology Evaluation of Concept Space Rating Algorithm and Navigation Scheme', international conference on IEEE [2010]
- [22] Aroyo, L., Dicheva, D. and Cristea, "A Ontological support for web courseware authoring, Proceedings of the 6th International Conference on Intelligent Tutoring Systems ITS'2002, Biarritz, France and San Sebastian, Spain, pp.270—280, 2002.
- [23] B. Chandrasekaran, J. R. Josephson, and V. R. Benjamins, What are ontologies, and why do we need them? IEEE Intelligent Systems, 14 (1):20–26, 1999.
- [24] Friesen, N. (2005). Interoperability and learning objects: An overview of e-learning standardization. Interdisciplinary Journal of Knowledge and Learning Objects, 1, 23-31.
- [25] Cohen, E., & Nycz, M. (2006), "Learning objects and e-learning: An informing science perspective". Interdisciplinary Journal of Knowledge and Learning Objects, 2, 23-34.
- [26] Nash, S., (2005), "Learning objects, learning object repositories, and learning theory: Preliminary best practices for online courses". Interdisciplinary Journal of Knowledge and Learning Objects, 1, 217-228.