Analytical Approvals For E-Learning Customization Based On Web Usage Of Mining Process And Information Development

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ABSTRACT

Recommender systems facilitate the interaction of teachers/students with virtual learning platforms. The aim of those systems is to resolve the matter of data overload, since they gift personalized content to every user. The user recommendations are created taking into thought the degree of data and user convenience to answer queries from different users. Recommendations these systems will herald a virtual learning platform area unit associated with objects of learning, actions or activities to be dispersed among the platform and proposals of different users with whom they act. Perform of the recommender a replacement approach to make the recommendations is different to the system: the name of the candidate users among the community. The name is calculated on the basis of what went before interactions, more precisely the fulfillment of the user who made the question. Results show that the recommendations supported name, data and availability of users are extra correct.

KEYWORDS: Recommender, TIC, CDR, Learning management system, recommender systems, information retrieval, interaction tools.

INTRODUCTION

In this project, a recommender system is described, where the user approvals are made considering the degree of knowledge and user availability to answer questions from other users. A new comes up to make the recommendations is added to the system: the reputation of the candidate users in the community. The status is calculated on the basis of what went before interactions, more precisely the fulfillment of the user who made the question. Our experimental results show that custom-made delivery increases the usage of e-learning resources and the entitlement of reviewing compact disk resources if these materials are delivered in ways that fit students’ favorite. A number of past hard works have dealt with e-learning personalization, generally, relying on clear information. In this paper, we intend to work out online automatic recommendations to an active learner based on his/her recent direction-finding history, over and above exploiting similarities and dissimilarities surrounded by user preferences and among the contents of the learning resources. Results show that the recommendations based on character, knowledge, and ease of use of users is more accurate.
2. Related Work:

I. Advice Of Users Based On Information Obtained From Forums:

Information about knowledge or expertise of the people in a virtual environment is difficult to obtain implicitly. For example, if a student does not know about a topic he or she asks a colleague to help resolve that doubt. In a face-to-face environment the student knows the person, while in virtual environments this seldom happens.

The interactive tools in virtual learning environments facilitate communication between users, but still, the right person to answer questions might not be in the list of contacts. Therefore, it is necessary to provide tools to automatically suggest appropriate persons with whom they can interact.

In order to find the right person it is necessary to obtain information about the knowledge that users have about the subject. But it is not enough to know the subject: it is also necessary to obtain information about their availability to answer the question made. The person may know much about the subject but might not want to answer the question posed by others. In addition to the knowledge and availability of a person, your proposal takes into account the reputation of that person.

This can be estimated from their past behavior. In this work, the person with more reputation is the person who has satisfactorily responded to the most users. In short, the recommendation of a user i is calculated based on the degree of knowledge about the topic C, availability for answering questions D and reputation to answer questions satisfactorily R (Equation 1).

Recommendation = Ri (Ci , Di , Ri )  \hspace{1cm} (1)

II. Acquiring Knowledge Of User Candidates From Forums:

The tools of interaction in virtual learning environments facilitate communication between users. Through these tools students can ask teachers questions, publish news, etc. Forums allow users to communicate asynchronously, so it is not necessary that those who communicate are connected at the same time. Below are the steps to get information from the comments in forums. Based on this information, a measure is obtained that allows knowing whether a user can solve a question from another user.

A. Selecting Relevant Forums and Identification of Candidate Users; given a request P of the user X, all forums are looked up in the stand containing P request. A request from a user is of the form “Pythagorean Theorem”.

The search for relevant forums follows a simple search, where only those forums that contain p are selected. In our example, the forums that contain the words “Theorem” and “Pythagoras” are selected. The selected forums make up a collection of relevant forums.

B. Measuring the User’s Knowledge on the Subject, A candidate user’s knowledge on the subject is obtained from the information recovered from the set of candidates (Figure 3). A user’s knowledge C is obtained from interventions made about the topic IntTema and the amount of interactions which he or she performed in the forums CantInt. It is more likely that a user who intervenes much in forums answers queries from others. The knowledge C is obtained using equation 2.

Ci = (IntTema * CantInti )  \hspace{1cm} (2)

Where IntTema is obtained using equation 3.

IntTema =\sum_{j=1}^{n} wi j * Mi  \hspace{1cm} (3)

Wij is the weight that the word j has in the comments made by the user i. A request P can be formed by several words as shown in equation 4. Mi is the number of times the words of P appear together in the comments of user

IP = (p1, p2,.., pj )  \hspace{1cm} (4)

Wi j is obtained by the tf-idf measure of equation 5. Fjk is the normalized frequency of the term j in the comments made by the user i, which we call k. idf j is the inverted frequency of the word j. These measures are obtained through equations 6 and 7.

wi j = f jk * id f j  \hspace{1cm} (5)

f jk =f recjk/MaxFreck  \hspace{1cm} (6)

idf j = logN/n j \hspace{1cm} (7)
Where \( f_{\text{freq }jk} \) is the frequency of the word \( j \) in the comments \( k \). \( \text{MaxFreck} \) represents the maximum frequency on all the words of the comments \( k \). \( N \) is the number of forums that exist and \( n_j \) is the number of forums that contain the term \( j \).

### III. Obtaining The Availability Of Candidate Users:

The degree of knowledge of a user is not always enough to know if that user will be available to answer a query. The next step is to know the availability that a candidate user can have. Availability \( D \) is calculated based on the past behavior of the user as shown in equation 8.

\[
D_i = \frac{( \text{pos} + 1)}{(\text{Pos} + 1)} + (\text{neg} + 1)
\]  

(8)

Where \( \text{pos} \) is the number of times that \( i \) has responded to queries from users and \( \text{neg} \) is the total number of times that \( i \) has been requested but has not responded. The first time that a user enters a forum his or her availability value is 0.5. Once this user has been recommended and selected for the query, the system asks the user interested in performing the query to confirm contact with the user (Figure 4). This information updates the value \( D \) in equation 8.

### IV. Obtaining The Reputation Of Candidate Users

The reputation of a user can be estimated from the opinions that other users have about their actions. In this work the value of reputation \( R \) is obtained from the positive and negative interactions made by the users. The measure of reputation to be used is specified by Jigar Patel and others [9]; they define the value of reputation in a range between \((0, 1)\), in which 0 is little reliable and 1 means a reliable user. This value is obtained using equation 9:

\[
T = E[\beta = \alpha; \beta]
\]  

(9)

Where \( E \) is obtained as:

\[
E[\beta = \alpha; \beta] = \frac{\alpha}{(\alpha + \beta)}
\]  

(10)

\( \alpha \) and \( \beta \) are defined as:

\[
\alpha = m_s + 1
\]  

\[
\beta = n_s + 1
\]  

(11)

where \( \alpha \) is the number of positive interactions + 1 and \( \beta \) is the number of negative interactions + 1. A positive interaction is one in which a user has successfully assessed an answer given by another user.

Reputation represents the quality of the answers given by the user; a positive evaluation means that the reply has solved the problem of the user. To obtain this valuation is used the feedback from the user that is shown in Figure 4. When the system is informed that user X has responded affirmatively to be contacted by the user Y, an email is automatically sent to the user asking if the answer given by user X solved his or question. This is the information that is used to calculate the parameters \( \alpha \) and \( \beta \).

### V. Experimental Results:

This section presents results to evaluate our proposal to make recommendations taking into account the reputation as well as the knowledge and availability of a user, in comparison with recommendations only taking into account knowledge and availability presented in [8]. The recommender system was implemented in the Module platform where students and professors interacted in 12 forums.

Two experiments were carried out using the same set of data (information from 12 forums) and the participation of 20 students, 10 students for each experiment.

Experiment 1 [Recommendation of Users Taking Into Account Knowledge, Availability and Reputation (CDR)]:

10 students took part in this experiment, where each student was asked to pose 10 questions on various topics. Those issues were involved in the forums where students and teachers had previously participated for four months.

**Accuracy Of The Recommendations In Both Experiments:**

These questions were made by using the recommender system in the Module platform. The recommender suggested for each question a user taking into account knowledge, availability and reputation from the set of candidates. These values were obtained by using metrics defined in the previous sections. Then, the system asked users to respond whether the recommendation had met their expectations. This information is used to evaluate the recommendations.

Experiment 2 [Recommendation of Users Taking Into Account Knowledge and Availability (CD)]:
10 students took part in this experiment, where each student was asked to pose 10 questions on various topics. Those issues were involved in the forums where students and teachers had previously participated for four months.

The questions were performed using the recommender system in the Module platform. The Advisor suggested a user for each question taking into account only the knowledge and availability as presented in [8] regardless of the user’s reputation. These values were obtained using metrics defined in the previous sections. The system requested the user to respond whether the recommendation had met their expectations. This information is used to assess the recommendations.

To evaluate the recommendations in both experiments, we used precision measurements obtained from equation 12. The evaluation was carried out taking into account the successful recommendations over all the recommendations. Successful recommendations are defined as: given a requirement of the user, the recommendation that meets their expectations is considered successful. The evaluation obtained from the user about the recommendations made is used for precision.

\[
\text{Precision} = \frac{\text{NR}}{\text{N}} \quad (12)
\]

where NR is the number of successful recommendations and N the total number of recommendations. The results can be seen in table I and Figure 6. They show that the recommendations made by taking into account the reputation as well as knowledge and availability have greater accuracy. Reputation allows us to measure the quality of the answers and knowledge that a user has.

3. Proposed System:

Possible synchronous and asynchronous possibilities incorporated in the training and education field encourage new interaction and feedback options to help educators and students develop / teach knowledge to more sectors of society. Recommender systems facilitate the interaction of teachers/students with virtual learning platforms. The purpose of these systems is to solve the problem of information overload, since they present personalized content to each user.

4. System Design:

5. Module Description:

1. User Interaction Design:

To connect with server user must give their username and password then only they can able to connect the server. If the user already exits directly can login into the server else user must register their details such as username, password, Email id, City and Country into the server. Database will create the account for the entire user to maintain their queries. Name will be set as user id. Logging in is usually used to enter a specific page. It will search the query and display the query.
2. Choose Relevant From:

Once user logged in there are many domains in the page. Choose the particular domain what relevant question you have to ask your queries. For Example there are java,.net, php, and lot of domains. Your question is java means choose java forum otherwise choose the particular domain you have questions.

3. Identify Recommender:

In that article the recommendations of users are made based on the degree of knowledge of the subject and the availability of answering questions from other users. Forums are analyzed to obtain the knowledge and availability of people participating in them. This article adds the reputation of users within the community to carry out the recommendations. The reputation is calculated based on the satisfaction of users with the replies received.

Additionally, it presents results that show that the recommendations are more accurate if performed taking into account the reputation as well as the degree of knowledge and availability.

4. Suggest Recommender Available:

Once choose the domain article focuses on the recommendations of users, specifically, giving answer to the question who can I consult about a topic? A student wants to know who can respond topics question. The recommender suggests that available person.

5. User Feedbacks:

In order to find the right person it is necessary to obtain information about the knowledge that users have about the subject and ask the question directly to the right person of the recommender. Once users ask the question to the recommender, recommender directly answers to the users. Once get the response from the recommender side user can give the feedback to the recommender.
6. Algorithm Technique:

Technologies of Information and Communication (TICs), it is more likely that a user who intervenes much in forums answers queries from others. The knowledge C is obtained using equation 2

\[ \text{IntTema} \cdot \text{CantInt} \]

Where IntTema is obtained using equation 3.

\[ \text{IntTema} \cdot w_{ij} \]

1 is (3) Wij is the weight that the word j has in the comments made by the user i. A request P can be formed by several words as shown in equation 4. Mi is the number of times the words of P appear together in the comments of user i Wij is obtained by the tf-idf measure of equation.

Conclusion:

The contributions of this paper are: a tool for virtual learning platforms which suggests users to ask about a topic; a new contribution of the recommendation method presented in that incorporates reputation as a criterion of recommendation; a method to obtain information from forums such as comments, the quantity and quality of the interactions. To demonstrate the feasibility of the proposal a system recommender was implemented for the Module platform; two experiments were made with real users resulting in a high degree of effectiveness of the recommendations. Future work aims to improve the text mining method by analyzing different writing styles. This work only took into account the analysis of well-written words, excluding abbreviations, regionalisms, symbolism, etc. usually present in the writing of comments from people. Results show that the recommendations based on reputation, knowledge, and availability of users are more accurate. VLP furthermore conclude that collaborative filtering techniques can be utilized successfully. Future work aims to improve the text mining method by analyzing different writing styles. This work only took into account the analysis of well-written words, excluding abbreviations, regionalisms, symbolism, etc. usually present in the writing of comments from people.

REFERENCES