Hybrid approach into the design of a user model for adaptive recommendation system in MOOCs

Ahlam Zemmouri, Mohamed Benslimane, Mohamed Khaldi

Abstract: Today, many universities offer open and massive courses online through their platforms, in many areas in a thematic form. The MOOCs (Massive Open Online Course) are courses open to a very large number of students. Course participants are either student or teachers. The MOOCs are used as distance, open, distributed, participatory, permanent education’s support. The design of a MOOC is a complex job that requires several months of work, it mobilizes many skills: pedagogical, Technical and Technological. In this context, we believe that it is difficult to manage a large number of participants and provide assessments and adaptive personalized recommendations to their needs, and their interactions with the system. Thus, to avoid recurrent difficulties such as dropout. We present in this paper a mainstreaming approach of adaptive recommendation system in our MOOC which provides a personalized recommendations based on user modeling.

Keywords: MOOC, user model, hybrid Approach, recommendation system, adaptive system.

I. INTRODUCTION

The term MOOC: Massive Online Open Course or during open massively multiplayer learners, was proposed in 2008 and popularized by some American universities last year. The first characteristic of these courses is that they are open to all, each of which can register at will. The second dimension is the number of entries that the exchanges between participants (also known as peers) are encouraged; it’s become in our belief, the primary form of learning, or accompaniment. So we are indeed witnessing a new phenomenon rated online courses: open courses, not limited in number of participants (and this is probably the most innovative feature), some of which actually include a large number of participants. By cons, between the first MOOC 2008 (CCK08) and the first course offered by MIT as part of its joint initiative with Harvard, the approach is visibly different.

The first type of MOOC is based on a participatory approach, where everyone performs its own information research, exchange with peers, and publishes its own conclusions on the site of their choice. The concepts of abundance of resources, renewal and development capabilities. Everyone can define its own level of investment. We talk about cMOOC, C coming from connectivism. Rather courses from MIT or Stanford correspond to the line-up of an existing course (i.e. open the door of the lecture hall) the only novelty is that the ongoing evaluation of participants can also be open to exteriors. Also referred xMOOC referring to the initiative edX from MIT.

The design of a MOOC depends on the target audience. Several options and tools are indeed possible to configure a MOOC. Next continuing intentions, successful tools can be different for the target architecture. If the audience is known, it may be advantageous to use the tools that these participants already use. Otherwise, it is probably important to emphasize the accessibility and ease of use. Selecting tools that allow optimal learning experience is essential for the less technologically warned public. Courses from the connectivistes approach are the ones appeared there a few years ago on the idea that learning occurs by sharing, linking people and knowledge. Siemens, Downes, Cormier … try to formalize the form of a theory they call connectivism. But above all they offer online courses, some of which are actually a form of collective research. The definition of the platform is rather a Personal Learning Environment (PLE), which can be defined as a Web services aggregation. So this research approaches during forms-based teaching approaches more open to free themselves of the need for important pre resources. The teacher is here more accompanying guide. Thus rather the extension of constructivist approaches or online active learning.

II. USER MODELING

User modeling has made great progress in recent years; the importance of a system to automatically adapt to their current users has been recognized in many application areas. Many applications such systems existence, for
example in the area of understanding and natural language dialogue systems in educational systems on the computer and online learning environments, in systems for computer supported collaboration systems recommendation for e-commerce, news and entertainment.

A. Definition
A model is an abstract representation of something that exists in the real world [1]. A model of the user is the presentation of a mental state (such as knowledge, preference, background and experience) related to a context in the real world [2]. Therefore, a user model is a collection of personal data related to a specific user. It is the basis of all the adaptive changes in system behavior. What data are included in the model depends on the purpose of the request. It may include personal information such as names and ages, interests, skills and knowledge of users, objectives and plans, their likes and dislikes or data on their behavior and their interaction with the system.

The main objective of User modeling is the customization and adaptation of systems to the specific needs of the user. The user's modeling must address the following issues [3]:

- How the user model (knowledge, goals, etc.) can be deducted from their behavior in the reasoning used to improve the performance of a target system?

- How the models of a large number of users can be maintained efficiently so that everyone is available when needed, but the system performance does not degrade?

The basic objectives of the user modeling can be listed as follows [4]:

- To help the user finding information;
- To customize the information presented to the user;
- To change an interface according to the user;
- To select exercises or appropriate educational interventions;
- Provide feedback to the user on the level of their knowledge;
- To strengthen the collaboration;
- To predict the future behavior of users.

B. Using approaches
The system gathers the user data based on three basic methods.

- Requesting specific information, while (first) interacting with the system [5]
- Learning the preferences of each user by observing and interpreting interactions with the system. [5]
- Adapting a hybrid approach that requires the explicit feedback and changes the user model based on adaptive learning. [6]

The third method is a good way because the hybrid approach tries to combine the advantages of the first two methods, firstly, through data collection, we get a first stock of information allows us to place the user, then that analysis of user interactions with the system, allows us to adapt the user model and achieve greater accuracy on the other.

III. SYSTEM ADAPTATION TO A MOOC PLATFORM
Adaptation decisions are based on various characteristics of users who interact with the system [4]. The main problem in distance education is the exposure of a large amount of learning objects causing a glut to the user by the information overload. To solve the problem, the solution is to automatically adapt the platform to the educational content based on user needs.
IV. CONCLUSION

In this work, we presented a brief introduction to MOOC system, especially on the side of adaptation. And a presentation on the user's modeling is proposed. In fact, improving the MOOC system requires integration of a recommendation approach based on modeling of the user by developing a recommendation system that considers a hybrid approach. In a future work we propose a detailed architecture for modeling the user of a MOOC platform.

REFERENCES


