

THE DEVELOPMENT OF AN EDUCATIONAL SOCIAL NETWORK TO SUPPORT BLENDED-LEARNING AT A UNIVERSITY

PHÁT TRIỂN MẠNG XÃ HỘI GIÁO DỤC HỖ TRỢ HỌC TẬP KẾT HỢP TRONG TRƯỜNG ĐẠI HỌC

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Abstract - Social Networks (SNs) have been successfully used in education, particularly in social knowledge training. However, using universal SNs such as Facebook or Twitter to deliver courses has limited the effect of social training due to lack of support from educational services. It is necessary to develop an educational SN that can provide better support for education in universities. This paper describes the development of an educational SN that integrates the social features of SNs with the academic features of educational training. The developed educational SN has shown certain advantages in comparison with the deployment on universal SNs or the usage of Learning Management Systems.

Key words - social networking; user modeling; Facebook; learning management system; blended-learning.

Tóm tắt - Mạng xã hội (MXH) đã được sử dụng thành công trong giáo dục, đặc biệt là trong đào tạo kiến thức xã hội. Tuy nhiên, việc dùng các MXH phổ biến như Facebook hay Twitter để cung cấp các khóa học, có nhiều hạn chế về hiệu quả đào tạo xã hội do thiếu sự hỗ trợ của các dịch vụ phục vụ giáo dục. Việc phát triển một MXH giáo dục có thể cung cấp sự hỗ trợ tốt hơn cho việc đào tạo trong một trường đại học là việc cần thiết. Bài báo này mô tả phương thức phát triển của một MXH giáo dục có tích hợp tính năng xã hội của các MXH phổ biến và các tính năng học thuật của giáo dục. Việc xây dựng MXH giáo dục đã cho thấy lợi thế nhất định của nó so với việc triển khai trên các MXH thông thường hay việc sử dụng Hệ thống Quản lý Học tập.

Từ khóa - mạng xã hội; mô hình hóa người dùng; Facebook; hệ thống quản lý học tập; học tập kết hợp.

1. Introduction

SNs provide new ways of learning, especially in universities. Social knowledge and skills, an important part of university training, can be provided through interactions between students in SNs. To facilitate social training, several lecturers have successfully used SNs as a training environment to deliver their courses. However, universal SNs, such as Facebook, LinkedIn and Twitter, are not designed for teaching and learning, so their educational services are very much limited.

An educational SN can bring educational services to students but still keep the social features of SNs. This paper describes the development of an educational social network, called SoNITS (Social Network for Information Technology Students). In this SN, several useful educational services have been developed. The comparison between an educational SN with universal SN and Learning Management System is further analyzed.

2. Social Network In Education

SNs were effectively used in education. A web-based forum was deployed as a discussion medium to support traditional learning methods and provide a good effect on student performance [3]. SNs were used to encourage students engaging in social communication [4]. This study also shows that the learner outcome is proportional to their relationships and activities in SNs. A SN was also used as an enabler of group learning and collaborative work [5]. This teaching method successfully promoted creativity and group learning among students.

At the university-wide level, several SNs have been deployed and operated. Ten universities in Texas created their university SNs that are hosted on Facebook [7]. In this attempt, several interesting studies were carried out with a vast amount of information about the student activities collected from these deployed SNs. To support blended-

learning (a blend of traditional and electronic learning), a private SN was constructed at the University of Alicante [8] to provide a platform for online teaching and learning, accompanied with traditional teaching methods. This SN promotes the active participation of students and teachers in virtual activities to improve the academic performances of students. This SN is successfully deployed and operated to support teaching and learning of several courses of various disciplines.

According to [6], the educational usage of social networking is motivated by three factors as follows:

- **Communication:** students and instructors use forums to take part in class discussions, keep track of announcements from teachers, departments or schools, deliveries of homework and assignments, get information about resources and links related to their courses.
- **Collaboration:** students can exchange ideas, share information and work together (the most popular Web application that enhances collaboration is Google Doc).
- **Resource and material sharing:** as people exchange ideas and information, they can also share resources, materials and documents, e.g. text documents, multimedia resources, project materials, links, etc.

These factors are difficult to execute in normal SNs, such as Facebook, due to the lack of organizational structures and user types. Developing a fully educational university-wide SN with particular features for education can bring more benefits for teaching and learning.

3. Educational Social Network For Information Technology Students (SoNITS)

An educational SN is a dedicated SN for education and mainly developed to support teaching and learning in universities. It is a virtual community that brings extra social dimensions to the traditional academic life of students in their university. It is the combination of the social features

of SNs and the academic features of educational environment. With this blending, social interaction can provide a better support for learning and education by enriching social interaction. Students live a long period of their life in universities, so it is better if educational SNs can provide social services for them to communicate with other students right in their learning environment.

A university has several different management and teaching-support systems to back its operation, but all these systems have a rigid structure tied to their business processes. A university portal provides useful information to students, but it is often one-way communication systems in which, only authorized managers can publish information to university's users. Blackboard [9] or Moodle [10] are electronic learning environments that are instructor-oriented and only focus on the delivery of separate courses. Intelligence Tutor Systems (ITS) are developed to support course teaching and in-class activities, but they are only developed for some particular courses so far. E-Learning tools are also constructed to support distance learning and only focus on delivering courses through the Internet. These systems do not provide rich social services for students. Therefore, these systems cannot provide a virtual community in which, students, the main actors, can live and communicate with others. Only an educational SN can provide that interactive environment.

The organizational structure is a particular feature of educational SNs in comparison with universal SNs. A universal SN is often a flat structure with a mainly peer-to-peer communication between their users. In universal SNs, users are free to make their voices, connect to other members or join communities. Social communities have no relationship with others. In an educational SN, both organizational and social communities exist together. Although the freedom of opinion expression is still maintained in educational SNs, students have their learning duties and academic regulations to fulfill in this virtual atmosphere as in the traditional academic environment. Therefore, the structure of universities has to be embedded into educational SNs to carry out educational activities. For instance, a person can play the role as a lecturer of a school, a member of a committee or a manager of a department at a university, but at the same time, he is also a member of a friendship network with other lecturers or students of different schools. These two relationships co-exist in an educational SN.

An educational Social Network for IT Students (SoNITS) is constructed and operated in an Intranet at the School of Computer Science and Engineering, International University – Vietnam National University HoChiMinh City (SCSE-HCMIU) since March 2011 to provide a platform for its members to conduct a university life. SoNITS is an educational SN with several different features and services compared with universal SNs. It is currently operated and monitored to evaluate its effect on teaching and learning at the School.

Built on top of Liferay [11], a popular open-sourced portal, SoNITS combines the features of a common SN and educational services. The architecture of the SoNITS is shown in Figure 1. External systems, such as university

management systems in Academic Affair Office or Youth Union, provide student with information to construct student models, which are managed by Student Model Server. Other educational systems, such as University Portal, Intelligent Tutoring System or Blackboard, can exchange data and co-operate with the educational SN. Users of the educational SN can also connect to popular SN through the interoperability of user profiles between SNs. Inside the educational SN, social and educational services can access student models from Student Model Server to deliver appropriate information to users. Social and educational activities of students are collected by the Behavior Tracking and Analysis module. Discovered knowledge about students is used to update student models or to create reports about student learning activities. Grading of students' social activities is based on these reports and then their result are sent to academic systems.

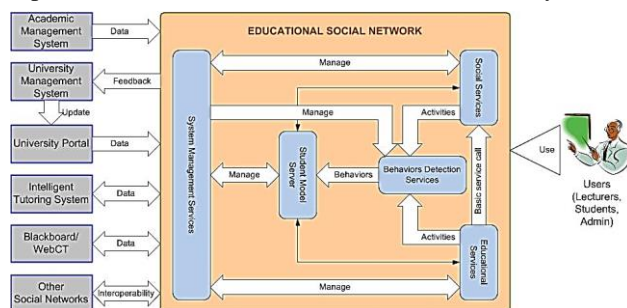


Figure 1. The architecture of SoNITS

SoNITS combines all the existing social services of the Liferay portal with newly developed educational services. Social services consist of essential services, such as mails, chats, forums, etc. that are necessary for social communication [[1]][2]. Educational services include services to support learning, such as Course Delivery Support Service, Useful Information Recommendation, Career Counseling. In an integrated environment like SoNITS, social and educational services can mutually support each other. Students only log in the system once and can use both two types of services. Information can also be shared between both services. Therefore, the academic and social lives of a student are blended together.

One of the most advanced features in SoNITS is the modeling of students. The student model in SoNITS is organized as a tree-like ontology of competencies including two main parts namely social and academic portions. Student models are initialized by the academic records for the academic portion. Throughout the social interaction of students, their activities are traced and then their social behaviours are extracted and updated to the social portion of their student models. The students models give based data structures for all services in SoNITS. With student models, new features can be added to educational services to improve their quality.

Main social services in the Liferay framework, such as mails, messages, wall comments, etc. are modified to keep all activities in SoNITS. The recorded information of social interaction is only about the senders, the receivers, time to start/end. The content is not stored to avoid the violation of privacy. This recorded information can be used to evaluate

the social interaction of students, study about students' behaviour to update the student model or do research on social communities.

Course delivery is one of the main processes in universities. A course delivery service is developed to facilitate lecturers to create a virtual class on SoNITS. Each virtual class plays a supporting role to the traditional class. In this virtual class, lectures and students can socially interact and discuss issues outside classrooms. In this service, a lecturer can create his class by using the students list that is imported from the academic management system. From the beginning, he can know about the abilities of his students, such as their GPAs, their abilities in programming, their performances in the prerequisite courses, etc. During the course, the lecturer can use all available social services to deliver his course. With the

support of SoNITS, he also can know about the social activities of his students, topics which students are interested in, etc.

The course delivery service in SoNITS can provide a better service for lecturers and students than Blackboard or universal Social Networks. In comparison with Blackboard, the course delivery service in SoNITS can provide richer information about students based on their student models and provide more social services in an integrated environment. Compared with the deployment of a class on a universal SN like Facebook, roles, rights and activities of the lecturers and students in this service are clearly defined by the business process. This service provides the perfect blended-learning environment because in an integrated environment, students can re-use all their social interactive services and relationships while learning.

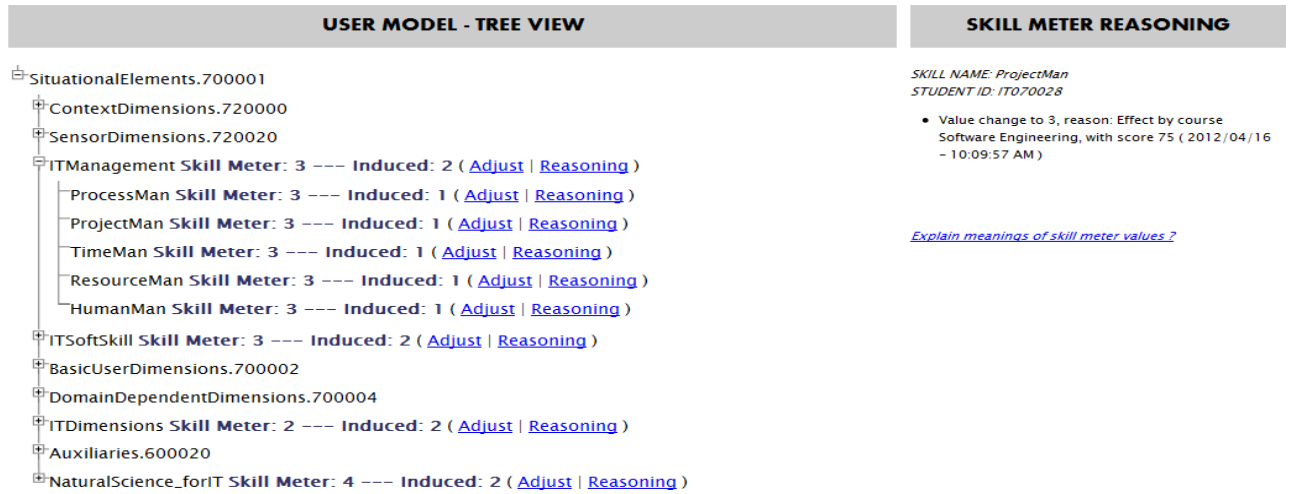
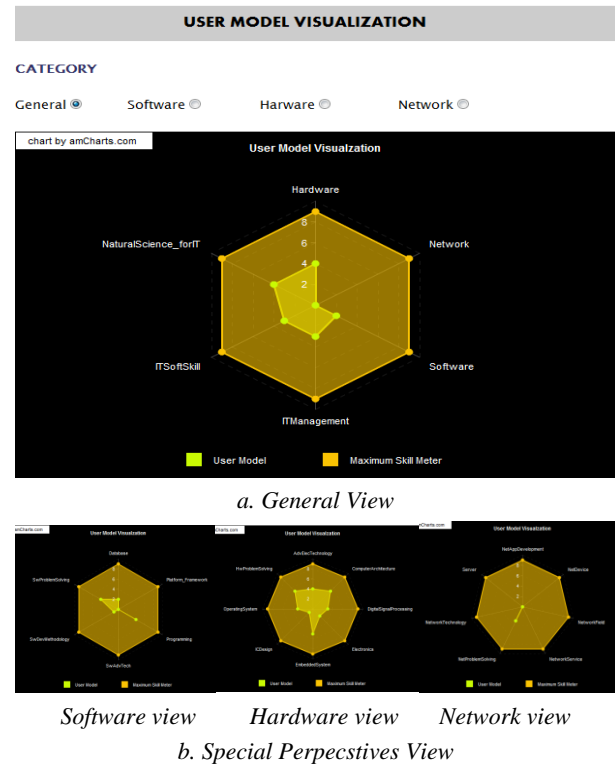


Figure 2. Competencies monitoring and editing



selected from the Standard Occupational Classification System (SOC) [13] – version 2010, as the aimed jobs for IT students. A matching function is used to compare the student ability with the demand of the job. Using this matching value, the counseling service suggest which job is suitable for that student, explains the reasons of the suggestion and recommends which courses or skills the student has to improve to fulfill the demand of that IT job. This counseling information is very helpful in helping students select their major, making their learning plan or studying professional courses to boost their chance in finding a job after graduation.

4. Discussion

Table 1 shows the comparison of an educational social network (eSN), a social network for education deployed on a universally social network (uSN) and a learning

management system (LMS). The main difference between an eSN with a uSN and a LMS is an eSN that allows users to bring the organizational structure to SN, in which each user plays the same role as in the real life and an eSN. However, an eSN also allow users to freely make social connection to other users as in a uSN. This freedom of forming a virtual community is a significant difference between an eSN and a LMS. Therefore, a user in an eSN can be a social user as in a uSN as well as a customer of a LMS.

Social services are the core of a uSN and an eSN. In a LMS, social services are limitedly provided because it is designed for teaching. Only some basic social services, such as forums or white boards are provided in a LMS, and only used to connect to other students in the same course. Thus, social training in a LMS is much limited in comparison with a uSN and an eSN.

Table 1. The comparison of an educational social network, a social network for education deployed on a universal social network and a learning management system.

Features	Universal Social Network (Facebook, ...)	Learning Management System (Blackboard, Moodle, ...)	Educational Social Network (SoNITS)
Community	No hierarchy	No hierarchy	No hierarchy (for community) Hierarchical structure (for organization)
User role	Social user	Strict role in a information system	Both
Social service	Support Fully integrated No limit in making connection to other users	Limited Some basic service Limit connection to the community of a course	Support Fully integrated No limit in making connection to other users
Educational service development	Not much support	Fully support	Fully support
User model	Simple profile	Academic record	Student model of competencies + academic record
Course delivery service	Not dedicated support No academic role for a user No business process	A dedicated system Strict academic role for a user Strict business process	A dedicated service of the system Strict academic role for a user Strict business process
Social interaction tracking	Support	Less support	Support

A uSN is not designed as an information system with strict business processes, so it is difficult to develop educational services in uSN. As previously mentioned, there is no user role in a uSN, so deploying a business process on uSN is nearly impossible. For example, when setting up a class on a uSN, a user is supposed to be a lecturer and other users are presumed as students. There is no different right and activity between this lecturer and his students in this virtual class. Academic regulations are difficult to be applied in this situation.

In a uSN, a user profile often keeps essential information about social connection and preferences of a user. When an academic record is not stored, educational services on a uSN is not fully supported as in a LMS or an eSN. In an eSN, the social and academic parts of a user are all kept together to provide better information about a student.

Course delivery service is one of the core services in any academic system. With the lack of academic support of a uSN, the development of the course delivery service in

a uSN is not efficient. On the other side, LMS is an information system dedicated for course delivery. In an eSN, course delivery is only one of the core services. It also enriches this service by integrating social services of a SN.

Finally, user activity tracking is available in all SNs to support social network analysis. In LMSs, user tracking is limited to the interaction between users and the course delivery services. Social interaction is not focused in LMSs.

In conclusion, an eSN combines the social features of a uSN and the academic features of a LMS in a integrated environment. Compared with a LMS, an eSN provides enriched social interaction. When developing an educational service, an eSN have a better academic support than a uSN.

5. Conclusion

The paper discusses the need for developing a particular social network for education, called the educational social network. The features of this new social network type have been explained via the experience through the development of an educational social network, called SoNITS. Finally, the

benefits of using the educational social network in education have been discussed and compared with the deployment on the universal network or the usage of learning management systems. The integration of social and academic features in educational SNs is a promising platform to construct several other useful educational social networks in the future.

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