

APPLY SNS FOR SOLVING PROBLEMS OF IMPLEMENTING A KMS IN VIETNAMESE SME

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ABSTRACT: *In knowledge society, knowledge management (KM) is increasingly considered the best strategy for improving the competitiveness of any enterprise. However, successfully implementing a knowledge management system (KMS) is a difficult problem for many enterprises, especially for small and medium enterprises (SMEs). Currently, Vietnamese SME becomes the majority and very important for the development of Vietnam economy. Therefore, successfully implementing a KMS in Vietnamese SMEs will strengthen their competitiveness and ensure their sustainable development in the knowledge economy. Based on case studies, some difficulties in implementing a KMS in Vietnamese SMEs are found, such as: lack of support and resources for KMS projects, complication of technologies for KMS, ambiguity of KMS concepts and processes. Recently, social network service (SNS) becomes not only a powerful tool for communicating, interacting, or marketing, but also an ideal platform for implementing a KMS. In this paper, SNS is suggested as a solution for Vietnamese SMEs to solve both organizational and technological problems in implementing a KMS. Moreover, a prototyped KMS based on SNS is also implemented for a consulting company of Vietnam to illustrate the solution. The demo KMS based on SNS shows the feasibility of utilizing SNS for implementing a KMS in Vietnamese SME in practice.*

Keywords: KMS, knowledge management, social network service, Vietnamese SME.

1 INTRODUCTION

Nowadays, small-and-medium enterprise (SME) is the majority (90%) of the world's enterprises and Vietnamese SME increasingly becomes the dynamic of the economic development of Vietnam (Tran et al., 2007). In the knowledge era and global knowledge economy, SMEs have to adapt themselves to survive and to grow. Because the wave of the knowledge era has equally affected all organizations, knowledge management (KM) becomes as important for SMEs as for big enterprises.

However, implementing a knowledge management system (KMS) successfully is difficult for many enterprises, especially for SMEs in developing countries like Vietnam. In order to successfully implement a KMS, a suitable organizational structure, knowledge structure, KM strategy and an appropriate technology must be clarified and applied for facilitating knowledge management processes. According to Vu H.D. (2008), the number of failure cases of KMS implementation in Vietnamese SMEs is very high. Therefore, causes of these failure cases must be analyzed and solutions to ensure the

success of KMS implementation in Vietnamese SME must be suggested.

With the development of web 2.0 technology, social network service (SNS) becomes a powerful platform for communicating, collaborating, marketing, and knowledge sharing. Recently, SNS is increasingly believed a suitable platform for implementing a new KMS and creating a new kind of organizational structure, which can facilitate knowledge creating and sharing.

Therefore, the main purpose of this research is to explore the ability to use SNS for solving problems of KMS implementation in Vietnamese SMEs. To get this purpose, firstly, current conditions of Vietnamese SME is studied, secondly, opportunities for using SNS in solving problems of KMS implementation is explored, then, a prototyped KMS based on SNS will be implemented for testing the solution. The structure of this research is as follows: (2) Definitions and related works; (3) Case study of KMS implementation in Vietnam; (4) SNS for solving problems of Vietnamese SME; (5) Prototyped KMS based on SNS; and finally (6) Conclusions.

2 DEFINITION & RELATED WORKS

2.1. Definitions

According to Decree 56/2009 of Vietnamese Government, SME or small-and-medium enterprise is differed from big enterprise by its size of total capital and the average annual number of laborers. In this research, for simplification, SME refers to enterprise with less than 300 full-time employees.

Social network service (SNS) is a representative of new generation of web technology (web 2.0), in which it focuses on building online communities of people who share interests and activities, or who are interested in exploring the interests and activities of others (Smith, 2006). The most powerful characteristic of SNS is the ability to integrate various applications for supporting online interaction between people in the network.

2.2. Related works

This research is based on Design Science methodology (Hevner et al., 2004). Its main purpose is to develop technology-based solutions to Knowledge Management field. According to this methodology, building an innovative and creative system is enough to be considered a contribution to the research community.

From our previous researches (Pham & Hara, 2009; Pham, 2010; Pham & Hara, 2011), key lessons for Vietnamese SMEs in implementing KMS are as follows:

- A preparation phase is needed for improving the current ICT maturity of Vietnamese enterprises up to

level 4 or 5 before implementing a KMS. (Pham, 2010)

- For a successful KM solution in Vietnamese enterprises, Technology capabilities (Techno-ware and ICT-ware) should be improved first, and then Knowledge capabilities (learning, culture, communication and innovation). Besides, KM approach should focus on improving employee satisfaction because of its direct effect on KM and labor productivity. (Pham & Hara, 2011)
- Using SNS of web 2.0 for KM can ensure the success of KMS because of its ability in combining 2 main KM strategies and integrating various technologies for KMS. (Pham & Hara, 2009)

3 KMS IMPLEMENTATION IN VIETNAMESE SME

3.1. Case study of KMS implementation

In order to understand difficulties of KMS implementation in Vietnamese SMEs and their main causes, three cases of KMS implementation in Vietnamese SMEs were analyzed, including BR&T Consulting Ltd., Hufalit Center, and Lam Dong DST. (see appendix 1). In case 1, difficulties of BR&T Consulting Ltd. fall into developing stage, while in other cases of Hufalit Center and Lam Dong Department of Science & Technology (DST), most of difficulties fall into operating stage of KMS. In general, difficulties of Vietnamese SMEs in implementing a KMS can be summarized as follows.

Table 1. Difficulties of KMS implementation in Vietnamese SMEs

Case	Developing stage	Operating stage
Case 1 – BR&T Ltd.	Lack of common understanding about KMS Lack of preparation for KMS implementing. Lack of resources for KMS project. Loss of long-term support from top leader.	
Case 2 – Hufalit Center	KM strategy and business strategy are not aligned.	Unfamiliar with using computer. Unwilling to share knowledge and afraid of losing power when sharing knowledge. Dissatisfaction of search function of KMS.
Case 3 – LamDon g DST.	Too high expectation from KMS. Knowledge structure is not defined.	KMS is too complicate to learn & use. Expert aren't available for knowledge sharing Hard to measure the value of knowledge.

3.2. Approach for solving problems

Analyzing above problems by developing stage, most problems are caused by the lack of organizational readiness for a KMS (organizational reasons). Without a suitable condition for KMS, other difficulties will appear, such as: knowledge structure is not clear, business strategy and KM strategy cannot be aligned, conflict will occur easily, expectation cannot be controlled, and finally, loss of support from the top manager. Analyzing by operating stage, most problems are caused by the lack of a suitable technology for KMS processes, which is easy to learn and utilize and capable of bridging communication gaps and integrating various existing applications (technological reasons). Without such technology, other difficulties will appear, such as: the system is too complicate to learn, dissatisfaction with some functions of KMS, inconvenience in sharing knowledge, and finally, worry about losing power due to immeasurable contribution.

In general, two main reasons of above problems are: (1) Lack of organizational readiness; and (2) Lack of suitable technology for KMS. From above analysis, Vietnamese SMEs need to (1) prepare their organizational condition for KM project, and (2) apply a new technology platform for overcoming technological difficulties. From above studies, Vietnamese SMEs need a new model for business and a new technological platform for ensuring the success of KMS solution.

4 SNS FOR SOLVING PROBLEMS OF VIETNAMESE SME

In this paper, building a KMS based on SNS is a solution for above problems because applying SNS in implementing a KMS can help Vietnamese SMEs overcome both organizational problems and technological problems. The following figure summarizes above difficulties of Vietnamese SMEs in applying a KMS and the solution for them.

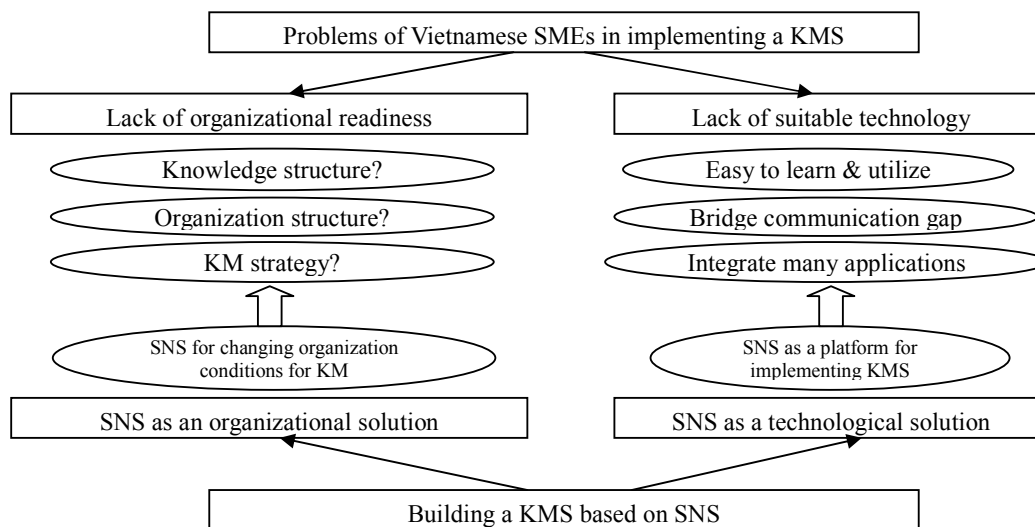


Figure 1. Solution for problems of Vietnamese SMEs in implementing a KMS

Firstly, to solve the technological problem, SNS is needed because of its ability in bridging communication gaps, integrating various applications and its convenience in learning and using. According to Avram G.. (2005), SNS is very simple and easy to use and it could provide a

useful complement to existing knowledge repositories. Besides, from the result of our research (Pham & Hara, 2009), SNS can be used as an integrated platform for supporting KMS processes and bridging communication gaps in knowledge sharing. Therefore, an integrated framework for

implementing KMS based on SNS will be a solution for above problems, in which SNS is the key.

Secondly, to solve the organizational problem, SNS is needed because it can help to prepare conditions for a KMS, such as: knowledge structure, organization structure for KMS and KM strategy. Using SNS in implementing a KMS, three main aspects of implementing a KMS, including knowledge structure, organization structure for KMS, and KM strategy, will be clarified. Directions of using SNS as a base for knowledge structure, organization structure and KM strategy are summarized as follows:

4.1. Knowledge structure based on SNS

According to Bontis (1999), knowledge or intellectual capital includes: human capital, structural capital and relational capital. Previous approaches of knowledge management focused on (1) turning human capital and relational capital into structural capital, and (2) managing structural capital. But, structural capital is realized not enough for KMS and other capitals can hardly be turned into structural capital. SNS is found to be a suitable platform for this requirement because it is capable for managing not only structural capital but also human and relational capital (through friend network and communicating tools). For example, human capital can be managed by list of profiles and communicating tools for direct interacting; structural capital can be managed through knowledge base, wiki, blog, file, project-oriented document...; relational capital can be managed through friend network, activity log, chat, message, comment, and link to useful resources... Therefore, based on SNS, knowledge can be visualized and organized in three forms: tacit knowledge (human capital), explicit knowledge (structural capital) and knowledge flow (relational capital).

Tacit knowledge is expertise, skill, insight, belief... of an expert, which only

exists in the human brain. Explicit knowledge is validated knowledge, which is codified and stored in a knowledge base. Knowledge flow is knowledge in a dynamic form, which exists in the knowledge cycle, when tacit knowledge is turn into explicit knowledge or vice versa. The last kind of knowledge is very useful for sharing knowledge throughout the enterprise and suitable for interacting and creating new knowledge.

4.2. Organization structure based on SNS

According to Nonaka & Takeuchi (1995), a new organization structure for knowledge creating cycle in company must be a hypertext organization, in which both the efficiency of a bureaucracy and the flexibility of a task-force organization are enabled. However, without a suitable technical platform, this kind of organization is difficult to be implemented in practice.

SNS is an ideal technology for making above organization structure becomes true by adding a middle layer (social network layer), which can help connecting people and sharing knowledge between them from both business layer and project layer. Therefore, based on SNS, organization structure should be reorganized including three layers: business layer (business process oriented), project layer (group work oriented) and social network layer (human relationship oriented). In which, social network layer is a new contribution of social network and can be used as a middle layer connecting 2 other layers of an organization. In this structure, each department, project, employee, customer and partner is a node in the organizational social network. Employees, partners and department connect in a hierarchical structure. Project members connect in a team-work structure. Partners and employees of different departments/projects connect with each other in social network structure. This structure is illustrated in the following figure.

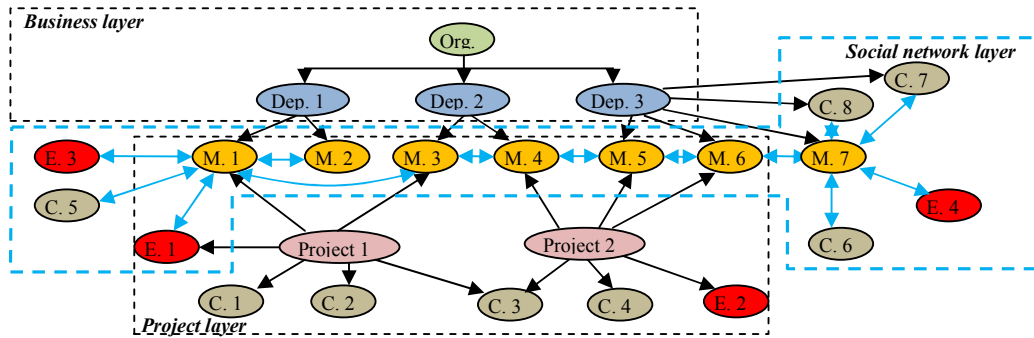


Figure 2. Organization structure for KMS based on SNS
 (Note: Org. – Organization, Dep. – Department, M. – Employee, C. – Customer, E. – Expert)

4.3. KM strategy based on SNS

From our previous study (Pham & Hara, 2009), a suitable KM strategy must be a combination of two main KM strategies, which are Codification and Personalization strategy. These two main KM strategies are separated by two kinds of knowledge (explicit and tacit, respectively) and should be combined to make a more effective strategy for KM. Based on that study, technology for this combination should be SNS. Besides, a Combination KM strategy can help not only balancing tacit knowledge and explicit knowledge of an enterprise but also encouraging knowledge flow between those two kinds of knowledge. This strategy will also facilitate the knowledge creating cycle in the enterprise as Nonaka’s SECI model (Nonaka & Takeuchi, 1995). Therefore, Vietnamese SMEs should apply a Combination strategy for implementing a KMS based on SNS, in which knowledge flow plays an important role in balancing

tacit knowledge and explicit knowledge of organization.

5 PROTOTYPED KMS BASED ON SNS

In order to illustrate above solution of KMS based on SNS in Vietnamese SME, a prototyped KMS based on SNS will be implemented for a Vietnamese SME, which is BR&T Ltd. (see appendix 1). The main purpose of BR&T in building a KMS is to manage its knowledge in various consulting projects and to improve the effectiveness of consulting activities by sharing case-based knowledge.

5.1. System requirements

Based on documents of BR&T about its old KMS project and above ideas of KMS based on SNS, the core requirements in function and non-function are made as follows:

Table 2. BR&T’s requirements of a KMS based on SNS

Functional requirements	Non-functional requirements
Storing information about experts and their experiences.	Convenient for learning and using.
Building a knowledge base of solved problems for reusing.	Adaptable, friendly and good looking user interface.
Communicating and collaborating tools for problem solving.	Support rich content information, such as: audio, video, map...
Knowledge sharing tools between consultants.	Knowledge base can be accessed from anywhere and anytime.
Search function for finding expert, information & knowledge.	
Tools for managing experts, problems, & related information.	
Admin tools for monitoring users & protecting security.	

5.2. System analysis and design

Architecture of KMS based on SNS : The architecture of demo KMS includes 3 layers (business, project, social network layer) and is illustrated in following figure. In order to demonstrate the solution, a prototyped KMS based on SNS is built using open source code of Elgg SNS package (Sharma, 2008). The environment

for testing server includes: Windows 7 operating system, Apache web server, My SQL DBMS and PHP programming language. The client environment are networked PCs with Mozillar Firefox web browser. Knowledge source includes experts' brain and knowledge base stored in My SQL database. The prototyped KMS is shown in appendix 2.

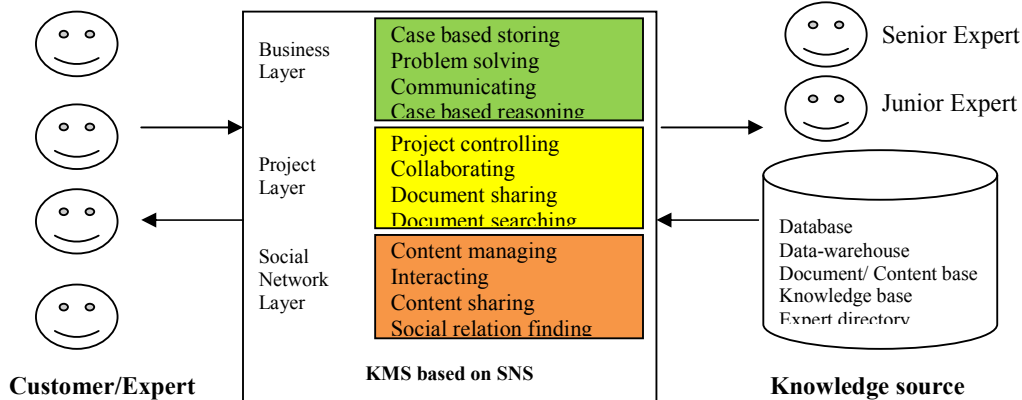


Figure 3. Architecture of KMS based on SNS

6 EVALUATION AND DISCUSSION

Through the demo KMS, one of the most important advantages of KMS based on SNS is realized that knowledge flow (relational capital) can be managed and derived. All relations of an employee will be visualized and can be searched through friend network, which is considered a part of that employee's department capital. So that, when someone quits his/ her job, new one who takes that job can set up new relations based on those relationships quickly. On the other hand, SNS also helps sharing knowledge between employees of different

departments and different projects directly (tacit knowledge) and indirectly (explicit knowledge). Furthermore, using SNS for KMS, emotion of employees can be visualized through their activities, comments and friend networks. This factor is very important in controlling employee satisfaction, which mutually affects KM and determines the labor productivity (Pham & Hara, 2011).

By discussing with several Vietnamese managers, who are going to implementing a KMS in their enterprises, some advantages and disadvantages of a KMS based on SNS are summarized as follows.

Table 3. Advantages and disadvantages of a KMS based on SNS

	Advantages	Disadvantages
About organizational problems	<ul style="list-style-type: none"> - It makes Vietnamese SMEs ready for a KMS solution. - Social characteristics of a KMS based on SNS will create knowledge sharing culture. - SNS facilitates innovation by attracting young employees in using and creating knowledge. 	<ul style="list-style-type: none"> - Ideas about organization structure based on SNS can hardly be implemented. - Some concepts need to be clarified more to be applied in practice. - Knowledge policies and reward system must be applied during the deployment.
About technological problems	<ul style="list-style-type: none"> - SNS allows new features to be integrated, which is helpful for SME in developing a KMS gradually. - The demo KMS can be built in a short time with open source code. - KMS based on SNS is easy to learn and use. 	<ul style="list-style-type: none"> - Different kinds of SME need different approaches for KMS implementation, so the prototyped KMS is just applicable for BR&T. - The initial knowledge base must be set up in advance for attracting users.

However, there are still some limitations of applying SNS for implementing a KMS in practice. For example, it requires a suitable corporate culture, which is not easy to establish; a compulsory SNS does not attract employees' participation; conflicting between protecting private intellectual

property and encouraging public knowledge contribution may be happened; and ensuring the security of organizational information is not easy. In summary, below disadvantages must be considered in applying SNS for implementing a KMS:

Table 4. Disadvantages of using SNS for KMS implementation and possible solutions

Disadvantages of using SNS	Possible solutions
<ul style="list-style-type: none"> - Useless content shared through SNS will prevent the productive output. - Some possible problems in security and intellectual property protection. - Adding new features to SNS can cause difficulties for users. - Compulsory SNS in company will probably take the fun factor away. 	<ul style="list-style-type: none"> - Making rules about information accessing and knowledge sharing; - Allow users to control their privacy or to decide their knowledge sharing level; - Organizing training courses for users whenever new functions are installed; - Encouraging employees to use the KMS based on SNS rather than forcing.

7 CONCLUSIONS

In general, based on previous researches and case studies, this paper proposes a solution for solving problems in implementing KMS in Vietnamese SMEs by applying SNS. Using SNS as an organizational model and a technological platform, Vietnamese SMEs can make them ready for KM solution and overcome difficulties in implementing a KMS. The proposed KMS based on SNS can be further developed for conducting a KMS project in Vietnamese SMEs in practice.

Through this research, SNS is found as an important element in designing knowledge structure, organization structure and KM strategy for ensuring the success of a KM solution. Besides, a demo KMS based on SNS is also implemented for a

Vietnamese SME, which shows that the ability for applying SNS in implementing a KMS in Vietnamese SME is feasible.

However, there are some limitations of applying SNS for implementing a KMS, such as: sharing culture, security... They must be considered carefully in applying this solution. Some implications for future works are: (1) Measuring value of knowledge and contribution of expert for a better KMS; (2) Testing the demo KMS based on SNS in Vietnamese SMEs in practice.

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ỨNG DỤNG MẠNG XÃ HỘI ĐỂ KHẮC PHỤC CÁC VẤN ĐỀ TRONG CÀI ĐẶT MỘT HỆ QLTT TRONG CÁC DOANH NGHIỆP VỪA VÀ NHỎ VIỆT NAM

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TÓM TẮT: Trong xã hội tri thức, quản lý tri thức (QLTT) ngày càng được xem là chiến lược tốt nhất để cải tiến năng lực cạnh tranh của các doanh nghiệp. Tuy nhiên, cài đặt thành công một hệ QLTT là một vấn đề khó khăn cho bất kỳ doanh nghiệp nào, đặc biệt là doanh nghiệp vừa và nhỏ (DNVVN). Ngày nay, DNVVN của Việt Nam đang chiếm đa số và trở nên rất quan trọng cho sự phát triển của cả nền kinh tế. Vì vậy, cài đặt thành công hệ QLTT trong các DNVVN của Việt Nam sẽ củng cố năng lực cạnh tranh của chúng và giúp chúng phát triển bền vững trong nền kinh tế tri thức. Dựa trên nghiên cứu tình huống, những khó khăn trong cài đặt một hệ QLTT trong DNVVN của Việt Nam

được tìm thấy, như là: thiếu sự hỗ trợ và nguồn lực cho dự án QLTT, sự phức tạp của công nghệ QLTT, sự không rõ ràng của các khái niệm và tiến trình QLTT. Gần đây, dịch vụ mạng xã hội (DVMXH) không chỉ trở thành một công cụ mạnh mẽ cho truyền thông, tương tác hay tiếp thị, mà còn được xem là một nền tảng lý tưởng cho việc cài đặt một hệ QLTT. Trong bài báo này, DVMXH được đề xuất như là một giải pháp để khắc phục các vấn đề về tổ chức và công nghệ của DNVVN Việt Nam khi cài đặt một hệ QLTT. Hơn nữa, một hệ QLTT dựa trên DVMXH thử nghiệm cũng được cài đặt cho một DNVVN của Việt Nam để minh họa giải pháp. Chương trình thử nghiệm cho thấy tính khả thi của việc ứng dụng DVMXH để cài đặt một hệ QLTT trong DNVVN của Việt Nam trên thực tế.

Từ khóa: Hệ QLTT, quản lý tri thức, dịch vụ mạng xã hội, DNVVN Việt Nam.

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APPENDIX 1 – CASES STUDY OF KMS PROJECT IN VIETNAMESE SME

Case	Description	Lesson learnt
Case 1: BR&T Consultancy Ltd. Company	BR&T Ltd. Company is established in 2003 in Ho Chi Minh City (HCMC) of Vietnam with about 50 employees. The main business of BR&T includes (1) organizing training courses in business management, and (2) consulting for Vietnamese enterprises in doing business. Realizing the important role of KMS in sharing knowledge, BR&T decided to build up a KMS in 2006. The main purpose was to manage its knowledge in various consulting projects and to improve the effectiveness of training and consulting by sharing knowledge. KMS implementation was planned to be conducted in 1 year (7/2006 – 7/2007). At first, a KMS team was established from IT staff and the director directly managed this project. In a few months later, the project was conducted normally as any IT project. But then, some problems appeared during implementing process: (1) system requirements must be changed vastly because of its not clearly statement; (2) some team members could not continue their jobs in this project; (3) prototyped system was very different from the original idea of leader. The project was not completed on time and finally, it was cancelled because of some changes in director board and the lack of resources for it to continue.	The failure of this project is due to: (1) lack of a preparation for KMS implementation; (2) KM strategy & knowledge structure are not clearly specified; (3) difference in knowing of KMS between project members; (4) high expectation from a KMS of leader; (5) lack of resources; and (6) loss of long term support from top manager.

<p>Case 2: Hufalit Foreign Language Center</p>	<p>Hufalit Center is established in 1997 in HCMC of Vietnam with about 40 employees. The main business of Hufalit Center includes (1) teaching, training students in foreign languages, such as: English, French..., and (2) organizing examinations for national certification in foreign languages. In order to create an environment for knowledge sharing between teachers and students, as well as to manage its knowledge in form of question and answer (from store of lectures and tests), Hufalit Center decided to buy and customize a KMS. This system included a web-based forum for teachers to interact with students and with each other and an application for creating new examinations from knowledge-base. This system was customized and deployed in 6 months (1/2006-7/2006), but when running in practice, it was ended in failure. Some main problems are: (1) teachers were not familiar with using computer and lack of culture for sharing knowledge, (2) interaction between teacher and student through this system was very weak, (3) dissatisfaction with some functions of system, such as search function, and (4) KMS strategy and business strategy are unaligned.</p>	<p>The main reason for failure must be in the lack of a preparation for implementing and deploying KMS. Moreover, focusing much on technology rather than organizational aspects is not a good approach for a KMS. In fact, a suitable culture for communicating and knowledge sharing is more important in this case.</p>
<p>Case 3: Department of Science - Technology (DST) of Lam Dong Province</p>	<p>Department of Science-Technology of Lam Dong Province is a branch of Ministry of Science-Technology of Vietnam. One of its purposes is to encourage enterprises in Lam Dong province to innovate and to apply modern management methods and technologies in doing business. In 2007, it had a project to create a virtual network of experts in agriculture and forestry field to help those SMEs in Lam Dong province (mostly in above fields) to solve their problems and to improve their competitiveness. In getting this goal, it tried to build a KMS for storing an expert directory and facilitating communication between real experts and local SMEs through this network for solving problems. Solved problems will be stored in Q&A knowledge-base for searching and reusing. The project finished on time in 2008, but 1 year later, it was considered a failure. Some main problems are: (1) Number of SMEs used this system in practice was very low even after training courses, (2) Most of experts were from HCMC and didn't actively use this system to answer the question online, (3) Hard to measure the value of knowledge and contribution of expert, (4) The case based knowledge was so poor compared with too high expectation from it.</p>	<p>SMEs are too busy with their daily activities to learn a complicated KMS. Technology for this KMS is not suitable and unable to attract the participation of both SMEs and experts in problem solving. In fact, knowledge base of this KMS was so poor and experts were not available to help SMEs.</p>

APPENDIX 2 – INTERFACE OF KMS BASED ON SNS

Dashboard of demo (<http://localhost/clsq/>) - After logging in, users can see the Dashboard, where most of useful tools are shown. Dashboard is divided into 3 groups of functions (Business layer, Project layer, Social Network layer). All tools can also be called from menu Tools. Profile page (picture at the left corner) allows users to update their own profile (personal information, hobbies, skills...), their knowledge (ideas, writings, messages, videos...) and their friendship (friends, groups, activities...). Those things can be shared with their friends by changing privacy setting to public/ limited mode. Mail and Chat function allow users to communicate with each others in this system. Besides, users can configure their environment display, notification method or privacy policy to their contents by using menu Settings. Menu Administration is shown only for admin/ CKO to monitor, configure and make change to functions, users, policies and displays for the whole system. Search box is used for searching in knowledge base based on tag system (expert directory, case base, and knowledge flow).

