



# Cancer Care System: An Online Support for Cancer Community

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**Abstract**— This paper presents an ongoing study on the development of online support for the cancer community. It aims at proposing a prototype of the online social support system for the cancer community, which is named Cancer Care System (CCS). It starts off with some facts on the backgrounds of the study. It is followed by defining the problems among cancer community in different views and a brief explanation on the methods it follows, which is involved requirements gathering and design and development activities for the CSS. Finally, a section concluding this paper includes the plan for future study.

**Keywords**— Cancer Community, Cancer Patient, Social Interaction, Social Support.

## I. INTRODUCTION

Undeniably, the rise of social technology such as Web sites brings a lot of benefits to the users. It provides capabilities and opportunities for users to share their experiences, expose their tacit knowledge, discuss a wide range of topics, and to seek for support [1]. According to John et al., [2] social interaction web sites such as Blogger, Facebook, Friendster, MySpace, and Twitter have radically changed user interactions on the World Wide Web (WWW) from a static, one way, and consumption model to a dynamic, multi-way, and participation model.

According to Walther and Boyd, [3] social support communication traditionally is considered to be the exchange of verbal and nonverbal message such as expression, information, or recommendation. Nevertheless, traditional social support recently has been transforming into computer-mediated communication (CMC). It involved in the large social network among people who not know each other and it has eliminated the face-to-face communication. While traditional is referred to a particular person in seeking support, online interaction support enables a particular person goes to a virtual space where inside there no one knows anyone or has heard about any person.

The concept of online social networking is prospectively potential in supporting cancer community in communicating among themselves. A study conducted by Schweizer et al. [4] shows that most of the issue of social relationship split amongst cancer patients is caused by the burden of the disease. Therefore, new relationships have to be established as well in order to address the need for social interaction. In addition to fellowships and self-help support groups, virtual cancer communities have the capability to provide an environment where these relationships can be established. Besides that, Schweizer et al. [4] also point out some advantages and disadvantages of CMC for establishment of virtual relationships among cancer patients. Among the advantages are: (1) the internet allows patients to seek support from the person who made similar experiences, (2) patients can use the internet any time of day and despite geographical or physical limitations, and (3) the internet allows patients interact with persons who have different experience about the disease. Meanwhile, disadvantages addressed may include: (1) lack of body languages and facial expression can cause misunderstandings and (2) it is difficult to establish personal relationships through the Internet.

A preliminary study involving a series of interviews cancer community was carried out. The outcomes from the

preliminary study is summarize into two different views which are view points of patients and view points of parents. Each view point is further elaborated in the following paragraphs.

The main limitation faced by most cancer patients is mismatching. This happens in which a particular person who wants to interact with others is not able to find any proper channel. Also, experienced patients who are willing to help new patients to reduce the feelings of uncertainty and stress that are affected by their illness are not supported. Besides that, the problem of physical isolation which means patients and their caregivers are isolated physically from each other for significant period. Cancer patients must follow a series of radiotherapy and chemotherapy from time to time in order to got the chance to recover from illness. By that, they most spend long period of time for that purpose in medical center and this cause them have limited face-to-face access with other in their social network.

Meanwhile from parents' views, they should interact with medical practitioners through phone calls or face-to-face in order to follow up the patient's condition and to gather information regarding the diagnostics and treatments of cancer disease. Nevertheless, these assume to be time-consuming and costly for the parents.

Based on the preliminary study, this study deduces that an online social support system for the cancer community is appropriate to be proposed. Hence, this study aims at designing and developing a prototype of the online social support system for the cancer community and which is called Cancer Care System (CCS). Activities involved in designing and developing the CCS are discussed in the following section.

## II. METHODS

As mentioned earlier, this paper aims at developing the CCS. Hence, the activities reported in this paper are scoped to gathering requirements of the CCS and designing and developing tasks which are summarized illustratively in Fig. 1.

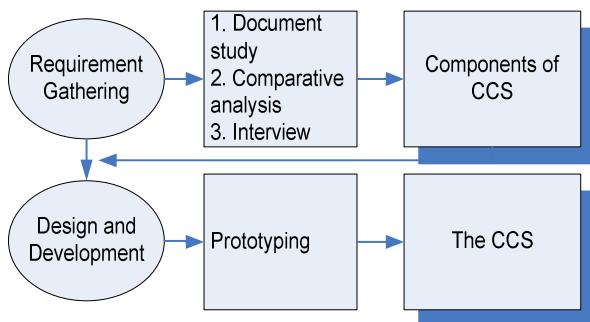


Fig. 1 Methods of study

The diagram in Fig. 1 explains that the requirements of the CCS were gathered through document study, existing social network system, and interviews. Having collected the requirements of CCS as listed below, the CCS was developed using prototyping technique.

- Text-based conversation (chatting)

- Manage message (compose, send, reply)
- Manage community bulletin (search, view, create, and maintain)
- Manage community forum (replay, create, and maintain)
- Navigate to other related cancer community web sites.

## III. DESIGN AND DEVELOPMENT

This section starts by describing about the architecture of the CCS, modules and functionalities, and database design. Then, the CCS with its snapshots follows.

### A. Design

The CCS works on an open architecture as illustrated in Fig. 2. It is provided for every cancer community who are connected to the Internet. Users are divided into two categories, either cancer community or personnel who administer the system, which is called Administrator. In CCS, the cancer community includes patients, parents, and medical practitioners.

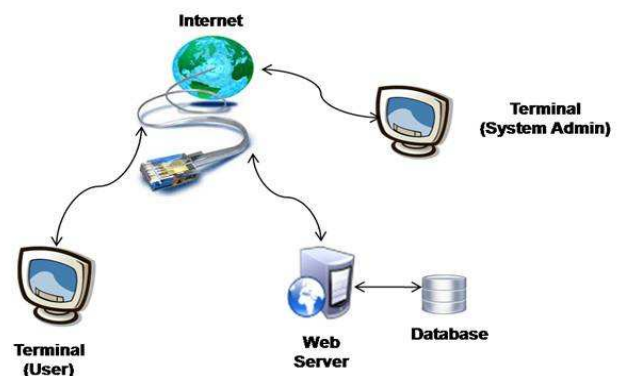


Fig. 2 Architecture of CCS

Modules in the CCS are different for different types of users as depicted in Fig. 3. Further, the functions of each module are provided in Table 1.

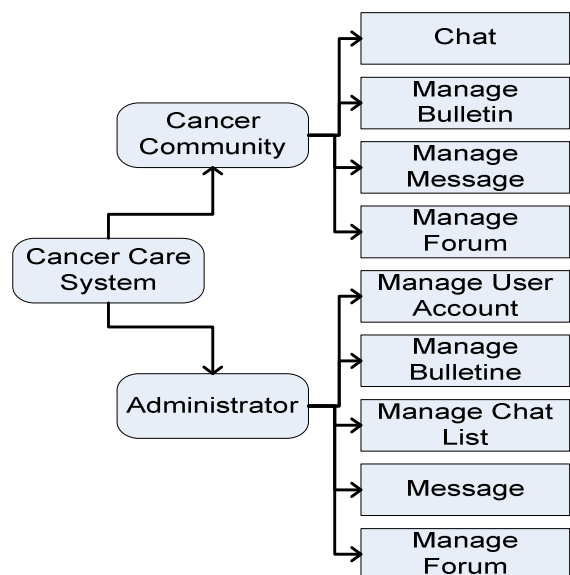


Fig. 3 Modules in CCS

TABLE I  
FUNCTIONS OF EACH MODULE IN CCS

Cancer Community	
Sub Module	Functionalities
Chat	<ul style="list-style-type: none"> <li>User can make text-based conversation with other users by sending the message through the chat room.</li> </ul>
Manage Message	<ul style="list-style-type: none"> <li>User can compose a message and send it to a particular user.</li> <li>User can reply the incoming message.</li> </ul>
Manage Bulletin	<ul style="list-style-type: none"> <li>User can search and view the info that posted on the bulletin board.</li> <li>User can manage own application for bulletin board.</li> </ul>
Manage Forum	<ul style="list-style-type: none"> <li>User can enter other users' forum post and post message on it.</li> <li>User can create own post through the community forum.</li> </ul>
Administrator	
Manage User Account	<ul style="list-style-type: none"> <li>System administrator can create user account for cancer community members.</li> <li>System administrator can block the status of particular user.</li> <li>System administrator can drop a particular user account form the system database.</li> </ul>
Manage Bulletin	<ul style="list-style-type: none"> <li>System administrator can manage all the bulletin application that sent by user.</li> </ul>
Manage Chat List	<ul style="list-style-type: none"> <li>System administrator can view the conversation records in the chat room.</li> <li>System administrator can clear the chat list.</li> </ul>
Message	<ul style="list-style-type: none"> <li>System administrator can compose message and send it to a particular user.</li> </ul>

Manage Forum	<ul style="list-style-type: none"> <li>System administrator can enter other users' forum post and post message on it.</li> <li>System administrator can drop a particular post from the forum.</li> <li>System administrator can create own post through the community forum.</li> </ul>
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To support the functions as listed in Table 1, the CCS is developed with a database that contains six tables as depicted in Fig. 4. Also, Fig. 4 shows the relationships among tables.

### B. Development

The CCS is developed with Hypertext Pre-processor (PHP) as the scripting language, Apache as the web server and MySQL as database. Besides that, Dreamweaver MX is used as a web development tool. PHP stand for Hypertext Pre-processor, it is primarily used in server-side scripting, command-line scripting, and client-side GUI application and it is also compatible with many database such as MySQL, PostgreSQL, Oracle, Sybase, etc [5]. In addition, PHP scripting language is Open Source which able to be improved and enhanced by developer [6]. The language syntax of PHP is more similar with C, Perl, Java language, so this enables development of dynamic web pages become easier. Moreover, it also cross platform which can be supported in major operating system, including Windows, Mac OS X, Linux, UNIX variants and so on [7].

. Apache web server is one of the most familiar web server applications [8], a free open source application that run on variety operating systems containing Microsoft Windows, Mac OS X, Linux, Solaris, and NetWare [9]. The Apache web server is not only a freeware, but it is also open source. This means that the source codes can be examined and configured by any programming expertise [10].

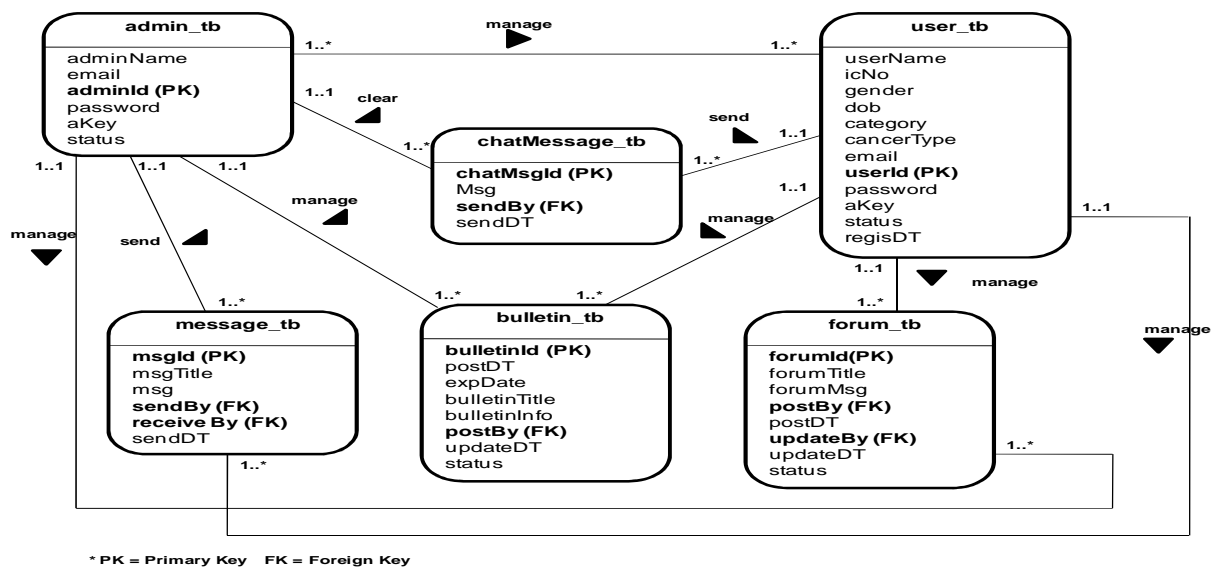


Fig. 4 Database Design

According Ullman, [11] MySQL is a free open source application like PHP and some UNIX variants. Besides that, it is also a database management system (DBMS) for relational database which it able to organize a collection of data, including text, numbers, or binary files. In addition, MySQL is a relational database system that is faster, more reliable, and cost nothing than other commercial database system including DB2 and Oracle [12]. MySQL scripting interfaces exist for variety language such as C, C++, Java, Pasca, PHP, etc [13].

### C. The CSS

The main page of the CCS is shown in Fig. 5. Users should be first registered into the system by the system administrator. Once a user is registered, the created id and password will be the key to log into the system. This paper shows some samples of the CCS with brief explanation.

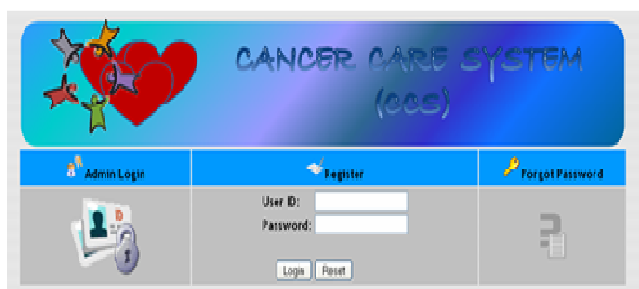


Fig 5 Main login page

In CCS, each user is given opportunities to compose messages and send them to any particular registered user and the message recipient is able to reply the message from the same window being read as seen in Fig. 6.

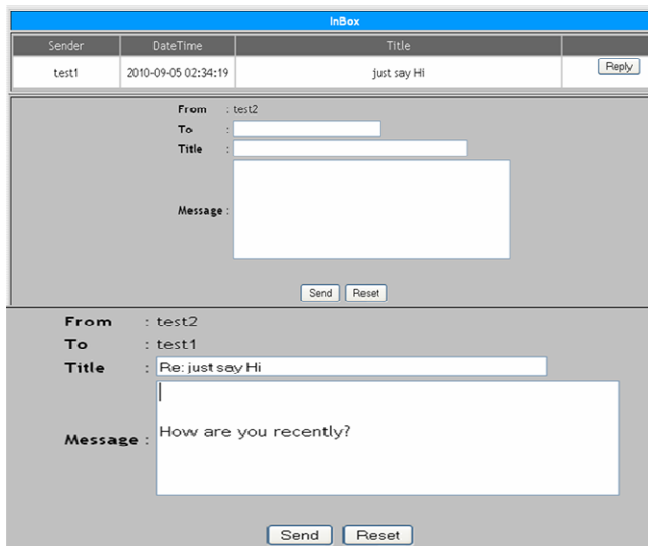


Fig. 6 Compose message and reply message page

Besides the messaging utilities such as writing messages, replying messages, and deleting messages, the CCS also provides bulletin board utilities. Fig. 7 shows the main screen for bulletin board, in which users are able to view

more detail about a particular approved bulletin by searching it with the provided bulletin ID that is shown on the bulletin board.

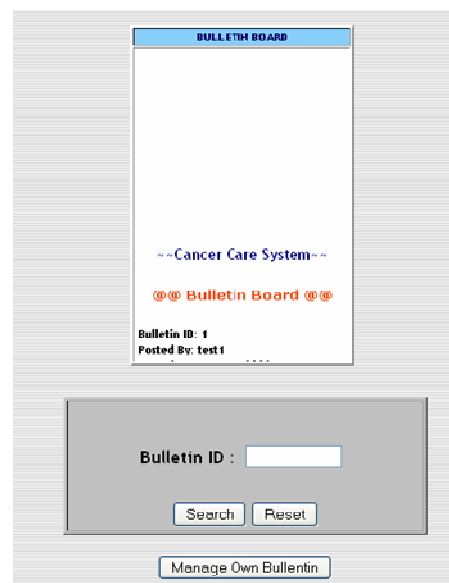


Fig. 7 Bulletin board

The entry into the bulletin board is controlled by the administrator. The administrator can view all records of bulletin board which are in 'approved' and 'pending' status. Then, the administrator can access the particular pending applications that are created by the user and decide on the status of the application in the window in Fig. 8. The status is approved, rejected, or obsolete. Just the approved bulletin will be posted on the bulletin board.

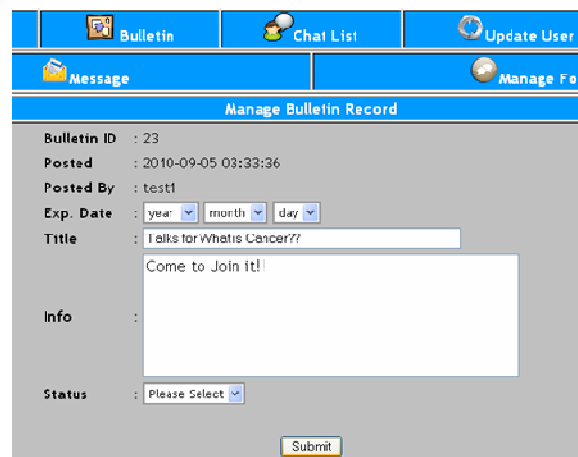


Fig. 8 Manage bulletin board in administrator module

In addition, users are able to engage synchronous communication through the CCS. They can interact with each other in real time by using chatting utilities. Fig. 9 shows the main screen for chat room. Inside the chat room, users are able to make text-based conversation with other users by sending messages with each other.

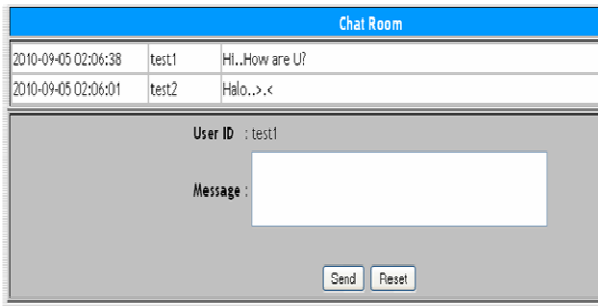


Fig. 9 Chat Room

Another function is forum. The administrator is able to create a new forum site, post message on users' forum sites, and can drop unwanted forum site from the list of community forum in the window in Fig. 10.

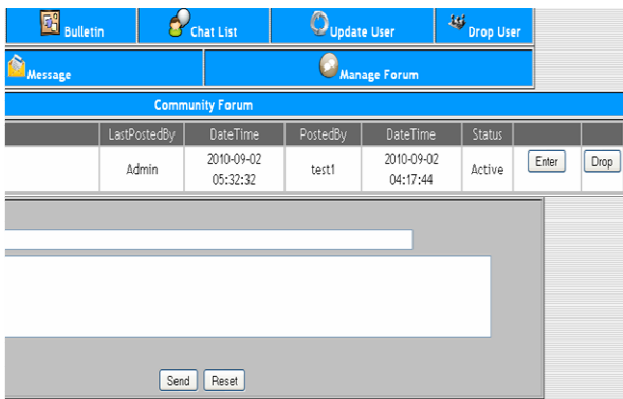


Fig. 10 Manage community forum in administrator module

Meanwhile, users are able to access the listed forum sites and post message on it as seen in window in Fig. 11.

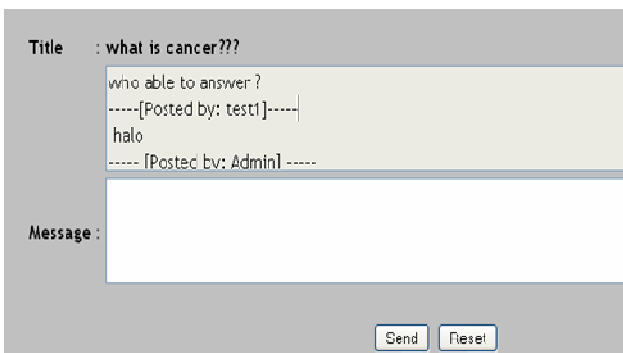


Fig. 11 Post message on forum site

#### IV. CONCLUSIONS

This study investigates the potentials of establishing online support among the cancer community. In this study, an online support system namely CCS has been designed and developed for the cancer community, by gathering requirement through the document study, existing social network system, and interviews. In addition, this study defines some limitations among the cancer community.

Therefore, the CCS is suggested in order to establish virtual relationships among the cancer community tend to seek support, share experiences, and give the support to persons who are faced by problems.

The CCS has been tested in terms of functionalities. The whole system was run with pilot data, and found that all functions work as they should. Also, the subjects were observed excited while using the CCS. However, a systematic feedback from users has not been carried out. Hence, this study plans to carry out a cycle of user test to determine how users feel after experiencing the CCS after a period.

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