

# Implementation of Knowledge Sharing System for Online Users

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## Abstract

*The system is developed for sharing knowledge on online environment to achieve effectiveness knowledge specific to IT related fields. These IT related fields are classified to many levels, (e.g. Basic Programming, Intermediate Programming, etc...). To avoid unwanted knowledge, the system prohibits users who have no knowledge in each level by making online testing using common gateway interface (CGI). CGI is a server-based method that can be used to implement online testing. Knowledge of the system concerns three kinds of knowledge privileges (public knowledge, group private knowledge and private knowledge) like as knowledge grid. A community of practice (CoP) is a group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. The system is developed with common gateway interface (CGI) and community of practice (CoP). The system evaluates and analyses the number of people participates in IT related fields by yearly. So, the users can know obviously which field is hot or not hot is known by yearly.*

**Keywords:** common gateway interface (CGI), knowledge grid, community of practice (CoP)

## 2. Introduction

People and organization managing knowledge (reviewing and updating knowledge resources periodically) and using them efficiently contribute substantially in raising the standards of living. Lack of knowledge and skill to use available resources and capability to develop resources are the major reasons of backwardness. In the modern age of information, knowing is winning. Efficient management the level of knowledge resources and securing optimum benefit from those resources is one of the ways of staying relevant. The cost of creating and capturing knowledge may be very high. Efficient management of knowledge level can save time and resources [1].

The system is Implementation of Knowledge Sharing System for Online Users and but the knowledge is specific to IT related fields. For sharing knowledge, online users must be registered in the system to be members. Each level of IT knowledge sharing, members are tested to whether have basic knowledge of respectively by making online testing.

This online testing is implemented by Common Gateway Interface (CGI). CGI is a server-based method that can be used to implement online testing [2]. People who lack knowledge cannot share knowledge and but can get other members shared knowledge.

Member can create groups, join other interested groups and can share knowledge within these groups. By grouping, members can share more specific knowledge that they interest with other members whose interested is the same. It is like as Community of Practice (CoP). A community of practice (CoP) is a group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis [3].

Moreover, the system provides three kinds of knowledge privileges (public knowledge, group private knowledge and private knowledge) to members like as knowledge grid [4]. So, knowledge shared person (user) of this system, can define their knowledge (posted forum) for public or specific group or private. For public forum, anyone can discuss or reply to this forum. For specific group forum, only members of this group can discuss or reply to this forum. Private forum can be edited or changed privilege by only posted member and other members cannot see it.

The rest of the paper is organized as follows: Related Work is proposed in Section 2. Section 3 represents Overview of the System. Section 4 is System Implementation. Section 5 describes Evaluation and Analytical Result of the system. Conclusion comes in section 6.

## 2. Related Work

Nowadays, we can share knowledge in internet forums. An internet forum, or message board, is an online discussion site. It is the modern equivalent of a traditional bulletin board, and a technological evolution of the dialup bulletin board system. From a technological standpoint, forums or boards are web applications managing user-generated content. People participating in an Internet forum may cultivate social bonds and interest groups for a topic may form from the discussions.

Early Internet forums could be described as a web version of a newsgroup or electronic mailing list; allowing people to post messages and comment on other messages. Later developments emulated the

different newsgroups or individual lists, providing more than one forum, dedicated to a particular topic.

Internet forums are prevalent in several developed countries. In terms of countable posts, Japan is far in the lead with over two million posts per day on their largest forum, 2channel. China also has many millions of posts on forums such as Tianya Club. The United States does not have any one large forum, but instead several hundred thousand smaller forums, the largest of which are Gaia Online, IGN and GameFAQs. China, the Netherlands, and France are also home to hundreds of independent forums [5].

Technology, computer games and/or video games, sports, music, fashion, religion, and politics are popular areas for forum discussions, but there are forums for a huge number of topics.

Most Internet forums require registration to post. Registered users of the site are referred to as members and are allowed to post or reply discussions.

But every member can discuss or reply and there is no constraint. For technology areas of discussions, discussions of members who have no knowledge are interference.

This system tests members' knowledge for IT related discussion and classify their knowledge level. The system allows members to discuss or reply in each level of IT related discussions only if they have knowledge relevant to this level.

## 2.1 Knowledge Sharing

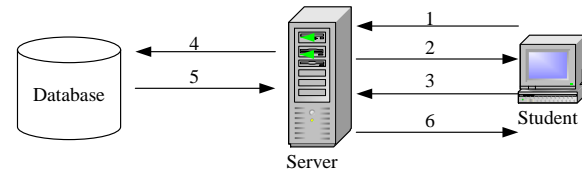
It is about stimulating the exchange of experiences, ideas and thoughts between people through social interaction. Sharing of knowledge among colleagues and organizing debates helps to refine and enrich knowledge. Three conditions (social, organizational and technological) support in sharing knowledge. Social conditions imply motivation, values, attitude, moods, emotions, skill levels and roles. Organizational conditions refer to strategy, structure, systems, and style and shared values in organizations. Technological conditions imply knowledge repository, knowledge route map and platform for sharing knowledge. A major tool of knowledge sharing is Information and communication technology (ICT) which connects people or with the sources of explicit knowledge [6].

## 2.2 Common Gateway Interface (CGI)

CGI is a server-based method that can be used to implement online testing. A student would connect to the Quiz page and fill out a HTML form that may ask for student name and identification number. A series of questions (multiple choice, true or false, fill in the blanks) are presented to the student by the browser and using mouse clicks or keystrokes the student enters answers to questions displayed on the screen. When all questions have been answered the test is submitted for 'grading'. Results of the quiz are then

displayed on student screen, mailed to the instructor and/or stored in a file on the server for instructor records. These apparently simple procedures on the user's side hide the complex sequence of database queries on the server side to generate a complete graded test.

CGI Sequence Procedure is in the following with figure 1 [2].



**Figure 1: CGI Execution Sequence**

- Student connects to the web server using browser such as Netscape Navigator or Microsoft Internet Explorer
- Server presents form data(test questions and answers for choice) to student's browser
- User selects answers from form items and submits data to server
- Server performs the following actions:
  - Data is parsed into variables
  - Query is generated by gateway script
  - Query is submitted to database
- Database returns dataset items that match query
- Dataset is formatted to HyperText Markup Language (HTML)
- Server sends formatted output to client
- Client displays result page on buyer's browser.

## 2.3 Communities of Practice (CoP)

Communities of Practice (CoPs) are groups that form to share what they know and to learn from one another regarding some aspects of their work. Such groups have been around ever since people in organizations realized they could benefit from sharing their knowledge, in-sights, and experiences with others who have similar interests or goals [7].

Knowledge is both social and individual. Forming a group thus promotes learning and innovation. Creating a community of practice (CoP) is a way to share their knowledge with others who are passionate about the same topic. In return, they learn from others knowledge and experience. CoP members freely discuss the various situations they face. They share their aspirations. They identify their needs. They develop a unique, action-oriented perspective. Together, they discuss, innovate and develop a common practice in their field.

CoPs can be small or large. CoPs can be internal or linked to partners outside the organization. CoPs can be virtual or physical. CoPs develop and must be

tailored to their members' needs. CoPs are not like working groups. CoPs do not mainly aim to achieve a collective result. A CoP is a place where people collaborate. CoP members manage their knowledge in a given field as effectively as they can.

### 3. Overview of System

The system implements knowledge sharing system for online users to improve their knowledge levels. The system is developed with three parts which are;

1. Knowledge sharing and searching
2. Knowledge level management for members and
3. Evaluation and analytical result of the system.

For sharing knowledge, online users must be registered in the system to be members. After becoming members, they can share knowledge by discussions or replies, add or edit their profiles data, invite or make friends, send message to their friends, add or edit their friend groups and join other friend groups. Members can create groups, join other interested groups and can share knowledge within these groups. By grouping, members can share more specific knowledge that they interest with other members. It is same like as CoP. Members can post link that they think it is a useful site for other members. They can search other members' profiles, members posted links and members posted discussions.

Before knowledge sharing in each level of IT related fields, members have to answer online test to check their knowledge level. This online testing is implemented by Common Gateway Interface (CGI). Members who lack knowledge cannot share knowledge and but can get other members shared knowledge. They can share knowledge in each level of IT related fields only if they have knowledge of this level. In this way, the system manages knowledge level of members.

The system evaluates numbers of people participate in IT related fields that are discussion fields or member groups. And then, the system analyzes which field is maximum numbers of people participated by yearly.

#### 3.1 Process flow of the System

The system is start from the home page and then next sections are forum discussion (to share knowledge between members), registration (to be a member), link (to post links that are think useful sites), profile (to edit member profile), search (to search members, discussions and links) and evaluation and analytical result of the system.

Knowledge sharing by discussion can be accessed by only members. Members who want to share knowledge, they must first login. This system is specific for IT knowledge sharing and sharing for IT

related discussions is only permitted to the members who can answer theory or practical questions of each discussion. If members want to share in a discussion, they must be answer theory or practical questions of this discussion. Administrator of the system adds questions and answers for these IT related discussions.

If the members want to discuss or reply for a discussion, the system verifies whether they have login to the system. And then, the system checks whether they can access or not in this discussion i.e. members answered questions of this discussion and passed it before the current discussion.

If the members can access this discussion, their discussions or replies are stored to database and view their discussions or replies to them. If they cannot access, the system retrieve questions and answers for this discussion and view these to them. And then, the system gets their answers, checks their answers right or not and determines pass or fail to access this discussion. If the getting mark of members is greater than 50% of all questions of a discussion, the system determines they pass for this discussion.

If they passed, their posted discussions or replies are stored to database and view these to them. For the next time their discussions or replies in this discussion, there is no need to answer again these questions for them. If they don't pass, "Fail to Access" page is shown to them and for the next time they want to discuss, they need to answer again these questions. The process flow of discussions is shown in Figure 2.

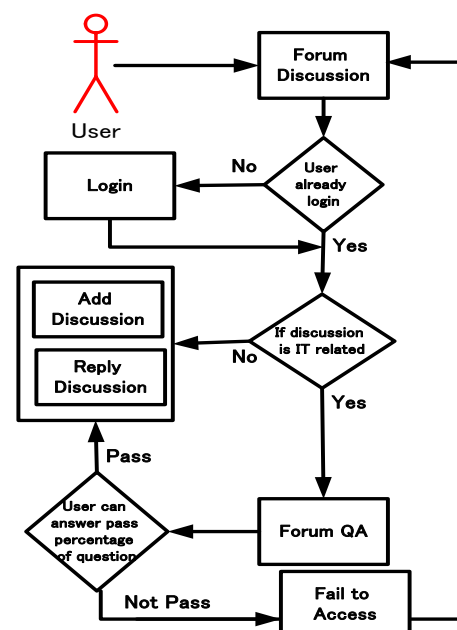


Figure 2: Process flow of Forum Discussion

## 4. System Implementation

The system is developed with common gateway interface (CGI) and community of practice (CoP). Users, who want to post discussions, replies, and links and interact with other people in the system, they must be register to be members. User ID and email must be unique and verification code must be typed (shown in Figure 3).

The screenshot shows the 'Register at Knowledge Sharing System' page. It includes a navigation bar with links: HOME, FORUM, LINK, MYPROFILE, MEMBERS, ADMIN, REGISTER, and ANAL. The registration form contains the following fields and instructions:

- User ID:** A text input field with the example 'pyekunzaw'.
- Password:** A text input field with the instruction: 'Please enter a password for your user account. Note that passwords are case-sensitive.' Below it is a 'Confirm Password' field.
- First Name And Last Name:** Two text input fields. The first name field has 'Pyie Kun' and the last name field has 'Zaw'.
- Email Address:** A text input field with the instruction: 'Please enter a valid email address for yourself. You will be required to click an activation link and fill the verification code that will be emailed to you before you can post on the site.' Below it is a 'Confirm Email Address' field.
- Gender:** Radio buttons for 'Male' and 'Female'.
- Date of Birth:** A dropdown menu showing '4' for the day and 'Aug' for the month, with the year '1996'.
- Verification:** A text input field with the instruction: 'Please enter the six letters or digits that appear in the image opposite.' The image shows the code 'j40J3j'.

At the bottom of the form is a 'REGISTER' button and a 'Go Back To Home Page' link. The footer includes 'About us', 'Contact us', 'Terms of Service', and 'Copyright©2009 Knowledge Sharing System(ver.1.1)'.

Figure 3: Registration

After becoming members, they can edit their profiles data, change email addresses, change passwords, and upload their photos. They can see other members' lists. They can also share knowledge by discussions. Discussion fields are categorized such as Programming, Networking, and etc... In each category, there are sub-categories such as Basic, Intermediate, and etc...

Because of the system is intended for IT Knowledge Sharing, discussions are specific for various level of various IT fields. Fields are categories and levels are sub-categories. In each level of each field, discuss person must have knowledge respectively. It is tested by theory or practical questions using Common Gateway Interface (CGI) to a member who want to discuss (shown in Figure 4). It is knowledge level management for users.

The screenshot shows the 'Knowledge Sharing System' forum page. It includes a navigation bar with links: HOME, FORUM, LINK, MYPROFILE, MEMBERS, ADMIN, REGISTER, and ANAL. The page displays a question titled 'You must answer the following question for accessing the forum'.

Q1. In Java, an abstract class cannot be sub-classed.  
☐ A. True ☐ B. False

Q2. Consider these classes, defined in separate source files,  

```
public class Test1 {  
    public float aMethod(float a, float b) throws IOException {  
    }  
}  
1. public class Test2 extends Test1 {  
    Line 2  
    Line 3  
}
```

  
Which of the following methods would be legal at line 2 in class Test2?  
☐ A. float aMethod(float a, float b) ☐ B. public int aMethod(int a, int b) throws Exception() ☐ C. public float aMethod(float a, float b) throws Exception() ☐ D. public void aMethod(float p, float b)

Q3. TreeMap class is used to implement which collection interface. Select the one correct answer  
☐ A. Set ☐ B. List ☐ C. Tree ☐ D. SortedMap

Q4. How can you force a subset collection of an object?

Figure 4: Knowledge Testing

When the getting marks of the members are less than threshold value ( $\alpha=50\%$ ) of the discussions, they cannot discuss or reply their knowledge in these discussions, and they can only read other members' shared knowledge. The system shows "Fail to access forum" message to the members who cannot get the threshold value (shown in Figure 5).

The screenshot shows the 'Fail to access forum' message. It includes a navigation bar with links: HOME, FORUM, LINK, MYPROFILE, MEMBERS, ADMIN, REGISTER, and ANAL. The message says 'Welcome, Khin Lai Lai' and 'Message Red-stay Out'. Below the message is a 'Go to Home' link. The footer includes 'About us', 'Contact us', 'Terms of Service', and 'Copyright©2009 Knowledge Sharing System(ver.1.1)'.

Figure 5: Fail to access

The getting marks of the members are greater than or equal to threshold mark of the discussions, can discuss or reply in these discussions (shown in Figure 6).

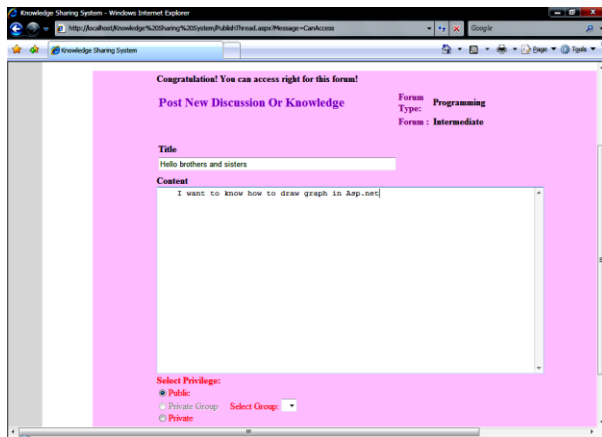


Figure 6: Success to access

Posting discussions must be defined public, private group or private. Public is to share all members of the system. Private group is only to share members of a specific group and private is to use uncompleted discussion that is intended to update later and at the time, do not want to share it to other members. It concerns three kinds of knowledge privileges (public knowledge, private group knowledge and private knowledge) like as knowledge grid. Figure 7(a) and Figure 7(b) show the discussion in a group.

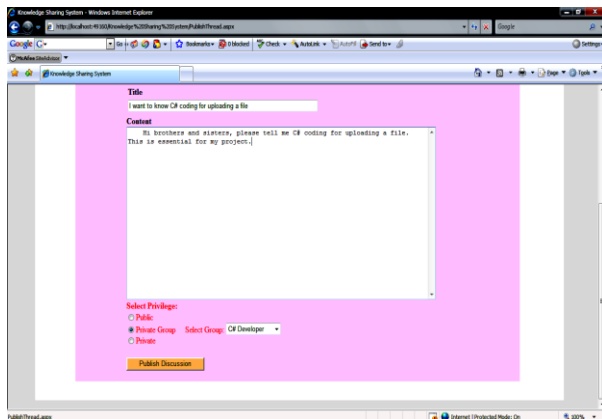


Figure 7(a): Discussion in a Group

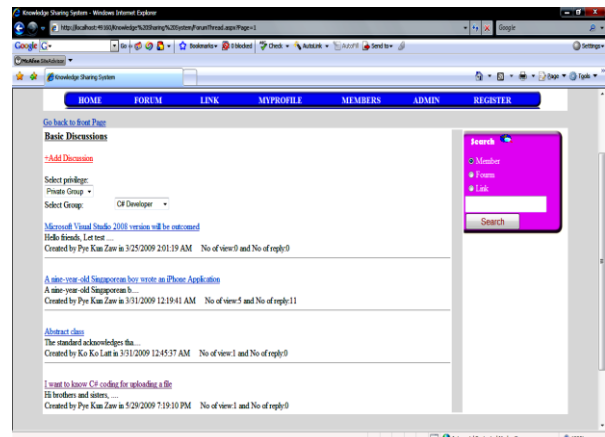
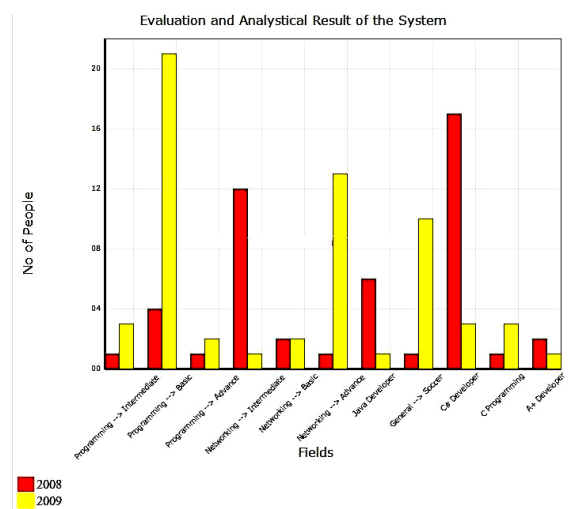


Figure 7(b): Discussion in a Group

Other features of the system, members can make albums and add photos to their albums. They can also make friends with other members within community by inviting and acceptance to invitation from other members. They can send messages to friends and receive and read messages from friends likes as email system. In sending messages, members can send to only one person or all members of a group and all of their friends.

## 5. Evaluation and Analytical Result

In this system, there are not only IT related discussion fields but also many other discussion fields. But the system is intended to IT related discussion fields. The system evaluates the number of people participate in these IT related discussion fields or IT related member groups. And then, it analyzes which field is hot (maximum number of people participate) or not by yearly. Figure 8 shows the evaluation and analytical result of the system.



In 2008, C# Developer is the hot topic  
In 2009, Programming -> Basic is the hot topic

Figure 8: Evaluation and Analytical Result



## 6. Conclusion

One of the most important aspects of knowledge level management is that of knowledge sharing among the members of an enterprise not only where face-to-face communication takes place but also in a virtual environment. The system provides virtual environment of Knowledge sharing to members to improve their IT knowledge or skills by using CGI and CoP methods. The system tests the shared person of IT related discussions by theory or practical questions. This testing is performed by Common Gateway Interface (CGI). So, it can be improved the level of knowledge for users. For IT related fields, knowledge of the system is concerned three kinds of knowledge privileges (public knowledge, private group knowledge and private knowledge) like as knowledge grid. Therefore, members of the system can divide public, private group and private to their knowledge. Public knowledge can be shared by all other members, group private knowledge can only be shared by members of the same group and private knowledge can only be used by its owner. Therefore, the system is efficient for online users to share knowledge.

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