KUI : The OSS-Styled Knowledge Development System

Virach Sornlertlamvanich

Thai Computational Linguistics Laboratory, NICT

112 Phahon Yothin Road, Klong Nueng, Klong Luang, Pathumthani 12120, Thailand

virach@tcllab.org

1. Introduction

The Internet is a must for forming an online community in the present day. Many tools have been developed to support such an online community work. For instance, SourceForge.net facilitates project based Open Source software development. Open Source software developers deploy SourceForge.net to announce their initiation, to call for participation, to distribute their works and to receive feedbacks. SourceForge.net is said to be the largest Open Source software development community. Wiki.org facilitates a database for creating and editing Web page content. It keeps the history of the online editing works which allows multiple authoring. Wiki is especially derived for several online collaborative works such as wikipedia, wikitionary, wikibooks etc. In addition, PhpWiki is one of the derived works of wiki as a handy software tool for managing the organizational documentation. This collaborative working environment has changed our working style to a more efficient manner. In the same time, the flood of information under the open collaborative works is now challenging us for an efficient management system. The disorder of the information causes difficulties in the requirement of the systematic maintenance for retrieval, extraction, or even summarization from the stored information. To understand the intention of an article (or a solution), we not only rely on the trace or the history of editing, but we also constantly recall the background of our decision in producing the article (or the solution).

Why don't we organize the information in the development process beforehand rather than limiting our capability in making use of the unstructured information? Google successfully responds our needs in looking for documents from the WWW. However, the results from the search can simply over a million sites and just some tens out of which are viewed for the search. This most powerful searching tools does not digest the information to meet final our requirement. It only thoroughly shows the results of the related document.

We proposed and developed KUI (Knowledge Unifying Initiator) to be a Knowledge User Interface (KUI) for online collaborative work to create knowledge bases. KUI is a platform to unify the various thoughts following the precess of thinking, i.e. initiating the topic of interest, collecting the opinions to the selected topics, localizing the opinions through the translation or customization and finally posting for public hearing to conceptualize the knowledge. The process of thinking is done under the selectional preference simulated by voting mechanism in the case that many alternatives occur.

2. To Manage the Knowledge

A thought is dynamically formed up by a tricker which can be an interest from inside or a proposed topic from outside. However, a knowledge can be formed up from the thought only when managed in an appropriate way. Since we are considering the knowledge of a community, we can consider the knowledge that is formed by a community in the following manner.

1. Knowledge is managed by the knowledge users
2. Knowledge is dynamically changed
3. Knowledge is developed in individual or community
4. Knowledge is both explicit and tacit

The environment of online community can successfully serve the requirement of knowledge management. Under the environment, the knowledge should be grouped up and narrowed down into a specific domain for each group. The domain specific group can then be managed to generate a concrete knowledge after receiving the consensus from the participants at any moment.

3. Process of Knowledge Development

Open Source software development is a model for open collaboration in the domain of software development. The openness of the development process has successfully established a largest software community that shares their development and using experience. The activities are dedicated to the domain of software knowledge development. SourceForge.net is a platform for project based Open Source software development. Open Source software developers deploy SourceForge.net to announce their initiation, to call for participation, to distribute their works and to receive feedbacks concerning their proposed software. Developers and users are actively using SourceForge.net to communicate with each other.

Adopting the concept of Open Source software development, we will be possibly able to develop a framework for domain specific knowledge development under the open community environment. Sharing and collaboration are the considerable features of the framework. The knowledge will be finally shared among the communities by receiving the consensus from the participants in each step. To facilitate the knowledge development, we deliberate the process into 4 steps.

1. Topic of interest

The topic will be posted to draw the intention from the participants. The selected topics will then be further discussed in the appropriate step.

2. Opinion

The selected topic is posted to call for opinions from the participants in this step. Opinion poll is conducted to get the population of each opinion. The result of the opinion poll provides the variety of opinions that reflects the current thought of the communities together with the consensus to the opinions.

3. Localization

Translation is the straightforward implementation of the localization. Collaborative translation helps producing the knowledge in multiple languages in the most efficient way.

4. Public-Hearing

The result of discussion will be revised and confirmed by gathering the opinions to the final draft of proposal.
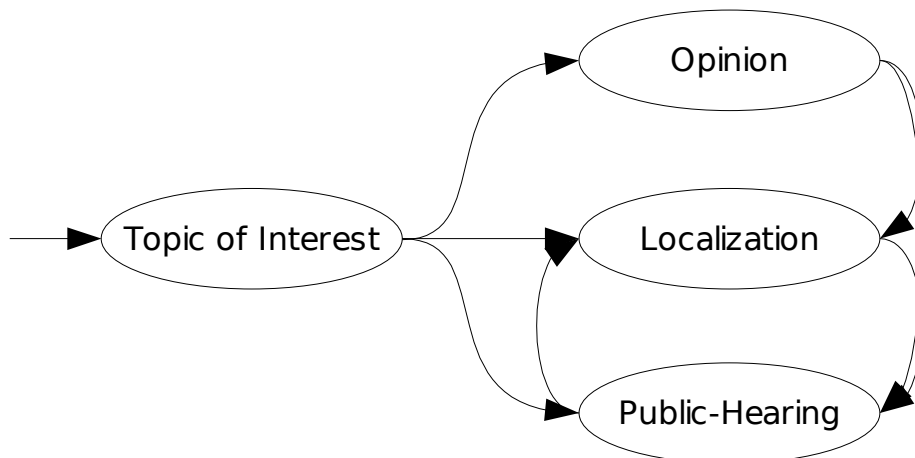
Drawing 1: Process of knowledge development

Drawing 1 shows the process of how a knowledge is developed within a community. Starting from posting 'Topic of Interest', participants express their supports by casting a vote. Upon a threshold the 'Topic of Interest' is selected for conducting a poll on 'Opinion', or introducing to the community by 'Localization', or posting a draft for 'Public-Hearing' to gather feedbacks from the community. The transition from 'Opinion' to either 'Localization' or 'Public-Hearing' occurs when the 'Opinion' has a concrete view for implementation. The

discussion in 'Localization' and 'Public-Hearing' is however interchangeable due to purpose of implementation whether to adopt the knowledge to the local community or to get feedbacks from the community.

The knowledge creating is managed in 4 different categories corresponding to the stage of knowledge. Each individual in the community casts a vote to rank the appropriateness of solutions at each category. The community can then form the community knowledge under the 'Selectional Preference' background. On the other hand, the under threshold solutions become obsolete by nature of the 'Selectional Preference'.

4. Knowledge User Interface for Knowledge Unifying Initiative

4.1 What is KUI?

KUI is a GUI for knowledge engineering, in other words Knowledge User Interface (KUI). It provides a web interface accessible for pre-registered members. An online registration is offered to manage an account by profiling the login participant in making contribution. A contributor can comfortably move around in the virtual space from desk to desk to participate in a particular task. A working desk can be a meeting place for collaborative work that needs discussion through the 'Chat', or allow a contributor to work individually by using the message slot to record each own comment. The working space can be expanded by closing the unnecessary frames so the contributor can concentrate on the task. All working topics can be statistically viewed through the provided tabs. These tabs help contributors to understand KUI in the aspects of the current status of contribution and the tasks. A knowledge community can be formed and can efficiently create the domain knowledge through the features provided by KUI. These KUI features fulfill the process of human thought to record the knowledge.

KUI also provides a 'KUI look up' function for viewing the composed knowledge. It is equipped with a powerful search and statistical browse in many aspects. Moreover, the 'Chatlog' is provided to learn about the intention of the

knowledge composers. We frequently want to know about the background of the solution for better understanding or to remind us about the decision, but we cannot find one. To avoid the repetition of a mistake, we systematically provide the 'Chatlog' to keep the trace of discussion or the comments to show the intention of knowledge composers.

4.2 Feature of KUI

- Poll-based Opinion or Public-Hearing

A contributor may choose to work individually by posting an opinion e.g. localization, suggestion etc., or join a discussion desk to conduct 'Public-Hearing' with others on the selected topic. The discussion can be conducted via the provided 'Chat' frame before concluding an opinion. Any opinions or suggestions are committed to voting. Opinions can be different but majority votes will cast the belief of the community. These features naturally realize the online collaborative works to create the knowledge.

- Individual or Group works

Thought may be formed individually or though a concentrated discussion. KUI facilitates a window for submitting an opinion and another window for submitting a chat message. Each suggestion can be cast through the 'Opinion' window marked with a degree of its confidence. By working individually, comments to a suggestion can be posted to mark its background to make it better understanding. On the other hand, when working as a group, discussions among the group participants will be recorded. The discussion can be resumed at any points to avoid the iterating words.

- Record of Intention

The intention of each opinion can be reminded by the recorded comments or the trace of discussions. Frequently, we have to discuss again and again on the result that we have already agreed. Misinterpretation of the previous decision is also frequently faced when we do not record the background of decision. Record of intention is therefore necessary in the process of knowledge creation. The knowledge interpreta-

tion also refers to the record of intention to obtain a better understanding.

- Selectional Preference

Opinions can be differed from person to person depending on the aspects of the problem. It is not always necessary to say what is right and what is wrong. Each opinion should be treated as a result of intelligent activity. However, the majority accepted opinions are preferred at the moment. Experiences could tell the preference via vote casting. The dynamically vote ranking will tell the selectional preference of the community at the moment.

5. Conclusion

KUI is a platform for composing knowledge in the Open Source style. A contributor can naturally follow the process of knowledge development that includes posting in 'Topic of interest', 'Opinion', 'Localization' and 'Public-Hearing'. The posted items are committed to voting to perform the selectional preference within the community.

The results will be ranked according to the vote preference for the purpose of managing the multiple results. 'Chatlog' is kept to indicate the record of intention of knowledge composers. A contributor may participate KUI individually or join a discussion group to compose the knowledge. We are expecting KUI to be a Knowledge User Interface for composing the knowledge in the Open Source style under the monitoring of the community. The statistical-base visualized 'KUI look up' is also provided for the efficient consultation of the knowledge. Future extension of KUI will cover the intelligent user supports in both aspects in knowledge composing and look up process to increase number of participants and the communities.

6. Reference

http://www.sourceforge.net/
http://www.wiki.org/
http://google.com/
http://www.tcllab.org/kui/