Knowledge Unifying Initiator for Poll: KuiPOLL[*]

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Abstract—Social software is providing new opportunities for individual expression, community's creation, collaboration and sharing. This paper proposes a social software called KuiPOLL to develop online social knowledge, focused on Poll-based Opinion and quesionnaires. KuiPOLL is a derived work of KUI (Knowledge Unifying Initiator) and it is a collaborative tool for opinion collection and event prediction. There are several main features in KuiPOLL varied from posting topic of interest, polled-based opinion and questionnaire supported for member and public,and KuiPOLL news. Since KuiPOLL is an action research, the feedback from community is important. We are planning to implement KuiPOLL to mobile devices.

Keywords: Social software, Social networks, Collaborative tools, Polling system, Questionnaire, Knowledge development, Knowledge Unifying Initiator.

1. INTRODUCTION

As a powerful of internet technologies, huge numbers of people in the cyber world is able to work together in a new way. The recent successes of such systems suggest that the time is now ripe for much more new social software and it is providing new opportunities for individual expression, community's creation, collaboration and sharing There are interesting questions such that whether there is any knowledge creation during the social software is using and how such knowledge can be managed.

In this paper, we proposed a knowledge user interface for online collaborative tool in order to create online social knowledge. A motivation of this work is from KUI (Knowledge Unifying Initiator) [2]. Theoretically, KuiPOLL is derived work of KUI. A development of KuiPOLL aims to manage and handle online opinion poll and questionnaire. It includes a feature for finding out what people think under the interesting topics. The opinion poll in KuiPOLL supports both member poll and gadget poll. This feature is also available in the KuiPOLL questionnaire. In addition, KuiPOLL is a platform for composing knowledge in the Open Source software development style similar as KUI.

The organization of this paper is as follows. In the Section 2, we will explain a concept of collective tools and relevance social software. A conceptual of social knowledge development and main components of KuiPOLL are discussed in the Section 3. The usages and evaluations of KuiPOLL in online communities are explained in the Section 4. We end up with our conclusion and future works in the Section 5.

2. COLLABORATIVE TOOLS

Collaborative software is a software designed to facilitate people involved in a common task to achieve their goals. Most collaborative software can be used to support social networking. As this research is about online collaborative work, in this section, we shall discuss the relevance collaborative tools and concept starting from a discussion of social software followed by knowledge development process. Since the motivation of our contribution is from software KUI, we then briefly explore the main features of KUI. In addition, as this work is an action research, we will explain regarding to action research for information systems development.

2.1 Social Software

Collaborative software sometime can be named by social software, especially when collaborative software is used outside the workplace. Social software provides new opportunities for

personal expression, the creation of communities, collaboration and sharing. There are varieties of such software available in the online community, including blogs, wiki, and podcasting.

Principally, we can draw a definition of social software in terms of mathematical formula [1] as follows:

$$Social\ software = (tools + services + aggregation)^\wedge scale.$$

That is social software is not only an application tool, it also provides services of online data. All of them joined together using common protocols. In addition, how to engage people as active participants in communities to achieve new knowledge trough distributed collaboration in online social networks. A various type of organizations takes an attention to importance of not only storing information and data but also creating a new knowledge with utilizing the stored information and data.

2.2 Knowledge Development Process

Generally, a thought is formed up by a trickery in dynamic manner. It may be either an interest from inside or a proposed topic from outside. Nevertheless, knowledge can be formed up from the particular thought only when managed in an appropriate way. Since this research focuses on the knowledge of an online community, we will consider the knowledge in four different aspects [3, 5]: (1) knowledge is managed by the knowledge users, (2) knowledge is dynamically changed, (3) knowledge is developed in an individual manner or a community manner, and (4) knowledge is both explicit and tacit.

Based on the online environment, the knowledge can be firstly classified and narrowed down into a specific domain in each group. Once the consensus from the participants in such domain specific group is collected, we can then analyze them in order to generate a concrete knowledge. In addition, by adopting the concept of Open Source software development, i.e. under open community environment, a framework for domain specific knowledge development can be developed. The knowledge will be finally shared among the participants.

2.3 Knowledge Unifying Initiator: KUI

KUI [2, 3, 4, 5] is a GUI for knowledge engineering. It is developed to be a knowledge user interface for online collaborative work to create knowledge bases. KUI 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 knowledge community can be formed and can efficiently create the domain knowledge through the features provided by KUI. These features fulfill the process of record human knowledge from his thought.

Principally, both KUI and KuiPOLL are GUI for knowledge engineering. There are four main applications in KUI: polling, public-hearing, translating, and writing whereas KuiPOLL contains only polling adopt from KUI. In KuiPOLL, however, a capability of polling system is extended to support online poll and questionnaire both for member and public.

2.4 Action Research for Information Systems Development

Action research is an established research method in use for information systems development since the end of the 1990s. There are various forms of information systems action research such as information prototyping, soft systems methodology, action learning, process consultation, etc. The characteristics of information systems action research could be considered via the process model, the structure, typical involvement and the primary goals.

The characteristics of information systems action research's process model are iterative, reflective and linear. Also the structure characteristics are rigorous and fluid. Typical of involvement could be collaborative, facilitative or expert. Finally the project's primary goals may be organizational development, system design, scientific knowledge or training. [6]

3. KNOWLEDGE UNIFYING INITIATOR FOR POLL

In this section, we will start with an explanation of knowledge development process in KuiPOLL and then explore five main components in KuiPOLL, including member poll, gadget poll, member questionnaire, public questionnaire, and KuiPOLL news.

3.1 Knowledge Development In KuiPOLL

We will describe the process of how knowledge is constructed using KuiPOLL. Firstly, participants post a "Topic of Interest". According to particular topics, a set of "Open questions (Opinion)" is then formed in order to receive participation expressions. After participants express their opinions to the system, a "Target Event" is defined by using information from "Opinion (knowledge) base" together with other related knowledge base data and the target event is applied to series of "Closed questions (Opinion)". Next, the system will let participants join the community again with a set of closed questions. In addition, all opinions of the community participation will be stored in the "Opinion (knowledge) base" and we can use this information as a tool for "Event Prediction". Finally, the "Opinion (knowledge) base" will become "Knowledge" for particular community. All processes of knowledge development are illustrated in Figure 1.

KuiPOLL allows pre-registered members to post a topic of interest into a system. If such topic is interesting, it will be voted on by other members. Once the topic is popular the system will automatically or manually allow members to propose their opinions. KuiPOLL supports two different groups of interface: (1) polling system and (2) questionnaire. If the structure of a problem is not complicated, we can use the polling system otherwise we recommend the questionnaire system. In addition, both interfaces can work with open and

closed questions. The conclusion is automatically calculated in a real time manner.
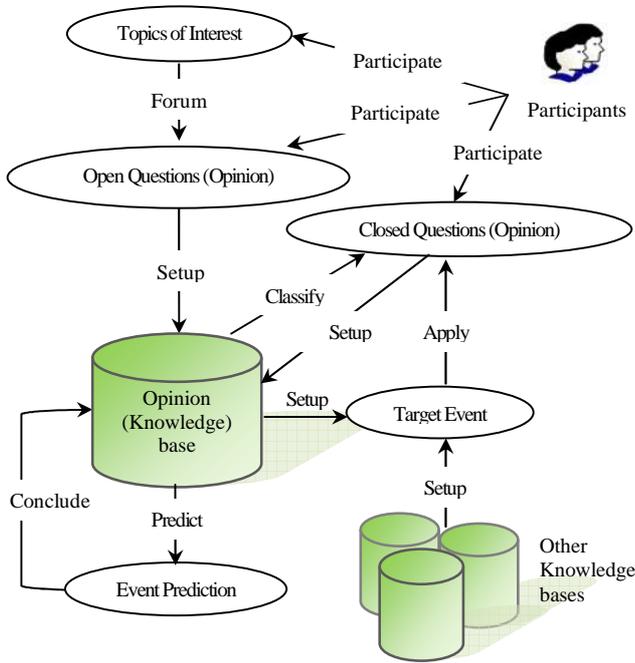

Figure 1. Knowledge Development In KuiPOLL

3.2 Components of KuiPOLL

There are five main components in KuiPOLL, i.e. member poll, gadget poll, member questionnaire, public questionnaire and KuiPOLL news (illustrate in Figure 2). The first page of KuiPOLL is shown in Figure 3.

Figure 2. Home page in KuiPOLL

- **Member poll**

A member poll is a tool that allows KuiPOLL's member to participate the system via poll. Firstly, KuiPOLL's member proposes the topic of interest to the system. It will be then voted
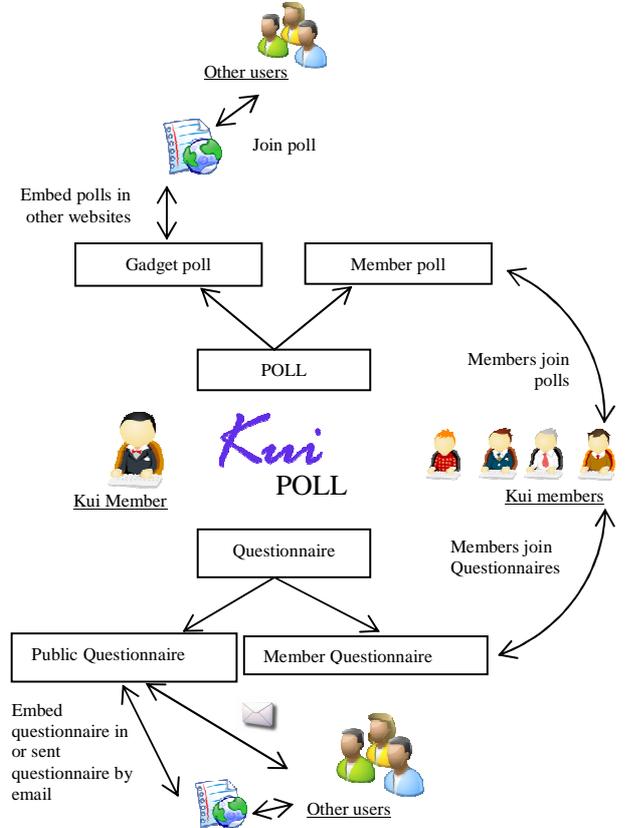
Figure 3. Components in KuiPOLL

by other members. Next, the interest topic with sufficient supported votes will be passed to the member poll system. This poll can be either closed or open and then the KuiPOLL system will allow members to participate this poll by adding comments or votes. Figure 4 displays a list of topics of interest.
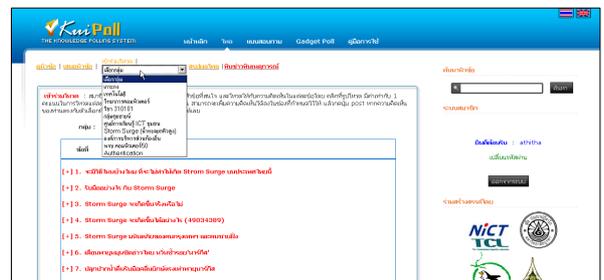
Figure 4. Topics of interest in member poll

- **Gadget poll**

In order to make members having another choice of using poll, KuiPOLL provides a gadget poll as illustrated in Figurer 5. It is a tool such that KuiPOLL's member is able to specify a topic of interest and template. Once the poll is constructed, the member can download such poll together with the source code. They will be then installed in other social software, such as blog and web board. After that participants can join the gadget poll by voting or adding comment. The result will be stored in the KuiPOLL system and the owner of such poll can view the result.
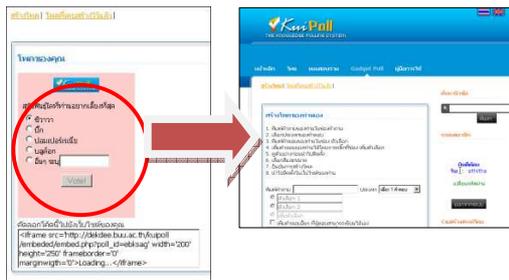
Figure 5. A gadget poll

- **Member questionnaire**

KuiPOLL allows member construct a questionnaire consisting of a tile questionnaire, instruction, and a set of questions. A question can be closed or open supporting several tools, such as check box, radio box, text box, multi-line text box, and matrix rating. In addition, the owner of such questionnaire is able to specify a target group of members to participate the system (shown in Figure 6). Finally, the result can be viewed via web and exported to spreadsheet format.

Figure 6. A target group of members in member questionnaire

- **Public questionnaire**

Similar to gadget poll, KuiPOLL's member can download the public questionnaire together with its source code and install in website, other social software or sent questionnaires by email.

All features of public questionnaire are the same member questionnaire. Figure 7 illustrates the usage of public questionnaire.
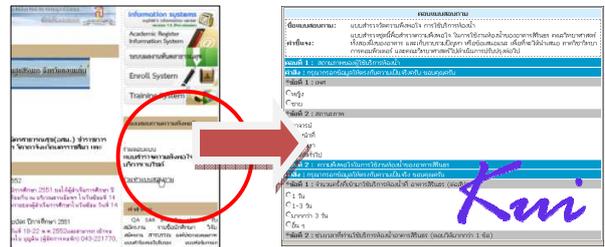

Figure 7. Usage of public questionnaire

- **KuiPOLL news**

Software KuiPOLL emphasizes output from poll by automatically selecting a set of active polls to generate KuiPOLL news. They are then setting into the news format and showing on the first page of KuiPOLL (Figure 8). By using RSS and XML technology, KuiPOLL news provides content feeding to other systems. Unlike traditional news system, a list of KuiPOLL news will be sorted by lately active poll.

Figure 8. KuiPOLL news

4. SOFTWARE USAGES AND EVALUATAIONS

KuiPOLL is an web-based application. It developed by using PHP as a programming language, and MySQL as a database management system based on Burapha linux operating system. Presently, it is located Burapha University via http://www.thaisocial.net. This section provides a discussion of KuiPOLL development process in terms of action research. It also contains experimental result and evaluation.

4.1 KuiPOLL Development

KuiPOLL is a core part of the action research project called "Social Software for Knowledge-based Society Developments". We use information system action research to develop KuiPOLL software. The software development cycles can be shown in Figure 9. In the cycle consist of four stages: the planning stage, the software development/implementation stage, the field works/observation stage and the reflective/feedback stage. That is, the software prototype is first developed under the specific planning. The software implementation is then performed in the online community base on field works. During this time, the observation is in action in order to receive selected feedbacks. The software modification based on the analytic feedback is then planned and developed, and the other three steps are then repeated until finally a completed version of KuiPOLL is archived.
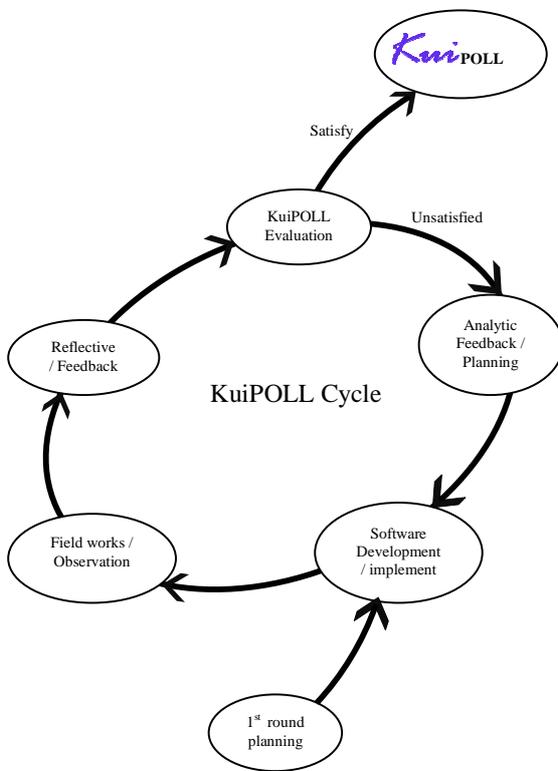

Figure 9. A Cycle of KuiPOLL Development Process

4.2 KuiPOLL Evaluation

As mentioned earlier KuiPOLL is a part of the research project : Social Software for Knowledge-based Society Developments. The project is always evaluated periodically by the funding support organization. We, as the researchers always accept reasonable feedback from the evaluation committee as the same value of the other users. We have conducted many experiments in different activities by using KuiPOLL. The software has been used for a participating in the drafting of "Constitution of the Kingdom of Thailand 2550 B.E.". Pre-

registered members of KuiPOLL participated in the online community and posed their opinions in the different issues based on the Constitution draft. We recommend KuiPOLL for graduated students at Burapha University. KuiPOLL's users show interest in different features of KuiPOLL. For example the blogger users may be interested in Gadget Poll. Many webmasters use public questionnaire in KuiPOLL for their web site evaluation from public. These include Thai Meteorological Department web site (http://www.tmd.go.th), Thai National Mirror web site (http://www.mirror.in.th) , The web site of Boromarajonani College of Nursing, Trang (http://www.bnct.in.th) , The web site of Sirindhon College of Public Health KhonKaen (http://www.scphkk.ac.th) and many others. Both questionnaire parts, public questionnaire and member questionnaire in KuiPOLL are also good for collecting data for other research work. The paper "Questionnaire Builder in KuiPOLL" [7] was introduced for the purpose of promoting the software to new users at the national conference on computing and information Technology 2009. The paper also got the best paper award at the conference [8].

However, the above conclusions are based solely the results of our experience. In our view, this research uses the action research methodology. Using the fourth generation evaluation [9] in the evaluation model, we determined that the best way to evaluate KuiPOLL is to join the project. The KuiPOLL web site is ready for use today at the URL mentioned before. The software is open source, and is ready for continued refinement with the help of the community.

5. CONCLUSION AND FUTURE WORKS

This paper proposes a social software called KuiPOLL. It is a derived work of KUI (Knowledge Unifying Initiator). KuiPOLL is a collaborative tool for opinion and questionnaire collections, and KuiPOLL news. Process of KuiPOLL starts from pre-registered members post a topic of interest into the system. There are two kinds of poll-based opinion in KuiPOLL, polling system and questionnaire. KuiPOLL also supports social space for participants with some social software tools. In the next step, the opinion and relevance information are recorded in the opinion (knowledge) base. Next, the opinion base is extracted for event prediction and it will be finally stored in the knowledge base. Since this work is an action research, it is important to get the feedback from the community and take the feedback to improve the process in KuiPOLL. We are planning to implement KuiPOLL access system via mobile devices in the coming future.

6. ACKNOWLEDGMENT

7. REFERENCES

[1] Emerging Technologies for Learning Volume 2 (2007). http://www.becta.org.uk/research.

[2] V. Sornlertlamvanich. "KUI: The OSS-Styled Knowledge Development System".. In the Proceedings of the 7th AOSS Symposium, Kuala Lumpur, Malaysia, March 2006.

[3] V. Sornlertlamvanich, T. Charoenporn, K. Robkop, and H. Isahara. "KUI: A Self-organizing Tool for Multi-lingual WordNet Construction". AAMT Journal, No. 41, pp. 31-35, December 2007.

[4] V. Sornlertlamvanich, T. Charoenporn, K. Robkop, and H. Isahara. "KUI: an Ubiquitous tool for Collective Intelligent Development". In the Proceedings of Workshop on NLP for Less Privileged Languages, IIIT, Hyderabad, India, January 2008.

[5] V. Sornlertlamvanich, T. Charoenporn, K. Robkop, and H. Isahara. "KUI: Self-organizing Multi-lingual WordNet Construction Tool". In the Proceedings of the 4th Global WordNet Conference (GWC2008), Szeged, Hungary, January 2008.

[6] Richard L. Baskervile, "Investigating Information Systems with Action Research", Communication of the Association for Information Systems, Volume 2, Article 19, October 1999.

[7] Tawatchai Iempairote, Nuansri Denwattana, Athitha Chokananratana and Virach Sornlertlamvanich. Questionnaire Builder in KuiPOLL, Proceedings of National Conference on Computing and Information Technology, NCCIT2009, King Mongkut's Univertsity of Technology, North Bangkok, Bangkok, May 22-23, 2009.

[8] Announcement of the NCCIT2009 Best Paper Awards http://www.nccit.net/english/Download/Best%20Paper.pdf

[9] Egon G. Guba, Yvonna S. Lincoln, "Fourth Generation Evaluation", SAGE Publications, ISBN 0-8039-3235-9, Newbury Park London New Delhi, 1989.