

# Public Opinion Channel: Facilitating Community Knowledge Circulation

Tomohiro FUKUHARA<sup>\*1</sup>, Shintaro AZECHI<sup>\*2</sup>, Nobuhiko FUJIHARA<sup>\*3</sup>,  
Ken'ichi MATSUMURA<sup>\*1</sup>, Hidekazu KUBOTA<sup>\*1,\*4</sup>, Toyoaki NISHIDA<sup>\*1,\*4</sup>

<sup>\*1</sup>Synsophy Project, Communications Research Laboratory

<sup>\*2</sup>School of International Cultural Relations, Hokkaido Tokai University

<sup>\*3</sup>Research Center for School Education, Naruto University of Education

<sup>\*4</sup>School of Engineering, The University of Tokyo

E-mail: tomohi-f@synsophy.go.jp

**Abstract.** *Public Opinion Channel (POC), which is a community broadcasting system for facilitating circulation of community knowledge, is proposed. POC collects community members' opinions, and broadcasts the opinions by editing them into a story. One of application domains of POC is critical domain in which content-oriented communication is required. We propose (1) quasi-anonymous message for enabling the content-oriented communication, and (2) open source story that allows members to edit existing stories and distribute in a community again. Concept and current implementation system of POC are described.*

## 1 Introduction

We describe a community broadcasting system named *Public Opinion Channel (POC)* for facilitating circulation of community knowledge. POC is a concept of social information system that collects opinions from community members, and broadcasts them as an edited story in which related opinions are summarized[1].

Community knowledge in this paper is information shared by community members such as issues recognized by members, each member's opinion, and consensus of a community. Facilitating a process of formation and circulation of community knowledge is important for community supporting systems in the era of *inter-x* communication where variable  $x$  is substituted by national, culture, generation, gender, position, policy, and so on.

POC targets facilitating discussion in *critical domain* in which content-oriented communication is required. Existing communities such as based on a mailing list and a BBS have limitations on applying the communities to the critical domain such as topics related to an emotionally-charged argument. Existing communities are not suitable for discussion on a critical domain because they often cause flaming and personal attacks. We propose *quasi-anonymous message* for facilitating discussion in the critical domain.

For facilitating active knowledge circulation, *open source story* in which community members can edit and distribute existing stories in a community is proposed. A story is a structured set of opinions including not only a text message but also images, movies, and audio. By adopting open source story in a community, exchange of opinions

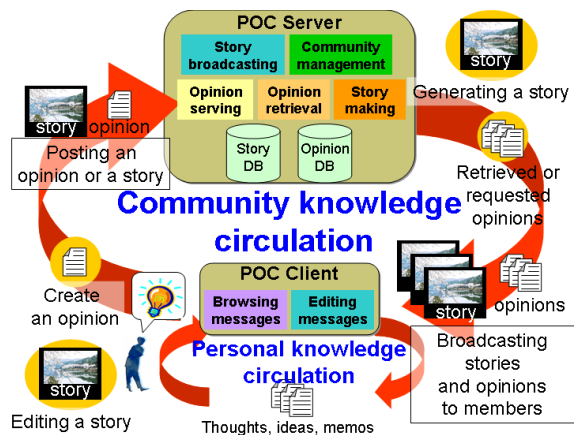


Figure 1: An overview of POC. POC facilitates knowledge circulation in both community and personal levels.

becomes actively.

In this paper, we describe an overview of POC from the viewpoint of knowledge circulation in a heterogeneous community.

## 2 Public Opinion Channel

The aim of POC is to facilitate community knowledge circulation, i.e., personal knowledge such as one's thoughts, opinions, questions, and experiences is exchanged between community members actively and safely. Figure 1 shows an overview of POC. The figure illustrates a process in which community knowledge is formed through posting personal knowledge to a community, and receiving others' personal knowledge. Important point here is that personal knowledge (a story) is edited re-

peatedly by members as means of expressing his or her opinion. We describe application domain and functions of POC in the following subsections.

## 2.1 Application domain of POC

One of application domains of POC is a critical domain in which a community has to discuss on a serious topic. Examples of such domain are (1) a large scale online discussion such as relevant to policy making, and (2) discussions on international issues such as an international dispute. In these critical domains, arguments must be pursued under logically and briefly. Existing online communities have risks on discussion in these domains because personal information is revealed.

We consider that anonymity is necessary for discussions in a critical domain. Azechi argued that anonymity is important for facilitating discussions in a critical domain[2]. He argued that a publicity of personal information such as sender's name or e-mail account is dangerous because s/he might be attacked from authorities or opponents, furthermore, the freedom of speech might be infringed. Although one might say that anonymity causes irresponsible actions on the Internet, however, to protecting the freedom of speech, anonymity is inevitable. In the next subsection, we propose an approach to solve this problem.

## 2.2 Functions of POC

POC provides functions for (1) quasi-anonymous message, and (2) open source story for facilitating diverse community knowledge circulation. The former prevents irresponsible actions in an anonymous community. The latter enables community members to exchange their personal knowledge actively.

### Quasi-anonymous message

POC is an anonymous medium based on anonymity, i.e., POC doesn't show personal information when message is made public to community members. For preventing irresponsible actions in anonymous community, we introduce a notion of *quasi-anonymous message* in which sender's information is stored in background of a discussion.

Quasi-anonymous message is a message that keeps the sender's information. When the quasi-anonymous message is made public, only contents of a message are shown for community members (i.e., foreground of a discussion), and sender's information is hidden from members except for moderators of a community. In this style of a discussion, one must submit a message itself and sender's information such as user ID when s/he posts a message to POC. By submitting sender's information, POC

facilitates a liberal discussion. When one posts a message including a personal attack or malicious information, moderators can easily find sender's information, and cope with the message and the sender.

## Open source story

In order to facilitate community knowledge circulation, POC allows *open source story* in which community members can edit existing stories post by other members and distribute them in a community. We consider that community knowledge is a result of direct or indirect arrangement of personal knowledge. For example, free softwares allowing modification and distribution under GNU Public License<sup>1</sup> are good instances of community knowledge. Free softwares have proved that modifying and copying software freely have possibilities to create valuable softwares. Important point here is that community members create a valuable software collaboratively. We propose that open source story for facilitating formation of community knowledge collaboratively.

Editing stories mutually and collaboratively is important for circulating diverse community knowledge. We consider the relationship between existing stories and edited stories as "the struggle for existence" because most new stories are considered to be generated by POC server automatically, and only a few of the stories are evaluated, edited, and circulated in the community. This process resembles to the competition between creatures in the world of nature. Only appropriate stories for the community are survived and evolved. We propose this function for circulating diverse stories and applying social selection to the diverse stories.

## 3 POC prototype system

POC prototype system consists of a *POC server* and *POC client*. The server collects opinions, and generates and broadcasts stories in a community. The client is an editor/viewer for opinions and stories. In Figure 1, a community member browses opinions and stories received from the server. When a member turns on the client, opinions and stories are played automatically. Opinions and stories are played repeatedly so that s/he can browse them at any time.

Community members can create a new opinion and story and post them to a POC server. The POC server broadcasts the opinion and the story in a community.

POC server generates stories automatically based on opinions accepted from community members. The server serves stories by radio and TV

<sup>1</sup> <http://www.gnu.org/copyleft/gpl.html>

programs. Members can edit the stories and distribute them in a community. By generating and editing stories, some stories are evolved and others are filtered out.

### 3.1 POC server

POC server accepts opinions and stories from community members, and provides opinions and stories with members. The server also generates stories and broadcasts them.

#### Broadcasting stories

POC server broadcasts messages in radio and TV program. In case of radio program, the server generates audio files (MP3 files) for narration by text-to-speech (TTS) system. Generated audio files are broadcasted by MP3 streaming server. Members can listen to the program via MP3 players when s/he is such as WinAmp<sup>2</sup>.

In case of TV program, stories are narrated by virtual newscasters. Kubota proposed a system named EgoChat for viewing community members' opinions as a talk show[3]. They continue to develop the EgoChat so that the system can display stories in a POC.

#### Generating stories

POC server generates a story automatically. Here is an overview of story making process.

1. Pick up an opinion (source opinion) from opinion database.
2. Retrieve opinions from opinion database using title of the first opinion.
3. Sort retrieval results by date order, and first  $n$  opinions are added to the source opinion. ( $n$  is threshold)

First, the server picks up an opinion that becomes introduction of the story. Implemented system picks up a source opinion randomly from opinion database. Then, server retrieves related opinions based on keywords that are nouns exist in the title of the source opinion. Finally, retrieval results are sorted by date. First  $n$  opinions are added to the source opinion. In summary, a story consists of a source opinion and  $n$  opinions retrieved from opinion database.

Example of a story is shown in Table 1. In this table, presenter introduces three opinions related to "affordance". These opinions are sorted by date order.

Table 1: Example of a story.

|           |  |
|-----------|--|
| Presenter | <i>Next opinion is "affordance".</i>   |
| Opinion   | Does anyone know about affordance?   |
| Presenter | <i>Related to this opinion, there is another opinion.</i>  |
| Opinion   | There is a workshop on designing intelligent artifacts. How about attending this workshop?         |
| Presenter | <i>This is the last opinion.</i>   |
| Opinion   | I found a good text book of cognitive psychology on the WWW. This page describes affordance a lot. |
| Presenter | <i>Thanks all.<br/>We're waiting for your opinions.</i>  |

Table 2: Example of an opinion.

|   |
|---|
| <pre>&lt;?xml version="1.0" encoding="Shift_JIS" ?&gt; &lt;opinion name="tem_imf" date="2001/5/6 20:52:18"   host="192.168.31.163" reference="comment5.xml"&gt; &lt;title&gt;Diversity of plants&lt;/title&gt; &lt;comment&gt; I noticed that there are various colors and shapes of plants in the gardening shop. Plants have various colors and shapes innately. &lt;/comment&gt; &lt;url&gt; http://daphne.palomar.edu/wayne/trmar98.htm &lt;/url&gt; &lt;/opinion&gt;</pre> |
|---|

### 3.2 POC client

POC client is viewer/editor for an opinion and a story. Figure 2 shows a screen image of a POC client. Basic functions of the client are browsing and posting an opinion. An example of an opinion is shown in Table 2. An opinion is described in the XML format, and consists of a title and a body. In the table, body is described between comment tag, i.e., `<comment>` and `</comment>`. A message may includes references to an another opinion and URL. Attributes of `<option>` tag indicates that this message refers to `comment5.xml`. URL described between url tags indicates reference URL.

In addition to the basic functions, there are several features in the client tool. We describe the following features: (1) personal knowledge pool, and (2) story editor.

#### Personal knowledge pool

When a community member is browsing messages, s/he can write his or her thoughts and ideas, and stores them as personal memos in a local message pool. S/he can browse the memos personally. In the local message pool, captured messages

<sup>2</sup> <http://www.winamp.com/>

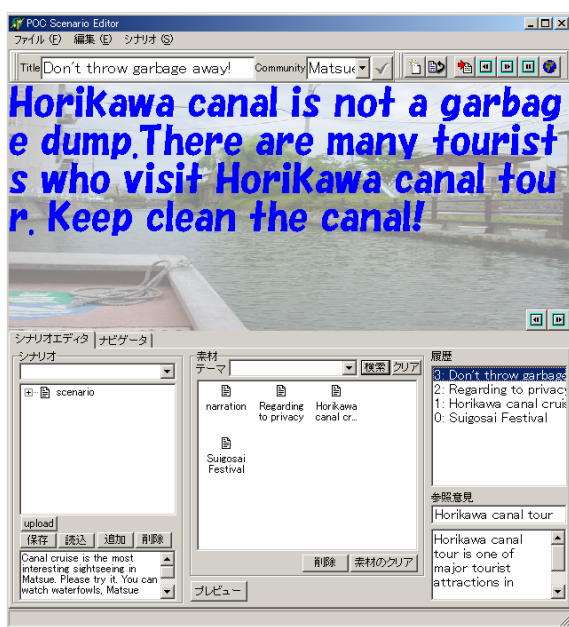


Figure 2: Screen image of a POC client. Members can view and edit messages from a POC server.

are stocked as local collections. S/he can browse memos and captured messages stored in the local message pool for elaboration while s/he is writing a paper, or self-brainstorming by taking look at the memos from a third person's view.

### Story editor

A community member can not only view a story but edit and post it to a community. When s/he has an interest in a story, s/he can capture and store the story in his or her local message pool. When s/he wants to add his idea to the captured story, s/he add his opinion to the story, and post to the POC server. The server circulates updated story again.

## 4 Discussion

We discuss on related work and issues related to an anonymity.

### 4.1 Related work

Nakata proposed a framework for facilitating a process of making consensus within a community on critical domain[4]. He proposed multi-modal communication system and a visualization tool for facilitating the process of making consensus. The former system enables community members to communicate non-verbal information such as eye contact and gestures. The latter system enables members to find a distribution of opinions in a community by showing a map in which each member's

opinion is located two dimensional plane.

One of major differences between POC and his research is an approach to support a discussion in a critical domain. POC summarizes community members' opinions and broadcasts them. By summarizing and mediating members' opinions, POC facilitates content-oriented discussions. Although current implementation of POC is not enough for summarization and mediation, applying POC to critical domains is necessary for facilitating knowledge circulation in a community.

### 4.2 Exercising privilege unfairly in quasi-anonymous message

One of problems of the quasi-anonymous message is that an exercise of privilege unfairly. In quasi-anonymous message, moderators have a great privilege on both of messages and members in a community. When a malicious moderator exercises his or her privilege unfairly, discussions and community itself might be died out. Further research on this problem is required from the viewpoint of social psychology.

## 5 Conclusion

We described an overview of POC for facilitating community knowledge circulation. One of application domains of POC is critical domain in which content-oriented communication is required. We proposed (1) quasi-anonymous message, and (2) open source story. Our future work includes implementation of POC so that the system can be applied on a critical domain, and verifying our approach in actual community.

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