Using Many Wikis for Collaborative Writing

Ng S.T. Chong[a] and Michihiro Yamamoto[b]

[a]United Nations University; [b]Media and Technology Laboratory

{Chong | Yamamoto}@unu.edu

Abstract

A typical Wiki environment allows any user to create or edit any page on the site, using basically any Web browser, and processes everything on the server. Wiki fosters a culture of shared authorship that is predicated on anonymity. While the combination of anonymity and unrestricted access can make exchange of ideas easy, it is not always conducive to effective collaboration. In fact, such an environment which requires the entire collaboration process to take place in an open space often cannot adequately support collaboration, especially when Wiki is used in an open Internet, and independent thinking and clear understanding of the state of mind of each team member are critical to the collective goal. In this paper, we propose an extension to the Wiki collaboration model by implementing a private space on a distributed architecture, and report our results in an essay writing exercise. To simulate the conditions of open collaboration on the Internet, the experiment drew on the participation of a closed work group of 20 people that never met each other or had any contact with each other prior to the study.

1. Introduction

Wiki (Cunningham, 2003; 2004; http://en.wikipedia.org/wiki/Wiki) is one kind of social networking software. The ability to support online editing of Web pages has turned Wiki into a popular platform for collaborative writing projects. Wiki fosters a culture of collectivism (Harasim et al. 1995) by maintaining contributors' anonymity in communication and collaboration. But anonymity is a double-sworded assertion. While it inspires freedom of expression and helps facilitate building a strong sense of shared ownership, the lack of personal accountability can easily lead to anti-social behaviors and other forms of abuses of the community trust. Anonymity coupled with the openness of the editing process could frustrate users when their inputs are changed or deleted by another user or buried in the clutter of other users' inputs against their wills. In fact, Ponser and Baecker (1993) observed the rich variety of methods that groups use to write collaboratively. The editable-by-all model of Wiki would be too open and could restrict users from having opportunities to fully incubate ideas at their own pace without any interference, before sharing them with the group. This suggests that content protection would be necessary to bring more flexibility to Wiki and improve the effectiveness and quality of online collaborative writing in Wiki.

In this paper, we propose a content protection mechanism for Wiki, and evaluate the new open environment for collaborative writing, and report our experimental findings.

2. Research prototype

The collaboration model of Wiki, based on open editing and anonymity, removes many barriers to collective ownership. But the simplicity in this model also limits flexibility and fails to fully support the writing process. To verify that merely adding a content protection mechanism to Wiki, the collaboration environment can become more productive and flexible, we implemented and evaluated a research prototype in a collaborative essay writing scenario.

2.1. System architecture

We implemented a content protection mechanism for Wiki using a distributed architecture, which allows users to contribute to the shared document in the public space by editing within their own private document and sharing only select portions of the private document with other members. This concept of dynamic fine-grained sharing from a private document is illustrated in Figure 1. The distributed architecture allows a user to specify multiple parts in the private document and decide where to integrate these parts in the shared document. The implementation is realized on top of FlexNetDiscuss (FND; Chong, 2003a;

2003b), an extensible communication and collaboration environment on the Web. The distributed collaborative writing and consolidation environment doesn't alter the existing Wiki environment. At the heart of the architecture is the aggregation mechanism, which is implemented on top of the extensibility framework of FND. The aggregation processor performs the following functions: search FND tags on the documents, identify and retrieve the corresponding Web documents from private Wiki document, and format the layout and display the content in the public Wiki page.
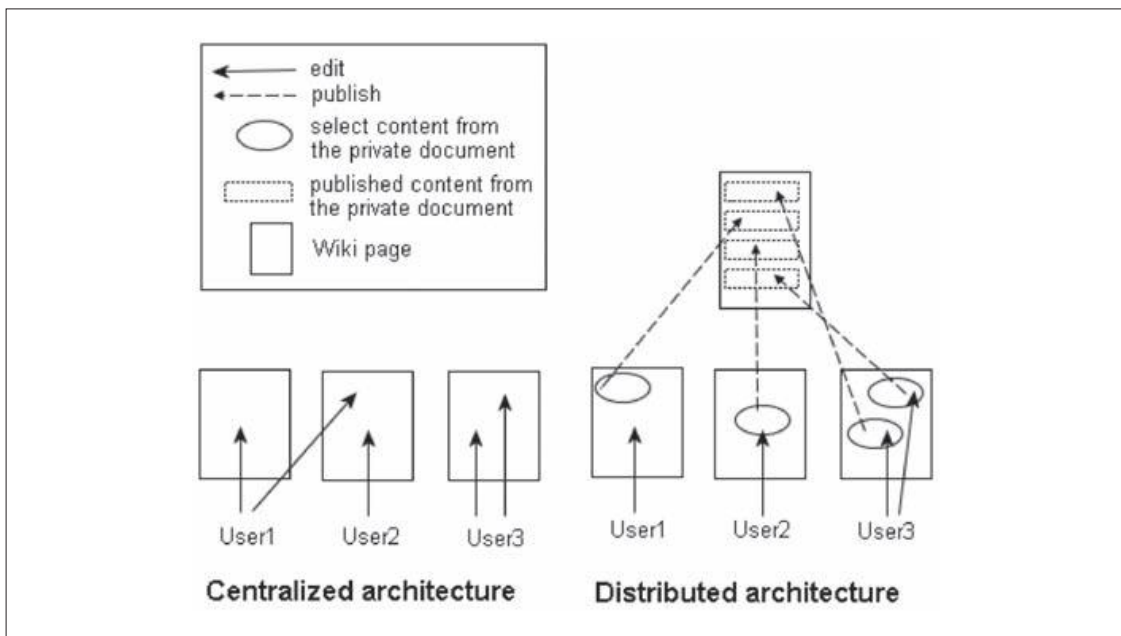

Figure 1   Collaborative writing – centralized architecture versus distributed architecture.

2.2. User environment

In the content protection mechanism we implemented, a user can publish multiple select parts of his/her private Wiki page into the public Wiki page, which is just a regular Wiki page. The private Wiki page contains information that is either shared or not shared. Shared information is specified by using the «fnd:public» tag. Private information doesn't need to be tag delimited. Before this shared information can appear on the public Wiki page, the user has to manually insert a special page reference in the public page.

The next issue that we need to address is how users can choose where to insert their inputs in the public page. In the editing mode of Wiki, users see the page contents and the special page references. However, unless these references are replaced with the actual contents from the corresponding private Wiki pages, it will be difficult to identify the desired places to insert what the user intends to write.

To reduce the cognitive burden of manually relating links with linked contents, we provide a tool that retrieves the public content from the corresponding private Wiki pages with a simple gesture of the mouse.

3. Evaluation

3.1. Experimental settings

A total of 20 people with similar interest in a topic were randomly invited from the online Wiki communities to participate in this experiment. Prior to the experiment, they received training to use the Wiki system designed to have the content protection mechanism. In the experiment, they were asked to complete collaboratively one informative essay and organize themselves any way they pleased.

3.2. Observation and results

After the experiment each user was asked to answer the survey questions, as shown in Table 1, with a grade from 1 (lowest) to 5 (highest). The selected comments from the users are shown in Table 2.

Table 1
SURVEY QUESTIONS AND PARTICIPANTS' AVERAGE RATINGS

	Survey	*Average grade*
Q1	What is your overall impression of the private space in support of collaborative essay writing?	3.9
Q2	Does the private space help improve the content quality?	4.3
Q3	Is the content in the shared space easy to follow?	3.2
Q4	Are you satisfied that the whole of your private space is open to public?	3.5

Table 3 summarizes the main observations from the experiment. In general, the merits of content protection were well supported by the test subjects [OB1, OB4], but some users had a negative impression on the technical limitations of the interface [C06, C07]. The private Wiki space was used as an informal communication channel independently from the public Wiki space [OB2], and it also assisted in the exchange of ideas [C08, C09]. The fact that users spent considerable amount of time on reviewing the private content of other users [OB3] may account partially for the positive feedback of the users on the content quality improvement [C11]. However, they were not completely satisfied with the environment as they had to manually check for updates in the private space of other users [C15]. This would be a very specific time for future interface improvement.

Table 2

REPRESENTATIVE COMMENTS FROM THE SURVEYED USERS

Q1	Positive	[C01] I was able to develop my ideas efficiently in a document structure that was based on my own preferences, and it was nice that I could cherry pick what I wanted out of my private content to go in the public space [C02] The availability of a public space and a private space afforded me a great deal of flexibility on how the team could organize the collaboration process [C03] The private space helped develop respect to each other's work [C04] I was free from the fear that somebody may delete what I wrote on the page, which sometimes happened in public space
	Negative	[C05] Prior to sharing my private content, I had to adapt it to fit into the content of the public space [C06] I could not easily comment on a specific part inside the protected content in the public space [C07] I found the user interface a bit clumsy to insert my content into where I wanted in the shared space
Q2	Positive	[C08] I was able to share easily my current state of mind with other team members [C09] I wanted people to see the whole of my private space, so that they could gain deeper insight into my ideas expressed in the shared space [C10] It took more argumentative efforts to convince someone to change his/her views [C11] I was glancing at the contents in the private space of other people while developing my ideas. That really helped me to distill my thoughts [C12] I was able to maintain the full history of my own thoughts without any extraneous comments [C13] I felt that there were less chances of plagiarism among the members of the team, since all of us were aware of the fact that the private space was publicly accessible
	Negative	[C14] I wanted to improve on the private content of other people by editing inline, but I couldn't [C15] I spent most of my time on accessing and reviewing the private content of other users instead of writing down my own ideas to make sure that they were unique and worth contributing to the public space
Q3	Positive	[C16] I was able to follow the content because it was easy to distinguish between the essay contents and follow-up messages
	Negative	[C17] It was difficult to quickly understand who modified what in the shared page
Q4	Positive	[C18] I could open to people my entire private space because I would not put any confidential information in there
	Negative	[C19] Some contents in my private space were so sketchy and messy that some readers might be confused of what I wrote [C20] I was very tempted to peek at what others were working on by looking at their private Wiki. I felt that that somehow diminished my potential to generate ideas independently

Table 3

OBSERVATION RESULTS

[OB1] Users had the choice to use the public Wiki, but we observed a lot of content was developed in the private Wiki
[OB2] Users used their private space to comment on the ideas expressed in other users' private space
[OB3] Users spent on reviewing the private content of other users more time than developing their own content
[OB4] Users made revisions in the private space more frequently than in the public space

4. Conclusion

Social software can help pool like-minded people to combine their strengths for a common goal. This study has examined one of such systems empirically – a new flavor of Wiki we have developed that supports content protection. Writers seek an audience who can review and comment on their work. The proposed design was driven by the recognition that writing is both a private and collaborative process. Extending the regular open editing environment of Wiki can support the creation of this dual-process environment. The qualitative results from our experiment are encouraging and point at the direction that collaborative writing using Wiki can benefit from both a private and public space. We observed that the private space played an important role in the collaboration, ameliorated some of the perils associated with anonymity, and helped enhance the overall quality of team writing.

While the experiments also unearthed a number of interface issues for future improvements, we believe that our architectural approach has the potential to offer flexibility and performance advantages with respect to centralized Wiki environments. Decentralization can make the Wiki environment more scalable in the size of online communities, while respecting the individual preferences on the different flavors of Wiki and their interfaces.

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