

qwikWeb: integrating mailing list and WikiWikiWeb for group communication

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ABSTRACT

We have developed a new powerful group communication system *qwikWeb*, which is an integration of a WikiWikiWeb (wiki) and a mailing list system. Mailing lists are useful for exchanging dynamic information among people, but not useful for sharing static information. Wikis are useful for storing and editing static information on the Web, but sometimes people want to restrict the users or want to know who is responsible for the edited wiki page. Also, casual users cannot create a wiki site or a mailing list easily.

We solved these problems by combining wiki and mailing list. Users of *qwikWeb* can create a wiki site and a mailing list simply by sending an e-mail message to the *qwikWeb* server, and start exchanging information by using the mailing list. All the messages sent to the mailing list are stored as newly created wiki pages, and they can be edited as standard wiki pages.

In this paper, we describe the basic ideas, implementation details, and user experiences of the system.

Categories and Subject Descriptors

H.3.5 [Online Information Services]: Web-based services; H.5.3 [Group and Organization Interfaces]: Web-based interaction

General Terms

Design, Experimentation, Human Factors

Keywords

WikiWikiWeb, Mailing list, groupware, QuickML, *qwikWeb*

1. INTRODUCTION

Various communication systems are used on the Internet, and many people exchange e-mail messages everyday. To support group communication using existing e-mail frameworks, "mailing lists"(MLs)

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have been used for a long time. A mailing list is a single e-mail account which represents a set of e-mail addresses. When an e-mail message is sent to the address of a mailing list, the message is forwarded to all the addresses which are registered as members of the mailing list. If you make a mailing list for a group, you don't have to send messages to all the members, but you only have to send a single message to the mailing list address.

Although mailing lists are widely used these days, using them is not always the best way for sharing information, because of the following reasons. First, it is usually not easy to create a mailing list for casual users. Users have to either modify the settings of a mail server or ask somebody to create a new mailing list. Second, new users cannot see old messages unless messages are saved somewhere for browsing. In a large mailing list, the same kind of questions are periodically posted from newcomers, and old members have to suffer from hearing the same questions again and again. Third, old messages cannot be modified at all, and new complete information has to be posted to the list again even when a small error is found in an old message. When you want to arrange a meeting using a mailing list, to make even a slight modification all the information about the meeting must be re-sent to the list.

The first problem can be solved if people use a mailing list service like *QuickML*[1, 2], where a user can easily create and use a mailing list just by sending an e-mail message to the server. However, the other problems are inherent to the architecture of the mailing list system, and cannot be solved without changing the architecture dramatically.

If people use a *wiki*[3] system instead of a mailing list, many of the above problems can be solved. For example, new wiki users can easily share information with older members of the group just by browsing old wiki pages. However, a wiki system cannot completely substitute for a mailing list, since it is not easy for wiki users to keep track of the latest information on the wiki page, unless all the users check all the wiki pages frequently.

We believe that integrating a mailing list and a wiki system is a convenient solution to these problems. If you want to share information among people coming to your party, you might like to use a mailing list for sending new announcements, but you might also want to use a wiki page for showing the map or sharing information on what people should bring to the party. It would be nice if we could use a mailing list and a wiki at the same time with minimal effort.

We have developed a system called the *qwikWeb*, where a mailing list and a wiki page are elegantly integrated (Figure 1). Using *qwikWeb*, users can create a mailing list and a wiki site only by sending an e-mail message to the *qwikWeb* server. All the messages sent to the mailing list are automatically saved as wiki pages and can be edited just like standard wiki pages. Using the *qwik-*

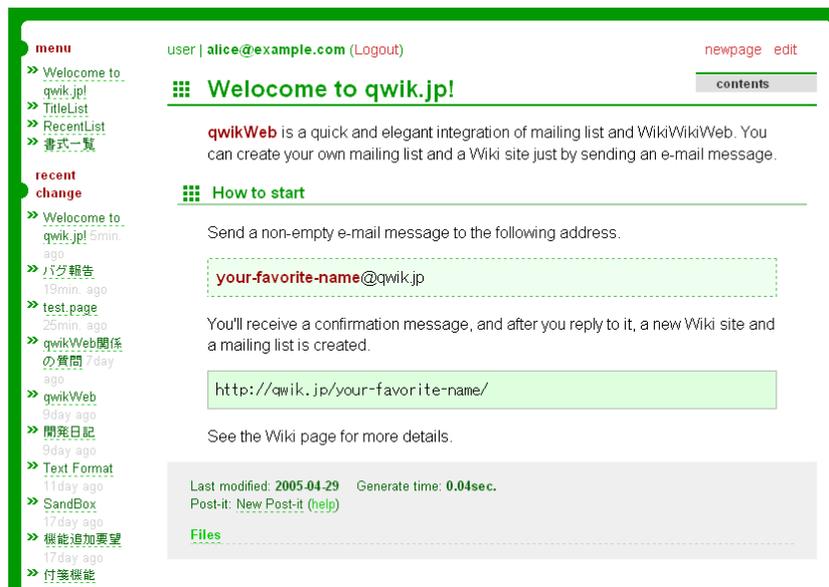


Figure 1: Screenshot of qwikWeb

Web system, people can exchange information with a mailing list, browse and edit old messages, add extra wiki pages, and so on.

2. USAGE OF QWIKWEB

Using qwikWeb, a user can make a wiki site and a mailing list at the same time, simply by sending an e-mail message to the qwikWeb server. In this section, we describe how users can create and use a mailing list and a wiki site quickly using the qwikWeb system.

Creating a new mailing list and a wiki

A user can create a wiki site and a mailing list at the same time, by sending an e-mail message to the qwikWeb server. He can select an arbitrary name (e.g. foo), and send a non-empty e-mail message to "foo@qwik.jp" to create a mailing list (foo@qwik.jp) and a wiki site (http://qwik.jp/foo/).

When Alice sends the following message to study@qwik.jp, a wiki and a mailing list named "study" are automatically created.

```
To: study@qwik.jp
From: alice@example.com
Subject: create

I created a new wiki site for our study group.
```

After sending this initial message, Alice receives a confirmation message from the qwikWeb server. She replies to the message, and a new mailing list (study@qwik.jp) and a new wiki site (http://qwik.jp/study/) are created, and a confirmation message is sent back to Alice. If a mailing list named "study" already exists before Alice tried to create it, an error message is sent to Alice saying that the name is already being used by somebody else.

```
To: study@qwik.jp
From: alice@example.com
Subject: [study:1] create

ML: study@qwik.jp
New Member: alice@e...

I created a new wiki site for our study group.

-
archive: http://qwik.jp/study/create.html
ML: study@qwik.jp
```

All the messages sent to the mailing list are stored as different wiki pages. At the end of each message, you see a corresponding URL (e.g. http://qwik.jp/study/create.html) for accessing the wiki page created from the message.

When you try to access the wiki site for the first time, you'll see the login screen of the qwikWeb system (Figure 2). You can go to the password acquisition page, and get your password using your e-mail address. Login information are saved as Cookies on the browser, and users do not have to enter a password again.

```
The user name and the password for http://qwik.jp/ are as follows.

User name: alice@example.com
Password: 12345678

Please access http://qwik.jp/study/.login again.
```

After entering the user name (your mail address) and the password at the login page, you can see the FrontPage of the wiki (Figure 3). Following the "Edit" link at the upper right corner of the page, you can go to the edit page (Figure 4) and modify the wiki page (Figure 5) just like using standard wiki systems. In this way, wiki pages of qwikWeb are only accessible to the members of the mailing list.

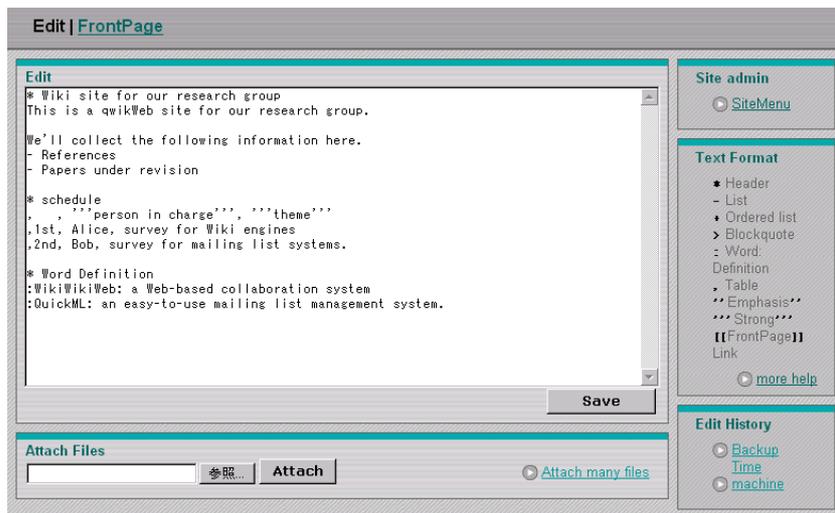


Figure 4: Edit mode of a wiki page



Figure 2: Login screen of qwikWeb

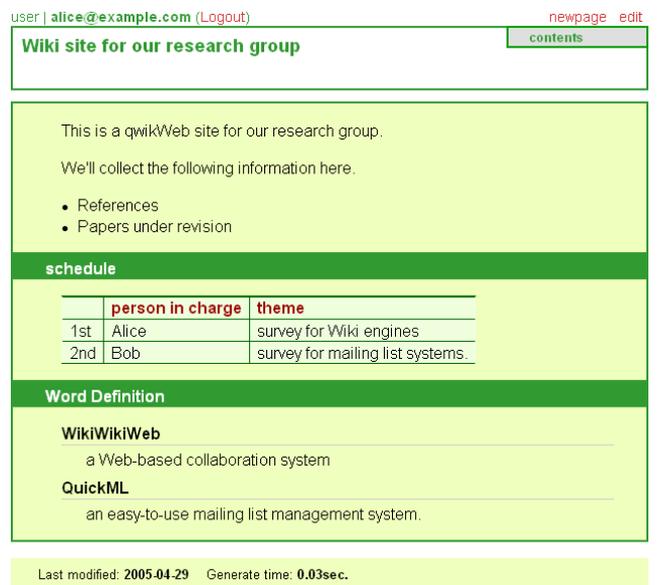


Figure 5: Result of the edit



Figure 3: FrontPage of qwik.jp



Figure 6: The first message becomes a wiki page

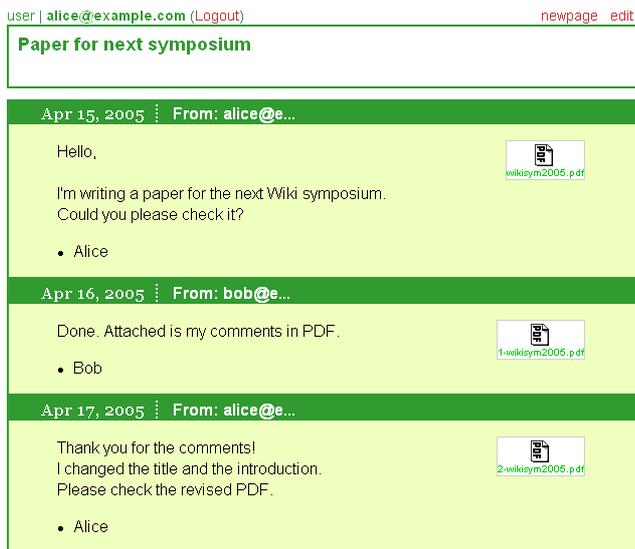
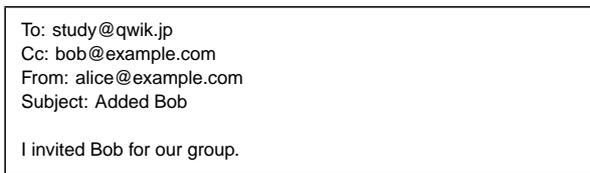


Figure 7: The mails are organized by each subject

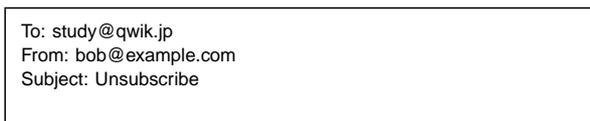
Member management

Any member can add a new member or remove an existing member by sending an e-mail message to the qwikWeb server, just like the QuickML system.

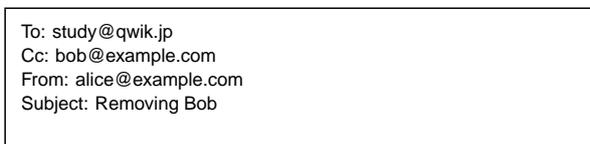
You can add a new member to the mailing list by sending an e-mail message with the new member's e-mail address in the Cc: section of the message.



If you send an empty message, you can leave the mailing list.



You can also remove other members by sending an empty message with the members' addresses in the Cc: section.



Converting messages to wiki pages

An e-mail message sent to the mailing list is automatically stored as a newly created wiki page on the wiki site (Figure 7). The subject of the message becomes the name of the wiki page. If the same page name already exists, the new message is added to the end of the old wiki page. On the wiki page, messages are stored in the form of i) headline of the date and the user-name and ii) continuing

body text of the message. With this function, all the messages with the same subject are saved on one wiki page.

If a file or an image is attached to the message, it also appears on the wiki page as a link or a thumbnail image.

Users can use wiki notations in the e-mail messages. They don't mean anything when they are read on standard e-mail readers, but they are treated as wiki tags on the created wiki pages.

Automatic deletion

When a wiki site and the mailing list is not used for more than one month, they will automatically disappear. The system sends notification messages to the members one week before the closing. If some of the members respond to the message or start using the wiki site again, members can continue using the wiki site and the mailing list.

Notification to users

When some of the wiki pages are edited, the system sends a notification message to the members of qwikWeb, and the members can tell that there were some modifications to the existing wiki pages. It would be annoying to receive e-mail messages every time somebody made changes to wiki pages, so the notification frequency can be selected. (Once a day is the default, but users can receive notification messages every hour, for example.)

3. ADVANTAGES OF USING QWIKWEB

In this section, we list the advantages of using the qwikWeb system for communication on the Web.

Easy creation of a wiki site and a mailing list

Using qwikWeb, creating a wiki site and a mailing list is extremely easy. They can even be created from a cell phone. Without qwikWeb, creating a mailing list is not an easy task, and creating a wiki site is often more difficult. People would not usually create a wiki site or a mailing list for a party on the same day, but qwikWeb users can create such trivial mailing lists without hesitation.

Easy member management

The wiki site created by qwikWeb is only accessible to the members of the mailing list. When a member is added to the mailing list, the new member acquires permission to access the wiki site. When one of the members modifies a wiki page, the name of the member is saved with the page, and the name appears on the wiki page. This feature is useful for showing who is mainly responsible for each wiki page.

Any member of the mailing list can add or delete a member by sending an e-mail message. No member has special privileges, and no single person has to take care of the mailing list and the wiki site forever.

Kind to newcomers

New members of the mailing list can easily read old articles on the wiki pages. Archived articles can be used for this purpose, but users of qwikWeb can easily add information to old messages or correct errors in old messages. For example, members can easily edit old mailing list articles to produce a useful FAQ page.

Flexible usage

Users of qwikWeb can select where they put particular information. They can decide to put important information on the wiki and send only new or trivial information to the mailing list. They can also decide to send all the information to the mailing list, leaving the

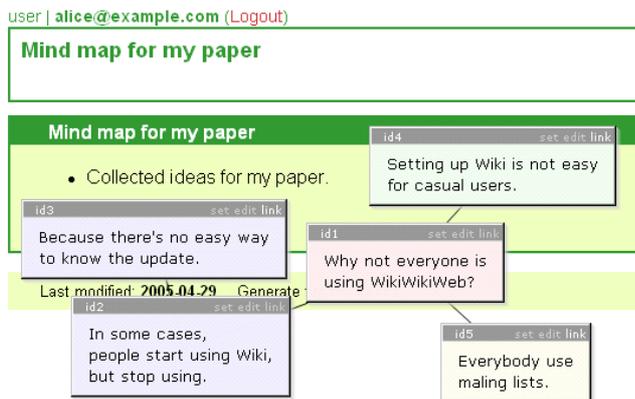


Figure 8: Post-it notes on a wiki page

wiki pages just for the article repository. Users can even use qwikWeb juts as a convenient wiki system, without using the mailing list at all.

4. IMPLEMENTATION

The qwikWeb server is written in *Ruby* language[4] and runs as a combination of a Web server and a SMTP (Simple Mail Transfer Protocol)[5] server, using a Web server library *WEBrick*[6]. As the system only uses standard libraries distributed with the *Ruby* language, you can install the qwikWeb system without installing extra libraries. The source code of qwikWeb¹ is distributed under GPL.

qwikWeb has several other interesting features.

- Snapshot archive of wiki site

The user can get an archive (a zip file) that contains static HTML files of all the pages of the wiki site. With this function, the user can browse the wiki pages without an Internet connection. The archive also contains the source text files of the pages.

- Page design collection

The user can select a page design from the page design collections. Customizing a page design can be a crucial factor, because the members might manage several wiki sites. Different page designs can avoid confusion.

- Video edit function

You can put a video file on a wiki page, and control how it can be played on the page by editing the time-line. This is useful for sharing multimedia information on the wiki.

- Post-it function

You can put post-it notes onto the pages (Figure 8)[7]. When you want to add a comment, but do not want to modify the page itself, you can put a post-it note to a specific position on the wiki page. You can also use this function for brain storming.

¹<http://qwik.jp/qwikWeb.html>

5. EXPERIENCES

qwikWeb has been available on the Web since July 2003, and we found the following usage patterns.

- 234 groups are using the qwikWeb server, and 91% (214 groups) are using wiki pages in addition to mailing lists.
- Many of the users begin by using qwikWeb as a mailing list service, but they start using wiki pages after some period.
- Many users hesitate to edit or delete old messages. They tend to create a new wiki page from the contents of old messages.
- Wiki pages are organized well when one of the members takes care of managing the wiki site. But when no member has experience using wiki, information is not organized very well on the wiki site.
- Users like handling attached files on wiki pages.

Since qwikWeb can be used as a mailing list and as a wiki at the same time, it can be used in various situations where wiki or mailing list alone is not sufficient.

- Uses in an educational environment

We used the qwikWeb system for supporting a class at Tokyo National University of Fine Arts and Music. When a teacher published a wiki page of a bibliography and a list of Web sites for the class, some students enhanced the document actively. Since the all modifications on the wiki site are logged with the user-name, the teacher can inspect the activity of the students from the wiki site. All the questions and answers posted on the mailing list are stored on the wiki, and related materials are also saved on the wiki. We found that the combination of mailing list and wiki is great for supporting class activities.

- Use in office

There are some examples of use in office environments. Though it is difficult to treat stock-type information like the schedule of each member, budget management, progress report and work flow management on the mailing list, they can be organized on the wiki site appropriately. As the discussion on the mailing list is organized on the wiki site, members can refer back to past discussions easily. Members can be sure that the other members are notified when the wiki site is updated.

- Personal Use

There are several personal wiki sites. After sending any memorandum, bookmarks, tips, etc. to the wiki site by e-mail, the user can organize the information later. This makes it easy to store information like bookmarks, how to, tips, etc. efficiently.

6. DISCUSSIONS

Using the qwikWeb system is different from using standard mailing list systems and standard wiki systems independently. In this section, we show some of our findings of the usage of qwikWeb.

Change of usage patterns

E-mail users do not tend to use the **Subject:** field with care. Even after the topic of the messages has changed, people do not tend to change the subject of the messages appropriately. We often find e-mail messages with a title quite different from the content of

Table 1: Comparison of various group communication systems.

	Web-based ML management system	QuickML	WikiWikiWeb	qwikWeb
Advantage	You can see mail archive on the Web. You can specify each authority of the members separately.	You can start a mailing list easily. You can add and delete members only by sending e-mails.	You can easily edit pages from Web browser. You can easily organize information.	You can easily start sharing information just by sending e-mails. You can also organize information on the Web.
Disadvantage	There is no corresponding wiki site. E-mails are accumulated, but you can not organize information.	Information is not accumulated. The person who participated later can't know prehistory.	You can't know when the page is updated, and can not know who edit the page.	All participants have same authority. It's not suitable for the group that need rigid authentication.
Summary	It is suitable for a group with rigid management rules.	It is suitable for a group that does not need to organize information.	It is suitable for a Web site that everyone can participate.	It is suitable when you'd like to share information immediately and organize information.

the message. This is not a big problem for mailing list users, but with the qwikWeb system, all the messages are saved as wiki pages based on the **Subject:** field, and it looks quite strange to see a wiki page whose title is very different from the content of the page. For this reason, users of qwikWeb tend to put appropriate titles to their messages, so that it doesn't look strange after the message is saved as a wiki page with that title.

Also, users of qwikWeb tend to be careful about the usage of special symbol characters in e-mail messages, since they are sometimes unintentionally converted to HTML tags on the wiki page. People often use arbitrary symbols (e.g. "*", "-") in their e-mail messages, but qwikWeb users tend to restrict the usage pattern and make them compatible to standard wiki notations.

Authentication

We cannot use standard wiki systems for exchanging secret information, since anybody can browse, edit or destroy the contents of the pages. Using qwikWeb, only the members of the mailing list can edit wiki pages, and authentication is automatically performed when they join the mailing list. This strategy seems to be better than adding special authentication methods to existing wiki systems.

Comparison

A comparison between the existing group communications systems and qwikWeb is summarized in Table 1.

7. RELATED SYSTEMS

Web-based mailing list management systems

There are many Web-based mailing list management services, including *Yahoo! Groups*[8] and *MSN Groups*[9]. Using these services, users can create and manage a mailing list easily on a Web browser. Messages are often stored on the server and can be accessed later from the browser, but unlike wiki, users cannot edit old messages or add new contents to the archived data.

Integrating wiki and e-mail

There are several approaches to integrating wiki systems with conventional e-mail framework. Users of *JotSpot*[10] can modify a wiki page by sending an e-mail message to an address corresponding to each wiki page. *PukiWiki*[11], a popular wiki engine in Japan, can also update its wiki pages after receiving e-mail mes-

sages. *Hiki*[12], another popular wiki engine in Japan, sends e-mail messages to registered users when its wiki pages are updated.

qwikWeb is different from other systems in that it is very tightly integrated with existing mailing list architecture. First, access control to wiki pages are closely related to the mailing list management, and only the ML members can access the wiki site. Second, all the messages sent to the mailing list are stored as wiki pages and the messages are organized properly. Third, update notification messages are sent to the mailing list so that members do not miss new information composed on the wiki site.

Special purpose wiki systems

Trac[13], developed by the Edgewall Software Inc., is a system that integrates wiki with a bug tracking system. Users can create "tickets" for bug tracking, and they can organize information using the wiki system. Users of *Trac* can not only manage the bug tracking information on the wiki, but also manage the documentation about the project. Since a bug tracking system is often used within a private project, no access control method is integrated to the system.

Access control of wiki

Although everyone can read and write standard wiki pages, we sometimes want to know who is actually responsible for each wiki page, or want to control the access level of each page. Burrow developed a wiki system which automatically generates access rule for a wiki site[14]. The system inspects the editing operations on wiki pages, and set access levels according to the operations. In qwikWeb, all the users have the same privilege for accessing the wiki site, but it might be useful if the system can generate access control rule automatically from editing histories.

Using wiki in educational environments

Guzdial et al. developed a wiki engine named *CoWeb*, and they use the wiki in a learning environment in Georgia Tech[15]. In two years of operation, more than 120 wiki sites were created on ten servers. For a learning environment, Wang et al. extended the standard wiki by adding extra access control such as page owner, writing authority, invisibility mode, etc[16]. Brereton et al. constructed a study support environment based on wiki[17].

We conducted a proof-of-concept experiment in a community of hundreds of people at an art university. We observed the usage of the system, and heard the comments from the community. We implemented some functions including the video edit function and

the post-it function as a result of the experiment.

8. CONCLUSIONS

We proposed a simple and powerful group communication system called qwikWeb that integrated wiki and mailing list. A qwikWeb server has been open to the public for more than one year, and we found that many users could enjoy using a wiki site and a mailing list at the same time. We also found various interesting usage patterns of qwikWeb.

We are hoping that we can develop the ultimate communication system on the Internet, where everyone can share dynamic and static information everywhere with minimal effort.

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