

WikiWikiWeb as a Tool for Collaboration

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Abstract: With the growth and increased usefulness of the World Wide Web it has become an effective means of collaboration between users'. WikiWiki meaning "very quickly" is a collaborative web server allowing multiple users to "collaborate" in editing pages without the need for user-names, passwords, or any other security mechanisms. This paper presents the results of building a 'WikiWikiWeb' web-site consisting of several 'Wiki' pages. The site was evaluated by students who carried out a series of tasks in order to measure the collaborative 'power' of the Wiki environment and the behavior of the students when faced with a site that allow them to freely edit and add content to their peer group's pages.

Key words: Collaborative learning, WikiWeb, collaboration, WWW

INTRODUCTION

Online communication is an ever-growing part of the World Wide Web today and as a result better and more improved methods of collaborating over the WWW are being sought after on a daily basis. 'Wiki' is best considered under the 'umbrella' heading of collaborative web servers. These are computer servers which allow more than one user to work together. The word "wiki" itself comes from Wikiwiki which means Fast, speedy; to hurry, hasten; quick, fast, swift. This term is used in numerous Hawaiian contexts, formal and casual, in the simple sense "quick" or "informal".

The WikiWikiWeb was originally developed in 1994 by Ward Cunningham, its advantages over other collaborative web servers in that, not only can its content be edited, but the organization of the content can also be edited^[1]. By simply using a standard browser without any add-ons, any user of a wiki web-site can edit existing pages (by clicking the "EditPage" button) or create new ones. WikiWikiWebs promote meaningful topic association by making link creation as intuitively as possible and showing the existence of target pages. An interesting aspect of WikiWikiWebs is that they are actually never "finished". There is an ongoing process of updating and extension where others can view updated pages as soon as they are posted. Users can also view documents recently created or updated by the RecentChanges page. One of the main features of the WikiWikiWeb is that users can do all of the above without passwords or other security measures. It is possible to have security built in but the experience of the

WikiWikiWeb to date has been that this lack of security has done little damage^[1]. There is an explanation within the first wiki site created (Portland Pattern Repository) of why this is the case. The explanation admits that information can be changed or deleted by anyone-however pages represent consensus due to the fact that it is easier to delete "flames" and "spam" than indulge them, and that's what remains is naturally meaningful "Anyone can play, only good players last" (WikiWikiWeb site of the Portland Pattern Repository, 2003). The goal of Wiki sites is to become a shared repository of knowledge, with the knowledge base growing over time. Wiki pages have an "EditText" link on all pages (Fig. 1) whereby any user can edit or add content. By default wiki pages are black and white. According to Leuf and Cunningham^[1] a reason for this is "because you have people editing content in browser forms, which is a very primitive user interface for anything except plain text". A typical Wiki page will have a large amount of internal hyperlinks. Wiki hyperlinks are formed by linking together a string of capitalised words e.g. "KieraPage", "StartPage". If a user creates a link to a page that does not exist, wiki inserts a "?" before the link, it visually clues and invites the visitor to provide content where it is lacking. Bicapitalisation or camel case (frequently written CamelCase) is the practice of writing compound words or phrases where the terms are joined without spaces, and every term is capitalised. The name comes from a supposed resemblance between the bumpy outline of the compound word and the humps of a camel. CamelCase is the original wiki convention for creating hyperlinks, with the additional requirement that the

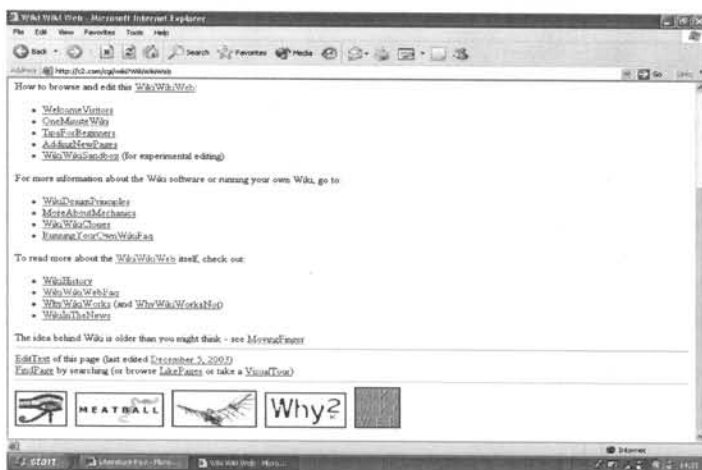


Fig. 1: Screenshot showing bottom half of a Wiki page

capitals are followed by a lower-case letter, hence ABc would not be a link but the colour of the bar is.

Wiki's have special search functionality. The search page will often contain entry forms and search buttons. In addition to this, Leuf and Cunningham^[1] describe "Backlinks search... which finds special use on "topic" pages to find other pages that contain this link and thus "belong" to a particular topic". Wiki is great for linking ideas (note, ideas not just documents)^[1]. Wiki also has an element of refactoring; nobody can write everything there is to know about a subject in one sitting however Wiki can encourage the scribbling of notes and ideas anytime and refactoring them later to make them useful. Leuf and Cunningham^[1] state that a wiki "slants in favour of authors at some inconvenience to readers". Perhaps the greatest overall advantage of wiki is its accessibility:

...by avoiding the feature-ridden "bleeding edge" of so-called "HTML design", we also avoid most browser dependencies. This is a significant step toward ensuring that the wiki is both platform and client independent—a true run-anywhere, view-anywhere^[1].

A prototypical 'WikiWikiWeb' web-site, consisting of several 'Wiki' pages was created where the functionality of the web-site allowed users to freely edit and add content thus engaging in the main concept behind 'wiki'-open authoring. We developed a WikiWikiWeb site which allowed students to freely edit and add web. We monitored their behavior and probed them on their interaction with a WikiWikiWeb environment.

Wiki site setup: A WikiServer with modifications by Elroy Ronald was used for hosting the Wiki site. This Wiki Server contained the original functionalities of Edwards^[2] WikiServer but also additional features such as the ability to protect pages, more colour and the ability to reproduce CamelCase as separate words. Upon first accessing the URL, a basic template for Wiki is

displayed in the browser window. This template contains a page entitled "Start Page"; the remainder of the page is blank with the exception of two links at the bottom, Edit and FindPage, respectively. The Edit Page is where all editing of a wiki page is carried out. The Edit Page contains a text box where the user inputs some data and the page is updated when the user presses the save button. The purpose of the Find Page is to allow users to find all Wiki pages containing specific text either within the page title or within the page content.

The architecture for a WikiWikiWeb web-site contains three components (Fig. 2). These are a wiki-server, a network connection, and one or more client browsers. Each of these components has certain roles. The wiki-server is responsible for distributing pages of formatted information to clients that request it. The requests are usually made over a network connection that uses the HTTP (Hypertext Transfer protocol) protocol—the set of rules for exchanging files on the web. The web browser sends HTTP requests by either typing in a URL (Uniform Resource Locator) or clicking on a hypertext link and this request is then sent to the address specified by the URL. The dialogue used throughout is simple and natural. For example, if the user wants to edit a page within the web-site they press the "EditPage" link at the bottom of the interface; the edit page will appear allowing the user to enter the required data (Fig. 3).

As the whole concept of wiki is about collaboration and open authoring these pages where only designed to aid the collaboration process and encourage users to add content to the site. Situated at the bottom left of the StartPage is a DumpAllPages link. This is a very useful feature that backs up all your 'wiki' files created within the web-site. When the Wiki server is started it looks for the DumpAllPages file in the server directory and if it finds it creates an archive of all the pages created within the wiki (overwriting

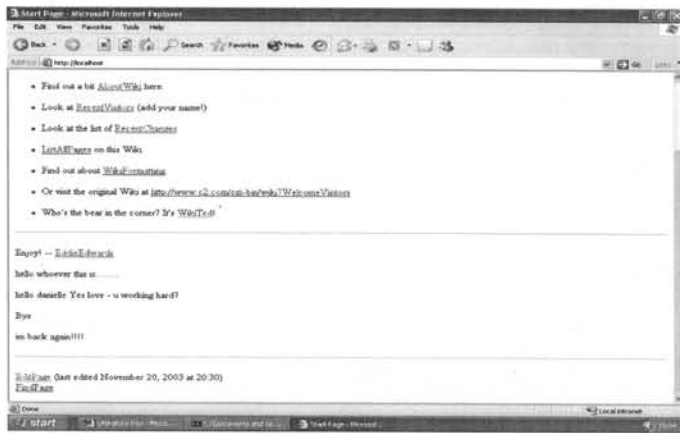


Fig. 2: Wiki-server architecture

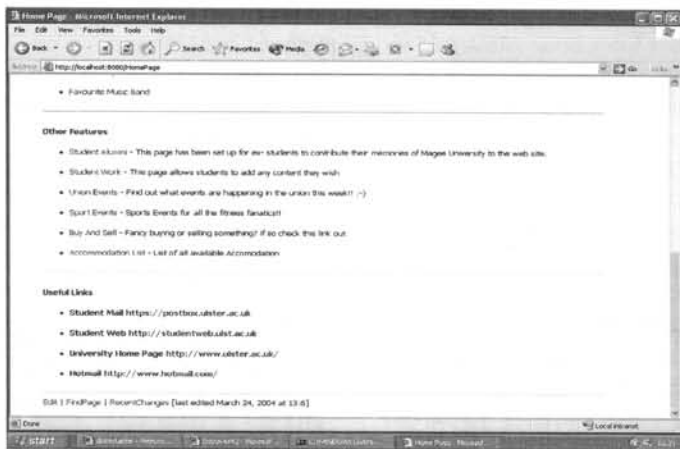


Fig. 3: Initial design of WikiWikiWeb web-site

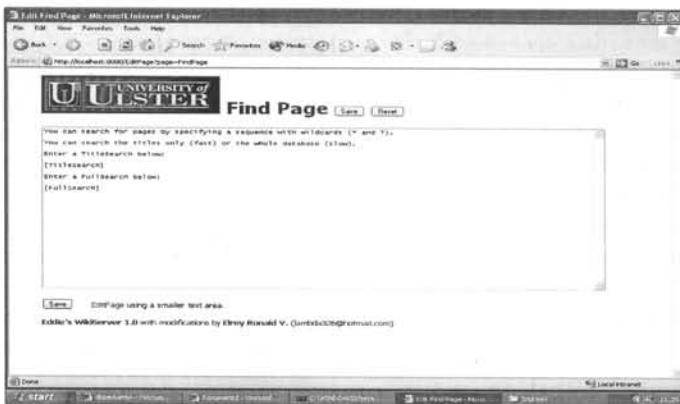


Fig. 4: Bottom half of homepage within the WikiWikiWeb web-site

pages with the same name). The Wiki server renames this file with a bak extension afterwards, so it will not create the pages every time it starts. A Pages subdirectory folder must exist for this

process to work. This is useful if you run the Wiki server in two locations, and you want to keep your wiki pages in sync; you can just e-mail the DumpAllPages file from one

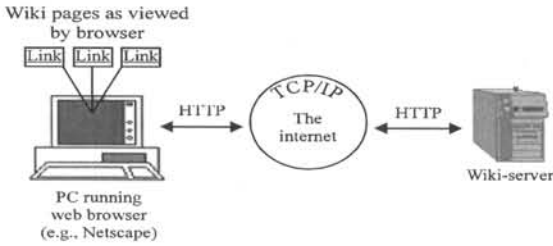


Fig. 5: Find page within the WikiWikiWeb web-site

computer to the other. It also acts as a security feature; if for some reason the content of the 'wiki' is deleted or becomes corrupted a back up copy is available. The file can be viewed in a text editor. To aid evaluating the site (later) pages such as Student Alumni, Student Work, Union Events, Sports Events, Buy and Sell and Accommodation List were created (Fig. 4). The purpose of these pages was to promote collaboration so that students would add relevant content within the site.

The "FindPage" link (accessible from all pages) includes both a "Title Search" feature (to search the entire site for all pages which had a particular string of text in the page title) and a "Full Search" feature (to search the entire site for all pages which had a particular string of text anywhere on the page). The search features were added by typing in "[TitleSearch]" for the title Search feature and "[FullSearch]" for the Full Search feature in the "Edit" window of the FindPage (Fig. 5).

Another feature within WikiServer is the ability to protect certain pages from being edited by users within the site. This was a very useful feature as it prevented the users from deleting content that may have affected the collaboration process. But as the whole idea behind Wiki is about open authoring without the hassle of security this feature was only applied to a small number of pages therefore still allowing the users to collaborate and enjoy the whole experience of wiki.

Evaluation: Two groups were chosen for monitoring their behavior and probing them on their interaction with our WikiWikiWeb environment. One group was 2nd year BSc Computing Science students from the University of Ulster, Magee campus and the other group was a year 11 ICT students from the local Thornhill Secondary School. A set of tasks was devised for each student to complete. To assist the students in completing the tasks, a set of User Instructions was given to them. The set of tasks consisted of seven tasks, each zoning in on a particular aspect of Wiki:

- Task 1: Creating a new wiki page-students were invited to create a new page using the Wiki procedure to do so, and to then add some content.
- Task 2: Formatting Text in a Page-students were invited to apply some emphasis (e.g. italics, bold) to the text they added in task 1.

- Task 3: Creating links-students were asked to create both internal and external links and a description of the links.
- Task 6: Creating an ISBN link-students were asked to create an ISBN link followed by a description of the link.
- Task 5: Searching-students were asked to use the search facilities within the wiki.
- Task 6: Editing Existing Pages-students were invited to add content to existing pages on the site.
- Task 7: Two or more students editing the same page at once-students were asked to investigate how wiki handled two or more users editing the same page simultaneously.

As more and more students contributed to the site, the collaboration process became more and more evident. Not only did the students add content that they were instructed to do but they also freely added their own comments and contributions to the site. The students respected content entered by others and no offensive material was entered into the site. Students had no difficulty in creating their own personal wiki pages in an orderly fashion as directed by the task list.

To summarize present findings, 85% of students claimed to find it easy to navigate around the site. Some students found it difficult to use CamelCase and it was essential to understand this feature to be able to create new pages. A large percentage of the users (60%) found it easy to format content within a page and none found it difficult or very difficult. A majority of the users found it easy to create internal links (61%) and external links (65%) with none finding it very difficult. This result also proved a little surprising as to create internal links the students had to use CamelCase which they stated in a previous question that they found difficult to use. After some consideration it was decided that initially the students found the concept behind CamelCase difficult but once they grasped how to use it effectively they had no problems. When questioned about using the "Title Search" and "Full Search" features a massive proportion of students 79% and 82% found it easy to use. The majority of students (83%) liked the idea that they could freely edit content within the site without the hassle of security and complicated markup languages. Also a lot of the students found it easy to use and thoroughly enjoyed their first wiki experience. As expected the main weakness that students stated (30%) was that the site lacked colour. In defense to this reaction the students have to understand that wiki is designed on the concept that it has to be freely accessible using a minimal web server. By default wiki pages are black and white^[1] a reason for this is because you have people editing content in browser forms, which is a very primitive user interface for anything except plain text. Wiki is not like other web

pages that are usually high on presentation and low on content. Navigation is also an issue within the wiki, it does lack structure and it is difficult to get used to using the Search facilities instead of the back button which users commonly use. Only 7% of the students said that security was a weakness within the site. The majority was positive and seemed to enjoy completing the tasks and collaborating with other users. One respondent did not approve of the idea that other students could edit content within their page and suggested that the exercise should have been better supervised. A problem with this idea is that it is against the concept of wiki; the whole idea of wiki is based on open authoring where provided that students respect the views of others within the site. Finally, we noticed that students did not feel the need to delete any content within the site. This is something that could have been done and it refers back to a comment made by Cunningham that pages represent consensus due to the fact that it is easier to delete flames and spam than indulge them, and that what remains is naturally meaningful-Anyone can play, only good players last.

CONCLUSIONS

A 'WikiWikiWeb' web-site has many advantages; the most notable of these advantages include the ability to edit page content using a simple web browser. The user was able to carry out this without the need of any passwords or knowledge of Internet mark-up languages. A key feature of wiki is that it is never-ending; it can be

continually updated by the users. Due to the nature of wiki; no complex scripting languages is required for users to update pages. The overall collaboration process increased at the pace of the student. The majority of students felt that the environment as a whole was very useful and could hold important benefits for the future of collaborative web servers. They could all see the potential of such a collaborative environment and some were extremely impressed with the new mode of collaborating. However, some students did not feel comfortable with the idea that other students could freely edit content entered by them, perhaps this was because they are not quite used to the concept of wiki. As the testing stage proceeded it became apparent that the users did react to the freedom given by wiki. One student decided to inject some humour by changing the names of films and bands that other students had entered. It is important to also note at this stage that no students abused this freedom, nobody deleted large amounts of content and nobody set out to offend anyone else.

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