# Understanding Information Sharing in Software Development through Wiki Log Analysis

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## ABSTRACT
The use of wikis in software development seems to be growing rapidly. Recently, software development teams have begun to employ wikis to do such things as: collaborate across locations; brainstorm and track projects; organize knowledge; and facilitate information sharing. This poster reports preliminary findings from the analysis of the logs of two wikis, which supported two different software development projects. This work shows that, with the wiki log analysis, it is possible to identify patterns of information sharing.

## Categories and Subject Descriptors
H.4.3 [**Information Systems Applications**]: Communication Applications; H.5.3 [**Information Interfaces and Presentation**]: Group and Organization Interfaces – *Computer-supported cooperative work.*

## General Terms
Management, Design, Documentation

## Keywords
Wiki, wiki log, information sharing, interdisciplinary design

## 1. INTRODUCTION
Interdisciplinary collaboration has created challenges in software development due to the difficulty in communicating and coordinating across disciplines [2]. As a result, software development teams employ many different kinds of information technologies to support communication and collaboration. Wikis, in particular, have gained popularity as collaboration tools. Recently, software development teams have begun to employ wikis to do such things as: brainstorm and track projects; facilitate information exchange within corporations; collaborate across locations; and organize knowledge [3].

To understand how interdisciplinary software development teams use wikis to share information during the design and development process, qualitative and quantitative data have been collected through observations, interviews, reviews of the content organization and visual design of wikis, and analyses of wiki logs.


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## 2. WIKI LOG ANALYSIS
Wiki log analysis is often done to understand large-scale collaboration or large-scale collaborative writing [4]. With the analysis of the Wikipedia log files, for example, researchers have examined the development of Wikipedia and its structure [1] conflict and coordination in co-authoring [5, 6], and the quality of content [6]. The study reported in this poster will demonstrate how the wiki log analysis can be useful in understanding information sharing and collaboration in small projects.

## 3. RESEARCH METHODOLOGY
The log files for two different wikis were analyzed. Each wiki supported the processes of a different software development project, taking place in the educational software research and development group of a research university. For "Project A: Online discussion board," the goal was to develop a major new release of an online discussion board application. For "Project B: Web-based collaborative space," the goal was to develop an online collaborative workspace for students, faculty, and staff. Both projects are interdisciplinary as they consisted of project managers, software developers, interaction designers, researchers, and QA engineers, who worked together throughout the process.

## 4. FINDINGS
We define information sharing as an activity that always involves at least two actors - a sharer and a receiver, and it is not completed until a receiver gets the shared information. What constitutes "information sharing" when using a wiki? In this work, we consider two kinds of activity. The first is "editing," where a page is either i) Created, ii) Subsequently revised; or iii) When a file is uploaded to the page. Thus, the amount of shared information can be measured in terms of page size, number of pages, number of files, and number of edits. The second kind of activity is "viewing," where a member of the project team views a wiki page. We use the number of page views to roughly measure how often shared information on the wiki is accessed by information receivers.

### 4.1 Information Sharing Overview
Each wiki was created by the project managers a few days before the projects started. Table 1 shows general statistics of the two project wikis. Although the projects are different in

length (4 months vs. 12 months), size (6 project members vs. 9 project members), and goals, the project wikis are similar in terms of size, number of edits, and number of views. The longest wiki pages of both projects contain meeting notes, agendas, and minutes.

**Table 1: General Statistics of Project Wikis**

| | Project A | Project B |
|---|---|---|
| Total pages | 59 | 70 |
| Longest page (bytes) | 29219 | 109601 |
| Shortest page (bytes) | 87 | 44 |
| Average page size (bytes) | 4043 | 5279 |
| Files uploaded | 88 | 163 |
| Highest edits (per day) | 79 | 53 |
| Reverted edits | 0 | 0 |
| Deletion | 0 | 0 |
| Total edits | 1028 | 1104 |
| Total views | 5052 | 6208 |

## 4.2 Information Sharing Patterns

Project wikis reveal that project members worked together in creating and sharing information on the project wiki. Many wiki pages (85% for Project A and 49% for Project B) were co-authored by multiple people as shown in Figure 1.

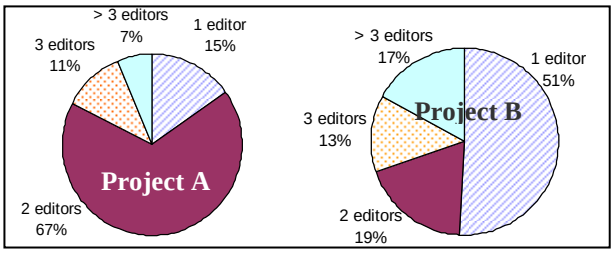


**Figure 1: Distribution of edits by number of editors per page**

Additionally, the wiki log analysis also shows that there was interdisciplinary collaboration among project members as 24% and 35% of project wiki pages (Project A and Project B respectively) were edited by people from multiple disciplinary groups. However, designers appear to share more information through the project wikis as shown in Figure 2 that they made more edits than other groups. Designers also created more wiki pages for the project wikis. In contrast, software developers rarely shared information through the project wikis.

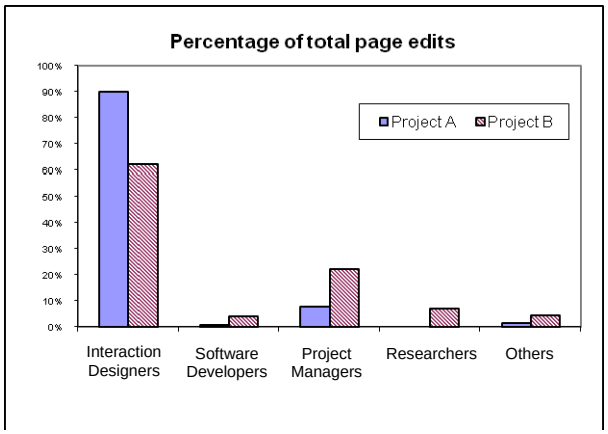


**Figure 2: Distribution of edits by disciplinary groups**

## 4.3 Use of Shared Information

Both project wikis were highly viewed when comparing the number of views to the number of edits. Figure 3 shows that the number of page views increases as the number of page edits increases. This suggests that those pages that are revised frequently are also used frequently.

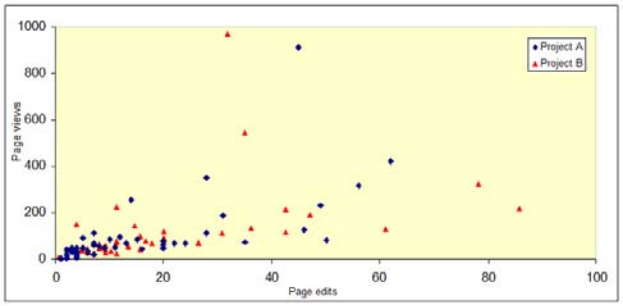


**Figure 3: Page views versus page edits**

## 5. CONCLUSION

This poster presents the preliminary findings from the wiki log analysis of two software development projects. It demonstrates how the analysis of wiki logs can help us understand information sharing and interdisciplinary collaboration during the software design and development process.

In future work, the data from this wiki log analysis will be combined with interview data to better understand how wikis are used to support information sharing and collaboration during interdisciplinary design processes.

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