

A STRAIGHTFORWARD APPROACH FOR ONLINE ANNOTATIONS: SPREADCRUMBS

Enhancing and Simplifying Online Collaboration

Ricardo Kawase and Wolfgang Nejdl

L3S Research Center, Leibniz Universität Hannover, Appelstr. 4, 30167 Hannover, Germany

Keywords: Annotation, Social Media, Social Network, Online Collaboration, User Interface, SpreadCrumbs.

Abstract: Countless user studies and everyday observations have shown that individuals make annotations while reading - highlighting, circling and underlining important parts of the text, moreover adding written comments. Since the Web became the biggest accessible source of information, many of the reading activities happens online in the browser. In this sense, it is expected that the individuals would keep their annotation behaviors, provided that the appropriate tools are available. Although several Web annotation projects currently exist, it is difficult to identify the most prominent in the field. With SpreadCrumbs, we simplify the annotations actions and the social navigation support. SpreadCrumbs users can add in-context annotations to any webpage with minimum cognition load, as they would do when reading a paper; in addition SpreadCrumbs enhances online collaboration and provides mechanisms to support social navigation by means of existing social networks. It allows the users to freely express themselves and to add any desirable substance to the resources. Technically, annotations carry valuable information about the content, more than bookmarks or tags, having a greater impact on collaboration and search for re-finding. SpreadCrumbs exploits all these advantages with an intuitive and easy-to-use user interface.

1 INTRODUCTION

We understand annotation as some extra information attached to a resource that can assume many different forms. In-context annotations may not only help you later but may be useful as well for other future readers. Eventually, scribbling is extremely common during reading activities. In some user driven tests O'Hara and Sellen (O'Hara, 1997) demonstrated that most of the subjects used annotations to help understand the text and to aid in the future task of writing. In an impressive field study on annotations in college textbooks, Marshall (Marshall, 1997), (Marshall, 1998) managed to identify patterns in annotations, statistics and further more describing and classifying the many forms of annotations such as: signalling for future attention, memory aiding, problem-working, interpretation, progress tracing in narrative and so on.

Given that the Internet is the largest source of information nowadays, it is expected that a lot of the readings occur online; consequently Web annotation would be an expected feature on the Internet. However, no annotation system so far has shown

nimbleness, perspective or has survived the first years of existence, nevertheless, it has been far discussed the importance of annotations for comprehension and also the benefits for reading/writing proposes (O'Hara, 1997). Given the absence of any dominant mature annotation system, it appears that there is still no generally accepted, concrete method for straightforward online annotation. In order to understand such problem – and the user's preferences for tagging and bookmarking systems over annotation systems - we've developed a simple, easy to use and straightforward system that supports Web annotation with basic features of annotation, bookmarking and social navigation support. In this paper we introduce this promising system explaining its usage and functionalities.

The rest of the paper is structured as follows: In Section 2 we go through some related work. In Section 3 we describe the SpreadCrumbs system closing with the future work and conclusion.

2 RELATED WORK

The first group of related works is the existing and past commercial tools for web annotation. ThirdVoice¹ was probably the first expressive commercial Web annotation tool. It was a plug-in for Internet Explorer 4 and Netscape Web browsers which allowed the users to publicly annotate any webpage. The “in margin” written annotations were visible to any user of the application that accesses the site. It is not completely transparent where ThirdVoice failed but the service was discontinued on April 2001. Some other old discontinued commercial systems Hypernix, NovaWiz, utok, Zadu followed the same steps with less public attention. More up-to-date systems Fleck², SharedCopy³, Diigo⁴ bring a new air for the annotations scenario. They grant tagging, re-finding, collaboration, social navigation and annotation itself working in the same way as the old tools - a plug-in for the browsers. Still, none of them reached a considerable impact level in the Web as it happened in social networks, folksonomies and tagging systems.

In addition to the commercial tools, several research projects aim to enhance Web collaboration by providing annotation capabilities. We have been through some of these works to try to understand the evolution in the Web annotation scenario.

The Anchored Conversations system (Churchill, 2000a) provides a synchronous text chat window that can be anchored to a specific point within a document. It is presented as a post-it note and can also be used for re-finding by the system search option. In this case the collaboration occurs during a synchronous chat. Like the Anchored Conversations we understand that the most appropriate metaphor for transient annotations is the post-it notes.

Fluid Annotations (Zellweger, 2001) supports in-context annotations and it is an extension of the open hypermedia Arakne Environment (Bouvin, 1999). But different from other researches, the studies and evaluations are mostly presentation of the annotations, as seen in (Zellweger, 2000) and (Zellweger, 2001) in terms of visual cues, interactions and animated transactions. Their evaluations give valuable material for annotations manipulation and usability, however, their approach of “between lines” annotations disrupts the original

layout of the annotated content besides the distractive animation transactions.

In the end, all attempts, projects and commercial tools aim to enhance communication and collaboration among the users independently of the task. Putting together all those systems there is a common understanding of the potential value provided by annotations nevertheless few has been used in large scale to gather enough data to understand the user’s behaviors and existing patterns during online task-free annotation practice.

3 SPREADCRUMBS

SpreadCrumbs is an in-context Web annotation system. The basic idea is that using SpreadCrumbs the users can annotate Web resources with keywords or sentences and share these annotations over a social network. We can compare SpreadCrumbs to social bookmark systems such as del.icio.us.⁵ or GroupMe!⁶ with the slightest but crucial difference that the annotations are displayed on a layer over the Web resource (in the context). We use a very common visual metaphor for annotations, reminders and alerts: *post-it* like notes. The annotations (which we will identify as a *crumb*) are added with minimum effort. The right click context menu shows an option “Add Crumb”. Instead of creating our own social network we decided that the right strategy would be to bring one’s service to the users and not the other way around. Due to that we chose to build our social infrastructure on Facebook⁷ platform. In our quest for answer the absence of annotation in the Web, this strategy covers what maybe the first dilemma – many users are not very confident subscribing to new Web sites services or installing new applications.

SpreadCrumbs consists in two different implementation packages, the Facebook application with the SpreadCrumbs server pages and the browser (FireFox) plug-in.

3.1 SpreadCrumbs Characteristics

On SpreadCrumbs we have two different concepts: *topics* and *crumbs* where each *topic* contains at least one *crumb*. The *post-it* note metaphor is a *topic* with *n crumbs*. Each *topic* on SpreadCrumbs is associated to an URL and it can assume different purposes. A

¹<http://www.ThirdVoice.com> (March, 2000)

²<http://www.fleck.com>

³<http://sharedcopy.com>

⁴<http://www.diigo.com>

⁵<http://delicious.com>

⁶<http://groupme.org>

⁷<http://www.facebook.com>

private *topic* where the user post it to herself is an annotation used as a bookmark, a reminder or some extra information about the resource. A shared *topic* between many users is a shared bookmark and also a reminder for the people involved in the *topic*.

Moreover it assumes the behavior of a discussion group or a forum on the defined context. In this last case the users involved can add new *crumbs* to the *topic*.

The post-it note contains the *topic* creator, the participants of the *topic*, the *topic* itself and the *crumbs* texts. The mouse-over tooltip shows the dates of each *crumb*. From the post-it interface the user is able to delete her *crumb*, reply the *topic*, change her status in the *topic* and follow her trail of *crumbs* or the trail left from other users as shown in figure 1. The users names involved are links to the user profile on Facebook and the mouse-over tooltip shows the user status in the *topic* - additionally, disconnected users have their names strikethrough.

The SpreadCrumbs⁸ application on Facebook is the user's "mailbox". We have different pages for the different status of the user in a *topic*. On each page the *crumbs* and *topics* are grouped by the website URL. There the user can read and delete her *crumbs*, reply *topics*, change her status in a *topic* and check the statistics of the *crumbs*. Finally, an internal search engine that searches all SpreadCrumbs' content lets the users re-find the annotated pages.



Figure 1: A crumb on WEBIST webpage sent from Ricardo to Wolfgang.

Social navigation support (SNS) describes techniques to guide users through specific chosen

⁸<http://apps.facebook.com/spreadcrumbs>

resources (Brusilovsky, 2001). Past systems relied basically on collection annotated by experts. The AnnotatEd (Farzan, 2006) system authors introduce two types of SNS: traffic-based SNS and annotation-based SNS. Our model fits on with the annotation-based style, wherein every annotated page becomes a step in a trail.

In the current version of SpreadCrumbs each *crumb* contains the name of the author together with a "back arrow" and a "forward arrow". These arrows are links to the previous/next *crumb* (in temporal sequence) that the author wrote for the user being considered. The current model allows the users to create trails with content and ordinality relevance. SpreadCrumbs interface provides a much more concrete model for browsing with SNS. The user follows exactly the trail given to her, different from other systems where the SNS is just a collection of links annotated or bookmarked from another user. Still, our social navigation support model is not totally defined. One problem identified is the difficult for distinguishing different trails: when a trail ends and when a new one begins.

4 FUTURE WORK AND CONCLUSIONS

So far we have not evaluated the SpreadCrumbs with respect to a particular annotation task or user groups. Our primary observations show that the tool has been favourably received by the users, although further analyses are required to fully evaluate with respect of usability, performance, and user satisfaction. We suspect that SpreadCrumbs may be useful for bookmarking activities and will show better results in the tasks of re-finding bookmarks and locate relevant content within the bookmarked pages, being valuable for everyday online annotations, e-learning purposes and general collaboration.

We are currently running the first part of user studies tackling online collaboration through annotations and information retrieval from previously annotated pages. We still miss a second round of the studies with the same participants to collect the complete results. We have strong beliefs that this evaluation will demonstrate the benefits of annotations over tags and bookmarks. Further evaluations are constrained to the number of user of the tool and also the frequency of usage. We hope that our simple mechanisms and intuitive interfaces will motivate the users to annotate and collaborate.

All the results regarding the evaluation will be posted as soon as they are ready.

Regarding implementation we want to make SpreadCrumbs available for all, which means to have different alternatives in some of our current implementations constraints. At the moment SpreadCrumbs only supports Facebook social network. This can be extended to incorporate some others social networks such as LinkedIn⁹, MySpace, etc. It is even possible to have an infrastructure completely disconnected from social networks where the users can do self annotations and collaborate with her email contacts. We are still planning and evaluating the possible benefits and disadvantage of those approaches.

Some of our early users are researches involved in some remarkable e-learning and online collaboration projects. Our collaboration is producing some great perspectives for connecting SpreadCrumbs with those works. Our ideas with GroupMe! (Abel, 2008) researchers are to integrate both tools giving the users the possibility to gather online resources through SpreadCrumbs and at the same time to have manners to group their annotations.

Within TENCompetence¹⁰, the prototype LearnWeb2.0 (Marenzi, 2008) tackles the functionalities of aggregation and annotation of Web 2.0 resources furthermore, supporting the creation, storage and exchange of learning objects and knowledge resources. In the scope of this project, the initial proposals are to employ SpreadCrumbs also as a resource collector and annotation tool integrated with its underlying social network.

In both of these research projects, annotation is an essential feature, however, such tool to facilitate this functionality and the “in-context” representation of the annotations are not supported yet.

Concluding, we presented in this paper a promising Web annotation tool that addresses different matters of past projects in the field, concerning end-user usability, simplification - the simpler the better - and rescuing user’s existing social networks for collaboration, in which the users have the possibility to annotate, in-context, Web resources in an easy way enhancing bookmark, information re-finding and cooperation.

REFERENCES

Abel, F., Henze, N., Krause, D., (2008) A Novel Approach

⁹<http://www.linkedin.com/>

¹⁰<http://www.tencompetence.org/>

- To Social Tagging: GroupMe!. WEBIST 2008. Funchal, Madeira, Portugal. May 2008.
- Bouvin, N. O. (1999). Unifying strategies for Web augmentation. Proceedings of ACM Hypertext’99, p 91-100, 1999.
- Brusilovsky, P. (2001) Adaptive hypermedia. User Modeling and User Adapted Interaction 11 (1/2), 87-110. Claypool, M., Le, P., Wased, M., and Brown, D. (2002) Implicit interest indicators. In: Proceedings of 6th International Conference on Intelligent User Interfaces, pp. 33-40.
- Churchill, E., Trevor, J., Bly, S., Nelson, L., and Cubranic, D. (2000a). Anchored Conversations: Chatting in the Context of a Document. Proceedings of the 2000 ACM Conference on Human Factors in Computing Systems (CHI 2000).
- Farzan, R., Brusilovsky, P. (2006). AnnotatEd: A Social Navigation and Annotation Service for Web-based Educational Resources. In: Proc. of E-Learn 2006, Honolulu, HI, USA, October 13-17, 2006, AACE 2794--2802.
- Marenzi, I., Demidova, E., Nejdil, W., Zerr, S. (2008) Social Software for Lifelong Competence Development: Challenges and Infrastructure. International Journal of Emerging Technologies in Learning (IJET), 2008.
- Marshall, C. (1997). Annotation: From Paper Books to the Digital Library. Proceedings of the 1997 ACM International Conference on Digital Libraries (DL 97).
- Marshall, C. (1998). Toward an Ecology of Hypertext Annotation. Proceedings of the Ninth ACM Conference on Hypertext and Hypermedia (Hypertext 98).
- O’Hara, K., Sellen, A. (1997). A Comparison of Reading Paper and On-Line Documents. Proceedings of the 1997 ACM Conference on Human Factors in Computing Systems (CHI 97).
- Zellweger, P., Bouvin, N. O., Jehøj, H., Mackinlay, J. (2001). Fluid annotations in an open world. Proceedings of ACM Hypertext 2001, pp. 9–18, 2001.
- Zellweger, P., Regli, S., Mackinlay, J., Chang, B. (2000). The impact of fluid documents on reading and browsing: An observational study. Proceedings of CHI 2000, 2000.