

Understanding and Improving Wikipedia Article Discussion Spaces*

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ABSTRACT

Wikipedia's article discussion spaces ("Talk pages") form a large and growing proportion of the encyclopedia, used for collaboration and article improvement. So far there is no in-depth account of how article Talk pages are used, what is wrong with them, and how they can be improved. This paper reports on three contributions promoting the understanding of and improvement of these spaces: (1) Wikipedia editor interviews provide an increased understanding of readers' and editors' needs, (2) a large-scale comparative content analysis adds to knowledge of what kinds of discussions and coordination occur on Talk pages, (3) a prototype bookmarklet-based system, which we test in a formative user evaluation, integrates lightweight semantics.

Categories and Subject Descriptors

H.5.3 [Information Interfaces and Presentation]: Group and Organization Interfaces, Web-based interaction; H.4.3 [Information Systems]: Communications Applications

Keywords

Wikipedia, Talk pages, Collaboration, Online discussions, Semantic Web

1. INTRODUCTION

Wikipedia is reaching a turning point where participation may be dropping off [18, 15]; converting readers to editors could help counter this trend. Readers both become more active and also learn community norms and policies in article discussion spaces [1]. Therefore our goal is to make it easier for readers and new editors to find conversations of interest, and to contribute on them. Based on understanding how Wikipedia discussion spaces are used, we propose useful enhancements to Talk pages using lightweight semantics.

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Each Wikipedia article has its own discussion space, or "Talk page" (Figure 1), used to improve the article. Talk pages on Wikipedia's software platform, MediaWiki¹, are, technologically, just like any other wiki page: anyone can edit or delete anything on the page (even others' comments), and the same wiki markup syntax is used. Talk pages have no explicit threading; editors (i.e. anyone, logged in or not, who edits the page) add indentation and section headings to delineate comments, and must sign their own comments.



Figure 1: Wikipedia's "Semantic Web" Talk page

Additional *semantic* improvements could further benefit Talk page conversations. So far there are mainly structural and interaction-based improvements, such as LiquidThreads², which makes Talk pages more similar to discussion boards, and Reflect³, which provides space for summarizing comments. *Semantic* improvements could, for instance, automatically transclude discussions to additional locations. Improvements are important due to the rapid growth of Talk pages, which have grown more quickly than articles on English Wikipedia in recent years (as measured by the number of new pages [19] or the percentage of edits [16]). In general, article talk seems to scale linearly with a wiki's size [6].

In this paper we report on three contributions: (1) Wikipedia editor interviews provide an increased understanding of read-

¹<http://www.mediawiki.org/>

²<http://www.mediawiki.org/wiki/Extension:LiquidThreads>

³<http://www.cs.washington.edu/homes/travis/reflect/>

ers’ and editors’ needs, (2) a large-scale comparative content analysis adds to knowledge of what kinds of discussions and coordination occur on Talk pages, and (3) a prototype bookmarklet-based system, which we test in a formative user evaluation, integrates lightweight semantics.

Following this introduction, we discuss the editor interviews and motivating examples. Next we report on a content analysis of how 100 Talk pages are used. We then describe our semantic enhancements along with examples of how they could be used. Finally, we provide a formative evaluation before concluding the paper.

2. INTERVIEWS AND USE CASES

Of Wikipedia’s various discussion venues [11], Talk pages, which sit behind each article, are the most accessible to readers. Researchers see Talk pages variously as overhead [17] spaces associated with increased conflict or as an essential locus of coordination, correlated with article quality [24]. While long Talk pages correlate with contentious editing, they may also offer social benefits reducing the likelihood of conflict [6]. Talk page characteristics depend on the number of contributors [2], and editors contribute to Talk pages at different rates, in part based on their social roles [23].

To understand editors’ perspectives on Talk pages, we conducted four semi-structured user interviews with two Wikipedia administrators and two editors.

Administrators talked about frequently monitoring the conversations in which they were participating. They felt a strong sense of community with their co-editors, whom they may have interacted with in other community spaces, sometimes offline. Some edits they made to Talk pages were not comments: they moved pages to rename them and added community-related information such as infoboxes.

Editors, however, reported mainly reading Talk pages, especially when they wanted to understand what was controversial about an article, or what scintillating facts did not make it into the article itself. They commented infrequently, if at all. Talk pages gave them perspective on the community and how it operated, for instance they sometimes discovered new policies or terminology while reading Talk pages.

Bringing the Talk page closer to the article, by indicating which sections or topics have related discussions, was requested in three of the interviews, as well as in informal conversations with other Wikipedians. This might also support readers’ desire to understand the controversies and previously disputed information of an article. Timescales are an important factor in Talk page design; while deeply involved users monitor pages on a daily or weekly basis, readers and casual editors are more likely to encounter existing pages with dormant discussions or substantial archives.

We now turn to specific usecases which we later return to in Section 4.4. First, editors might want to intentionally draw more attention to selected postings. Having a larger number of editors involved can sometimes be helpful in reducing conflict [2, 7], yet articles get varying amounts of attention and editing. One editor we interviewed suggested adding a checkbox editors could tick when posting a comment, to ask for feedback from a wider community. Currently, editors may post directly to a centralized discussion space; for instance, Arabic Wikipedia has some article-related discussions at the Village Pump to ensure a quorum. However, to avoid this fragmentation of article-related discussions, posts could be added on Talk pages and tran-

scluded to centralized spaces at the poster’s request.

Second, keeping up-to-date with dispersed discussions can be difficult. Existing mechanisms are limited; the “RecentChanges” shows the site’s most recently updated pages, or a user can create his/her own version by ‘watching’ pages. However, there are some issues: not all pages are ‘watched’, particularly new articles which may be created at any time; pages have a varying number of watchers; and watchers may not be constantly following the pages. On specific topics, WikiProjects⁴ (such as ‘WikiProject Computing’, ‘WikiProject Quebec’, and ‘Guild of Copy Editors’) may provide alerts about important stages in the article lifecycle, for instance listing articles in the project that are proposed for deletion or nominated as good or featured articles. Unfortunately, to ‘watch’ all the articles in WikiProject Computing, a user would need to add 24,000 articles to his/her watchlist, and continually add new articles to the watchlist as they are created.

Third, newcomers may leave questions on Talk pages even when there is a more appropriate place where they are more likely to receive a prompt response. For example, novices may ask a topical question or ask whether the article should be deleted; however, questions about a topic should be asked at the “Reference Desk”⁵, and article deletion can be proposed with a special template. Rather than expecting novices to know these facts, we would like to propagate their questions and comments to the appropriate place. Bringing more attention to novices’ comments might also reduce the lag between asking a question and receiving an answer, which might encourage new and less-involved Wikipedians to become even more active. Meanwhile, readers and experienced editors would benefit from an easier way to follow dispersed discussions, even if they are not participating in them.

In Section 4.4 we show how to address these three use cases with lightweight semantics and SPARQL⁶ queries. First we need to understand the comments themselves, so that we can highlight the most relevant ones with semantic structure.

3. CONTENT ANALYSIS OF TALK PAGES

Despite a large body of research using Talk pages⁷, content analysis of Talk pages has been limited in size and scope. Talk pages are large and complex, where six Talk pages can yield over 100 printed pages [3], and individual Talk pages may yield 50 printed pages. Sample sizes of existing studies range from six to twenty Talk pages, and generally focus on hand-selected samples [19, 5, 3, 16]. To understand the composition of Talk pages, we analyzed 100 Talk pages in five categories (most visited, controversial, featured, random, and most highly edited) [14], carefully reading each page by hand, and classifying the contents into 15 non-mutually exclusive classifications, as shown in Figure 2.

These classifications drew first from Viégas’ 11 classification⁸ [19], enriched with four new classifications: “Refer-

⁴http://en.wikipedia.org/wiki/Wikipedia:WikiProject_Council/Directory

⁵http://en.wikipedia.org/wiki/Wikipedia:Reference_desk

⁶<http://www.w3.org/TR/rdf-sparql-query/>

⁷<http://www.citeulike.org/group/13905/>

⁸“Requests/suggestions for editing coordination”, “Requests for information”, “References to vandalism”, “References to wiki guidelines and policies”, “References to internal wiki resources”, “Off-topic remarks”, “Polls”, “Requests for peer review”, “Information boxes”, “Images”, “Other”

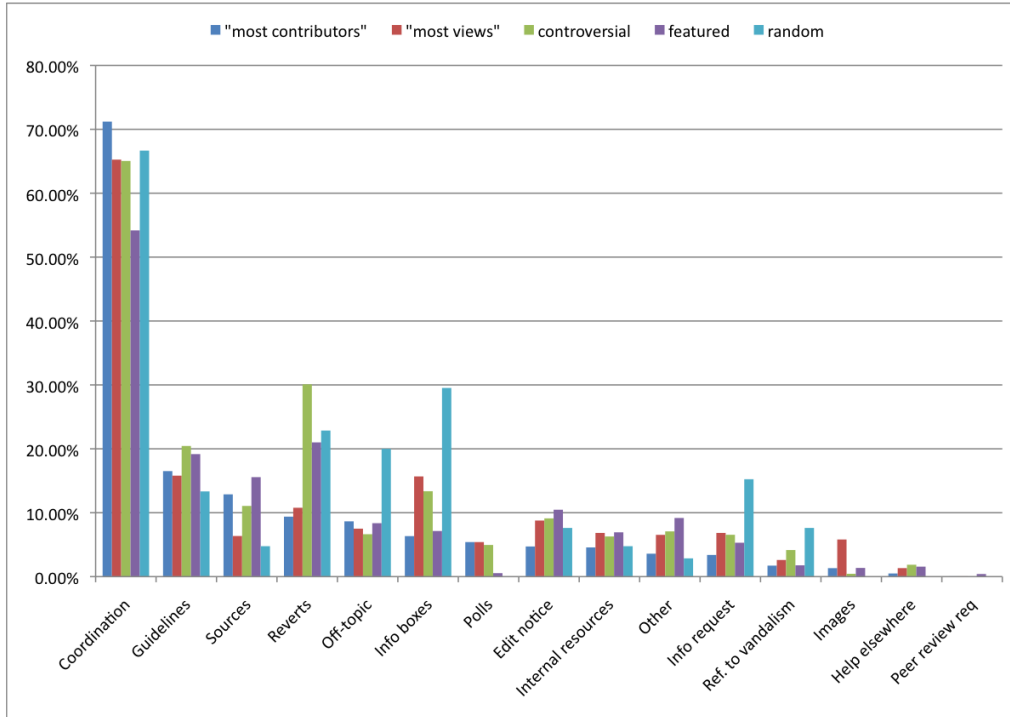


Figure 2: Frequency of Talk pages contributions by type for five categories of Talk pages.

ences to external sources”, “References to page reverts or other controversies”, “References to a user’s own article edits”, and “Requests for help with another article” [14].

Discussions vary considerably between individual Talk pages; the article category influences what types of discussions are most frequent. Coordination requests occur heavily on all five categories of Talk pages, especially for the articles with the most contributors. Articles with the most views tend to have Talk pages with more infoboxes, and may have FAQs and numerous archives; discussions of sources are somewhat less frequent in this category. Controversial pages are indicated by their high percentage of revert discussions, which may be long and entrenched. Discussions of policies and guidelines, while common on controversial pages, occur nearly as frequently on Featured Articles’ Talk pages. Intriguingly, while many Featured Articles show signs of extensive coordination and collaboration in their Talk pages (e.g. Reactive Attachment Disorder), others have seen no discussion whatsoever (e.g. Koli Point Action), indicating that there may be different processes for article improvement, and suggesting that explicit coordination may not always be needed. Random Talk pages often consist solely of infoboxes; many contain requests for information, off-topic comments, and discussions of reverted or disputed content.

The presence or absence of two main features—infoboxes and discussion threads—indicates how much and what kind of attention a Talk page has received. Talk pages are an artefact of community interest, and become more developed through controversy, collaboration of multiple active editors, or suggestions from a large reader-editor population.

Using the content analysis, we develop a taxonomy so that we can add a lightweight semantic structure to Talk pages.

4. SEMANTIC ENHANCEMENTS

4.1 Semantic Wikis

We take inspiration from various work that has been done in the realm of Semantic Wikis [22]. While most prototypes and models focus on representing simply the structure of the wiki (including generic models such as WIF and WAF [21], or ad-hoc ones such as SWIVT in Semantic Mediawiki [20] or the KiWi model [12]), a few systems enable structure in Talk pages. For example, IkeWiki (now KiWi) uses SIOC [4] to represent Talk pages, with an argumentation vocabulary to structure these pages [8]. In addition, the Semantic Form extension for MediaWiki can be used to structure wiki pages but also comments on Talk pages, providing them with more structure. However, this still requires an underlying model to represent the type of edits; we next discuss our lightweight taxonomy which offers a first model of finer-grained representation of Talk pages for Semantic Wikis.

4.2 Creating the Taxonomy

From the content analysis’ fifteen classifications, we culled five: two which we could not expect users to add as annotations (“off-topic remarks” and the catchall category “other”) and three which duplicated existing semi-structured information (“infoboxes”, “polls”, “images”). We then modelled the remaining ten classifications as the most relevant ones for retrieval [13]; these are now the SIOC wikitalk module⁹. These classifications were categorized as “References” or “Requests” and renamed, for instance, “References to a user’s own article edits” became the **ReferenceToEdit** class.

⁹<http://rdfs.org/sioc/wikitalk>

copyediting

[edit]

I've started copyediting a bit, starting with the introduction to make it less waffly (although the term in itself is, a bit). When I have time other goals would include to make things clearer for non-geeks and integrating the critics and projects with the rest of the article. Averell (talk) 20:41, 12 June 2010 (UTC)

Semantic Web Solutions

[edit]

Is this labeling mechanism restricted to a single meaning per term? It's nice that "cat" points to a lengthy definition of the furry critters... but the "dictionary" I'm playing from has 198 meanings for "cat." Can the rdf:about tag have multiple contextual meanings? DEddy (talk) 23:39, 23 July 2010 (UTC)

Figure 3: Using the “ReferenceToEdit” bookmarklet

4.3 RDF in Talk pages

```
@prefix content: <http://purl.org/rss/1.0/modules/content/> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix sioc: <http://rdfs.org/sioc/ns#> .
@prefix siocwt: <http://rdfs.org/sioc/wikitalk#> .
@prefix xs: <http://www.w3.org/2001/XMLSchema#> .
@prefix : <http://en.wikipedia.org/wiki/Talk:Semantic_Web#> .

<Thread4Post1 > a siocwt:ReferenceToEdit ;
  sioc:has_container <copyediting> ;
  sioc:has_creator <http://en.wikipedia.org/wiki/User_talk:Averell23> ;
  sioc:last_activity_date "2010-06-12T20:41"^^
    xs:dateTime ;
  content:encoded ""<p>I've started copyediting a bit, starting with the introduction to make it less waffly (although the term in itself is, a bit). When I have time other goals would include to make things clearer for non-geeks and integrating the critics and projects with the rest of the article. <a href="/wiki/User:Averell23" title="User:Averell23">Averell</a> (<a href="http://en.wikipedia.org/wiki/User_talk:Averell23" title="User talk:Averell23">talk</a>) 20:41, 12 June 2010 (UTC)</p>""^^rdf:XMLLiteral .

<copyediting> a sioc:Thread ;
  sioc:has_container <http://en.wikipedia.org/w/index.php?title=Talk:Semantic_Web> .
```

Listing 1: Example markup for a Talk page thread and comment, in Turtle RDF serialization

We first created an enhanced XHTML+RDFa version of each Talk page, inserting comment types (based on our own analysis) from the taxonomy into the markup of a local copy of the page. Listing 1 shows sample RDF markup, presented in Turtle for ease of readability; in fact, we added RDFa to an XHTML version of the MediaWiki page. We wrote JavaScript bookmarklets¹⁰ to highlight Talk page comments based on their taxonomy class. Relying on the RDFa markup and best practices¹¹, these bookmarklets parse pages to extract the RDFa, then highlight comments on that Talk page, if they belong to the specified taxonomy class. For instance, Figure 3 shows the results of the *ReferenceToEdit* bookmarklet, which highlights edits from that class.

¹⁰For bookmarklet code and example RDFa see <http://jodischneider.com/pubs/supinfo/2011SAC/>

¹¹<http://www.w3.org/2001/sw/BestPractices/HTML/rdfa-bookmarklet/>

4.4 Use Cases Revisited

In Section 2, we discussed three motivating examples, which we now address. In the first use case, posters used a checkbox to indicate that a comment needed community-wide attention when posting; second, editors wanted to follow all discussions on Talk pages belonging to a WikiProject; and third, novices' comments should draw special attention to increase the likelihood of replies. Using SIOC wikitalk, we can address these use cases with SPARQL queries¹².

Our first query, shown in Listing 2, finds all *RequestInfo* posts in WikiProject Computing; it provides a template for addressing the first two use cases. For the first use case, we remove *?page* references from this query. For the second use case, we remove the *siocwt:RequestInfo* constraint.

With a second query, shown in Listing 3, we can handle the third use case. We define novices as users who do have not made a User page, and get RDF of User pages from the SIOC exporter¹³. Then we can find all posts written by novices and which have not received replies.

Consequently, we can draw attention to these postings in an additional location such as a Wikiproject page, the Reference Desk, etc; alternately, with sparqlPuSH [10], users could register any queries and get new events in their RSS reader when matches occur. Since postings stay in their original location, comments still may be viewed and replied there, and it is not necessary for every comment to be annotated for the system to be useful.

```
SELECT ?comment ?page
WHERE {
  ?page sioc:links_to <http://en.wikipedia.org/wiki/Template:WikiProject_Computing> .
  ?comment sioc:has_container ?page ;
    a sioc:Post ;
    a siocwt:RequestInfo .
}
```

Listing 2: Using SPARQL to retrieve all *RequestInfo* posts in WikiProject Computing

```
SELECT ?comment ?reply ?user ?name
WHERE {
  ?comment a sioc:Post ;
    sioc:has_creator ?user .
  OPTIONAL { ?user sioc:name ?name . }
  OPTIONAL { ?comment sioc:has_reply ?reply . }
  FILTER (!BOUND(?name))
  FILTER (!BOUND(?reply))
}
```

Listing 3: Using SPARQL to retrieve posts by novice users (editors with no User page) which lack replies.

5. EVALUATION

The goal of our evaluation was twofold: (1) to compare two systems for finding and identifying Talk page comments: a manual control process and an assisted process using our RDFa markup and bookmarklet (2) to determine whether the assisted system would motivate users to add annotations.

¹²To save space, prefixes are omitted from these queries.

¹³<http://ws.sioc-project.org/mediawiki/>

5.1 Evaluation Setting

We used four Wikipedia Talk pages, with RDFa markup manually added as described above, from the SIOC wikipage module, along with two JavaScript bookmarklets, which highlighted instances of `ReferenceToEdit` and `ReferenceToRevertsOrControversialOrRemovedMaterial`.

The participants of the user study were 11 volunteers from our Semantic Web lab. Participants reported reading Wikipedia regularly, either weekly (4) or daily (7). Six also edited Wikipedia, either monthly (3) or a few times a year (3). Four editors and two non-editors had seen Talk pages before, and only two had previously edited a Talk page.

Participants were asked to find two types of comments on each of the four Talk pages, using bookmarklets for two pages and a control system for the other two pages. Pages were presented in the same order to each participant, but the order of bookmarklet use varied: Five participants used the bookmarklets for the first and third pages, while six participants used the bookmarklets for the second and fourth pages. We stopped users after five minutes on each task. Annotations were not visible to users except when using the bookmarklets, and “identify” meant that the user had to find the comments, but did not need to annotate them.

We briefly explained the tasks both orally and in writing but gave no description of the bookmarklets, only indicating where to click to activate them. Before completing the tasks, participants were asked to answer a one question, multiple choice questionnaire: “When posting a comment on a Wikipedia Talk page, how likely would you be to indicate the comment type?” This question was asked again in the post-task questionnaire.

Afterwards, we asked the participants to answer a multiple choice questionnaire with three sections. We asked about their technical background (experience with other wikis, use of Wikipedia and Wikipedia Talk pages) and their satisfaction with each of the two systems: we asked (using Likert scales) whether finding comments was fast, reliable, had good results, and was easy in each system. In four free-text questions, we asked what the participant liked and did not like in each system. A final free-text question solicited other overall comments and suggestions, and users made further oral comments, unprompted, while completing the questionnaire. Next we report on the evaluation results.

5.2 Evaluation Results

5.2.1 Talk pages are confusing

Talk pages and their current configuration proved confusing, in part due to the unusual structure. Several users asked “where are the comments?” when first encountering the Talk page, and most had never seen a Talk page before. For these participants, it took more than 4-5 minutes to understand the Talk page itself which was “disorganised” making it “difficult to take part in the discussion.” As one participant, commented, “At first glance, it’s very hard to understand the structure of the page and to find out where and how the comments are displayed.”

Several participants expected a forum interface and were confused that there was “no apparent order/hierarchy of threads”. Others pointed out that there is no indication of whether a thread is “open” or “closed”, and suggested that “resolved” be added for threads with completed actions. One participant appreciated how the bookmarklet helped iden-

tify the boundaries between highlighted posts; even more visual chunking would be helpful, and one participant suggested that colorizing or highlighting posts by commenter would help them follow the flow of a conversation.

5.2.2 Participant reactions to the bookmarklet

Figure 4 shows the results of our questionnaire about participants’ experience of the bookmarklet and control systems (we received 10 usable results; one participant declined to complete the questionnaire).

Participants were happy with the speed and ease of use of the bookmarklet system, and said that with highlighting, comments were easier to find and navigate. Overall, it “speeds up the reading of the Talk page, and makes it more understandable”. While users found that the bookmarklet drew their attention to relevant conversations, they also spent significant time checking its results. It was helpful, one user noted, that there were “no false positives”, although several users commented on clarifications of the categories, or suggested alternative determinations that could have been made. Despite concerns about accuracy, users preferred using the bookmarklet, and several groaned when asked to switch from the bookmarklet to the control system.

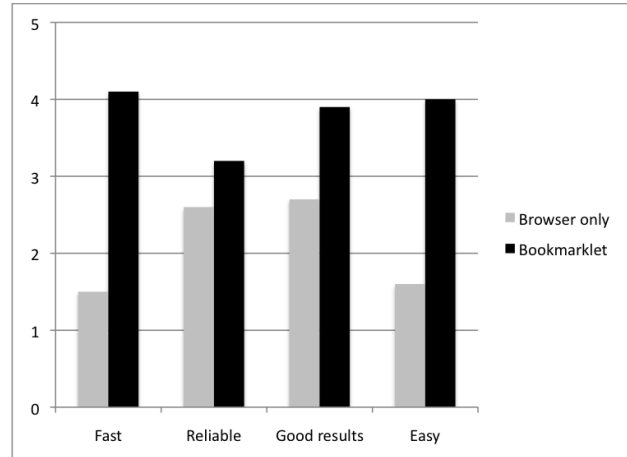


Figure 4: Average ratings of the control system (light) and bookmarklet (dark)

Initially it took about 50 seconds for a user to understand the bookmarklet and what it did. This might have involved reading the visible parts of the page (especially for users who started with the bookmarklet rather than the control system, who may never have seen a Talk page before), clicking the bookmarklet multiple times, or understanding the interface of the computer being used.

Participants suggested several improvements that could be made in future development of the bookmarklet interface. Several participants asked for highlighting only of the most important information, noting that “There’s no indication of what is really (even subjectively) important.” Highlighting the most significant words was a common request. Another request was for references to be typed so that, for instance, URLs providing supporting evidence could be distinguished from those providing contextual information. Another request was to hide irrelevant comments, or to load just the relevant ones in a new page. Other participants would have

preferred a faceted navigation approach (i.e. selecting which types of comments to show).

Participants mentioned that they would have classified some comments differently, pointing to a need for further refinement of the taxonomy. Most interesting was the suggestion that resolution, discussion, and proposed changes are among the important events which could be labelled.

5.2.3 Annotation

Users' likelihood of adding comment types increased after using the bookmarklet, and several wrote about user annotation in the feedback section. The average for all participants increased from 'somewhat likely' to midway between 'somewhat likely' and 'very likely'; after using the bookmarklet, Wikipedia editors were, on average 'very likely' to add annotations. Participants suggested additional categories that could be useful for annotation, and one wrote that "When posting a comment on a Talk page the user should have the possibility to choose the type of the comment".

Based on these results, we think that some Wikipedia editors would find it satisfying to annotate comments, although not all edits or editors might take part. To be successful, annotations would need to closely agree with editors' mental models, unannotated comments would need to not decrease the overall usefulness of the system, and a limited, tractable set of annotations would be needed (perhaps 3-5 choices).

6. CONCLUSION AND FUTURE WORK

In this paper, we have analyzed Talk page content and discussed the differences between categories of Talk pages, integrated lightweight semantics for the most important kinds of comments into a useful system, provided a formative evaluation, and discussed how semantics could be used to draw additional attention to certain kinds of Talk page comments with minimal overhead for users.

In future work, we will further investigate the interaction between Talk page discussions and article edits to better understand how to support discussions according to users' expectations; this might suggest ways to bring the Talk page closer to the article, a frequently requested feature of both editors and administrators. We also seek to add lightweight semantics to existing extensions like LiquidThreads, and to use similar minimalist annotation techniques in other argumentation and discussion forums.

7. REFERENCES

- [1] Judd Antin and Coye Cheshire. Readers are not free-riders: Reading as a form of participation on Wikipedia. In *CSCW 2010*.
- [2] Nicolas Auray. La négociation des points de vue: une cartographie sociale des conflits et des querelles dans le Wikipédia francophone. *Réseaux*, 154:15–50, 2009.
- [3] Nicolas Bencherki and Jeanne d'Arc Uwatowenimana. Writing a Wikipedia article: Data mining and organizational communication to explain the practices by which contributors maintain the article's coherence. In *Annual Mtg Int'l Communication Assoc 2008*.
- [4] John G. Breslin, Andreas Harth, Uldis Bojars, and Stefan Decker. Towards Semantically-Interlinked online communities. In *ESWC 2005*.
- [5] Katherine Ehmann, Andrew Large, and Jamshid Beheshti. Collaboration in context: Comparing article evolution among subject disciplines in Wikipedia. *First Monday*, 13(10), 2008.
- [6] Aniket Kittur and Robert E. Kraut. Beyond Wikipedia: Coordination and conflict in online production groups. In *CSCW 2010*.
- [7] Aniket Kittur, Bongwon Suh, Bryan A. Pendleton, and Ed H. Chi. He says, she says: Conflict and coordination in Wikipedia. In *CHI 2007*.
- [8] Christoph Lange, Uldis Bojars, Tudor Groza, John G. Breslin, and Siegfried Handschuh. Expressing Argumentative Discussions in Social Media Sites. In *First Int'l Workshop on Social Data on the Web*.
- [9] Fabrizio Orlandi and Alexandre Passant. Enabling cross-wikis integration by extending the SIOC ontology. In *SemWiki 2009*.
- [10] Alexandre Passant and Pablo N. Mendes. sparqlPuSH: proactive notification of data updates in RDF stores using PubSubHubbub. In *SFSW2010 at ESWC2010*.
- [11] Christian Pentzold and Sebastian Seidenglanz. Foucault@Wiki first steps towards a conceptual framework for the analysis of wiki discourses. In *WikiSym 2006*.
- [12] Sebastian Schaffert, Julia Eder, Szaby Grünwald, Thomas Kurz, and Mihai Radulescu. KiWi — a platform for semantic social software. In *ESWC 2009*.
- [13] Jodi Schneider, Alexandre Passant, and John G. Breslin. Enhancing MediaWiki Talk pages with semantics for better coordination - a proposal. In *SemWiki 2010*.
- [14] Jodi Schneider, Alexandre Passant, and John G. Breslin. A qualitative and quantitative analysis of how Wikipedia talk pages are used. In *WebScience2010*.
- [15] José Felipe Ortega Soto. *Wikipedia: A quantitative analysis*. PhD thesis, Uni. Rey Juan Carlos, 2009.
- [16] Besiki Stvilia, Michael B. Twidale, Linda C. Smith, and Les Gasser. Information quality work organization in Wikipedia. *JASIST*, 59(6):983–1001, 2008.
- [17] Bongwon Suh, Ed Chi, Bryan Pendleton, and Aniket Kittur. Us vs. them: Understanding social dynamics in Wikipedia with revert graph visualizations. In *IEEE VAST 2007*.
- [18] Bongwon Suh, Gregorio Convertino, Ed H. Chi, and Peter Pirolli. The singularity is not near: slowing growth of Wikipedia. In *WikiSym 2009*.
- [19] Fernanda B. Viegas, Martin Wattenberg, Jesse Kriss, and Frank van Ham. Talk before you type: Coordination in Wikipedia. In *HICSS 2007*.
- [20] Max Völkel, Markus Krötzsch, Denny Vrandečić, Heiko Haller, and Rudi Studer. Semantic Wikipedia. In *WWW 2006*.
- [21] Max Völkel and Eyal Oren. Towards a Wiki Interchange Format (WIF) - Opening Semantic Wiki Content and Metadata. In *SemWiki 2006*.
- [22] Max Völkel and Sebastien Schaffert, editors. *SemWiki 2006*.
- [23] Howard T. Welsch, Dan Cosley, Gueorgi Kossinets, Austin Lin, Fedor Dokshin, Geri Gay, and Marc Smith. Finding social roles in Wikipedia. In *Proc. Am. Sociological Assoc. 2008*.
- [24] D.M. Wilkinson and B.A. Huberman. Cooperation and quality in Wikipedia. In *WikiSym 2007*.