Enabling reuse of arguments and opinions in open collaboration systems

Jodi Schneider

Ph.D. viva
Galway, Ireland

Tuesday 1 October 2013
How can we make sense of disagreement?
Arguments & opinions give a rationale

Rob Eastaway
@robeastaway

Difference between cakes and biscuits? When stale, cakes go hard, biscuits go soft. Hence Jaffa Cakes are cakes. (Was official EU ruling).
Reuse arguments & rationales

- How do we make arguments more clear to BOTH humans and machines?

- Explicit arguments are not available
  - Important in bug reports, political commentary, product reviews, etc.

- Machine-readable arguments could help
  - Gather information – e.g. finding issues, claims, and opinion clusters
  - Connect opinions to explicit evidence
  - Navigate claims networks
Arguments in collective decision-making

Addison Phillips  2012-05-07 17:32:13 UTC

4.10.7.1.9 Month state
http://dev.w3.org/html5/spec/single-page.html#month-state-type-month

The 'month' type doesn't allow for 13 month calendars (undecimber). The limitation to Gregorian months doesn't work here because you can't convert a month by itself to/from the Gregorian calendar.

Ian 'Hixie' Hickson  2012-05-10 17:58:57 UTC

What's the use case?
Arguments about content deletion

1. Non-notable, 32-year old, free agent, minor league baseball pitcher who hasn't played since 2008. His 66-73 record is far from stellar and, in my opinion, does not merit an article. Alex (talk) 22:13, 29 January 2011 (UTC)

2. Keep "hasn't played since 2008" His page at the official Minor League Baseball website [1] states that his status is "Active". It also states that
Non-notable, 32-year old, free agent, minor league baseball pitcher who hasn't played since 2008. His 66-73 record is far from stellar and, in my opinion, does not merit an article. Alex (talk) 22:13, 29 January 2011 (UTC)

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Open collaboration systems

“people form ties with others & create things together” (Forte and Lampe 2013)
Open collaboration systems

“people form ties with others & create things together” (Forte and Lampe 2013)

Examples:
- Wikipedia
- HTML5 working group
- OpenStreetMap
- Project Gutenberg – Distributed Proofreaders
- Apache projects, Mozilla Firefox, …
How do we enable the reuse of arguments and opinions in open collaboration systems?
Use case: deletion in Wikipedia

- 1 in 4 new Wikipedia articles is deleted – within minutes or hours

- Demotivating!
  - 1 in 3 newcomers start by writing a new article
  - 7X less likely to stay if their article is deleted!

- Can we support editor retention?

Thousands of new editors each month

Source: http://reportcard.wmflabs.org/

See e.g. Butler, Joyce, and Pike. CHI 2008
"Don't look now, but we've created a bureaucracy: the nature and roles of policies and rules in Wikipedia."
Supporting open collaboration systems

- Can we support editor retention?

- Make criteria explicit to:
  - Explain community expectations (how to be convincing)
  - Support making & auditing decisions
Research Questions
How do we enable the reuse of arguments and opinions on the World Wide Web?

- RQ1: What are the opportunities and requirements for providing argumentation support?
- RQ2: Which arguments are used in open collaboration systems?
- RQ3: How can we structure and display opinions and arguments to support their use and reuse?
How do we enable the reuse of arguments and opinions on the World Wide Web?

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How do we enable the reuse of arguments and opinions on the World Wide Web?

- RQ1: What are the opportunities and requirements for providing argumentation support? **Netnography**
- RQ2: Which arguments are used in open collaboration systems? **Iterative Annotation**
- RQ3: How can we structure and display opinions and arguments to support their use and reuse? **Semantic Web Systems Development**
RQ1: What are the opportunities and requirements for providing argumentation support?
Methodology: Netnography

Methodology: Netnography

1. Planning and community selection
2. Participant observation and data collection
3. Data analysis and iterative interpretation
4. Presenting results
Results: Sample corpus
72 discussions started on 1 day

- Each discussion has:
  - 3—33 messages
  - 2—15 participants
- 741 messages contributed by 244 users.
  Each message has 3—350+ words.
- 98 printed A4 sheets
Example from Corpus

Heath Totten

Heath Totten (edit | talk | history | links | watch | logs) – (View log)
(Find sources: "Heath Totten" – news · books · scholar · JSTOR · free images)

1 Non-notable, 32-year old, free agent, minor league baseball pitcher who hasn't played since 2008. His 66-73 record is far from stellar and, in my opinion, does not merit an article. Alex (talk) 22:13, 29 January 2011 (UTC)

2 Keep "hasn't played since 2008" His page at the official Minor League Baseball website [1] states that his status is "Active". It also states that
Wikipedia:Articles for deletion/St. Andrew's Episcopal School (Amarillo, Texas)

From Wikipedia, the free encyclopedia
< Wikipedia:Articles for deletion

The following discussion is an archived debate of the proposed deletion of the article below. Please do not modify it. Subsequent comments should be made on the appropriate discussion page (such as the article's talk page or in a deletion review). No further edits should be made to this page.

The result was no consensus. There is liberty to redirect or merge to a school district if desired; such a proposal can be discussed on the talk page. Stifles (talk) 10:48, 8 February 2011 (UTC)

St. Andrew's Episcopal School (Amarillo, Texas)

St. Andrew's Episcopal School (Amarillo, Texas) (edit | talk | history | protect | links | watch | logs) – (View log)

(Find sources: "St. Andrew's Episcopal School (Amarillo, Texas)" – news · books · scholar · JSTOR · free images)

This primary school fails the WP:GNG, and, as it is not a high school, is not inherently notable. Contested PROD. Prod removed without comment/reason. Ravendrop (talk) 14:09, 29 January 2011 (UTC)

- Note: This debate has been included in the list of Texas-related deletion discussions. -- Gene93k (talk) 14:42, 29 January 2011 (UTC)
- Note: This debate has been included in the list of Schools-related deletion discussions. -- Gene93k (talk) 14:43, 29 January 2011 (UTC)

- Keep - Although this is not a primary school (which usually ends at grade 2 or 3), it's not a high school. However, the school's performance in the national middle school science bowl is a distinctive that would make this school notable. I'd like to see some third-party reliable sources (and less promotional language in the article), though, to establish general notability. --Orlady (talk) 15:32, 29 January 2011 (UTC) I see that the Middle School Science Bowl information was added to the article after this AfD was started. --Orlady (talk) 15:42, 29 January 2011 (UTC) PS - Since the above comment was posted, I and others have added several third-party reliable sources to the article. I'm no longer concerned about the absence of sources. --Orlady (talk) 05:40, 31 January 2011 (UTC)

- Delete Not notable. If sufficient third party sources are found to establish notability, then the article can be reinstated. Until then, it's of little encyclopedic value. Disagree that the "school's performance in the national middle school science bowl" is reason enough to make it notable. Dominus Vobisdu (talk) 15:38, 29 January 2011 (UTC)
Results: Terminology and policy knowledge becomes an obstacle

- **Delete** -- notability not demonstrated in a **reliable secondary source**. N2e (talk) 02:59, 31 January 2011 (UTC)

If you looked at the page it clearly states that its in Beta Testing. I know wikipedia has a dislike for all things airsoft but this page will have refs from other sources once it is live and the have it nominated for deletion is just plain stupid. -- Paul Firmin 08:58, 31 January 2011 (UTC)
Results: Important tasks for consensus discussions

1. Determine one’s personal position
2. Express one’s personal position in accordance with community norms
3. Determine the consensus
RQ2: Which arguments are used in open collaboration systems?
Methods

- Use corpus of 72 discussions
- Two types of annotation: 2 argumentation theories
- Iterative annotation for each theory
  - Multiple annotators
  - Refine to get good inter-annotator agreement
  - 4 rounds of annotation
Two argumentation theories

- Walton’s Argumentation Schemes
  (Walton, Reed, and Macagno 2008)
  - Informal argumentation
    (philosophical & computational argumentation)
  - Identify & prevent errors in reasoning (fallacies)
  - 60 patterns

- Factors Analysis
  (Ashley 1991)
  - Case-based reasoning
  - E.g. factors for deciding cases in trade secret law, favoring either party (the plaintiff or the defendant).
Walton’s Argumentation Schemes

Example Argumentation Scheme: Argument from Rules – “we apply rule X”

Critical Questions
1. Does the rule require carrying out this type of action?
2. Are there other established rules that might conflict with or override this one?
3. Are there extenuating circumstances or an excuse for noncompliance?
Walton’s Argumentation Schemes

<table>
<thead>
<tr>
<th>Argument Pattern</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argument from Evidence to Hypothesis</td>
<td>19.29%</td>
</tr>
<tr>
<td>Argument from Rules</td>
<td>16.90%</td>
</tr>
<tr>
<td>Note</td>
<td>13.69%</td>
</tr>
<tr>
<td>Argumentation from Values</td>
<td>4.20%</td>
</tr>
<tr>
<td>Argument from Need for Help</td>
<td>4.12%</td>
</tr>
<tr>
<td>Argument from Bias</td>
<td>3.87%</td>
</tr>
<tr>
<td>No reason given</td>
<td>3.22%</td>
</tr>
<tr>
<td>Argument from Position to Know</td>
<td>3.05%</td>
</tr>
<tr>
<td>Argument from Precedent</td>
<td>3.05%</td>
</tr>
<tr>
<td>Argument from Ignorance</td>
<td>2.97%</td>
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<tr>
<td>Argument from Composition</td>
<td>2.56%</td>
</tr>
<tr>
<td>Argument from Cause to Effect</td>
<td>2.31%</td>
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<tr>
<td>Argument from Analogy</td>
<td>2.23%</td>
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<tr>
<td>Argument from Waste</td>
<td>2.23%</td>
</tr>
<tr>
<td>Practical Reasoning</td>
<td>2.23%</td>
</tr>
<tr>
<td>Arg. from Verbal Classification</td>
<td>2.06%</td>
</tr>
</tbody>
</table>

Jodi Schneider, Krystian Samp, Alexandre Passant, Stefan Decker. “Arguments about Deletion: How Experience Improves the Acceptability of Arguments in Ad-hoc Online Task Groups”. In CSCW 2013.
Factors Analysis

Factors determined by iterative annotation
Factors Analysis

Factors determined by iterative annotation

4 Factors cover

- 91% of comments
- 70% of discussions
Factors Analysis

Factors determined by iterative annotation

4 Factors cover
  • 91% of comments
  • 70% of discussions

“Other” as 5th catchall
Factors Analysis

Factors determined by iterative annotation

4 Factors cover
- 91% of comments
- 70% of discussions

“Other” as 5th catchall

<table>
<thead>
<tr>
<th>Factor</th>
<th>Example (used to justify <code>keep</code>)</th>
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</thead>
<tbody>
<tr>
<td>Notability</td>
<td>Anyone covered by another encyclopedic reference is considered notable enough for inclusion in Wikipedia.</td>
</tr>
<tr>
<td>Sources</td>
<td>Basic information about this album at a minimum is certainly verifiable, it's a major label release, and a highly notable band.</td>
</tr>
<tr>
<td>Maintenance</td>
<td>...this article is savable but at its current state, needs a lot of improvement.</td>
</tr>
<tr>
<td>Bias</td>
<td>It is by no means spam (it does not promote the products).</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>I'm advocating a blanket &quot;hangon&quot; for all articles on newly-drafted players.</td>
</tr>
</tbody>
</table>
RQ3: How can we **structure and display** opinions and arguments to support their **use and reuse**?
Methodology

- Linked Data Application Development

- User testing – 20 users
Add a discussion summary

Discussion Summary

Each bar represents a number of comments referring to the corresponding criteria

Sources: 6
Notability: 5
Maintenance: 12
Bias: 0
Other: 6

The following discussion is an archived debate of the proposed deletion of the article below. Please do not modify it. Subsequent comments should be made on the appropriate discussion page (such as the article’s talk page or in a deletion review). No further edits should be made to this page.

[edit vote] Water and the environment

Water and the environment (edit | talk | history | links | watch | logs) – (View log)
(Find sources: "Water and the environment" – news · books · scholar · JSTOR · free images)

- Deprodded with a WP:SOFIXIT rationale even though prod was 2 hours past the 7-day limit. Article is four sentences long, almost tautological and ridiculously incomplete. I think the title is far too vague to be of any use, not to mention
Add a discussion summary

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources</td>
<td>6</td>
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<tr>
<td>Notability</td>
<td>5</td>
</tr>
<tr>
<td>Maintenance</td>
<td>12</td>
</tr>
<tr>
<td>Bias</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion Summary**

Each bar represents a number of comments referring to the corresponding criteria.

**Notability (5 comments)**

- **Strong keep.** It is a very notable topic. The article needs expanding not deleting. Continue the article topic is clearly defined - namely the intersection of water and the environment at Wikipedia:Articles for deletion/Agriculture and the environment. -- Alan Liefting (talk) 02:37, 30 January 2011 (UTC)
- **Keep** Notable topic with ample coverage. Click on the Google news archive or Google Scholar. Make sure for each site. Some of them are surely valid. And it isn't just about water. -- 02:37, 30 January 2011 (UTC)
- **Keep** No boilerplate WP:GHTS argument from Dream Focus is even less compelling than a boilerplate WP:VNO argument. I don't doubt that if you google "water and the environment" you will get billions of results, but we are not trying to prove that the subject of water as it applies to environmentalism is notable, just that it is. The nomination and most of the delete comments are based on the fact that it is too long, almost tautological and ridiculous. -- SnottyWong express 19:43, 31 January 2011 (UTC)
- **Keep** The nomination is too vague to be of any use as it offers no policy-based argument to retain and develop stubs on such evidently notable topics. Colonel Warden (talk) 21:18, 30 January 2011 (UTC)
Semantically enrich messages

Could you elaborate upon what it is you consider to be necessary to establish notability of a school?...
Use semantic structure

Implementation based on Jodi Schneider and Krystian Samp
Experimental design

Welcome & Instructions

Randomized

System A → System B

System B ← System A

Final Online Survey

Debriefing
System A (Control)

Wikipedia: Articles for deletion/St. Andrew's Episcopal School (Amarillo, Texas)

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System B (Experimental)

Discussion Summary

Each bar represents a number of comments referring to the corresponding criteria

- **Sources**: 6
- **Notability**: 5
- **Maintenance**: 12
- **Bias**: 0
- **Other**: 

Notability (5 comments)

- **Strong keep.** It is a very notable topic. The article needs expanding not deleting. Consider the article topic is clearly defined - namely the intersection of water and the environment. -- Alan Lifting (talk) 00:20, 11 January 2011 (UTC)
- **Keep** Notable topic with ample coverage. Click on the Google news archive or Google News for thousands of results for each. Some of them are surely valid. And it isn't just about water, it is about the environment as well. -- Alexeyb 02:37, 30 January 2011 (UTC)
- **Keep** Notable content fork. -- [Shalak](https://en.wikipedia.org/wiki/Special:Contributions/Shalak) 02:29, 30 January 2011 (UTC)
- **Keep** The nomination is too vague to be of any use as it offers no policy-based argument. The policy is to retain and develop stubs on such evidently notable topics. -- Colonial Warden 16:33, 30 January 2011 (UTC)
Experimental design

Welcome & Instructions → Randomized

System A → System B
System B → System A

Final Online Survey → Debriefing
Experimental design

Welcome & Instructions
Randomized
System A
System B

System B
System A

Final Online Survey

Debriefing

Description

Find Consensus of Debate 1

Find Consensus of Debate 2

Find Consensus of Debate 3

Experimental Post-System Survey
Survey on System A

* You have just made decisions on the outcomes of three discussions. Please answer, based on the tool you used and the decisions you made.

<table>
<thead>
<tr>
<th>Making the decision required me to put forth a great deal of effort.</th>
<th>Strongly Agree</th>
<th></th>
<th></th>
<th>Neutral</th>
<th></th>
<th>Strongly Disagree</th>
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</tbody>
</table>
PU* - Perceived usefulness
PE* - Perceived ease of use
DC - Decision completeness
PF - Perceived effort
IC* - Information completeness

Statistical Significance
PU* p < .001
PE* p .001
IC* p .039
Final survey

<table>
<thead>
<tr>
<th>System A</th>
<th>System B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely minor local poet who fails WP:AUTHOR and who does not</td>
<td>Discussion Summary</td>
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<tr>
<td>notability since May, 2010, without a single source added in that time</td>
<td>Each bar represents a number of comments refer</td>
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<td>AfD. [1] Qwerty (talk) 18:37, 22 January 2011 (UTC)</td>
<td>Sources</td>
</tr>
<tr>
<td>• This reads more like a resume than an encyclopedia article. I thin</td>
<td>Notability</td>
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<tr>
<td>well). Furthermore, I grew up in the area where she lives, and I've</td>
<td>Maintenance</td>
</tr>
<tr>
<td>• Note: This debate has been included in the list of Poetry-related</td>
<td>Bias</td>
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<td>deletion discuss</td>
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<tr>
<td>• Delete. As an author, appears to have had a few works published,</td>
<td>Other</td>
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<tr>
<td>importantly, there's nothing else out there about her, so she doesn't</td>
<td></td>
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<tr>
<td>• Keep: A lot of small accomplishments that add up to enough to ki</td>
<td></td>
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<tr>
<td>• To be frank, this rationale seems very flimsy. A laundry-list th</td>
<td>Sources (6 comments)</td>
</tr>
<tr>
<td>the basic criterion of WP:BIO is the satisfaction of WP:GNG).</td>
<td>• Delete: unsourced and largely contentless WP:C</td>
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<td></td>
<td>16:53, 29 January 2011 (UTC)</td>
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<tr>
<td>more useful</td>
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<td>easier to use</td>
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<td>allows making more confident decisions</td>
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<td>requires more effort to make a decision</td>
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<tr>
<td>provides more complete information</td>
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<tr>
<td>provides higher quality information</td>
<td></td>
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<tr>
<td>provides better information structure</td>
<td></td>
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</tbody>
</table>
Results: 84% prefer our system

“Information is structured and I can quickly get an overview of the key arguments.”

“The ability to navigate the comments made it a bit easier to filter my mind set and to come to a conclusion.”

“It offers the structure needed to consider each factor separately, thus making the decision easier. Also, the number of comments per factor offers a quick indication of the relevance and the deepness of the decision.”

Based on a 20 participant user test.
1 participant did not take the final survey.
Overall contributions

- A procedure for providing argumentation support
- A demonstration of this procedure, including
  - A requirements analysis
  - A categorization of the most common arguments used according to two theories
    - Walton’s argumentation schemes
    - Factors-dimensions theory
  - An ontology for argumentation in Wikipedia deletion discussions.
  - An argumentation visualization system that structures arguments with decision factors.
Main papers used in the thesis


### Citation indices

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<thead>
<tr>
<th>All</th>
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<tr>
<td>108</td>
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<td>6</td>
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### Citations to my articles

<table>
<thead>
<tr>
<th>Title / Author</th>
<th>Cited by</th>
<th>Year</th>
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<tr>
<td>Stick knots</td>
<td></td>
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<td>F. Furstenberg, J.I., J. Schneider</td>
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<td>Chaos, Solitons &amp; Fractals 9 (4), 561-568</td>
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<td>27</td>
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<td>A qualitative and quantitative analysis of how Wikipedia talk pages are used</td>
<td>16</td>
<td>2010</td>
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<td>J. Schneider, A. Passant, J. Breslin</td>
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<tr>
<td>Web Science 2010</td>
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<tr>
<td>A review of argumentation for the Social Semantic Web</td>
<td>11</td>
<td>2012</td>
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<td>J. Schneider</td>
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<td>Semantic Web-Interoperability, Usability, Applicability</td>
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<tr>
<td>Understanding and improving Wikipedia article discussion spaces</td>
<td>8</td>
<td>2011</td>
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<td>Proceedings of the 2011 ACM Symposium on Applied Computing, 808-813</td>
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<td>Enhancing MediaWiki Talk pages with semantics for better coordination. A Proposal</td>
<td>7</td>
<td>2010</td>
</tr>
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<td>J. Schneider, A. Passant, J.G. Breslin</td>
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<tr>
<td>th Workshop on Semantic Wikis (Hersonissos, Crete, Greece, May., Ed. by ...</td>
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<tr>
<td>Deletion discussions in Wikipedia: Decision factors and outcomes</td>
<td>6</td>
<td>2012</td>
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<td>Proceedings of the Eighth Annual International Symposium on Wikis and Open ...</td>
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<td>Semi-Automated Argumentative Analysis of Online Product Reviews.</td>
<td>6</td>
<td>2012</td>
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<td>A. Wymer, J. Schneider, K. Atkinson, T.J.M. Bench-Capon</td>
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<td>COMMA, 43-50</td>
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<tr>
<td>Arguementation 3.0: how Semantic Web technologies can improve</td>
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Summary

- We need better ways of structuring arguments on the Web.
- Arguments vary across Social Media.
- Different theories of argumentation stress different aspects.
- Factors analysis is useful for providing a brief summary of discussions. This can help find consensus.