Wiki content evaluation Framework

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ABSTRACT
Allowing anyone to edit content is the philosophy of most wikis. Such approach does not ensure that the editor is a specialist in the topic and is well-meaning. Poor quality of the content and vandalism can be a major problem.

We did a literature review on quality of information and criteria and examined a number wiki applications seeking to understand the process of authorship being used in larger wiki sites, such as those run by the Wikimedia Foundation and present a conceptual model to enforce quality in Wiki content. In this model, we suggest that each article should have an evaluation resulting from voting a pool of reviewers and that a historical record of the evaluation should be keep and available to users.

Categories and Subject Descriptors

General Terms
Design, Human Factors, Documentation

Keywords
Wiki, Wikipedia, quality of information, documentation

1. INTRODUCTION
The value of the Internet as a quick, efficient & economic means to access information and the possibility of easily downloading and uploading content through Wikis is more important in countries where high costs in communication and low economic resources make it impossible sometimes, to obtain available information at the right time or share with the rest of the world locally relevant content on tourism, culture, habits, etc.

The underlining characteristic of wikis is the philosophy of making it easy to edit and correct errors, rather than adding levels of difficulty to make the changes. Such approach raises the question of quality of the available information. The wiki content can potentially be of poor quality because of vandalism or because it is created and uploaded by a non specialist in the area. While this is true, on the other end secure wikis may grow very slowly compared to more open wikis.

Web is an important source of information and indeed as opposed to the traditional printed content, on-line resources are increasingly used. Nowadays pupils, students and even teachers and researchers from developing and developed world rely on wikis (especially Wikipedia) to fulfill their academic or professional activities. We argue, therefore, in this text for a pragmatic balance between the two approaches with a process rather than product orientation [21] as the underlining objective of the development of wikis.

Undoubtedly this is a challenge that is worthy to face to have a better quality and academically and scientifically accurate wikis for everyone.

Next, we analyze the problematic of information quality from different perspectives, define concepts, criteria and discuss the role of the content reviewer. Based on the literature review and requirement analysis and use of Wiki applications we present an approach to address the issue of quality in Wiki content.

2. INFORMATION QUALITY
2.1. Quality of Information – Need and Definition
With the advent of the Internet the world is observing an exponential growth of available information and with it the problems of deployment, access and relative lack of scientific and academic rigor in its content [13]. As result it is necessary to create mechanisms for evaluating the available information in the Internet. Several researchers and practitioners expressed the concern of the difficulty of evaluating the digital resources in the Web, for not always being easy to notice the way as the information is published and reviewed.

Information quality may be related to other type of quality:

- Data quality [15][17];
- Information quality[18];
• Knowledge quality[15].

There are several types of quality conceptualization [14]: (i) conformity to requirements, (ii) meeting or exceeding customer expectations, (iii) cost of quality and (iv) value for money. English[15] suggested the following function:

\[ I_Q = F(D, D, P) \]

Where \( D_q \) is the quality of data (accuracy, completeness, validity and consistency), \( D \) is the quality of definition of meaning and \( P \) is the form of presentation is understandable by the user.

Quality main also be analyzed in a more complex process, where data is transformed to information, to knowledge, leading to action, that may be converted into results (DIJKAR model)[19].

2.2. Quality of Information and Criteria

Several authors presented criteria that should be taken into account when assessing websites [22]. Alexander & Tate [11], Beck [9] and Kapoun [10] gave five approaches of evaluation of the press writing, they made a conversion for the digital world of the Internet. The main dimensions consider by those researchers are: accuracy, authority, objectivity, currency and coverage of the information.

Lash [13] divides the approaches of evaluation of the information in two different groups: a group that is meant to whether the information is adequate to the intended audience and the other group has an approach on the navigability.

Most researchers consider that authority, objectivity, currency, accuracy, design, navigation and usability are the most important items in an evaluating a website. Nielsen and Morkes [12] refer that, in fact, people tend not to read in the Web, instead users prefer scanning the information, searching keywords, read parts of sentences or even little sentences in search of information they would need.

On the other hand, COBIT[16] states the following information quality requirements: effectiveness, efficiency, confidentiality, integrity, availability, compliance and reliable. This perspective is oriented to organizational information.

Multicriteria is a way of evaluation a document. Even with a list of criteria, there is a need for a weight in each one of the criterion[1]. Multicriteria may be enforced by a general system imposing a specific weight for each criteria or may be subjectively defined by the evaluator, as it is normal in the scientific[3]

2.3. Information Quality and Evaluator

The intervention of a personal evaluation is needed, even if there are some criteria to be followed. This perspective is very different from the traditional perspective of the Wikipedia that starts as an anarchy and became a dictatorship.[20]

A person or a group of persons analyze each one of the criteria [1][2]. This person, the “peer” is a very important actor in the scientific evaluation [4][8]. Peer review is even seen as being essential to the process of maintaining standards of science and scholarship, [6].

A “peer” is defined as “one that is of equal standing with another”. A peer reviewer may be considered a consultant to the editor, a content expert, and an “arbiter for quality research”. [5].

A good “peer” is not necessarily the more qualified. In a research work [7] it was found a negative but statistically non-significant association between academic rank and review quality, probably because more qualified researchers refereed articles for many journals and also did a large amount of administrative work, consequently did not give enough time for review.[4]

3. PROPOSED CONCEPTUAL MODEL

3.1. Use case and Class Diagram description

In this section a model for authorship process is presented, which resulted from the literature review, the analysis of several wikis and discussions among the authors.

![Figure 1 - Use Case diagram](image)

The Use Case Diagram (see Figure 1), broadly presents the Wiki process of authorship in which some kind of access control is mandatory.
The evaluation process is based on voting whereby reviewers vote for each text according to a list of criteria.

The administrator defines the criteria and the weight of each criteria, the reviewers and even the level and knowledge field of the reviewers, but he does not have the possibility of deciding directly on the final evaluation of each Issue.

When reading the text the user has the possibility to see the current evaluation. Current evaluation is associated with a given date.

The User may also access the history of the evaluation of the text (or article).

For a given text or article (what we called Issue and Update) we may have the following function:

\[ Q_d = \sum_{i}^{n} (w_{i,d} \times v_{i,d}) \]

\( Q_d \) – quality level in a given date
\( w_{i,d} \) - is the weight given to criteria i in date d.
\( v_{i,d} \) – is the vote of the reviewer in date d to the criteria I

In the following table (Table 1) the previous diagram is briefly described.

<table>
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<tr>
<th>Actor</th>
<th>Use Case</th>
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| Administrator | • Defines criteria that may be used to evaluate each article.  
| | • Defines weights of each one of the criteria.  
| | • Identify specialists that may be used as reviewers of the articles.  
| | • Invites specialists to review the articles.  |
| Reviewer | • Is invited to vote in a specific article.  
| | • Votes in an article following a criteria list.  |
| Author | Writes text. User may write a title or add content to it.  |
| User | Reads text. If there is an update evaluation this evaluation is shown.  |

In the following Figure 2 we present the conceptual model, this is expressed as a Class Diagram that uses UML notation.

Criteria are characterized by a description (name) and weight. The criteria and weights are kept open. While is subject for research model presented here tries to be as agnostic as possible.

In the diagram, the article is composed of “Issues” and “Updates”. Issue is the title of the article and an “Update” corresponds to the body of the article. The date of the issue corresponds to the date of creation. Update corresponds to the several updates posted by the authors who contribute. The state allows identifying if the update is published or not. As usual in Wikis, the published content corresponds to the last update.

Figure 2 Class Diagram
The system suggests tree type of users: writer, reviewer and administrator.

Administrator defines criteria and invites other users (especially reviewer).

Reviews have a specific level and are assigned to several articles (issues). He also may have several fields of expertise.

As long as the text is written, reviewers may vote it. In fact, reviewers vote for every and each of the updates of an article.

The historical values are note recorder in the database. The database stores only raw data.

Administrators may be organized hierarchically. Each administrator may have several fields of expertise under his control.

3.2. Implementation

The conceptual model presented here is being implemented. It is developed in PHP and MySQL. In order to improve user interface, AJAX elements were also developed.

It is expected that in the near future it may be incorporated as an add-on or extension into a wiki application, like wikimedia.

In what concerns specificities related to the implementation, the system does not record the historical statistics. As we said before, the database stores only raw data. But as efficiency purpose, this will be changed.

The actual system is not very parameterized; consequently, customization is developed through programming.

4. CONCLUSION

In this context, we presented a conceptual model whose main purpose is to enforce quality in Wiki content. Based on this model a software application is being developed with the intention of being agnostic and with the possibility of gradually and progressively incorporating more of rules. Our expectation is that in the near future it will be integrated as add-on in a Wiki software or as a new feature in a Wiki System.

While Web and with it Wikis are an important source of information as opposed to the traditional printed content, is worthy to face the challenge of its quality to have academically and scientifically accurate content available for everyone. However, it is important to keep the underlining principle and philosophy of Wikis, of making it easy to edit and correct errors. Therefore, we suggest a pragmatic balance between flexible and rigid approaches with a process rather than product orientation as the underlining objective of the development.

5. ACKNOWLEDGMENTS


6. REFERENCES


