

Managing Real-time Collaboration in Validated Content Management System

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ABSTRACT: Content Management Systems (CMS) provide to its users the ability to publish on the Web with no need to have experience in developing web pages, this way CMS also participates in the expansion of reducing quality of content placed on the web similarly to Web 2.0 tools. The mechanism of validating content indicates a high level of quality content control while putting users as main players according to Web 2.0 standards, from this prospects we develop Validated Content Management System VCMS as a new Web 2.0 tool that supports content validation mechanism.

The VCMS system requires collaboration between users when content is being static validated. Real-time synchronization between users during collaboration on the same project can make this process easier and brings more rapidity to content publication while maintaining the mechanisms that allows quality control in our system.

In this article we present the technic of implementing real time interaction between users during collaboration on the same content. We focus on promoting the What You See Is What You Get (WYSIWYG) editor to support Real-time collaboration between multiple content generators. . The approach presented in this paper can be integrated to any collaborative Content Management System and also can be used in all collaborative applications that generate Web content such as blogs or wikis offering to these tools the feature of collaborating on the same content between multiple users in real-time.

KEYWORDS: Web 2.0, real-time, Content Management System, web content, WYSIWYG.

1 INTRODUCTION

Web 2.0 has created tools for users to produce and publish their content easily and simply [1], therefore the problem of lack of quality and information overload is still expanding [2].

While Web 2.0 has created an evolution on the web by facilitating publishing, we have many resulting limitations [3]. There are limitations to users:

- A limited number of participants.
- Low participation rate.
- Heterogeneous participants.
- The motivation of participants.
- There are also limitations related to the produced information:
- Low quality of information.
- Expanding the amount of information.
- Lack of security and copyright.
- Lack of semantics.

We focus our researches in improving content quality on the web 2.0 by controlling published content using its tools, in this way we build content validation theory based on implementing users in evaluating content and using a relevant user's measurement. The validation of Web content is used to classify the information published by relevance and filter publications by quality [4].

We consider Content Management systems as a new field for applying our content validation theory at the point where they make easy creating content on the web. Our team is building a new generation of Content Management Systems where content is controlled. During our analysis of different CMSs we found that they don't offer possibility to collaborate on the same content in real time while the workflow mechanism we made in our approach needs this technic. This article explains how we implement it in our Validated Content Management system.

In the first part we present the concept of validation of the content and its principles, subsequently we introduce content management systems and its architecture. Finally we present our Validated Content Management System and implementation of real time collaboration.

2 VALIDATION OF THE CONTENT ON THE PARTICIPATORY WEB

Content production on the Web was not subject to quality and relevance control. The approach proposed by our team introduced a new model of validation and monitoring of the quality of content along its life on the web [5]. It focuses on classifying both information and user:

- Information: the content is classified into categories that represent a range of quality. The organization facilitates the classification of content according to the relevance of the information.
- Internet users: users are classified into groups with certain privileges and responsibilities. We cite the producers (content production), the validators (content validation) and experts (supervision of validation).
- Content produced in the context of validated content involves two processes: static validation and dynamic validation.
- Static Validation: achieved by the validation committee (experts and validators). This is to assess the quality of content by two validators assigned by an expert. If the quality is unsatisfactory, the content will be rejected. Otherwise it will be published with an initial quality.
- Dynamic validation: this part is performed by users themselves. Everyone has the right to evaluate the content with a note that reflects its quality. The lifetime of this content is controlled by varying its note dynamically.

3 CONTENT MANAGEMENT SYSTEMS

We can look at a CMS as a publishing tool that allows users to create, edit, delete, and present content in various forms including text, imagery, video, sound, and animation. But there's much more to a CMS than this. A better way to come up with a definition of CMS technology is by pointing to a set of features that are associated with CMS technology [6].

Not all content management systems are created in the same manner. They possess a wide range of functions, components, and scopes that vary greatly based on the users they target. Most CMS applications have four main components:

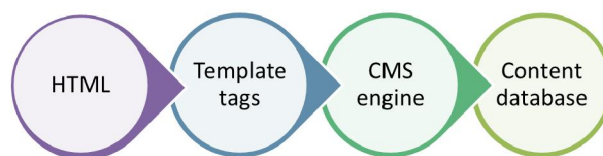


Fig. 1. Basically components of CMS [7]

3.1 PRESENTATION LAYER

Typically built in HTML and CSS (or occasionally Flash), this is the front-end interface with which site visitors interact. The presentation layer should be as clear and seamless as possible with intuitive navigation and frequent calls to action that

guide the user experience. Depending on the used system, the interface is often (but not always) built on the fly when users call up the page in a browser.

3.2 CUSTOM TEMPLATE TAGS

These custom tags or “hooks” provide the conduit by which the front-end design and the content residing in a database come together for front-end user experience. They are snippets of CMS specific code that call up pieces of content and insert them into the interface when a user browses from page to page on a content- managed site. If the interface is built properly, the experience should work flawlessly for users.

3.3 ADMIN INTERFACE

This is, in effect, the CMS engine. Users have a specific and often unique URL to log in and access the site’s administrative functions, add or edit content, publish files, perform site maintenance, and soon. Most systems allow interface customization based on user permissions. A content author most likely wouldn’t have all the same options as a site administrator would.

3.4 DATABASE

This is literally where the content lives, a database file (or files) that houses text, images, audio, video, user settings, and so on. Ownership, usage, and security are big issues with any site data.

4 VALIDATED CONTENT MANAGEMENT SYSTEM

VCMS is simply a CMS that supports the structure of validating content and bring more features. We will not build a new system, but we will improve the architecture of CMS based on the following concepts [8]:

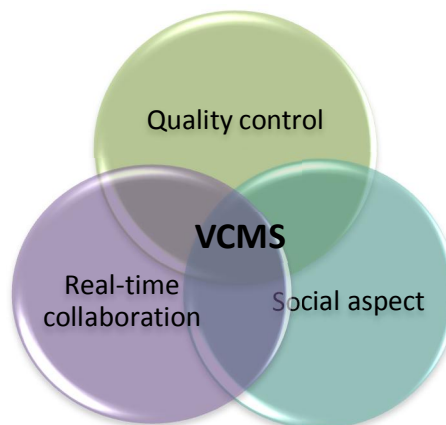


Fig. 2. VCMS principles

- Quality control: in the VCMS content can be published only after passing through the static validation process and will be controlled during his life on the Web by the dynamic validation. A centralized database of content creators used by the VCMS where users are classified as organized by role (expert, validator, producer, and visitor) and domain of experience allows for better evaluation of the content.
- Real time collaboration: The workflow of CMS has an automated mechanism, the author selects a template and a sequence of approvers to approve his content then the automatic workflow does the rest of the work [9]. The mechanism for validating the content requires collaboration between the producer and the validator when content is being static validated. The validator can correct and make changes and help to improve the quality of content at its validation. The implementation of real-time collaboration can facilitate the collaboration and also the rapidity of publication, keeping the mechanisms that allows quality control in our system.
- Social aspect: Users spend more than five and half hours on social networking sites [10]. Social and professional networks, forum and groups are the excellent place to gather information about the user domain of expertise

and interests. This information will be stored in a profile and used later to make the decision in the assignment of validators to certain content based on their domain of expertise.

5 REAL-TIME COLLABORATION

Currently, users of Content Management Systems do not have the ability to work on the same project, they Collaborate even in working together on a single machine or working in parallel on separate copies and integrating them in the end these copies.

The following figure explains the procedure for producing content on the web using a content management system:

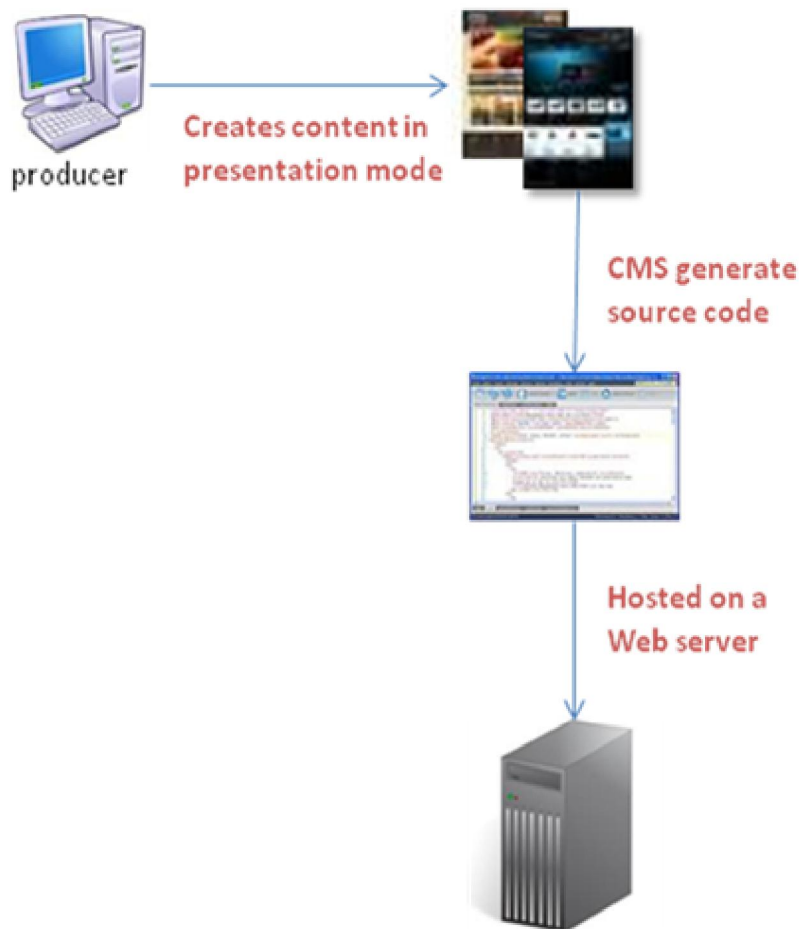


Fig. 3. CMS content production

Our VCMS require collaborative work between users especially between producer and validators which is ideal for collaboration is that both users contribute in the same project.

The following figure explains that the workflow of our system needs collaboration in real time to insure rapidity of publishing quality content:

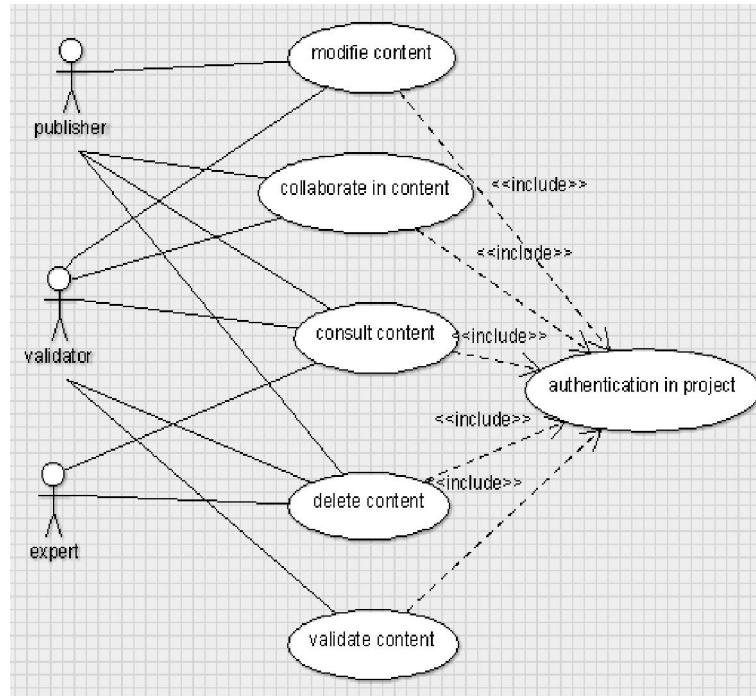


Fig. 4. Use case diagram for users when the content is being validated

Implementation of real-time collaboration is to support the changes made by users on the display interfaces for all users. Source code is always the basis of created content. Changing the source code generated automatically by the VCMS causes the change in presentation for all users. The following figure explains this concept:

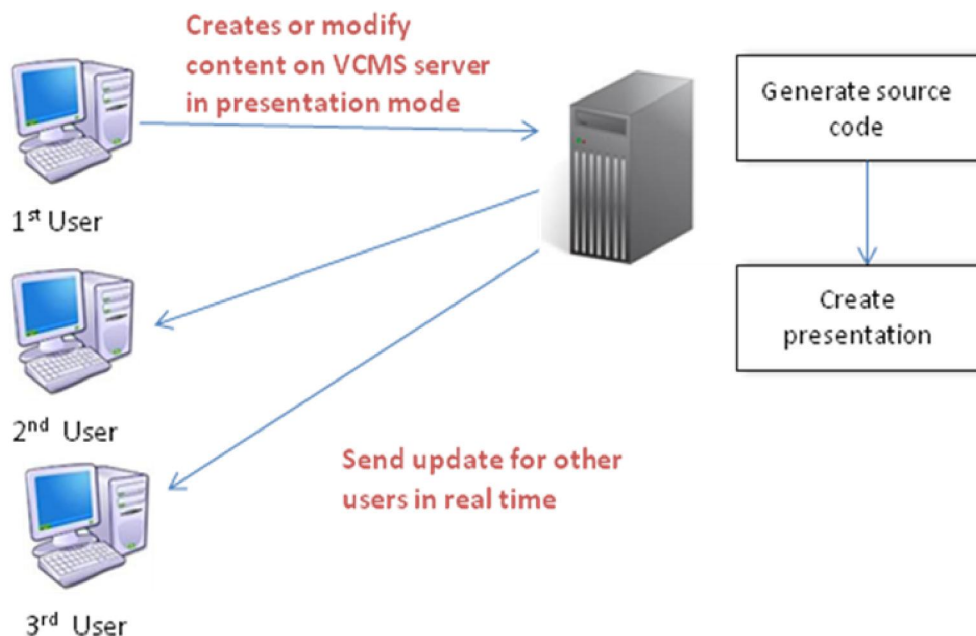


Fig. 5. VCMS real time update

To create or modify content VCMS uses a WYSIWYG editor. It’s simply an HTML text area that offers to user options for shaping its page. To collaborate in real time on the same content we have to add real time update for all this text areas. Every component should have its daemon file on the web server. We use a JavaScript file to control modification and send updates to the daemon file.

Figure 6 explains that every web page have a content that is divided into N divisions, every division can be edited with using a WYSIWYG editor. The same division on the same content can be edited by all real time collaborators, so we can have n WYSIWYG editors collaborating on the same division where every editor is on a user interface. The editors of the same division are connected to the same daemon file, this last exchange all updates with all users, so every division have only one corresponding daemon file. In this way all users can receive all updates of the other users.

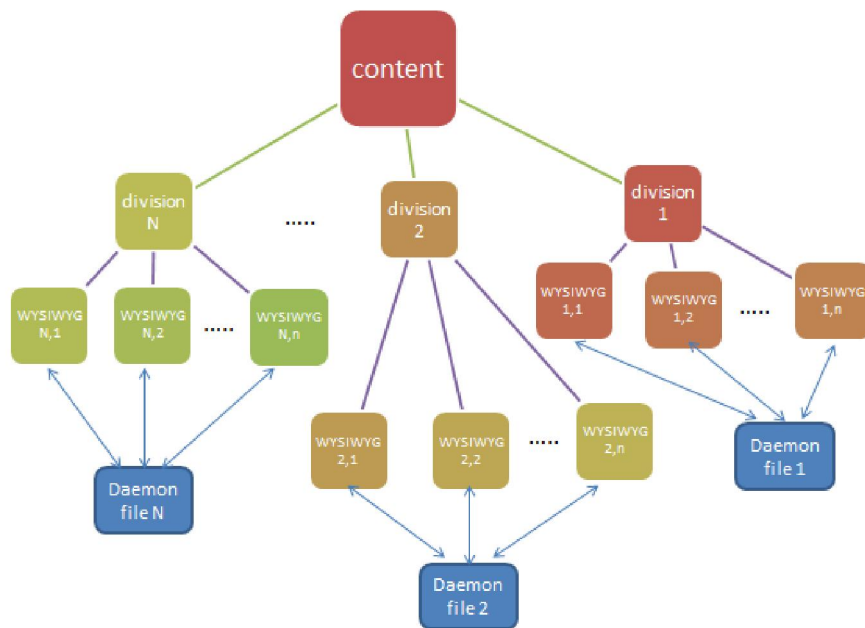


Fig. 6. Managing real time synchronization

The following figure represents a sequence diagram that describes the process of modifying content by a user and synchronization with another user:

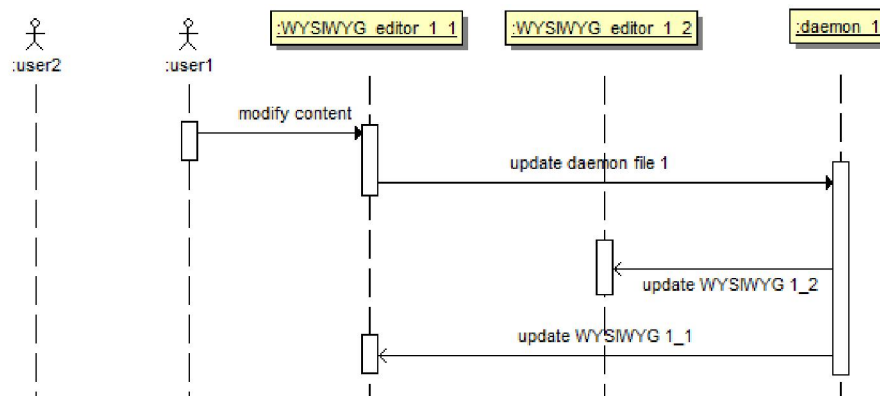


Fig. 7. sequence diagram of modifying content process

6 CONCLUSION

Content Management Systems are widely used to create content on the Web. Validated Content Management System we build uses the mechanism of content validation in building a new generation of CMS. The real time technic is the new concept of Web applications that collaborative workflows needs. We adopted this concept to improve collaboration between users in the hierarchy of content validation.

Finally we note that we have made publication more easier, but the quality of content is always controlled which brings over publishing of relevant content. Prospects of this work will focus on implementing this editor to other tools of Web 2.0.

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