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TRILHA PRINCIPAL

An Exploratory Study of Wiki Tools for Virtual Museums

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***Abstract*— The museum is a place of preservation and elucidation in the history of a group of people; it exposes the past, contextualizes the present and takes us to a prospective vision. Studies show that even though they are in rise, virtual museums would tend to fail due to the lack of interest between the public and the collection. The objective of this research was to select Wiki tools that meet the criteria to provide more interactivity in an virtual museum.**

***Keywords*— virtual museum, wikiseum, wiki, collaborative environment.**

I. Introduction

Based on the spread of information, museology, the knowledge área dedicated specially to administration, maintenance, organization of exhibitions and events in museums began to see the cyberspace as a place to show, research and publicize museum art (OLIVEIRA, 2002).

The old museums which reflected a classic image and were limited to a physical place transformed their aesthetics, including a virtual interface, integrating information and the public in the network (BARRETO, 2000).

One modality of virtual museums is the totally virtual museums, which present themselves only in virtual format, not having a physical location with objects in exhibition for public visitation, as in traditional museums (OLIVEIRA, 2002).

Nevertheless, Oliveira (2004) states that even if they are currently growing, virtual museums face problems such as the slim interaction between the public and its collection, the lack of information referring to the exposed collection, which makes the user to visit the site once and does not feel motivated to further visitation.

According to data gathered by the Brazilian Museums Institute (Ibram) in 2011, in Brazil there is a total of 3118 museums, and only 23 of them are virtual museums. Even if it has a large number of presential museums, the number of visits to this type of place is still small, and the devaluation of culture from the Brazilian population itself is seen as a major factor, which ends up reflecting also in the virtual museums.

This problem was confirmed in a project developed in 2013 by the Federal Institute of Goiás – Campus Iporá, by the authors of the current proposal, with the creation of a fully virtual museum for the city of Iporá, in the state of Goiás.

In spite of having used a Wiki resource (Wikinarua, which is a social network created by the Brasília University which offers four services seeking to offer interactivity), we confirmed the main problems verified in virtual museums: the low interactivity and the spectator behavior.

The solutions presented to solve the low audience of virtual and presential museums consist in applying mechanism that allow for a satisfactory environment for the user, with an improvement of the interface and an increase in the interaction.

Based on this idea, we began this research in the search of alternatives that fostered the increased interaction and we came to the term Wikiseum.

Based on this, this project intended through studies to investigate the possibilities of interaction offered by Wiki tools, as well as their potential to help the teaching of History in public school through a Wikiseum environment.

Wikiseusm has the focus in the combination of the usual presentation of a museum in the Internet with the functionalities of Wiki tools, which allow for the creation, edition and deletion of content, giving the user more knowledge about the museum through an active participation in the conception of the information that is inserted there (HOFFMANN, 2010).

Hoffman (2010) states that the main goal of the Wikiseum is to increase the visitor motivation so that he feels motivated to visit the presential museum because of the knowledge he acquired.

The Wikiseum environment comes with the implementation of Wiki tools in a virtual museum. The tool, through its functionalities, will allow the users not only to seek knowledge, but also to create new knowledge, through a process in which the users can participate actively, debating and creating text. Primo (2003) emphasizes that “the role of the agent that is interacting is not only one of a librarian, but truly of an author, in the most strict sense of the word”.

Wiki, which is the study object of this work, was born in 2001 with the North American programmer Ward Cunningham, which created the Wikipedia, and given the

success he found in this one, the collection of Wiki softwares became widely popular (ALVIM, 2012).

Wiki is a free collection of interconnected web pages. It is a hypertext system to store and modify information in a data base, where each page is easily editable by any user (HOFFMANN, 2014).

The Wiki structure is maintained by the involvement of its users, which present their proposals for knowledge organization and simultaneously archive and preserve the information, as in a digital repository (ALVIM, 2012).

Wiki tools have a great educational potential because, besides fostering the development of reading and writing in students, they instigate them to participate in the debate, fostering the critic by exposing opinions, contributing in this way to the growth of the social character of each individual.

According to Torres (2004), the applicability of collaborative technology in the educational environment stimulates both the student and the professor to participate in the learning process in an active and effective way. Based on this context, we can say that Wiki contributes to the construction of a space to exchange ideas and knowledge sociabilization, enriching the teaching-learning process.

Based on this, we sought the study and selection of Wiki tools which given their collaborative nature have characteristics that, if added to a virtual museum will transform it in a Wikiseum, increasing their interactivity.

The Wikiseum can be the alternative to the lack of interactivity, besides offering a tool for pedagogic support. Its collaborative authorship has, among other resources, a hierarchy of users and, consequently, different editing rights, but everyone can contribute, which allows the user to guide, organize and control the posts.

II. MATERIALS AND METHODS

We performed the research by making a bibliographic analysis, reading papers, investigating case studies involving Wikis, the visitation of virtual museums and virtual learning environments.

This type of methodological goal is classified as exploratory research, to select Wiki tools that favor visitor interaction in a virtual museum, in order to turn it into a Wikiseum environment.

We researched in descriptive studies the functionalities required in a Wiki environment and then compared them to the functionalities presented by the tools under study (Table 1).

A. Characteristics of Wiki tools

Bowen (2008) states that the Wiki tools way of working is equivalent to a Content Management System (CMS), because it allows for the easy creation, editing and management of content even by people that have no advanced skills in programming and that may be geographically dispersed.

According to Bordignon (2007), the main characteristics of Wiki tools are the following:

• Presentation formats: they have the editing and reading modes; the reading mode allows visualizing the published content, the prepared document. The editing mode, on the other hand, allows for the authorized used to introduce, correct and add new contents through an exclusive interface with text formatting options and media insertion in a simple and very intuitive way, not requiring specific knowledge in HTML for the creation and editing of content.

• Review: at the end of the edition of a page, the changes are immediately visualized, in case the user has a profile authorized for this feature. If not, it requires the review by an administrator or another person that is responsible for the Wiki that authorizes the introduction of the changes.

• Page version control: allows for the reversion of the content of a document if needed, returning to the older version. It is the edition history, which is very useful in case of vandalism attacks against a Page or document.

• Page insertion: allows for the creation of new pages in a simple way.

• Search engines: allow the management of researches made by the users, being the mediators between them and the content data base. They offer results to the searches made and keep and historic of all the changes performed in a page.

• Internal and external communication: allow the internal use as a collaboration and communication tool between professionals within a company or institution and external use, offering a service and waiting for user participation (as contributors or content reviewers).

• Authorization control: the authorization control over final edition of each article is variable, depending on the setting defined by each Wiki creator, the administrator and reviewer profiles and the permissions offered to the common user registered in the Wiki.

• Free rights: free from author rights, making it easy to copy, modify and redistribute contents.

• Grouping of specific information: allows for the grouping of articles from a specific knowledge area, creating a structure that allows for the navigation of this area and the deepening of the investigation in topics of interest, with the help of categories, subcategories and hyperlinks.

• Hyperlinks: creation of links between articles in the Wiki and other sites.

B. Selection of Wiki tools

The Wiki system allows the user to contribute to their community through reports, discussions and experience exchanges, making them interfere in their own way in the context in which they live.

In the bibliographic review, we studied two Wiki tools that are used in virtual museums in other parts of the world but that in Brazil are usually associated with virtual learning environments (VLE) in distance education and that has been also inserted as a resource in presential education – MediaWiki and Moodle.

The third tool studied here and which shows great potential as to its Wiki functionality is TWiki, used in corporative environments.

C. MediaWiki tool

MediWiki is a free Wiki tool offered for internet servers that can handle millions of accesses per day. It was developed it PHP and uses the MySQL database. It is flexible and can be used in several applications. One of its benefits is the use of WikiText formatting, allowing its users to use text editing and creating resources easily, independently of the fact whether they have previous knowledge of XHTML or CSS (MEDIAWIKI, 2015).

MediaWiki, as the other Wikis, uses HTML text markings in its editor. It has resources for inserting tables, links and images and for font selection in order for the information to be presented in a more attractive and clear way.

Page editing in MediaWiki is similar to the one presented in Wikipedia. When the user edits a page, the edition is inserted in the database, but the previous versions of the edited page are not deleted, being saved and working as a backup so that it becomes possible to revert what to was previously written in case there is vandalism to that text (MEDIAWIKI, 2015).

The information presented as articles in MediaWiki are organized into categories and there will always be a specific category in which related information will be inserted.

The resources for internal and external links allow the user to navigate from an article to another within the museus as well as use links to other sites.

Version control is made through the tab “History” where we can see the changes to every article with date, time and user that made each change. With this functionality it is possible to recover previous versions unmaking changes with information that is incorrect or irrelevant.

MediaWiki users have some privileges that allow them to use (or not) system functionalities. The existing user types are: anonymous, registered, administrators and burocrat groups.

The anonymous users are those that are not enrolled in MediaWiki and which, for safety, are monitored through the connection IP, and in case they do not abide by the system rules of conduct, they can be blocked and prevented from participating in the system by file uploading.

Registered users are those that have an account to access MediaWiki, having a password. They have a user Page with their information and another page for “discussion”, where they can write and control their articles.

The access restrictions and privileges in MediaWiki are also managed by the administrator user, who delegates the access function and establishes the functionalities use restriction for the other members, storing, protecting and unprotecting pages, as well as deleting them. Besides, there is a special control that allows the administrator to block the IP address from users that break the environment rules and also import pages and restore excluded ones.

The “Burocrats” group allows the users the privilege of changing the user type of other members of the system through the access of a page that is restricted even to the administrator. This type of privilege is defined when the Wiki installation process is performed.

Nevertheless, this group cannot be used only by a single user, but by a collegiate, because of safety reasons, because if something happens that blocks the access of one of the burocrats, the does not experience change in the routines in which this kind of user privilege is needed.

The negative point of the MediaWiki tool is that it has a technical flaw that needs to be correction. The functionality of page redirecting based on the title is not offered and must be created so that the link and search for content can work appropriately (MEDIAWIKI, 2015).

D. Moodle tool

Moodle is a virtual learning environment that offers teachers a way to create and teach distance courses through activities that require student action, such as answer, discuss, and others or materials for consultation and study organized based on a teaching plan (LEITE, 2015).

Moodle has many resources such as a forum that foster communication between users, as well as access and permission for everyone to cvisualize and create contents such as doubts, sugestions, coments on contents taught in the distance learning environment or even in the presential environment (LEITE, 2015).

It also has a small blog that allows the student to create his personal page, a mural in which are exposed the works performed by the students and the most important thing for us: a Wiki tool that offers a space for the construction of text in a collaborative way(LEITE, 2015).

Moodle has been used in the educational environment as a support tool for course application and administration, specially in the distance learning mode, allowing for greater integration between student and professor and offering an opportunity for its users to express opinions and constantly improve the content inserted in this environment.

Moodle's Wiki was created with the goal of helping the individual to build a social critique, seeking an improvement in student development with resources that make them thinks on the information, studied content in order to be able to build and contribute with knew knowledge based on what was

observed.

The text editor used in Moodle is Atto, which has icons and functions familiar to those who use the conventional editors, in order to facilitate its use. It allows the creation of editing section titles, activity descriptions, answer to a question in a questionnaire of the edition of contents with many blocs(MOODLE, 2015).

The Moodle environment has the function to turn on or off in case some administration rule relating to the edition of Wiki content is broken.

Moodle also offers the autosave resource for the content inserted in the Atto editor, allowing for automatic saves of the page when the user leaves it. Besides, it also offers the resource of frequency of automatic save which defines the interval defined for a text to be saved and posteriorly restored. Its standard is 60 seconds, but it is possible to change this interval by having administrator permission.

In spite of the advantages presented, the Moodle tool has some disadvantages such as: redundancy in the execution of some tasks, which may cause a certain confusion in the user when he performs them (an example is content posting); the space to publish media is very small, which makes it impossible to post videos, for example. Another disadvantage is the lack of instruments to help the user (MONTANARI et al, 2014).

E. TWiki tool

TWiki is one of the most widely known and powerful Wikis (together with MediaWiki) and is a public domain tool developed in Perl, a stable and multiplatform programming language, widely used in web development (TWIKI, 2015).

This tool is a corporative Wiki with Open Source license, normally used in the development of projects, document management and collaborative authorship group works (groupware). As the other Wiki tools, it is easy to use in the tasks of creating of web applications for all user levels, from basic to advanced (TWIKI, 2015).

TWiki offers several resources that make it easier to use it and allows it to be recognized as a collaborative system, through the following resources:

• Browser: the creation of new pages and the editing of existing pages can be made in any browser. There is no need for FTP or HTTP-puts to upload pages.

• Auto links: the web pages are linked automatically and it is not necessary to learn the HTML commands to connect them.

• Text formatting: simple and easy to learn, because it is similar to common text editors.

• Page grouping: the pages are groups into TWiki webs (or collections). This allows for the creation of separate collaboration groups.

• Search: allows to search from complete texts or regular expressions.

• E-mail notification: an e-mail is sent to the administrator as soon as a change is made to the TWiki pages.

• Structured content: the information can be classified and divided into categories, making it easier to work in this environment.

• Revision control: the changes in pages and attachements are tracked. Previous reviews can be recovered and the difference between versions can be shown. It is possible to know who changed content, what was changed and when it was changed.

• Access control: it is possible to define user groups, manage participating users and restrict access to users andu ser groups, as well as define punishments to those Who fail to comply with the access rules.

• TWiki Plugins: there are several plugins with different functionalities that improve TWiki, adapting it to the user needs, such as plugins for calendars, graphs, databases, news portals, slide shows, etc.

• Page management: individual pages can be renamed, moved and deleted using the browser.

• User management: web pages based on registered users and passwords.

The disadvantage of using this tool is the functionality for review control that, if used in an incorrect way causes the loss of structure in pages version, preventing the user from returning to the original version of the Page when he removes content changes (HAETINGER et al., 2005).

III. RESULTS AND DISCUSSIONS

Through the literature review, we were able to realize that the Wiki in virtual museums, as well as the Wikiseum, is something not yet discussed or implemented in Brazilian virtual museums, but in our country these tools are used normally in learning environments.

In order to analyze the tools to be used in the virtual museum, we studied three Wikis, two already used in virtual museums in Europe and United States and the other used in a leaning environment, especially in the distance learning mode. The Wikis studied were MediaWiki, the Moodle platform and TWiki.

Next we present a table comparing the characteristics that should be present is a Wiki for the implementation of virtual museums, turning them into a Wikiseum, as well as an analysis of their existence in the analyzed tools.

The characteristics that are analyzed below are described in the documentation of the mentioned tools, as well as in articles that describe case studies of their use.

The MediaWiki tool is used in several virtual museums in the United States, such as *The Newark Museum* specialized in art and natural sciences, the New Jersey museum, and in Portugal, in the Casa de Camilo museum. TWiki, on the other hand, is used in the creation of sites that discuss subjects involving the community through forums such as the CyberPark Anísio Teixeira site. Moodle's Wiki is used in distance learning, but with some changes in could be used to implement a virtual museum.

	Analyzed tools		
Characteristics	MediaWiki	Moodle	TWiki
Presentation mode	Yes	Yes	Yes
Review	Yes	No	Yes
Pages version control	Yes	No	Yes
Page insertion	Yes	Yes	Yes
Search engines	Yes	Yes	Yes
Internal and external communication	Yes	Yes	Yes
Authorization control	Yes	Yes	Yes
Free rights	Yes	No	Yes
Specific information grouping	Yes	Yes	Yes
Hyperlinks	Yes	Yes	Yes

Table 1 – Comparative table of the analyzed Wiki tools.

After the comparative study, we came to the conclusion that the most adequate tool for the future implementation of virtual museums is MediaWiki, because it shows great potential in the environment where it is used to help teaching-learning, especially in the distance learning mode.

This Wiki has specific characteristics that allow for its use in a virtual museum, such as the existence of different levels of users and consequently, different editing rights that form a hierarchy, making it possible to control what is inserted in the museum and serving also as a way to prevent eventual vandalism.

The potential to create and edit collaborative content in MediaWiki was also decisive to choose this tool for the creation of the Wikiseum environment. As Alvim (2012) states, "using MediaWiki software is a quality guarantee, because it supports Wikipedia and this is the most used, developed and studied wiki environment".

Nevertheless, Bowen (2008) points out that the success or failure of this Wiki does not depend only of the tool itself, but also needs the creation of a team, in order to discuss, select the team and organize the initial structure of the Wikiseum, as well as to motivate the community to participate in its development.

IV. CONCLUSIONS

Through bibliographic review, it was possible to verify that the Wikiseum is a possible solution to the lack of interaction that occurs in most virtual museums. In Europe and mainly in Portugal, this tool is widely used as a resource to improve the interaction between the public and the collection and as a way to publicize the presential museums.

We selected MediaWiki as the most effective to solve the problem found, mainly because of the success in the implementation of virtual museums in Portugal. Besides, this tool stands out because it has two very important characteristics for a Wiki, which are essential for the management and better use of the functionality of a Wikiseum: authorization control and presentation modes.

The Wiki tools and especially the Wikiseum, were analyzed in order to foster the users interaction with the museum environment. This type of resource is not a guaranteed solution and as future work we need to implement and test them in order to verify the effectiveness of the ideas that were discovered in the theoretical study. The application of Wiki tools may be performed in virtual museums in order to attract visitors, as is the case of the totally virtual museum in the city of Iporá.

When thinking about the application of the MediaWiki tool to the totally virtual museum of the city of Iporá, we realize the need to enlarge the team that develops the virtual museum (which today has only two persons) and also that it is imperative to involve the community in the authorship and growth of the collection.

As future work, we state that there is an ongoing application of a usability text of the totally virtual museum by History teachers. This will help organize the virtual museums collaborating with the inclusion of new content and as moderators of the content inserted there, we can say that the collaboration of more authors to the collection will guarantee the vitality of the project.

REFERENCES

[1] ALVIM, L. (2012) Wikis & museus: uma oportunidade de abertura das Coleções à comunidade. Portugal.

[2] BARRETO, Margarita. (2000) Turismo e legado cultural. Campinas: Papirus. p. 53-73.

[3] BORDIGNON, Fernando R. A. (2007) Wikis: hacia un modelo comunitario de preservación y socialización del conocimiento. Disponível em: < http://eprints.rclis.org/9612/>.

[4] BOWEN, J. (2008) Wiki Software and Facilities for Museums, Proceedings Museums and The Web 2008, Toronto: Archives & Museum Informatics. Disponível em: <http://www.archimuse.com/mw2008/papers/bowen/bowen.html>.

[5] CASA DE CAMILO. Disponível em: <http://camilocastelobranco.org/>.

[6] CIBERPARQUE ANÍSO TEIXEIRA. Disponível em: <http://twiki.ufba.br/twiki/bin/view/CiberParque/WebHome>.

[7] HAENTIGER, D. et al. (2005) Twiki, uma ferramenta de co-autoria livre. RENOTE: revista novas tecnologias na educação, Porto Alegre. Disponível em: < http://www.cinted.ufrgs.br/renote/nov2005/index.html>.

[8] HOFFMANN, P.; HERCZEG M., Atração por Interação: Wiki Webs como uma maneira de aumentar a atratividade da Web Sites Museus, J. Trant e D. Bearman (eds.) Museus da Web 2005: Proceedings, Toronto:

Arquivo & Museu da Informática, publicado 31 de março de 2005. Disponível em: <http://www.archimuse.com/mw2005/papers/Hoffmann/hoffmann.html >. Acessado em: maio de 2014. _____. Loki – mobile localization and wiki-based Information for museums. International Journal of Computing. 2010.

[9] LEITE, Maria Teresa Meirelles. O ambiente virtual de aprendizagem Moodle na prática docente: conteúdos pedagógicos. Laboratório de Educação a Distância– UNIFESP. Disponível em: <http://www.pucrs.br/famat/viali/tic_literatura/artigos/ava/textomoodlevvirtual.pdf>. Acessado em: março de 2015.

[10] MEDIAWIKI. Disponível em: <http://www.mediawiki.org/wiki/MediaWiki>. Acessado em: abril de 2015.

[11] MONTANARI, T. et al. (2014) Da plataforma Moodle à construção de objeto de aprendizagem para o ensino de embriologia. Congresso Brasileiro de Ensino superior a Distância. Florianópolis/SC. Disponível em:<http:// http://esud2014.nute.ufsc.br/anais-esud2014/files/pdf/126235.pdf>.

[12] MOODLE. Disponível em:<https://docs.moodle.org/29/en/Features >. Acessado em: abril de 2015.

[13] NEWARK MUSEUM. Disponível em: <http://www.newarkmuseum.org/>.

[14] OLIVEIRA, José Cláudio Alves de. (2002) Democracia e informação: os museus virtuais totais. Diálogos possíveis. Salvador, v.1, n.0, p. 133-148, jul/dez. _____. Três cases: os museus no ciberespaço. In: Revista Textos e Contextos. Salvador, v. 2, n. 2. p.87-96, jul/2004.

[15] PRIMO, Alex. (2003) Hipertexto cooperativo: uma análise da escrita coletiva a partir dos blogs e Wikipédia. Revista FAMECOS, Porto Alegre, n. 22, pp. 71-89.

[16] TORRES, P. L.; Alcantara, P. R.; Irala, E. F. (2004). Grupos de consenso: uma proposta de aprendizagem colaborativa para o processo de ensino-aprendizagem. Revista Diálogo Educacional,v. 4, p.13. Disponível em: <http://www2.pucpr.br/reol/pb/index.php/dialogo?dd1=766&dd99=view&dd98=pb>. Acessado em: março de 2015.

[17] TWIKI. TWiki - o Wiki Corporativo Open Source e Plataforma de Aplicações Web. Disponível em: <http://twiki.org/ >. Acessado em: maio de 2015.