Reengineering of a virtual library in Science Technology and Innovation: improvements on information access

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Abstract— **Ensuring information access has become a critical issue in modern society. Information is considered nowadays one of the most valuable and strategic asset. Information access improvements aim to reduce the barrier between information creators and information seekers. Aligned to this definition, five improvements (Search Engine Optimization, Information Architecture, Usability, Accessibility and Social Media) were selected as a main guideline for VLs' information access upgrade, which are under development in FAPESP's VL.**

Virtual library; Search Engine Optimization; Information Architecture; Usability; Accessibility; Social Media

I.   INTRODUCTION

Ensuring information access has become a critical issue in modern society. Information is considered nowadays one of the most valuable and strategic asset [1].

The last (eighth) edition of the Regional Congress on Health Sciences Information (CRICS8), featured online presentations of Ministries of Health from 25 countries [2], the vast majority belonging to developing countries in Latin America.

The Ministries of Health presented their efforts in health information dissemination through virtual libraries (VL). One of the recurring topics was the improvement of information access on VL. The initiatives involved, in general, the development or adoption of new information systems, cooperation with bibliographic databases and the expansion in the number of documents indexed.

The initiatives mentioned above are important, but there are others that should be emphasized: Information Architecture, Web Usability, Accessibility, Search Engine Optimization and Social Media, as ways to improve information access in VLs. None of them, however, was approached in the presentations of the countries involved in CRICS8.

A single Search Engine Optimization improvement in the application for bibliographic reference display, on The State of São Paulo Research Foundation (FAPESP)'s VL (available at www.bv.fapesp.br), improved the number of visits in 983.04%. This result means that, in 2010, FAPESP's VL had more than

1,500,000 page views and a worldwide access represented by 155 countries [3].

The aim of this study is to present proposals under development at FAPESP's VL that can also be applied for the improvement of information access in other VLs.

II.   CURRENT VL'S METHODOLOGY AND APPLICATIONS

The 25 national VLs participants in CRICS8, as well as FAPESP's, adopt the methodology and applications developed by the Latin-American and Caribbean Center on Health Sciences Information (BIREME-PAHO-WHO).

The methodology applied by these VLs defines a metadata standard for bibliographic references inclusion and display and for web-site design. Aligned to this concept, the applications were developed according to the methodology [4].

Although the methodology and applications are standardized, it requires features upgrade for a proper information access for users on the Web.

In 2004, FAPESP's VL was launched using BIREME-PAHO-WHO's methodologies and applications. In early 2009, FAPESP's VL began to maintain, by itself, the methodology and the applications. At the same time, it started the development of information access solutions with a different approach from that of other countries VLs that adopt BIREME-PAHO-WHO's assets and presented their experience at CRICS8. This VLs' methodology is adequate, but the applications require improvements so that information access can be boosted.

III.   INFORMATION ACCESS IMPROVEMENTS IN VLS

Information access improvements aim to reduce the barrier between information creators and information seekers [5].

Aligned to this definition, the following five improvements were selected as a main guideline for VLs' information access upgrade, which are under development in FAPESP's VL.

A. Search Engine Optimization (SEO)

SEO plays an important role in information access improvement, since this technique is able to greatly boost a website's visit rate. This means that VL users will be able to reach the information that matches their query in search engines.

In [6] and [7] is illustrated a relevant improvement in information access after the implementation of SEOs techniques in a virtual or digital library.

B. Information Architecture

The need to structure and organize the information available on the web makes the Information Architecture (IA) a prerequisite for VLs, because it guarantees a good navigation, efficiency of search systems and the recovery of content. The intention to apply the techniques of IA in VL is to improve the quality of navigation, to determine the provision of relevant content, and to provide strategies to allow more rapid and accurate access to information [8].

C. Usability

The practices of usability determine the perception of a system's ease of use by users. It is measured by observing the behavior of people performing a particular activity. Different techniques, comprising qualitative (more holistic) and/or quantitative methods, are used in usability evaluations.

Regardless the technique, it is important to consider the five basic attributes of usability – the ease of learning, the efficiency of use, the ease of memorization, the low rate of errors and the subjective satisfaction [9]. Usability and IA concepts, when applied in VLs, may indicate guidelines to improve tools and services. The application of these concepts is likely to strengthen the visibility of website and increase the number of visitors.

D. Accessibility

Accessibility in the Web is associated with effective provision of information to all people, regardless of the technologies used, or the limits of sensory and functional capacity of users.

The Web Accessibility Initiative (WAI) provides guidelines that prioritize the reduction of accessibility barriers existing on the Web. This initiative takes into account not only people with disabilities, but promotes a high level of usability for Web pages.

Studies show that this initiative has also obtained other results, such as the reduction of maintenance costs, the increase in the number of visitations, among other benefits [10].

E. Social Media

Social media is a communication tool for spreading information across a large number of users. Its main attributes include the capacity to provide collaboration, the rapid dissemination (with viral capacity) and the sharing of content, in addition to stimulate the dynamics of creation of networks. In order to meet the current demand of society and contribute to expand the supply of services, the VLs that use these tools seek: to establish a differentiated relationship with users by increasing the effectiveness of bidirectional communication; to provide new forms of information segmentation in order to meet target public; to establish a link between supply and demand (relevance to the user); to aggregate content in different formats selected by users themselves; and to encourage participation and interaction of the community.

IV. EXPECTED RESULTS

The application of the improvements presented in this work will guarantee a better information access to VLs, meaning a greater visibility, efficient user navigation, user satisfaction and an accurate content recovery through search systems.

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