EVM.net: an Extensive Tool for Web Content Management

Marcelo Fontoura, Hebbertt de Farias Soares, Elmira Simeão

University of Brasília, Faculty of Economics, Administration, Accountancy and Information Science and
Documentation—Department of Information Science and Documentation
Campus Universitário Darcy Ribeiro, Asa Norte, Brasília, Brazil
marcelo.fontoura@gmail.com; {hfarias | elmira}@unb.br

Abstract

By the late 90's Brazil experienced the "boom" of Internet although its use was restricted to the universities and large companies. On this context the Parliament of the state of Rio Grande do Sul (Southern Brazil) has sponsored the development of a tool for publishing its contents. That tool should have some characteristics like be portable, "plug-and-play". Responding to the demand has emerged EVM.net (acronym for modular virtual structure on the Internet), a GPL integrated solution for publishing and managing web contents. EVM.net follows a distributed information architecture, each user is responsible for maintaining his contents. The system has been conceived to be scaleable: its architecture has been planned following the metaphor of a building. The foundations contain the security tools and the persistence model, while the other stages are customized for each demand. EVM.net also contains algorithms for query optimization and phonetic search for Brazilian Portuguese. Recently the tool had been used to implement the Extensive Communication Model, which is based on interactivity, hypertextuality, and hypermediation. Currently, EVM.net is being used at many institutions like the University of Brasilia, the Federal Senate of Brazil and the Brasilia's Federation of Industries.

1   Introduction

In the last decades the technological infrastructure evolved faster than on any period of the Modern Era. These technologies opened new possibilities of storage, retrieval, classification and distribution of information. The capability of librarians, archivists and other information professionals for dealing with their object of work also has been empowered. Internet is an example of the referred evolution.

On the web the platforms used as tools for managing electronic content require a reconsideration of the usual document concept. Even though they work based on traditional publication processes, these platforms open different possibilities for specific methods which implement a new way for reading and writing the hypertext.

Given this context, this paper address the question of the implementation of an academic portal using the Model of Extensive Communication (Simeão and Miranda, 2003) and the Modular Virtual Structure for Internet (EVM.net).

2   The Model of Extensive Communication

The information and communication technologies pose new challenges to Information Science on what may concern the organization format of the hypertext. The most distinguished feature of content published on the WWW is its hyper textual format, i.e., a kind of textual organization in which the reader may choose the sequence to follow based on remissive entries.

One of the web-related phenomena seen in the last times has been the migration of content published under the traditional, intensive, press format to electronic format. About that transition of formats Brown (1999) defined his expectations regarding new formats:

> "With the existence and scientific massification of electronic texts, the bibliographical capacities add themselves in order to establish links to the electronic body of the texts, be it in form of magazines or in electronic document servers. The multimedia capacities are introduced to the magazines, and therefore there is a change in the concept of what the magazine is or can be, incorporating not only videos and sound, but also active mathematical formulas, the visualization of theorems and collected data, the visual display of genetic structures and simulations that calls for the interactive participation of the reader, researcher and visionary". [3:44]

When dealing with those problems, Simeão and Miranda (2003, 2004) proposed what they called the Model of Extensive Communication, a.k.a. a new paradigm for studying the hypertext.

2.1   Variables of the Model

This model comprises three variables: interactivity, hypertextuality and hypermediation (Simeão, 2004).

- Interactivity—interactivity is the possibilities of interaction within readers, authors and readers, authors and editors, readers and editors inside the same platform. Interactivity changes are strongly related to advances in the format of content publication, the amount of storage and the network's capacity of data transmission. In her study about the nature of electronic journals, Simeão (2004) considers as possible majors for interactivity the presence of some elements like:
  - Possibility of content and format evaluation;
  - Possibility of the reader doing records and annotations;
  - Chats;
  - Forums;
  - Alert services;
  - FAQ's;
  - Availability of service for e-mailing author, editor and journal.

- *Hypertextuality*—hypertextuality is concerned with the quantity and the format of hyperlinks inside a document and in the platform globally. At first sight, the use of HTML language is a sine qua non condition for hypertextuality, once that aspect emerges related to open and flexible languages. Nevertheless, its existence is observed even in closed formats like PDF documents. The hypertextual aspects of a platform can be improved by interoperability within different systems. According to Simeão (2004), possible majors for hypertextuality are the presence of some elements like:
  - Internal and external links;
  - Authorship and subject conceptual links;
  - Cross-crossed references;
  - Codification.

- *Hypermediation*—hypermediation is characterized by the use of audio and moving (kinetic) images, resources embedded within the structure of the document. According to Simeão (2004), possible measures for hypermediation are the presence of some elements like:
  - Use of sound;
  - Letter boards;
  - Graphics in movement.

3   EVM.net: a Solution for Publishing Web Content

EVM.net is the result of a set of efforts undertaken in the last eight years. Its origins date back to a demand made first by the Rio Grande Sul State Assembly (southern Brazil) and then funded by the National Union of State Assemblies (UNALE). That demand was for a technological solution enabling content management, which could be adjusted to other institutions.

The name of the technology is an acronym for modular virtual structure on the internet (in Portuguese, **E**strutura **V**irtual **M**odular na Inter**net**) referring to the system's technological architecture.

3.1   Technological Architecture

The technological architecture of EVM.net can be expressed through the image of a building (see Figure 1): the entire system shares a common infra-structure of databases, connections, security system, and system library. New functions, i.e., modules (or stages, if we think of a building) can be added just by calling the methods and classes implemented into the system core (the foundations, as in the building metaphor).

3.1.1   Active Security

In the entire system information is accessed exclusively by system registered pages. No data or information can be accessed by a user unless he or she belongs to a workgroup with an explicit authorisation for carrying out the requested action.

The active security in EVM.net is based on the relationship between the four basics entities of the system: the pages, their security rules, the sites under the portal, and the workgroups. Each page has a security rule for the four functions of a page:

- Select – permission to query for data related to a page;
- New – permission to add data to a page;
- Alter – permission to modify data inside a page;
- Delete – permission to delete data of a page.

Under EVM.net users are registered in a site and inherit the permissions granted to the workgroup they belong to. The relationship "page ↔ workgroup ↔ security rules" can be translated as the permissions that a user may have in a page, which behaves according to that standardization. All links to pages a particular user isn't granted access to will not be activated, as all page permissions are checked before links are shown to users.

3.1.2 Features

- Identification of the page through the URL—a system function checks the identification of a requested page on the database;
- Access rules stored on the database—based on page ID, access level is defined according to the values stored on the database;
- Structured coding using logic groups—all the operations of the system are coded inside groups of function1 that might be reused;
- Phonetic search for Brazilian Portuguese in multiple fields—the search might be carried out in multiple fields at the same time and using phonetic search for problematic letters in Brazilian Portuguese like "s" and "z", "w" and "v". Words like "Vanderlei", "Wanderlei" or "Wanderley" are retrieved in a clear way to users;
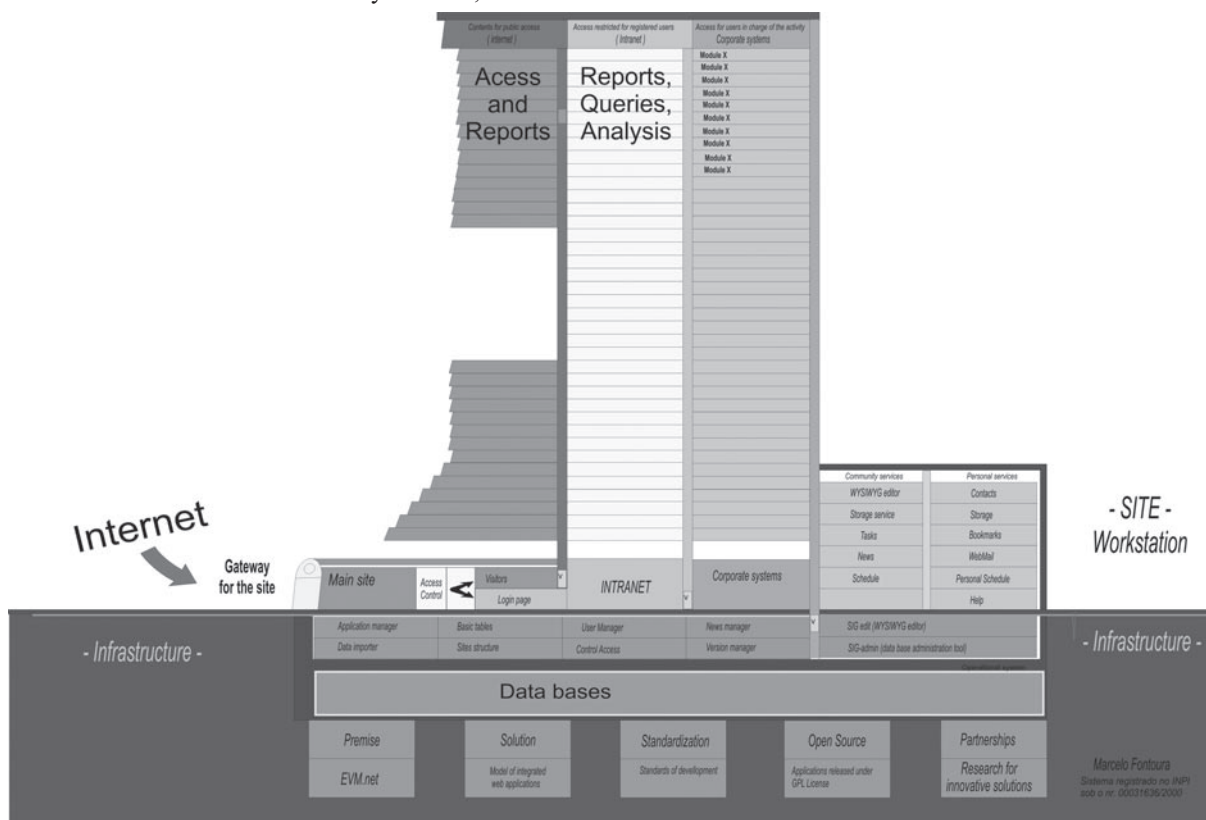

Figure 1: Technological architecture of EVM.net

---

[1] In OO system this resource is called "class".

- Search by ordinary expressions—the system looks up for identical strings;
- Completion of time and data—to enter the date 8th of June 2005 (supposing the current month is June 2005) it is necessary just to enter 8, then the system will complete to 8/6/2005;
- Paginations—all the pages that have search functionality also have the pagination function which separates the results in regular intervals (30 by default);
- Multi-Sorting—the possibility of sorting the results by some criteria;
- Virtual disk integrated to context—All the sites in the system contain a folder in the server for storing their images and documents. Each time the virtual disk is opened, it points to the respective site or page folder;
- WYISWYG editor—the system also contains a WYISWYG editor for publishing content.

4   The Experience of Publishing an Academic Portal with EVM.net Using the Model of Extensive Communication

The process of planning, implementing and managing a web portal should consist of constant staff training and the conception or adjustment of a defined technological architecture focussed on its users. Academic portals work mostly with a highly-specialized audience and with a documentation diversity ranging from administration or unit's documents to those documents directly related to the productivity of the institution managing them.

The Department of Information Science and Documentation at the University of Brasilia[2] (CID/UnB) comprises Library Science and Archive Science undergraduate students, Information Science graduate students as well as professors and specialists in the field of Information Science, Communications and Information Technology. The Department's Portal has been conceived under the model of extensive communication proposed by Simeão and Miranda (2003), prioritising the provision of information products and services.

Initial planning of the Portal has been based on a study of information needs at the CID/UnB developed by Silva (2004). Through the results of the above-mentioned study, the essential requisites of a web platform were defined considering the expectations of students, teachers and researchers – users of the portal. Joining the development team, Silva (2004) has focused on the possibility of implementation of a web portal to satisfy the expectations of each group, verifying there is a favourable environment for using this kind of tool, as well as for the implementation of policies to improve electronic communications. It has been verified in the referred study that 93.8% of professors often or frequently make use of the chain of electronic communications. Based on this, Silva (2004) believes the portal could be used as a channel for informing on professor activities, increasing their visibility for students and researchers as well as promoting their publications. Both students of the graduate courses (Master and Doctor Degrees) and undergraduate courses highlight the importance of the portal as a tool for improving the communication process inside all sectors of the Department.

When inquired about the desired functionalities of the portal, the professors group asked for the publication of Curriculum Lattes[3] (94 %). They also find important publishing the organizational structure of the Department (65%) and information on professional and academic career of the professors. All the segments considered important providing an institutional repository containing, specially, the theses and monographs produced by the students. Also, 56% of interviewees considered relevant greater promotion of the research done at the Department, both at graduate and undergraduate levels.[4]

Based on the survey carried out by Silva (2004), and on the conceptual model provided by the extensive communication model, the plan for implementing the portal has focused, at a first moment, on the relationship of professors and students as well as on releasing documents important for the daily work of academic staff. The development team's goal is to consolidate the Portal as a work tool for all professors, students and staff of the CID/UnB.

Based on the premise of content management decentralization, the platform chosen first was Plone/ZOPE. Due to difficulties managing the system, the group has decided to move to EVM.net—a tool that allowed the conception of products and services following the extensive communication model (especially hypertextuality) at the same time that each module could be combined and controlled on its whole extension. Then, information entered into the platform can be synchronized with the possibility of retrieval from a module different from that to which it was originally entered, thus creating a more interactive and hypertextual reading.

---

[2] http://www.cid.unb.br
[3] The Lattes Platform is a set of information systems, data bases and web portals focused on Science and Technology Management. It has been conceived to integrate the information systems of federal research agencies. Currently it is maintained by the National Council for Research and Development (CNPq) and it is available at: http://lattes.cnpq.br/.
[4] Researches of scientific initiation program – the program for stimulating young researchers. Funded by the CNPq.

The construction process of the portal attempted to create a standard structure, but flexible to user needs, prioritizing the communication within the different nuclei in an autonomous way. The exchange of information may be measured through some characteristics of EVM.net, like:

- Minimization of interference on client side;
- Intuitive interface;
- Centralized access control;
- Customization of information presentation.

4.1 The Navigational Structure

The graphical project of the Portal interface has considered de need of creating the visual identity of the Portal through the association of colours and patterns of design, i.e., different colours and visual unity for the modules. The central concepts rely on facilitating the navigation through the fragmentation of the main modules of the system:

- About the CID/UnB;
- Professors;
- Classes;
- Publications;
- Archive Science course;
- Library Science course;
- Master and Doctor courses;
- Specialization course;
- Special training courses prepared by the Department[5];
- Research groups;
- External links to the University's Homepage, the professor's web mail system, the undergraduate student's web mail system, the portal of academic affairs, and the Central Library.
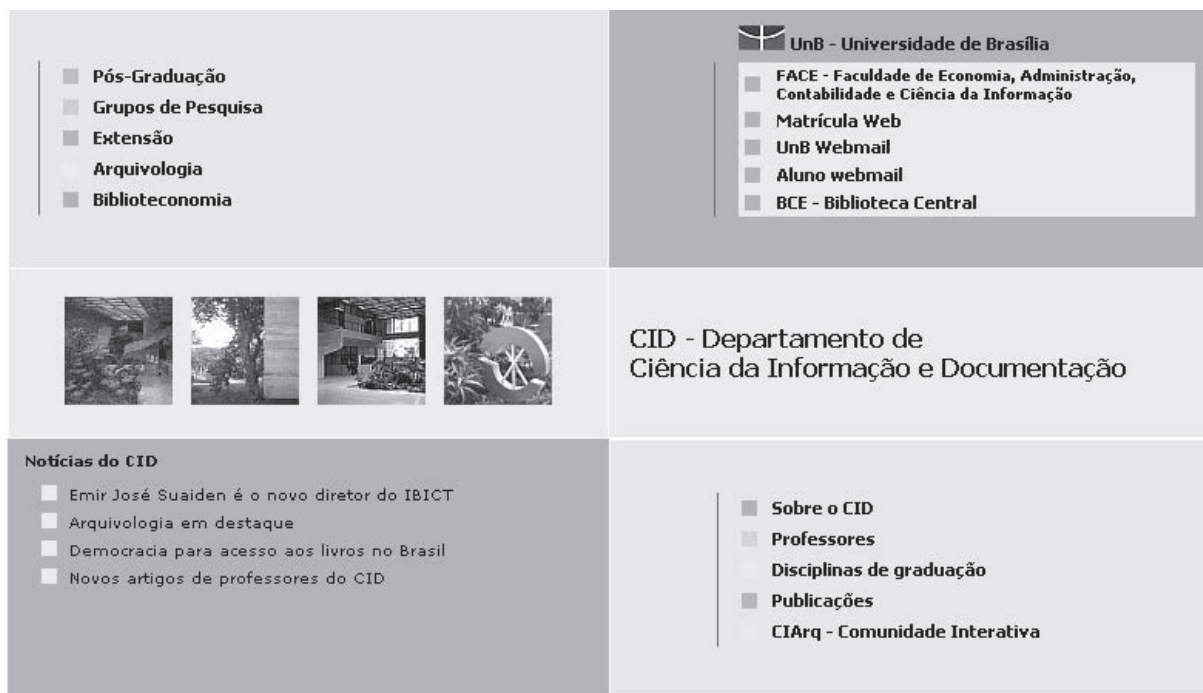
4.2 Feeding the portal

Figure 2: Portal CID/UnB FrontPage

---

[5] In Portuguese – Cursos de extensão.

One of the premises of the Portal is the decentralization of content feeding; each module of the system has a supervisor in charge of information available. Each of those supervisors has the freedom to manage their own sites, with autonomy to insert and modify content. This logic is a qualitative approach of information management, allowing for the construction and integrated management of information adapted to specific needs.

4.3　Services and Products under Development and Provided

Currently there are subprojects on the Portal project. The most consolidated are:

- CIARQ – The community of archivists with a CID/UnB degree;
- Information Science Glossary—a multi-lingual (Brazilian Portuguese, Portuguese, English, German, French, Italian and Spanish) encyclopaedia of Information Science and related disciplines;
- Repository of publications—repository of the documents published by the Department.

References

Brown, J. Gary (1999). La revista eletronica: los desafios de autores, lectores y editoriales. *Revistas Científicas en América Latina*. México: Internacional Council of Scientific Unions, Universidad Nacional Autónoma de México.

Miranda, Antonio; Simeão, Elmira (2002). A conceituação de massa documental e o ciclo de interação entre tecnologia e o registro do conhecimento. DataGramazero. Avaiable at: http://www.dgzero.org/dez02/F_I_dgz.htm.

Miranda, Antonio; Simeão, Elmira (2003). Ciência da informação: teoria e metodologia de uma área em expansão. Brasília: Thesaurus.

Simeão, Elmira (2004). Comunicação extensiva e o formato do periódico científico em rede. Brasília, CID/UnB (Doctor Thesis).

Simeão, Elmira and Miranda, Antonio (2004) Extensive Communication and the Format of the Online Scientific Journal. In: Engelen, Jan, Costa, Sely M. S., Moreira, Ana Cristina. Proceedings of the 8th ICCC International Conference on Electronic Publishing. Brasília: CID/UnB.

Simeão, Elmira; Miranda, Antonio (2003). Comunicação Extensiva e a linguagem plástica dos documentos em rede. In: Medleg, Georgete R. e Leite, Ilza. (Orgs.). Representação e Organização do Conhecimento: Série Estudos Avançados em Ciência da Informação. Brasília: CID/UnB.

Simeão, Elmira; Soares, Hebbertt de Farias; Fontoura, Marcelo (2004). Acessando informação de maneira extensiva: a experiência da organização de dados no Portal do Departamento de Ciência da Informação e Documentação da Universidade de Brasília. Proceedings of the 1º Congresso Nacional de Arquivologia. Brasília: ABARQ.

Silva, Marcus Albert Alves da. (2004). A comunicação eletrônica no contexto da comunidade acadêmica do CID/UnB. Brasília: CID/UnB.