TOWARD A COMMON TEMPLATE FOR SCIENTIFIC WEBSITES: AN INSTITUTIONAL PERSPECTIVE

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ABSTRACT

Web-based Content Management Systems (CMS) technology continues to play an important role during the Web 2.0 epoch. This paper starts from the experiences of two Italian research institutions using the same web-based CMS framework, based on Plone open-source software, to emphasize that similar institutions could adopt the same approach and tool to disseminate information to both their users and the public. The template will embrace different aspects of website design in terms of structural and logical components, and integration tools taken from web 2.0 and social networking sites, which contribute to disseminating information.

KEYWORDS

Information dissemination, content management systems technology, communication, science, open source software, web 2.0 tools, social networks

1. INTRODUCTION

Can a common framework for institutional scientific websites be progressively mapped out?

This paper presents the case of two Italian research institutions sharing experiences and skills using Plone (http://www.plone.org) as their Content Management System (CMS), in order to outline some possible guidelines for scientific institutions interested in following a coordinated and reusable approach. In fact, on one hand, web information systems are becoming more and more important for organizations that need to distribute knowledge and share information that is nowadays structured as web content. With this term, we refer not only to classic hypermedia content structured as a collection of HTML/XHTML pages including formatted documents, audio/video, etc., but also each single piece of information created by social networking sites' tools such as news, blogs, text messages, etc., that contribute to increase the amount of information present on the web. On the other hand, the demand for software products suitable for managing web content and services is always increasing. Several solutions exist, but the choice is not always simple for information stakeholders, even when their requirements are stated clearly. A research institution's mission does not necessarily include web development. Nevertheless, effective communication and information dissemination over the Internet are nowadays mandatory. Special skills within an institute have to be mined, developed and continuously trained; different professionals: researchers, communication specialists and Information Technology managers, need to meet and coordinate themselves. We have experienced that, to achieve these aims, useful practices often can be borrowed from similar organizations and scenarios. For these reasons we thought that sharing our skills and practices, doing this for two scientific institutes that work in two different scientific fields would bring us some interesting and useful results. Public research institutes

provide content and services through their websites with a communication model which seems to be "standard" to some extent, and share at least some common features (Massoli, 2007). These features spring from the institutions' organization, the peculiarities of the activities they perform, their missions and the roles they play in both the scientific community and society. Open source and collaborative projects allow a community of users who have similar demands to share and contribute to common solutions. Plonegov (http://plonegov.org) is an initiative between public organizations, open source communities and companies to develop Plone-based common solutions. CommunesPlone (http://www.communesplone.org) is an example for 100 municipalities in France and Belgium.

The paper briefly describes the two Italian research institutes and their Plone–based portals, and illustrates the efficacy of the role CMS still plays in the Web 2.0 epoch and the rationale behind drafting a proposal for a common Plone-based framework for public research institutes to tune and reuse.

2. INAF, INGV AND THEIR WEB DISSEMINATION SYSTEMS

INAF (National Institute for Astrophysics, http://www.inaf.it) and INGV (Istituto Nazionale di Geofisica e Vulcanologia, http://www.ingv.it) are two Italian national research institutes that rely on Plone to develop their first-level domain institutional portal.

INAF, formed in July, 2000, is the Central Administrative Institute that, in Italy, promotes and coordinates research activities in astrophysics through its network of 19 institutes placed throughout the country and two National Observing Facilities (the Telescopio Nazionale Galileo Galilei (TNG) in La Palma (TF, Spain) and the Large Binocular Telescope (LBT) on Mount Graham (Arizona, U.S.)). In 2005, when the institute assumed its definitive organizational structure, a new web information system was designed to ensure an efficient flow of information coming from different sources, both from the headquarters to the peripheral institutes and vice versa ,and to disseminate information to and from the different categories of web users (internal staff and the public).

INGV was formed in 1999 from the merger of the former Istituto Nazionale di Geofisica, Osservatorio Vesuviano and three institutes of the National Research Council. It was meant to include all scientific and technical institutions operating in geophysics and volcanology in Italy. The institute, currently the largest European body dealing with research in these fields, also is charged with seismic and volcanic monitoring of Italian territory and related hazard assessment. It is composed of 9 sections plus the Central Administrative Unit; it is headquartered in Rome and has important facilities in Milano, Bologna, Pisa, Napoli, Catania and Palermo. Its institutional portal is the result of a laborious redesign process, which started on the occasion of the institute's scientific reorganization in 2004. It was carried on within the framework of a dedicated Transversal Thematic Coordinated project (TTC) on which all sections collaborated (2004-2007).

An analysis of the available solutions for the situation and the problems to solve (Boccato, C. and Pastore S., 2006 and Rubbia, G. et al. 2008), led to the choice of a web CMS and, specifically, the Zope/Plone platform, as the right tool for portal development.

2.1 Main features of the two platforms

The INAF's web dissemination system collects the bulk of information that comes from the central administration and the other institutes, and manages through Plone all the information workflow to put all the blocks into the right places. The editorial organization consists of 20 content creators and editors, each of which manages his own section by, for example, inserting all types of content, and two reviewers who control the information flow and resolve conflicts. Finally, at the head of this hierarchical structure, one person is responsible for the entire site by authorizing publication. This logical structure reflects the institute's organization, under which specific activities and projects are dynamically brought onto the home page. The INGV's web dissemination system consists of a network of institutional websites, including the first-level domain portal plus websites for sections, online databanks and web applications. The portal's editorial staff consists of selected personnel form all sections i.e. researchers, technicians and administrative units, who are physically distributed in Italian territory and update content relevant to their section in specific areas of the portal. For example, the Press Office's personnel maintain the area of press releases, press reviews, etc.; one researcher is the leader in providing content, and initiating updates when multiple sections

contribute to a specific research theme. The English version is left to the editors themselves. Both portals (Fig. 1) rely on Plone 2.5 to guarantee stability and efficiency, even if an upgrade (e.g., the 3.x version) is in development. Add-on products have been added to the basic version, e.g., INGV uses ItalianSkin (http://redomino.com/it/labs/progetti/ItalianSkin), LinguaPlone and FAQulator, in order to manage compliance with the accessibility requirements of the Italian Stanca Act n.4/2004 (http://www.pubbliaccesso.gov.it/normative/law_20040109_n4.htm), the English version and editing questions and replies for Frequently Asked Questions, respectively, to name just a few. The INAF uses PloneArticle to manage press about the main institute's activities, and the INGV uses it to manage its journals' collections (Quaderni di Geofisica, Rapporti Tecnici INGV, etc).

Fig. 1: Homepages of INAF and INGV (October 2009)

3. TOWARD A COMMON FRAMEWORK

CMSs still help to manage web content. The structure, type of information and tools that research institutes' websites require, as outlined by our experiences, motivate the proposal of guidelines for common choices and customization of specific add-on products, suitable for organizations that have similar needs.

3.1 The role of CMS software

Web-based CMS provides the facility for managing massive amounts of digital content through a front-end accessed through a browser as the user interface and a back-end consisting of a database system where content is stored and organized. The actual role of CMS in portal management is justified by its ability to manage different kinds of information such as events, news and forum items, as well as textual information, graphics or multimedia, and by its peculiarity in being a tool that is fast, flexible and accessible to multiple users. Its role also is crucial in the Web 2.0 epoch, when users should deploy web content directly.

Even if all scientific literature about web evolution emphasizes the shift toward a participatory web by underlining the fact that specific tools such as CMS should be replaced by newer technologies such as wikis, CMS remains the primary tool to use for portal management because of its main feature, i.e., its ability to process all phases of information flow from creation to publishing, even for users without specific technical skills. The choice of a CMS is a strategic one: a web-based CMS can be generic or specialized, open-source (Stallman, 2009) or commercial and developed with different programming languages such as jAPS2.0 (http://www.japsportal.org) or Lenya (http://lenya.apache.org) (Java-based); Drupal (http://www.drupal.org), Joomla (http://www.joomla.org) or Typo3 (http://typo3.com) (PHP-based); Plone (Python); WebGUI (http://www.webgui.org) (Perl-based), Radiant (http://radiantcms.org) (Ruby-based) or DotNetNuke (http://www.dotnetnuke.com) (.NET-basec). Plone's key strengths is its security model as regards its ability to configure roles and permissions for users accessing content. Moreover, it uses a Zope application server that, introducing a complexity in software layering, improves performance by providing a clear separation between Plone and web server management. Plone requires a great deal of initial effort to design and implement, but then with minimal changes it works very well.

3.2 Main advantages of a shared framework

Beyond the INAF and INGV, several other Italian research institutes use Plone including the Consiglio Nazionale delle Ricerche (CNR) and the Ente per le Nuove tecnologie, l'Energia e l'Ambiente (ENEA), for example. After analyzing the similarities and differences between our Plone-based systems and communication models, we propose a project to design a common framework to share, which could be very useful for other scientific institutions. The project should take into account at least three aspects: 1) institutional communication, 2) content accessibility and 3) evolution of dissemination in the Web 2.0 epoch.

Most Italian research institutions, subjected to digital administration's code (http://www.cnipa.gov.it/site/_files/Opuscolo%2013II.pdf), have similar organizational structures, and their websites reflect this. A customized Plone layout could help highlight the main information that such an organization should present by means of, for example, portlets, viewlets and single sections of information (e.g., news, main events, etc.). Italian Public Administration, and therefore public research institutes, must provide quality websites, in that their contents should be widely accessible, and, specifically, comply with the Stanca Act's 22 technical requirements. The Plone ItalianSkin product seeks to obey this law. It is worth noting, in fact, that CMS accessibility affects different categories (Scano, R., 2008): the back-end that stores and organizes content, the editor that helps to build the pages and the content that is generated (web pages, audio and video content, pdf documents, etc). Integrating participatory tools to increase dialogue and interactivity with the users has to be taken into account, such as tools taken from the social networking sphere, which has gained a great importance in communicating with the public (Funk, T., 2008). Examples ranging from videos on YouTube (http://www.youtube.com) channels or images from Flickr (http://www.flickr.com) stores, and pieces of information in the form of news through RSS feeds (thanks to the Google API (http://code.google.com)), to short text messages through profiles in Twitter (http://twitter.com). Plone 3.x, could integrate most of these tools in a platform using different products.

4. CONCLUSION

Two research institutions, INAF and INGV, have been experimenting from some years with using the Plone CMS open-source software to manage their institutional portals. For this reason, we thought it would be worthwhile to share our skills and practices by proposing a project that aims to implement a common framework that could be reused by other scientific institutes involved in different scientific fields. Peculiar features of a CMS technology such as Plone simplify the communication process for such institutions; working on specific aspects of this software could produce a reusable strategy. The template should embrace the definition of a website's structural and organizational components, by specifying single Plone objects and integrating tools taken from social networking sites and Web 2.0 tools, which nowadays, are mandatory to reach the public broadly.

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