



## BRIEF REPORT

# Application of the Technology Web 2.0 in a Drug Information Centre☆☆☆

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Received 30 January 2011; accepted 10 July 2011

Available online 11 February 2012

### KEYWORDS

Web 2.0;  
Hospital pharmacy;  
Drug information  
centre;  
Pharmacology

### Abstract

**Objective:** To develop a Web 2.0 resource map and select those that may be useful in a Drug Information Centre at a Hospital Pharmacy Department (CIMSF).

**Method:** A multidisciplinary working group under the Biomedical Information Commission selected some of the Web 2.0 resources included in the *Guía d'usos i estil a les xarxes Socials* guide of the Catalanian Government.

**Results:** Six resources were selected: *Netvibes*, *Delicious*, *Google groups*, *Google Docs*, *Slideshare* and *Twitter*. These tools were used for 5 months to manage biomedical information for the medical staff, and to provide external visibility by providing information to other health professionals. More than a thousand hits were recorded on the portal *Netvibes* and more than 100 professionals followed CIMSF on *Twitter*.

**Conclusions:** The Web 2.0 offers useful, user-friendly and cost-efficient tools which could be implemented in a CIMSF, while also enabling participation in external networks of pharmacotherapeutic interest, increasing its visibility to other professionals.

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### PALABRAS CLAVE

Web 2.0;  
Farmacia  
hospitalaria;

### Aplicación de la tecnología web 2.0 en un centro de información de medicamentos

### Resumen

**Objetivo:** Elaborar un mapa de recursos Web 2.0 y seleccionar los que pueden ser útiles en un Centro de Información de Medicamentos de un Servicio de Farmacia Hospitalaria (CIMSF).

☆ Please cite this article as: Juárez Giménez JC, et al. Aplicación de la tecnología web 2.0 en un centro de información de medicamentos. Farm Hosp. 2011;35:315.e1–315.e5.

☆☆ This study has been presented partially as a poster at the 55th National Conference of the Spanish Society of Hospital Pharmacy held in Madrid from 19 to 22 October, 2010.

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Centro de  
información de  
medicamentos;  
Farmacología

**Método:** Un grupo de trabajo multidisciplinario, dependiente de la Comisión de Información Biomédica, seleccionó algunos de los recursos Web 2.0 incluidos en la *Guia d'usos i estil a les xarxes Socials de la Generalitat de Catalunya*.

**Resultados:** Se seleccionaron 6 recursos: *Netvibes*, *Delicious*, *Google groups*, *Google Docs*, *Slideshare* y *Twitter*. Tras 5 meses de utilización, estas herramientas permitieron gestionar información biomédica para los facultativos del centro y generar visibilidad externa aportando información a otros profesionales de la salud. Se registró más de un millar de accesos al portal *Netvibes* y más de un centenar de profesionales se añadieron como seguidores a la cuenta de *Twitter*.

**Conclusiones:** La Web 2.0 ofrece herramientas útiles, intuitivas y coste-eficientes, que pueden implementarse en un CIMS F permitiendo también participar en redes de interés farmacoterapéutico externas aumentando su visibilidad a otros profesionales.

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## Introduction

For more than a decade, new technologies have been creating fundamental changes in drug information centres belonging to hospital pharmacy departments (CIMS F in Spanish). Through new technologies, the classic idea of the CIMS F as a body of knowledge has evolved to become an area of knowledge management.<sup>1</sup> To this end, CIMS Fs have developed web pages, intranets and web resources for managing all pharmacological information, whether it is generated actively or passively.<sup>2</sup> Despite these steps forward, disseminating and sharing information among health care professionals and patients themselves is still one of the primary goals for medical organisations and CIMS Fs.<sup>3</sup>

Web 2.0 has been defined by different authors<sup>4,5</sup> as next-generation Internet, with tendencies toward collective use, improved communications and open cooperation. In Web 2.0, users participate actively in social networks that may be accessed through different mobile devices. There are many examples of Web 2.0 technology, and its applications in the healthcare field have given rise to the term "Medicine 2.0".<sup>6</sup> These resources have been widely used by healthcare organisations and scientific and professional societies. At present, there are only a few reports of CIMS Fs using Web 2.0 technologies for drug therapy purposes, and most are in blog format.<sup>7</sup>

As part of our hospital's quality plan, we formed a Biomedical Information Committee (BIC) 4 years ago. Our BIC is a multidisciplinary group with different professional profiles that include the lead CIMS F pharmacist and the library documentalist. One of the goals set by the BIC for the year 2010 was to disseminate and implement potentially interesting Web 2.0 technologies in the library and in clinical departments. In this case, we felt that the CIMS F could be an area that might be able to use this technology.

The purpose of this study was to draw up a "map" of the different Web 2.0 resources, evaluate and select the ones that might be useful in processes having to do with drug information, and integrate them with CIMS F.

## Material and Method

This study was carried out by a working group reporting to the BIC. It included a documentalist and expert in Web

2.0 resources, the CIMS F lead pharmacist and the resident pharmacist on rotation in that area. We initially designed a wide-ranging search for resources with selection criteria based on ease of use, degree of use by other healthcare organisations, the prestige of the developer or responsible body, content encryption and security, availability of storage space, acceptance of different archive types and usefulness criteria for the drug information process. These included information storage, dissemination, reception, mainstreaming and updating. Lastly, given the large number of available resources and the difficulty of evaluating them, the working group recommended selecting those listed by the *Guia d'usos i estil a les xarxes Socials de la Generalitat de Catalunya*<sup>8</sup> (Social network use and style guidelines for the Catalan Regional Government). This guide presents different Web 2.0 resources with specific recommendations for configuring and using them.

Once the map was set up and the resources selected, we adapted the drug information centre content and processes for use with each of the selected resources. We then passed the resulting Web 2.0 architecture along to members of the department.

## Results

By applying the proposed criteria, we selected 6 resources, which are listed and described below:

1. *Netvibes*, a virtual dashboard based on *Really Simple Syndication* (RSS) technology.
2. *Delicious*, the social bookmarking service.
3. *Google groups*, a work tool that professionals may use to exchange information and documentation.
4. *Google Docs*, for creating collaborative documents.
5. *Slideshare*, for disseminating Microsoft PowerPoint presentations.
6. *Twitter*, a social network that promotes the exchange of opinions and information on the Internet.

The project structure was based on creating and editing a website in *Netvibes* to host the rest of the selected resources.

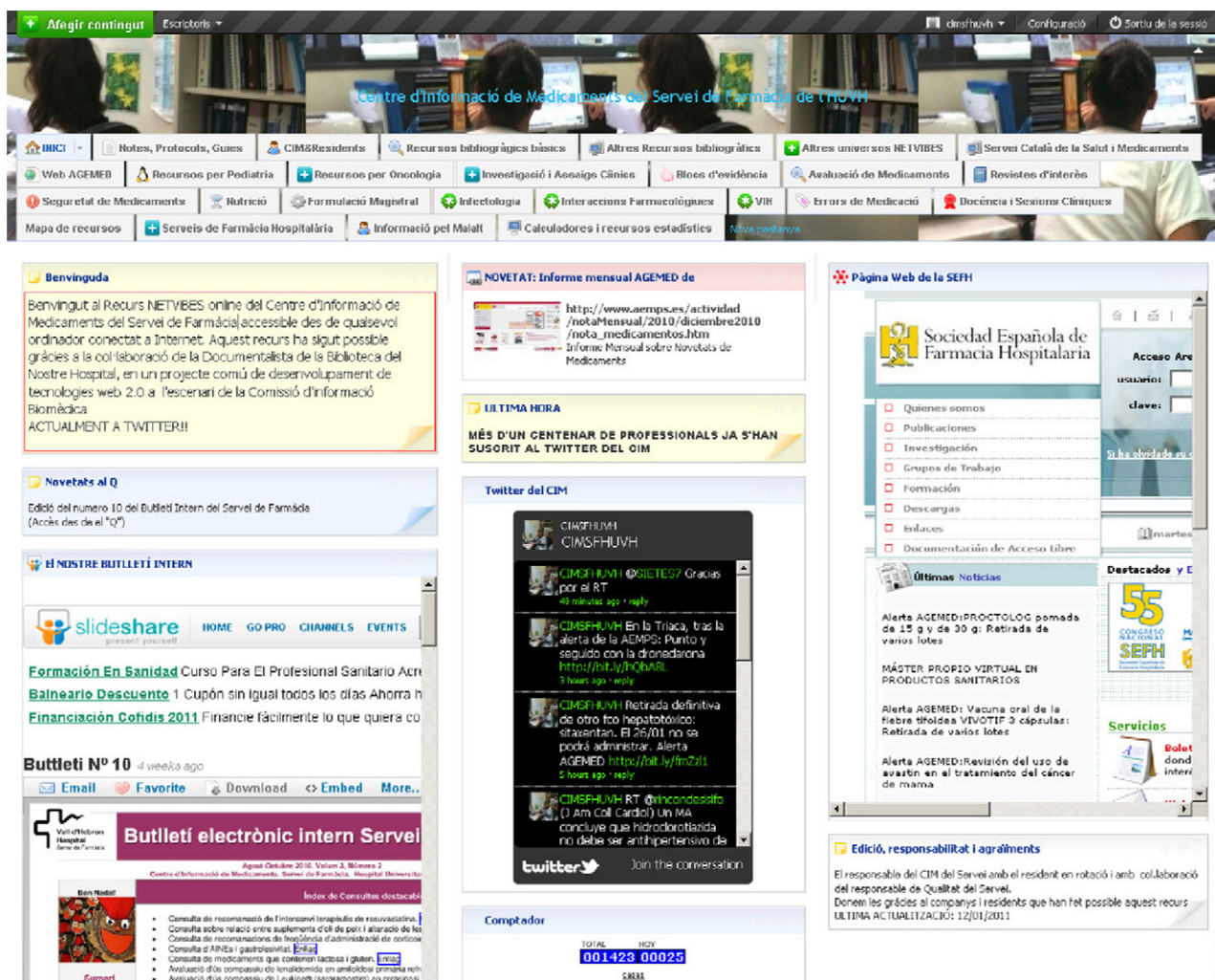


Figure 1 Netvibes dashboard for the drug information centre.

Below, we describe the utility of and experience with each of the selected resources applied to the CIMS after 5 months of use:

1. **Netvibes:** <http://www.netvibes.com/cimsfhuvh#INICI>

This resource let us create a virtual dashboard with more than 20 thematic areas in hospital pharmacy and pharmacology, including links to web pages and interesting sites for resolving treatment queries, generating drug evaluation reports, information on continuous training, as well as small descriptive documents, remarks and tables of contents for specialty journals based on RSS technology. In this case, we included a start page explaining the content and purpose of the dashboard with a hit counter and a survey tool for recording users' opinions (Fig. 1). This resource was linked with Netvibes for the hospital library through <http://www.netvibes.com/huvh#Inici>. The CIMS Netvibes site was set up as a central resource, which allowed it to link to the other Web 2.0 resources we selected for the drug information centre. The feature allowing us to add a hit counter informed us about acceptance by users; in this case, there were more than a thousand hits after 5 months.

2. **Delicious:** <http://www.delicious.com/cristinapuyal>

We used this tool as a social bookmarking service; it included a set of links for different medical specialties designed to create a virtual library.

3. **Google Groups:** <http://groups.google.com/group/farmaceutics-residents-huvh>

The tool was used to generate a forum for residents in the department with drug treatment and paedagogical information. They posted scientific articles, presentations of clinical sessions, completed studies and other types of professional information. The forum served to create debates, exchange opinions and discuss organisational and training topics. Due to the need for privacy, the account was set up with access restricted to group members. Each group member can create his or her own profile and decide where to receive the information being exchanged, for both posted documents and debate topics. Items may be sent either to personal e-mail addresses or to the group address.

4. **Google Docs**

This work tool was used by attending physicians and residents to exchange information and documentation. It let us create, modify and discuss different documents that require participation from



different users since they need a variety of interpretations and opinions.

5. *Slideshare*: <http://www.slideshare.net/CIMSFHUVH>

This tool was used to store and disseminate pharmacy department Clinical Sessions, and other documents in PDF format. It should be said that this tool permits different access levels, which may be either public or private. The application itself contains a counter that registers each published presentation or document to keep a record of its visibility.

6. *Twitter*: <http://twitter.com/#!/CIMSFHUVH>

This social networking tool promotes the online exchange of opinions and information by means of messages shorter than 140 characters. This is known as nanoblogging or microblogging. Users subscribe to the messages of other users with common interests, and this generates topic-related networks. The CIMS F subscribed to different healthcare and professional organisations in order to obtain pharmacological information as quickly as possible. We must state that it was difficult to find hospital-related organisations and users, including hospital pharmacists. Primary care physicians used the network the most, and they were therefore the ones who monitored CIMS F activities. The main objective was to post short messages on new and topical items in the literature, web pages of interest, drug therapy news, training activities and actions undertaken in this area, including reports for the drug therapy commission, bulletins, notes and more. In 5 months, more than 100 healthcare professionals and organisations subscribed to the CIMS F's Twitter account.

The 6 resources were integrated in the CIMS F intranet and in the hospital's library webpage. Users were trained in on-site sessions in the hospital library. Information was disseminated through the pharmacy department's electronic newsletter and the hospital library intranet.

## Discussion

There is no doubt that in the current context, with new information and communication technologies, healthcare professionals must adapt continually to the use of emerging technologies, including Web 2.0 resources. In this study, we present a selection of various resources and demonstrate how they adapt to a hospital pharmacy department's drug research and information area.

Published studies of this type on the subject of hospital pharmacy are scarce. The literature basically recounts experiences with creating networks by using Web 2.0 tools for research and teaching. Montano et al.<sup>9</sup> describe their experience using a *Wiki* as a tool to manage training and research in a hospital. Our study did not use this tool because it was not on our list of selected resources.<sup>8</sup> However, we have not ruled it out for future use. *Wikis* allow multiple users to edit and modify content that may be classified at a later moment; one very well-known example is Wikipedia. Other specialists, such as Chu et al.<sup>10</sup>, propose using Web 2.0 as tools for anaesthesiology training.

There has been particular interest in new technologies in the area of public health. In fact, some prestigious authors have recommended using Web 2.0 tools in healthcare

information systems. The 2010 report by SESPAS (Spanish society for public health and healthcare administration)<sup>3</sup> explicitly includes this recommendation. It justifies the use of Web 2.0 tools because they allow professionals with different specialties, from different institutions, to share their knowledge, which is fundamental to completing work efficiently.

The current panorama, in which we must mainstream information instead of employing a classical, closed pyramid structure, was what led to the idea of using Web 2.0 technologies for innovation in the CIMS F.

It must be said that the tools fundamentally permit information management for professionals in the department, as well as making the department visible to other external healthcare professionals. This is especially true for Twitter; our account on that network was widely monitored. This tool allowed us to access alerts or news in the literature that were generated by healthcare organisations and prestigious journals such as the *FDA*, *CDC*, *New England Medical Journal* and *The Lancet*, which offer notifications on Twitter before their websites themselves have been updated. This tool also lets us access the information included in certain medical blogs belonging to prestigious healthcare professionals and featuring evidence-based content.

On the other hand, the *Netvibes* web tool or dashboard made creating and maintaining a webpage unnecessary in our case. *Netvibes* does not offer the same storage and search capabilities as a webpage, but it may be freely accessed and it lets us add links to other resources that store and manage information, such as Slideshare, in addition to other advantages we have already listed. This tool may be an option for pharmacy departments lacking their own website and wishing to make use of Web 2.0 technology; another advantage is that it is free. Google tools, including *Google Groups* and *Google Docs*, are well known, simple and widely accepted. *Delicious* enabled the CIMS F professionals to work together to develop personalised library, with bookmarks organised according to hospital specialty.

One of our study's limits is that we did not perform an objective evaluation with a systematic search for all Web 2.0 resources available on the Internet. However, studies of this kind have not yet been published. It is possible that Web 2.0 technologies are simply selected according to their user-friendly qualities and the visibility of their content. In our case, we decided to simplify the selection process by using recommendations put forth by our regional government. While tools such as Facebook, LinkedIn and Youtube were recommended by the guide, we did not use them. This was because we were able to offer in-depth analysis of the implementation and development of the tools which we did select.

It should be said that the constant updating and appearance of new resources oblige us to revise and evaluate the prospect of using new tools. In this case, designing a working group that reports to a hospital committee and includes a documentalist with ample experience with Web 2.0 is necessary; this individual efficiently assesses the entire process of selecting, developing, implementing and renewing resources. This is yet another example of cooperation and alliance-building between different professionals with a view to innovation and improving healthcare quality.

Lastly, Web 2.0 resources also have their limitations, mainly the dubious quality of the information they contain; excess advertising; lack of security for the content; excessive presence and the impermanent nature of the resources themselves. Selecting resources based on the recommendations we mentioned may prove useful for locating Web 2.0 tools that present fewer limitations and more advantages. Undoubtedly, including other CIMSFs in the study will help to show which resources are the most useful for our area, and these information centres would also be participating in an established healthcare 2.0 network.

To conclude, Web 2.0 offers useful, user-friendly and cost-efficient tools that can be implemented in a CIMS as a set of resources that aid in information management and dissemination. This is true not only within the hospital, but also in external networks of pharmacotherapeutic interest, which makes information more visible to other healthcare and information technology professionals.

### Conflict of Interest

The authors have no conflict of interest to declare.

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