



DOSSIER "ICT and Heritage"

Narrowcasting of Virtual Cultural Portals: the Cases of Barcelona's Botanic Gardens and the Boí Valley

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Abstract

This article aims to explain the reasons behind the success of a cultural resource on the internet. It is not always the number of hits that determines this success, instead they need to be used by specialist groups and in the context of cultural dissemination, education and research. The aim in defining the key concepts of cybermetrics, the discipline that studies the quantitative description of the content and communication processes seen on the internet, is to show how the narrowcasting of cultural resources to groups of interest is more important than general broadcast over the internet.

Keywords

cybermetrics, virtual portal, narrowcasting

Resum

Aquest article mira d'explicar les raons que hi ha al darrere de l'èxit d'un recurs cultural a Internet. No sempre el volum d'accessos resulta determinant en aquest èxit, sinó que calen col·lectius especialitzats que el facin servir i contextos de difusió cultural, educació i recerca. Per mitjà de la definició dels conceptes clau de la cibermetria, la disciplina que estudia la descripció quantitativa dels continguts i els processos de comunicació que s'esdevenen a Internet, es mostra que la difusió selectiva a grups d'interès dels recursos culturals té més importància que la divulgació general a Internet.

Paraules clau

cibermetria, portal virtual, difusió selectiva

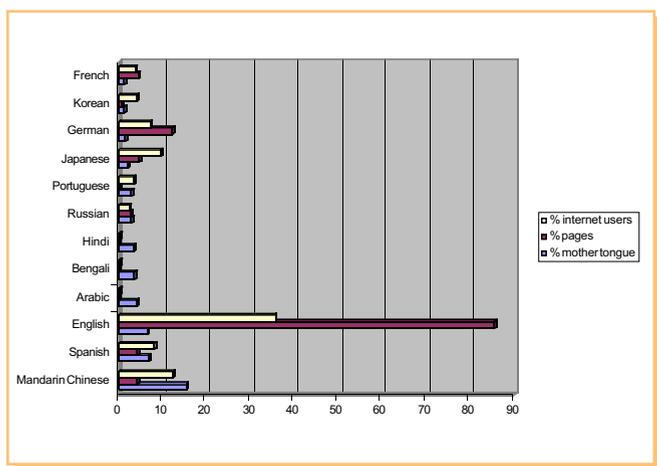


Over the last few years, a new discipline has become increasingly important, known as *cybermetrics*, it "studies the quantitative description of the content and communication processes on the internet" (Aguilló, 2004). This new discipline covers any area of knowledge that can be applied to the web and, for this reason, has recently seen increased interest at educational and cultural institutions present on the internet. A sign of this is the recent holding of the *Jornadas de Posicionamiento.es* conference in Alicante (May 2004), where the key factors for positioning Spanish-language cultural institutions were analysed.

Some key aspects of cybermetrics

The importance of the discipline comes from the fact that it is assumed that it has been empirically proven that today's internet users have a standard behaviour when searching for information. It has been stated that 80% of web sessions use search engines, with Google being the favourite in 60% of these cases, and that users normally only access the first three or four results from each search (Aguilló, 2004). Thus, considering this to be a user's standard behaviour, if a heritage institution wants to publicise its cultural contents, it needs to take these criteria into account.

In any case, we need to bear in mind that the guidelines for current behaviour fit a specific internet situation, where general portals are to the fore and where it is difficult to access specialist fields quickly. As portals and search engines become more specialised, (ie the Semantic Web), a change in these guidelines for user behaviour should be seen.



Without doubt, another of the characteristics that needs to be taken into consideration is the language used on the internet. The

graph showing the world's 12 most used languages shows the percentage of population in terms of each mother tongue, and allows for comparisons with the percentage of pages on the internet and the percentage of internet users using each language.¹ As can be seen, English is currently the *lingua franca* on the internet, both in terms of the amount of content (percentage of internet pages) and the number of internet users, despite the fact that only 6.48% of the world's population speaks English as their mother tongue.

Languages	% mother tongue	% pages	users 03 % internet
Mandarin Chinese	15.27	4.3	12.2
Spanish	6.94	4.3	8
English	6.48	85.3	35.6
Arabic	4.16	0.1	0.4
Bengali	3.7	0.06	0.5
Hindi	3.47	0.06	0.5
Russian	3	2.8	2.5
Portuguese	2.9	0.4	3.5
Japanese	2.08	4.6	9.6
German	1.62	12.1	7.3
Korean	1.29	0.7	4.1
French	1.24	4.5	3.8

This same situation, where internet presence outweighs actual numbers, is seen with languages such as French, German or Japanese, whereas other languages, including Spanish, Portuguese, Chinese, Russian and Korean need to produce more content in order to measure up to the numbers of speakers and internet users. However, the situation of the Arabic, Hindi and Bengali languages on the internet is disproportionately poor when compared to the position they deserve. In line with this data then, cultural portals on the internet should use those languages required to make them accessible to potential audiences, taking into account that as more pages are published in each language, the competition between them will increase.

Another important factor when placing a resource on the internet is the amount of data or the number of individual pages, both directly visible and invisible – ie, generated dynamically from a database. Logically, the greater the amount of data, the more possibilities to increase the number of consultations of these resources.

As has been stated above, the key to the popularity of a resource is the fact that it appear in one of the top positions in

1. Data obtained from Linguasphere (<http://www.linguasphere.org>), for frequency of words on AlltheWeb, and Global Reach (<http://global-reach.biz/globstats>).



search engines, a concept that has been defined as *visibility*. A range of factors influence this by affecting the algorithms used by the search engines, above all Google, including the number of external links, the definition of keywords (*metatags*), the page's ranking (*PageRank*) and diversity. A website's impact depends on the relation between its visibility and the number of pages it has.

Finally, the evaluation of the results for access to a virtual resource requires indicators for its popularity (absolute number of visits, relative ranking of visits) and for the visitors (sessions, geography, itinerary, language, search words). Basically, the idea is to analyse the data provided by a range of access or log analysis programs, each with its own limitations. In this case, we have generally used the Webalizer, Webtrends and Awstats programs.

Virtual resource dissemination strategies

Optimising results, in quantitative terms, which requires the correct application of the concepts of cybermetrics, is the most common strategy for publicising a website. The site looks to offer universal access and the resource's success is measured in terms of the number of visitors, without taking into account whether visitors are satisfied or not with their visit or whether the site has a social or cultural function.²

It has already been mentioned that, in terms of culture, the popularity of a virtual resource is not necessarily a reflection of its quality nor does it ensure its success in providing a specialised audience with specific materials or content. For heritage and cultural resources, broadcasting and narrowcasting to specialised audiences are equally important (Carreras, 2004). When we talk about specialised audiences, we are referring to potential users of a resource with an interest in the specific subject, and to their links to the institution and the use they make of the resource for education or cultural dissemination (such as tourism). In all these cases, it is necessary to publicise the resource through portals or virtual communities linked to these specialised audiences.

At times these virtual communities or portals can be easily identified, but in the majority of cases they do not exist or are so atomised that great efforts are required in order to reach the specialised audience. Whereas broadcasting strategies are well characterised, those for narrowcasting have still to be developed and need the internet to adapt.

An initial phase of publicising can be carried out using the large internet portals specialising in cultural subjects, such as Clio, Cervantes Virtual or Monografias.com, which generate high levels of access during the first few weeks of the introduction of the resource. In Spain, there are virtually no monographic portals for museums: there is the Virtual Museum de España web space, which has yet to work, and some private initiatives, such as the Musealia portal,^[www1] which have a limited geographical reach. Whereas, in some countries there are already monographic museum portals (such as <http://www.24hourmuseum.org.uk>), which aid wide-ranging raising of awareness for all those interested in the activities of cultural institutions (Carreras *et al*, 2003).

Following this initial phase of broadcasting on specialised monographic portals, the narrowcasting can focus on a specific audience. The aim is to find groups that might be interested in the resource, such as museum users, educators, journalists, students and groups linked to the subject in question.

A second phase consists of publicising the resource within the educational community. In our case, the Òliba group^[www2] contacted the administrators of the Xarxa Telemàtica Educativa de Catalunya portal (Catalonia's Educational Telematic Network, XTEC),^[www3] a web space for the exchange of virtual resources for the teaching community in Catalonia. Many of the virtual resources, which were highlighted on the homepage and in the portal's telematic sections, raised a great deal of interest. The majority of the digital resources for heritage centres need to provide an informal educational function and, thus, need to reach educational communities so as to be used in the classroom or as part of visits to these centres.

The final phase in the dissemination, but by no means less important, looks to define a series of metadata, ie, keywords that serve to aid both the subject indexing of the website by search engines and access from possible users interested in the subject. Firstly, this metadata needs to be carefully defined, in line with the Dublin Core protocol, which has been expanded for cultural resources with contributions from other institutions, including the Canadian Heritage Information Network (CHIN).^[www4] All the keywords defining the website's contents are vitally important: in this case it is advisable to use a large number of specific words, rather than a small number of generic words.³

There is still a lack of studies into website dissemination strategies on the internet. The empirical experience from the Òliba group suggests that more specialised words, ie, those that are unlikely

2. Some of the cases of greatest success on the internet in terms of levels of access are the digital press (immediacy of news in real time) and distance education universities, such as the UOC (large virtual communities).

3. As we have statistics for access to our websites and know which words are used to find the resource, we can expand the search keyword metadata with any new words that appear on these lists.

[www1]: <http://www.musealia.com>

[www2]: <http://oliba.uoc.edu>

[www3]: <http://www.xtec.es>

[www4]: <http://www.chin.gc.ca>



to appear as metadata on other websites, ensure improved access to the resources. Thus, instead of searching for words like *heritage* or *culture*, which may well appear in many other resources on the internet, it is a much better idea to target expressions such as *computational linguistics* or *opus vermiculatum*.

Once these keywords have been defined in the different languages, programs such as AddWeb 6.0 can be used, which provide forms to define virtual resources. Once the corresponding data has been entered, all this documentation can then be sent to the world's leading search engines to aid their indexing. And what are the results?

Below are the results from the assessment of two portals created by the Òliba group for Barcelona's Botanic Gardens^[www5] and the Boí valley,^[www6] based on the study of the logs, reviews of the links from search engines and web crawlers, and comments from users.

The portal for Barcelona's Botanic Gardens^[www7]

The portal for Barcelona's Botanic Gardens is a project that was carried out during the spring of 2001 and which went online in December of the same year. The order came from the Science Museum and work was carried out in collaboration with the Gardens' managers, under the direction of Núria Membrives.

The project for Barcelona's Botanic Gardens is not the only work carried out together with Barcelona's Science Museum, as there had been earlier collaboration on the virtual exhibition "Nature's Treasures". The excellent results from this initial collaboration were one of the main reasons for participating in this second project, which was set up in May 2001. There were to be two phases for introduction: the first was to allow for the presentation of a prototype at the ICOM Conference held in the first week of July and the second definitive version was to be produced for December 2001.

The aim of this project was to widely publicise what people could find when visiting the Botanic Gardens, a facility that is little known to the inhabitants of Barcelona and those visiting the city. The reason people do not know about this facility is due to its only recently having opened, in 1998, and, thus, it has yet to consolidate its position in terms of the city's educational and leisure activities.

Likewise, the Gardens' managers also wanted to offer a taste of the things people could see if they visited the gardens and, above all, to try to raise interest amongst the young or those interested in botany and gardening. In line with the models defined by the Òliba group (Carreras, 2002), the type of website needed by the

Botanic Gardens corresponded to the **connection model**, in which only part of the contents from the physical space are represented on the internet and which aims to have the real and virtual exhibitions complement each other.

Thus, the aim was to present some of the species of plants and ecosystems at the Botanic Gardens virtually, which correspond to the different Mediterranean landscapes around the world, in the format of a printable file that would act as a guide for a subsequent visit to the gardens themselves. There are eight sections in the Gardens corresponding to different Mediterranean landscapes, including California and Chile or the Iberian Peninsula. Thus, the idea is to show these landscapes using photographs, maps and related images and to link them to their location in the Gardens.

The website has four main sections: one with **information**, one for **exhibitions**, one about **art and nature** and, finally, one with **games for children**. In terms of the presentation, an animation has been created in Flash which shows some of the plants that form part of the exhibition. It has been proven that a good quality dynamic presentation in Flash makes sites more attractive, leading to users finding the content more interesting. Although they do cause a number of problems for search engines trying to index the contents. The structural design, and the definition of the transversal sections, was carried out through dialogue with the Gardens' managers – and without copying an existing portal or website model, instead looking to define a web space tailored to the interests and needs of those responsible.

It should be pointed out that a year after the inauguration of the web space, these same managers of the Gardens realised the potential of the resource and came up with a new design for a second phase, in which new functions could be incorporated. The new developments are to aid greater communication between the users and managers, above all for one-off activities (such as conferences, congresses and other events), and the introduction of educational materials by teachers. Likewise, the research carried out by the institution is also to be included.

To aid a wide-ranging dissemination, not only in the local audience, but internationally, the web space was designed in three languages (Spanish, Catalan and English), and the same strategy for broadcasting used for any other Òliba group exhibition was employed. The physical and virtual exhibitions take place at the same time, which means that they have to complement each other.

In defining the metadata, the name of the geographical areas were used, as were generic terms such as *flower* or *plant*, which caused problems for search engines indexing the site. Currently, there are plans to update the metadata with the specific species names of the plants in the Gardens. This is sure to greatly improve the narrowcasting via search engines.

[www5] http://oliba.uoc.edu/jardi_botanic

[www6]: <http://oliba.uoc.edu/boi/portal>

[www7]: <http://www.jardibotanic.bcn.es>



As has been seen with other web spaces, the Gardens' site has taken around 6 months to consolidate itself as a resource and, currently, it has an average of 75 visits per day from some 35 countries. The users are predominantly local, accessing the site via educational resource portals that use the site (XTEC), but there are others coming from different botanical gardens. In both cases, narrowcasting has been carried out, which, over time, has provided results.

Currently, there are around 2,000 visits to the resource each month, with between 60 and 80 visitors a day. It has also been seen that it is a "seasonal" resource, ie, it is visited more often in the months of March, April and May, dates which register peaks in visits, which must be related to the greater number of physical visits in the springtime.

Another fact that deserves highlighting is the increasing number of repeat visitors, who return to the website, despite the fact that one of the frequent comments from visitors was that the contents were not updated regularly – a factor that needs to be addressed in the future. As a sign of the evolution in visits over the last few months, the following table offers a series of figures (source Webalizer):

Evolution	Number of visitors
December 2003	1107
January 2004	1565
February 2004	1810
March 2004	2138
April 2004	2392
May 2004	2292
June 2004	1790
July 2004	1721
August 2004	1786
September 2004	2279

Proportionally, over 50% of visitors to the resource navigate the site in Catalan, which means that they are likely to be locals; 40% use Spanish, national and Latin American, and just 10% navigate in English. Likewise, it has been seen that an important number of virtual visits are very short, lasting less than a minute.

In terms of where visitors come from, the majority are Spanish, but there is also a wide variety in the countries from which the site is accessed, as reflected in the following map interpolating the data from March 2003. The distribution has not varied greatly over the last year, which means this map is representative for other months.

Access from abroad is generally American (USA) and European, where the preferred language is English. It is slightly surprising that, by comparison, access from Latin American countries does not match that seen for other resources created by the Òliba group. Accord-



Fig 1. Distribution of access to the Botanic Gardens portal (March 2003), interpolation in Idrisi 4.1.

ing to our analysis, this is due to the fact that the metadata has not been taken advantage of sufficiently. More specialised words are needed to allow for narrowcasting to Latin American groups interested in the subject, who could access the site via general search engines.

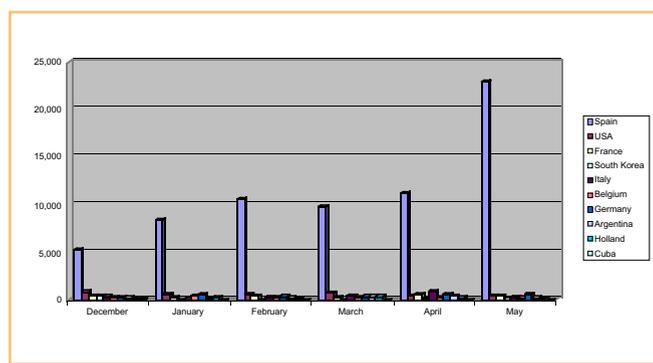


Fig 2. Histogram of the number of pages visited from each country (from December 2003 to May 2004).

The histogram shows the wide variety of different places from which people visit our resource, for whom we have qualitative information from their answers to the virtual questionnaire. Though the percentage of answers does not reach even 0.1% of visits, they do offer information worthy of consideration. Over 50% of messages stated that they knew of the existence of Barcelona's Botanic Gardens, but that they had never been, which meant that the website was their first contact with the institution.

Some of the messages stated that more information and more effective communications with the centre over the internet were required. To a degree, they justify the need to redesign the web space, incorporating more interactive sections. Likewise, most of the suggestions asked for more content on the website dealing with plants and their setting, such as J. P., from Colombia:



"I would recommend you include information on the architectural designs: a map, more complete views and of the different areas, maybe animations of the itineraries..."

Likewise, the subjects of gardening and botany were raised, as in this contribution from J. A., from Barcelona:

"More photos of the plants are needed and there should be more on gardening and botany."

There are even foreign visitors who, following a physical visit, have decided to relive the experience by visiting the website, and who have been left wanting more, as can be seen with A. and S. G., from Manchester:

"We feel that your website could be improved by including a list of all the plants in each area and maybe more photographs. Well done, keep up the excellent work."

Some more specialised comments in terms of gardening asked for details on how to organise the maintenance of the gardens, the people working there, etc.

The portal for the Boí valley^[www8]

The project for a portal for the heritage in the Boí valley was carried out during the years 2001-2002, and was probably the most ambitious undertaken to date by the Òliba group, both in terms of the multimedia applications and the size of the contents⁴ and in terms of the number of institutions and people that had to be coordinated. At this point in time, the second phase of development of the project (2003-2004) has been completed, which has seen the production of three versions of the portal, in Catalan, Spanish and English, the latter being a reduced version.⁵

One of the highlights of the project is, without doubt, the definition of a model for a virtual platform for the broadcast of natural and cultural heritage for a community that is located faraway from the country's main technological and economic centres, known as the **galaxy model**. Furthermore, it allows for the virtual presentation of objects and structures that are currently to be found in museums and institutions that are far from

the valley (such as Catalonia's National Museum of Art (MNAC), Lleida's Diocese Museum or Vic's Diocese Museum). Likewise, the virtual platform has been designed to be a meeting point for people interested in the Romanesque and medieval history, a means for communicating for the local community and an educational space for primary and secondary schools, universities and, even, tourists.

This project began in the spring of 2000, when the Òliba group contacted the Boí valley's Tourist Board so as to make a joint bid for the regional grants offered by the CIRIT (ACOM-2000), aimed at developing regional research projects in areas far from the country's main R&D and university centres. At this time, Barruera town council, as the legal representative for the Boí valley, had presented the valley's candidature as World Heritage to UNESCO, given the artistic value of its Romanesque churches. The awarding of the grant by the CIRIT was confirmed in October 2001 (ACOM-2000-026),⁶ and a few weeks later the Boí valley was also designated World Heritage – an ideal time for a portal to encourage greater broadcast, education and understanding of the valley's natural and cultural heritage.

What were the initial objectives for the project and why was it deemed pertinent to create a portal for the valley on the internet?

The Boí valley, despite its rich heritage, currently only has an interpretation centre with a small exhibition space and similarly sized space for resources to aid visits for all those who might be interested in the valley's natural, artistic and historical heritage. A great many of the valley's most emblematic objects are in museums in Barcelona (MNAC) or elsewhere in Catalonia, or even abroad, which means that they cannot be viewed in their original architectural and historical setting. For this reason, the creation of a virtual space that placed the objects and historical events within their geographical context would greatly aid educational visits to the Boí valley.

The web space is designed to act as a meeting point for all kinds of people, from specialists in any area of heritage linked to the Boí valley to tourists who know nothing about its treasures. There are a range of itineraries and hierarchies for navigation to meet the different user profiles and personal interests, which allow for both in-depth and superficial perspectives, offering basic introductory or more detailed information.

The treasures of natural and artistic heritage are always at risk from mass tourism, and, for this reason, the web space looks to raise awareness in potential visitors of the fragile nature of the val-

4. To give a general idea, the number of files on the Boí valley portal is twice as great as any other project developed to date (the Catalan version has more than 2,000 HTML files with text content), with the increased difficulty that we have had to create the majority of the content ourselves.

5. The production costs for a web space of the dimensions of that for the Boí valley would not be viable without the presence of a project collaborator who spoke the language to be translated to or without being able to make use of automatic translation programs.

6. The second phase of the project also received a further grant from the CIRIT for the regional development of research (2002ACOM0003).

[www8]: <http://oliba.uoc.edu/boi/portal>



ley's natural and cultural setting. Indeed, visitors need to take special care of this heritage in order to help maintain and preserve it, ie, to safeguard the valley's defining characteristics. In the words of UNESCO: "memory is vital to creativity: that holds true for individuals and for peoples, who find in their heritage – natural and cultural, tangible and intangible – the key to their identity and the source of their inspiration."

Both people from a range of Catalan institutions interested in the valley's heritage and people from the valley itself have taken part in creating content for the web space. Indeed, some of the sections are managed exclusively by people from local institutions (for example, the Tourist Board, Aigüestortes National Park, the secondary school in Pont de Suert), making use, thus, of information and communication technologies (ICT) to publicise their activities and acting as vital agents in the conservation project.

Likewise, the space is also seen to be an educational resource for students at primary and secondary school or universities who wish to find out more about medieval history, Romanesque art, Pyrenean ethnography or the natural heritage. They learn interactively not only about the Boí valley, but also about medieval Catalonia and, in turn, about the Middle Ages in western Europe.

The portal is based on the same single design, though the contents are held on a number of servers, which makes it an innovative experience in terms of the decentralisation of information, given that each institution is responsible for the management of its own content. The level of collaboration between institutions and companies varies: in some cases, the institutions themselves directly control the content in a given section; in other cases, they provide texts or images that they own or have as part of their collection, and for which they have the copyright, or they help in the portal's creation process. As the APME (Spanish Association of Museologists) defends, the priority is to make heritage accessible, and, in this sense, the internet can be very useful, above all in terms of broadcasting content (objects) spread between a number of centres.

The web content is physically located in at least three or four servers: one managed by the Aigüestortes National Park, another by the school in Pont de Suert,⁷ a third by the Boí valley Tourist Board, and finally the last one by the Òliba group from the UOC. This flexibility makes it easier to update the various sections, based on a series of shared templates and structures. There are sections of the portal that are kept relatively static, whilst others undergo continuous updating.

Alongside those responsible for the servers and the various sections, the following institutions also currently collaborate on the project: the Institute of Catalan Studies (IEC), Enciclopèdia Cata-

lana, Dortoka, Catalonia's National Museum of Art (MNAC), the Alta Ribagorça County Council, Barcelona's Ethnological Museum, the Mas Archive, the Catalan public TV channel TV3 and the Generalitat de Catalunya (Autonomous Catalan Government).

An initial version of the website in Catalan and Spanish was started up in January 2003 and, though it took some time to consolidate its positioning on the internet, it now enjoys a very stable level of visits, with between 90 and 120 a day, which is sure to increase once people find out about the English version (from July 2004). The following table shows the monthly evolution of access to the website:

Evolution	Number of visitors
December 2003	2674
January 2004	2760
February 2004	2468
March 2004	3623
April 2004	3342
May 2004	3014
June 2004	3226
July 2004	3759
August 2004	3779
September 2004	3231

A certain seasonal nature has been seen in access to the website, corresponding to the times of the year when there is most on offer for tourists. Thus, the number of visits increases in winter (ski resorts) until the month of May; subsequently, in the month of June, there is a slight drop, with numbers increasing again in July and August. They go down again in September and the increase begins again in October (the season for mushroom collecting).

Publicising of the initiative has been carried out jointly with the Boí valley Tourist Board with press releases and public presentations, both at conferences and travel trade fairs. Thus, the news appeared on the UOC's portal on January 23rd, 2003. As a result of the press releases, news of the portal's existence was publicised for a wide audience in newspapers such as *El País* (February 15th, 2003) and *Segre* (February 14th, 2003) and journals including *El Semanario de Hostelería y Turismo* (February 18th, 2003).

Subsequently links have been added regularly to a number of educational portals (Universia, XTEC), those specialising in the Romanesque (Románico Navarra), or tourism (Lleidatur, Diputació de Lleida, Turisme de Catalunya) and heritage (UNESCO). All this has aided the general broadcast of the resource, despite the fact

7. Teachers and students have received training so that they themselves can manage a section: life in the valley. They are, thus, responsible for one of the most dynamic sections of the website. Likewise, this activity allows them to use ICT in a practical scenario and see the possibilities they offer a region such as the Alta Ribagorça.



that it was initially only available in Catalan and Spanish. It is assumed that the introduction of the version in English, with its respective metatags, will aid greater broadcast of the resource in international search engines. The provisional data available for the last few months shows a 50% increase in visitors.

Thanks to these very specialised metatags, for the geography and medieval art, there are a great number of visitors accessing the site from the main search engines. Some sections, such as the glossary, are used by a number of communities for education, historians and linguists. Every day sees an increasing number of repeat visitors and, thus, the site can be seen to have become a stable educational resource.

In terms of where visitors come from, users have accessed the site from 40, mainly Spanish-speaking, countries. The following map of visit frequency for March 2003 offers a general view of their distribution.



Fig 3. Distribution of access to the Boi valley portal (March 2003), interpolation in Idrisi 4.1.

At that time, the lack of an English version only highlighted the fact that the majority of users were Catalan and Spanish, as could be seen in the language selection and user names. The following histogram aids comparison of the visitors in the last few months, where it can be seen that there are a good number of French and German visitors, despite the language problems.

The majority of visitors are Spanish, and only in recent months have numbers begun to increase for French, US and German visitors.

As has been mentioned, the assessment of the portal for the Boi valley is still in its early stages, due to the lack of time to evaluate the English version. Once this version has been up and running for a longer period of time, it will be easier to determine the site's positioning on the internet on an international scale. Although we can already analyse the behaviour of the local audience, we now need a better understanding of audiences from further afield.

In the specific case of physical visits, we know that the portal is actively used as educational material in university and secondary school courses. Indeed, even some classes at these insti-

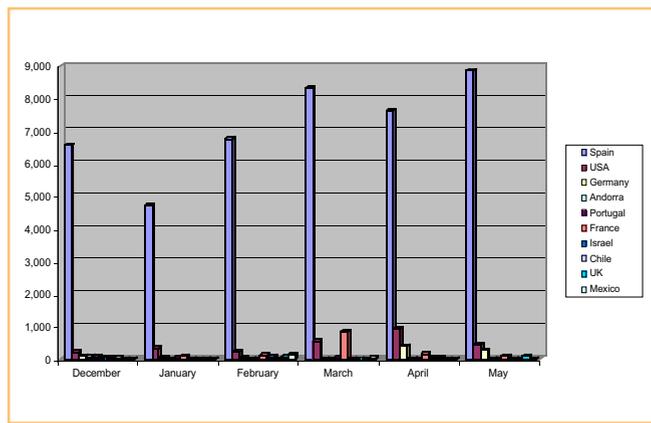


Fig 4. Histogram of the number of pages visited from each country (from December 2003 to May 2004).

tutions are carried out in computer rooms, as part of a series of activities. We have been present at some of these classes so as to indirectly assess the response from students and teachers (Subías, 2004), which, generally speaking, has been very positive in terms of interactive learning, given that it represents a change in the normal routine of the course.

Likewise, we have the comments made by visitors as part of the website's virtual questionnaire, which, despite not being statistically representative, provide interesting documentary information nonetheless. Some comments valued the site and requested more information, especially in terms of tailor-made complementary visits. Criticism has to be accepted with regard to the updating of certain content, where the processes have not been configured correctly.

In most cases, the comments are extremely positive on a wide variety of the contents and the ease with which the site can be navigated. On occasions, graphic documentation and videos are requested, indeed, some comments even propose the incorporation of webcams. Certain messages show how the contents have been used in courses on art or history, as is the case with a Mexican professor at the University of Laguna, who uses them in his classes on Romanesque architecture.

Final comments

This article aims to explain the reasons behind the success of a cultural resource on the internet. It is not always the number of hits that determines this success, instead they need to be used by specialist groups and in the context of cultural dissemination, education and research. The aim in defining the key concepts of cybermetrics, the science that produces a quantitative description of the internet, is to show how the narrowcasting of cultural resources to groups of interest is more important than general broadcast over the internet.



It is not always easy to carry out this narrowcasting of a virtual cultural resource, as the internet does not yet have the necessary mechanisms. Generalised portals and search engines with quantitative algorithms cannot always distinguish between different levels of specialisation or quality. The evolution of the internet may lead to the creation of monographic spaces that more accurately reflect the real diversity of humanity, instead of the generalised or global spaces that simply reproduce models that do not exist in the real world.

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[www9]: <http://oliba.uoc.edu>

[www10]: <http://nomos.csd.auth.gr/>