



The World Wide Web as an information system in Spain's regional administrations (1997–2000)

Antonio Muñoz Cañavate^{a,*} and Celia Chain Navarro^b

^a*Área de Biblioteconomía y Documentación, Universidad de Extremadura, Badajoz, La Alcazaba, Spain*

^b*Departamento de Información y Documentación, Universidad de Murcia, Murcia, Spain*

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Abstract

As a citizen's information system, the World Wide Web (Web) has led to a revolution in the information providing use of government services. It has also led to major changes in the very relationships that citizens have with their governments. The present work is an empirical analysis of the Web sites maintained by the Spanish regional government administrations. The aim is to determine the current degree of development of the technological application, the alternative service that the citizen is offered, and its evolution since 1997. The results show there to be different degrees of regional development, a notable advance in the number of new entities offering Internet-based services. They also demonstrate a slow evolution in the introduction of substantial changes into Web sites that have already been created and a great heterogeneity with respect to services provided (personnel directories, that is, addresses of functionaries and political appointees working in an Administration, press releases, tourist information, statistics, etc.). This study forms part of a broader investigation of the incidence of Internet technology within the Spanish Administration, that is, the hierarchy of organizations that administer Spain's public services.

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1. Introduction

After the death of General Franco in 1975 and the resignation of the last president of the previous regime, Spain entered into a rapid and exemplary process of democratization. This

* Corresponding author. Área de Biblioteconomía y Documentación, Facultad de Biblioteconomía y Documentación, Universidad de Extremadura, Antiguo Hospital Militar, Badajoz, La Alcazaba ES-06071, Spain. Fax: +34-924-28-64-01.

E-mail addresses: amunoz@alcazaba.unex.es (A.M. Cañavate), chain@um.es (C.C. Navarro).

process, without excessive social or political problems, allowed a constitution to be approved within only three years (in particular, on December 27, 1978). The constitution¹ establishes Spain as a social and democratic state, based on law, and with the form of a parliamentary monarchy. The major economic development that began in those years, with its diverse ups and downs, is still under way. A key aspect of this constitutional process was the establishment of seventeen autonomous communities with their corresponding regional governments and with widely varying areas of political competence and powers.

Upon joining the European Union in 1986, and with its democratic system relatively consolidated, the Spanish authorities began to adapt and develop norms aimed at full incorporation into the union. One of the issues that has attracted attention recently has been entry into the so-called “information society.” In the last ten years, new norms have created the legal framework to allow governments (public administrations) to develop new services to the citizen.² Examples are as follows:

- Law 30/1992 of the Juridic Régime of Public Administrations and of Common Administrative Procedures,³ whose publication signaled the start of a series of new actions aimed at introducing technological components into the day-by-day tasks of public administrations.
- The creation of the Interministerial Commission on Administrative Information (CIIA)⁴ to facilitate the changeover and encourage the use of the information generated by public administrations.
- The Plan Info XXI,⁵ an initiative of March 1999, which as of now is the clearest statement of the overall goal of building an information society in the nation. It contains a set of programs and measures for the government to boost the integral development of an information society in Spain and to bring government closer to all citizens.
- The “Organic Law” 15/99 on Protection of Personal Data (1999).
- The “White Book for the Improvement of Public Services”⁶ published in 2000, which presents in three well-differentiated parts the challenges, the policies and strategies to follow, and the commitments facing Spain’s public administration (public administrations are administrations outside the private sector, and administrations are organizations that administer services).

The public administrations’ use of Internet as a tool for the dissemination of public information has been an important advance in services to the citizen. Such concepts as e-government have radically changed the old image of a tiresome administration that, for the citizen, involved a series of length and laborious bureaucratic procedures to obtain any data or information to which he or she needed and had the right.

The essence of this investigation has been to analyze the Web as a new technological approach applied to network-based information systems for the citizen. Indeed the Web has marked an inflexion point in the distribution of information to citizens in the context of public administrations.

Investment in technological infrastructure has made the possibility of use fully viable. Nonetheless, it has to be borne in mind that other factors are also involved. There has

to be a creation of information content, which is in accord with the needs of the citizens it is directed at, which is kept up to date, and which is easily and rapidly accessed. The functionaries involved require training to carry out their tasks in this virtual form. Also, there must exist a real demand for these services or, which amounts to the same thing, a significant percentage of citizens require an Internet connection to be able to use the said services, as well as a knowledge of how to engage such Internet-based services.

Cullen propose the following changes to improve efficiency and responsibility vis-à-vis the needs of the citizens:⁷

1. to identify and make known the best practices in the construction and management of Internet services;
2. to develop strategies that will allow staff to experiment with and try out these new services;
3. to direct studies and investigation towards the identification of the specific benefits that result from putting these electronic services online; and
4. to integrate the Internet into overall policy strategies.

A worthy goal would therefore be to achieve the goal “service to the citizen should be equal to the best that businesses give.”⁸

Studies of public administration Web-based systems are relatively recent due to the recent application of Web-based e-government services. Stowers⁹ distinguishes these studies according to the depth of their objectives. They range from the merely anecdotic to those that are authentic demographic studies of Internet users. Of these studies, those which investigate the applications of already existing systems appeared in the mid-1990s. They have dealt with the quality of the Web sites, comparisons between administrations, studies of a given country’s Web sites or comparisons between countries, and specific applications to businesses, citizen associations, design techniques, or thematic descriptions of Internet sites. In 1997, Eschenfelder et al.¹⁰ gave an “Overview of Selected Website Assessment Sources” and “Criteria for Evaluation of Websites,” with an evaluation of content, scope, security, services provided, privacy, accessibility, links, design, browsability, etc. Also, McClure and Wyman, in an extensive work available online,¹¹ provide a set of criteria to evaluate U.S. federal Web sites.

While legislation has advanced greatly e-government initiatives, there still remain major challenges. An example is the one-way path towards open government and the freedom of information. Although this is already the reality in the United States, within the European framework, not all of the member states have given real signs of adhesion to this principle.¹² One of the best examples is the *Green Book on Public Sector Information in the Information Society*, published in 1998.¹³ This is a complete detailed report on the reality of public information in the EU. It recognizes the importance of transparency and the dissemination of information for all sectors—citizens, business, and administration—and for achieving greater support from EU citizens on European integration. All of the fifteen member nations except Germany, Luxembourg, and the UK have a general law on access to public information. These laws vary in strictness and appeared at a national level

in the 1980s and 1990s, with the exception of Sweden, which has the world's oldest law (1776). Some member nations, such as Belgium and Ireland, have somewhat more advanced legislation than the rest, but most have already drafted a report on the integration of their nation into the information society or on the modernization of their public administrations.¹⁴

2. The Spanish regional governments as objects of study

According to Article VIII of the Spanish Constitution, the state is organized territorially into municipalities, provinces, and autonomous communities.¹⁵ Each of these entities is endowed with autonomy for the management of its respective interests. The autonomous communities, which are the object of the present study, were formed according to the constitution in one of four possible ways:¹⁶

- (a) Mainland provinces with historical, cultural, and economic characteristics in common (Andalucía, Aragón, Cataluña, Castilla-La Mancha, Castilla-León, Comunidad Valenciana, Extremadura, Galicia, País Vasco, etc.). The so-named historical communities¹⁷ form part of this group (Cataluña, País Vasco, and Galicia).
- (b) The island territories (Balears and Canarias).
- (c) Those provinces which by themselves form a historical regional entity (Asturias, Cantabria, La Rioja, Madrid, Murcia, and Navarra).
- (d) Certain territories whose ambit does not surpass that of a province (Ceuta and Melilla, which are not communities but autonomous cities).

Among the various areas of competence that the constitution gives to these communities is the organization of their institutions of self-government.¹⁸ The statutes form the institutional norm of each autonomous community and were passed into law at different times for each Spanish region, within the period 1979–1983.

The object of our study was the autonomous institutional framework,¹⁹ which we distinguish from the territorial framework.²⁰ The former delimits geographically the entities that conform the territory of Spain, the latter the political entities responsible for their government. With this distinction, we wish to clarify that in regional administration, the self-governing institutional framework is developed by the statutes on autonomy of each community. The study begins by analyzing the departments (or *Consejerías*) and the “presidency” (*Presidencia* or Office of the President) of all the autonomous community regional governments of Spain.

This study of the incidence and penetration of Web-based citizen information systems (in the context of the Spanish Autonomous Community regional governments) assumes from the outset that the regional governments maintain an institutional presence on the Internet at the level of central services. The scope is therefore the evaluation of their information-providing development so that the object of analysis is the information services of the organs of each regional government's presidency and departments.²¹

3. Study objectives

The objective of the study is to analyze exhaustively the Web sites of the governments of the Spanish Autonomous Communities considered as citizen information systems. The specific goals were to

1. record the historical evolution of the use and application of the Web in the context of the seventeen Spanish regional governments;
2. compare and contrast this evolution of the Web-based information systems of the seventeen autonomous communities as a function of three developmental parameters:
 - 2.1. the initiation and evolution of the Internet presence of the regional organisms being evaluated (the presidency and the departments)
 - 2.2. the GDP of each autonomous community and the regional government budgets;
3. analyze their information policies by comparing the Web penetration of the four regions with the highest GDP with the regions with the lowest GDP;
4. perform a comparative analysis of the information policies of the four regions whose budgets are the largest with the four whose budgets are the smallest according to their Web-penetration results;
5. determine the domain used (“*.es*,” “*.org*,” “*.net*,” “*.com*,” and other types) in the group of the seventeen regional governments; and
6. analyze the information-providing resources available on the Internet information systems of the central services of the regional governments.

The study team used a number of methods to achieve the goals of the study.

4. Methods

To achieve the objectives described above, it was necessary to design an initial method to collect the data and information concerning the Internet information systems of the regional governments. The below sections detail the process through which the study team obtained the historical series of data, the set of units, the domains used by the administrations, the comparison of results between regions, and the establishment of a template of contents to apply to the different Web sites so as to determine their informational resources.

4.1. Study periods

One of the basic problems in the study was to know when new sites appeared and when old ones changed their Web address or added informational resources, that is, content offered to the citizen. For this purpose, different data gathering methods had to be applied. The collection of data, to determine the presence of new units and their domain type, was carried out every six months in 1997 and 1998: in June (to determine the evolution of the first semester of the year)

and in December (to determine the evolution of the second semester). In 1999 and 2000, data were collected only once per year (June). The investigation concluded in 2000.

The determination and monitoring of the information-providing resources were performed by applying a test in April and October of 1998 and October of 1999.

4.2. Design of a survey template for the collection of information on the departments of the governments of the Spanish autonomous communities

Each regional government in Spain consists of a president and different councilors. The councilors are political appointees responsible for each thematic area of government (education, health, culture, etc.), similar to the ministers of the national government. The administrative organ of each councilor is known as the *Consejería*.

For each of the seventeen regional governments, the study team designed a survey template that included the different units that were the object of the evaluation and study: the presidency of the government and the departments. The search for and collection of data on their organizational structure were performed from the Web servers themselves that some of the regional governments had already set up on the Internet by the beginning of the study in 1997 or by letter of request to the press offices of the regional governments of those autonomous communities, which still had no type of Internet presence available or whose presence did not indicate even the minimal department-level organizational structure that we required to initiate the monitoring process. This initial process of selection was carried out during the final months of 1996 and the beginning of 1997.

4.3. Study of the units of the regional governments

Once the initial template had established for each of the seventeen autonomous communities with their corresponding departments, we then consulted at different times major Web sites, indexes, and search engines, as well as the regional government Web sites themselves.

That allowed the study team to determine the degree of Internet implantation of the Spanish regional administrations. The evolution of the aggregate data of the seventeen regional governments is provided in [Table 1](#) and the data for the separate regional governments in [Tables 2²²](#) and [3](#).

Table 1
Semestral evolution of the aggregate of the regional governments

| | <i>n</i> | Percentage |
|---------------------------------|----------|------------|
| June 1997 (<i>n</i> = 169) | 35 | 20.7 |
| December 1997 (<i>n</i> = 169) | 54 | 31.9 |
| June 1998 (<i>n</i> = 169) | 67 | 39.6 |
| December 1998 (<i>n</i> = 169) | 100 | 59.1 |
| June 1999 (<i>n</i> = 169) | 125 | 73.9 |
| June 2000 (<i>n</i> = 192) | 166 | 86.4 |

Table 2
Percentage growth of regional government Internet presence

| | June 1997 | December 1997 | June 1998 | December 1998 | June 1999 | June 2000 |
|-----------------|--------------|------------------|--------------|------------------|--------------|--------------|
| Andalucía | 35.7 | 35.7 | 42.8 | 50 | 57.1 | 73.3 |
| Aragón | – | – | – | – | 71.4 | 90 |
| Asturias | – | 14.2 | 42.8 | 71.4 | 85.7 | 100 |
| Baleares | – | – | – | 27.2 | 27.2 | 100 |
| Canarias | 18.1 | 27.2 | 27.2 | 36.3 | 54.5 | 45.4 |
| Cantabria | 20 | 20 | 40 | 60 | 60 | 30 |
| Castilla León | – | 22.2 | 55.5 | 77.7 | 100 | 88.8 |
| Castilla Mancha | – | 100 | 100 | 100 | 100 | 100 |
| Cataluña | 40 | 40 | 40 | 46.6 | 53.3 | 100 |
| Extremad | – | 11.1 | 22.2 | 100 | 100 | 100 |
| Galicia | 46.1 | 61.5 | 84.6 | 92.3 | 92.3 | 100 |
| Madrid | 87.5 | 87.5 | 87.5 | 87.5 | 87.5 | 100 |
| Murcia | 12.5 | 12.5 | 25 | 37.5 | 87.5 | 88.8 |
| Navarra | – | – | – | 18.1 | 36.3 | 63.6 |
| P. Vasco | – | – | – | 100 | 100 | 100 |
| La Rioja | – | – | – | – | 100 | 100 |
| Valencia | 60 | 100 | 100 | 100 | 100 | 83.3 |

Table 3
Ranking of regional governments in the penetration in the Internet regarded as an information system for the citizen

| June 2000 | Rank by GDP | Total units of study | Total units with Web site | Index |
|-----------------|----------------|-------------------------|------------------------------|-------|
| Baleares | 1 | 14 | 14 | 1 |
| Madrid | 2 | 10 | 10 | 1 |
| Cataluña | 3 | 16 | 16 | 1 |
| Navarra | 4 | 11 | 7 | 0.636 |
| País Vasco | 5 | 11 | 11 | 1 |
| La Rioja | 6 | 8 | 8 | 1 |
| Aragón | 7 | 10 | 9 | 0.9 |
| Valencia | 8 | 12 | 10 | 0.833 |
| Canarias | 9 | 11 | 5 | 0.454 |
| Castilla León | 10 | 9 | 8 | 0.888 |
| Cantabria | 11 | 10 | 3 | 0.3 |
| Asturias | 12 | 7 | 12 | 1 |
| Galicia | 13 | 13 | 13 | 1 |
| Murcia | 14 | 9 | 8 | 0.888 |
| Castilla Mancha | 15 | 10 | 10 | 1 |
| Extremadura | 16 | 11 | 11 | 1 |
| Andalucía | 17 | 15 | 11 | 0.733 |

Real growth and by proprietary domains, June 2000.

4.4. The system of domains

The study team determined the top-level domain under which the Internet addresses were registered, that is, or others (see Table 4). To solve the problem of those units that put institutional information up on more than one domain (several Web addresses), we set the following order of priorities:

- First: Domain es
- Second: Domain org
- Third: Domain net
- Fourth: Domain com
- Fifth: Other proprietary domain or IP address.

4.5. Four-by-four comparisons

Given the overall results of the analyses of the regional governments, there arose the need to analyze the information-providing policies on the basis of the data that had been obtained from the study. Clustering a number of regions and comparing them with the aggregate data of another cluster of regions led to interesting results concerning information-providing policies. The four-by-four comparisons are one form of comparing the evolution of regional Web systems.

The study team chose to use eight regions so as to include a significant fraction of the units under study. The regional governments were clustered according to two factors: (1) by the per capita GDP²³ as listed in Table 5, and (2) in a second study, by total administration budget as indicated in Table 6. The per capita GDP reflects the average wealth of each region's inhabitants. The four wealthiest regions (Balears, Madrid, Cataluña, and Navarra) were compared with the four poorest regions (Murcia, Castilla la Mancha, Extremadura, and Andalucía).

The budget of the regional administration reflects the availability of economic resources of the institutions of that region. The comparison was made between the four regions having the largest budgets (Andalucía, Cataluña, Valencia, and Navarra) with the four having the lowest budgets (Murcia, Cantabria, Balears, and La Rioja). A

Table 4
Top-level domain system

| | June 1997 (%) | December 1997 (%) | June 1998 (%) | December 1998 (%) | June 1999 (%) | June 2000 (%) |
|--------|------------------|----------------------|------------------|----------------------|------------------|------------------|
| ES | 91.4 | 92.5 | 89.5 | 82 | 80 | 86.8 |
| NET | – | – | – | 11 | 10.4 | 6.6 |
| COM | – | – | – | 1 | 0.8 | 0.6 |
| ORG | 8.5 | 7.4 | 10.4 | 6 | 8.8 | 6 |
| OTHERS | – | – | – | – | – | – |

Table 5

Results of the comparison between the four regional governments with greatest GDP and the four with the lowest GDP

| | Rank by regional GDP | Total units of study | Total units with Web site | Index |
|----------------|----------------------|----------------------|---------------------------|-------|
| Junio 1997 | 1° | 45 | 13 | 0.288 |
| | 2° | 39 | 6 | 0.153 |
| Diciembre 1997 | 1° | 45 | 13 | 0.288 |
| | 2° | 39 | 15 | 0.384 |
| Junio 1998 | 1° | 45 | 13 | 0.288 |
| | 2° | 39 | 18 | 0.461 |
| Diciembre 1998 | 1° | 45 | 19 | 0.422 |
| | 2° | 39 | 27 | 0.692 |
| Junio 1999 | 1° | 45 | 22 | 0.488 |
| | 2° | 39 | 32 | 0.820 |
| Junio 2000 | 1° | 51 | 47 | 0.921 |
| | 2° | 45 | 40 | 0.888 |

First: Baleares, Madrid, Cataluña, and Navarra.

Second: Murcia, Castilla la Mancha, Extremadura, and Andalucía.

region such as Andalucía with a smaller per capita GDP has a greater regional budget, as its population is larger. Likewise, Baleares is one of the regions with the wealthiest population, while its government has one of the lowest budgets.

Table 6

Results of the comparison between the four regional governments with greatest budget and the four with the lowest budget

| | Rank by general budget of the autonomous communities | Total units of study | Total units with Web site | Index |
|----------------|--|----------------------|---------------------------|-------|
| Junio 1997 | 1° | 52 | 23 | 0.442 |
| | 2° | 36 | 3 | 0.083 |
| Diciembre 1997 | 1° | 52 | 29 | 0.557 |
| | 2° | 36 | 3 | 0.083 |
| Junio 1998 | 1° | 52 | 33 | 0.634 |
| | 2° | 36 | 6 | 0.166 |
| Diciembre 1998 | 1° | 52 | 36 | 0.692 |
| | 2° | 36 | 12 | 0.333 |
| Junio 1999 | 1° | 52 | 38 | 0.730 |
| | 2° | 36 | 23 | 0.638 |
| Junio 2000 | 1° | 56 | 50 | 0.892 |
| | 2° | 41 | 33 | 0.804 |

First: Andalucía, Cataluña, Comunidad Valenciana, and Galicia.

Second: Murcia, Cantabria, Baleares, and La Rioja.

4.6. *The information-providing resources on the Web sites of the regional governments*

To complete the study of the evolution of the presence of the Spanish administrations on the Internet, it was necessary to analyze the information-providing resources and the interactive information services that they present. Unlike in the elaboration of other information service maps (i.e., libraries, archives, or other centers of information and documentation that make up a library or archive system), in this new form of information dissemination, which also serves as a depository and information management system, the analyst of Web information systems has to cope with a fundamental characteristic—constant change. Once a Web-based information system is created, unlike a classical document depository, its Web server may disappear at any time. It may change its physical location even though this is transparent to the user, change domain without changing its information-providing structure, change its system of information recovery, or even locate its information-providing resources on different physical platforms.

To study this change, as well as the dynamism of the Web information systems of the regional administrations, it was decided to also analyze the information-providing resources that they contain. The survey template designed for this purpose was applied at three times (April 1998, October 1998, and October 1999) to the regional government central services. Table 7 provides both the template that was applied and the results.

To determine the information on each of the Web servers, the study team connected directly to the pages to look at their contents in depth and to check whether the information in the template was available or not. This process, however, was applied only to the pages of the central services of the regional governments²⁴ and not to the pages of their departments. The design of the template, that is, the type of information that was chosen to be looked for on the regional government Web sites, was based on the conference²⁵ on the Information Society organized by the G-7 and the European Commission on February 25–26, 1995.

This conference set in motion eleven projects aimed at boosting the advent of the information society among the world's citizens (worldwide inventory, broad-band network interoperability, training and education, electronic libraries, museums and galleries, environmental management, emergency management, health, online public administrations, worldwide commercial market, and maritime information systems). The project Government Online is developing a working plan for public administrations. This is to replace paper-based communication by e-mail or by providing interactive online services for citizens. Several subprojects have arisen out of this overall project (directory services, reuse of government information within national boundaries, developing "single window" government, improving customer service with kiosk technology, permits and licenses, delivery of government information electronically, locating government information electronically, charging for services, online formal transactions, compendium of government online activities and interests, and online support for democracy).

Most of the items proposed for the content test were based on this proposal taken from the Government Online subprojects but completed by the authors. Also the test applies certain recommendations made by the Interministerial Commission on Administrative Information of the Spanish government. This commission reflects the interest of the political authorities in

Table 7
Information-providing resources

| Dates of application of the test | April 1998 (%) | October 1998 (%) | October 1999 (%) | October 2000 (%) |
|---|-------------------|---------------------|---------------------|---------------------|
| <i>Location of information</i> | | | | |
| Links to other servers | 81.2 | 94.1 | 100 | 100 |
| Internal information search engines | 68.7 | 76.4 | 94.1 | 82.3 |
| External information search engines | 12.5 | 13.3 | 29.4 | 29.4 |
| <i>Directory services</i> | | | | |
| The organization's personnel directory | 6.6 | 5.8 | 11.7 | 5.8 |
| Directory of political authorities | 93.7 | 100 | 100 | 100 |
| Directory of organizations or sections of the administration | 87.5 | 94.1 | 100 | 100 |
| <i>Online e-democracy</i> | | | | |
| Agreements (departments of the regional government) | 31.2 | 35.2 | 41.1 | 47.0 |
| Public debates | 0 | 0 | 0 | 0 |
| Political diary | 25 | 29.4 | 54.5 | 41.1 |
| Speeches | 25 | 35.2 | 52.9 | 41.1 |
| Press releases | 31.2 | 35.2 | 52.9 | 58.8 |
| <i>Bureaucratic transactions and administrative procedures</i> | | | | |
| Existence of online information on administrative procedures | 37.5 | 52.9 | 58.8 | 47.0 |
| Transactions over the Internet | 18.7 | 23.5 | 35.2 | 29.4 |
| <i>Elements on the main page</i> | | | | |
| Electronic mail address | 81.2 | 70.5 | 64.7 | 82.3 |
| Link to the HIA | 25 | 17.6 | 11.7 | 11.7 |
| Date of the last update | 50 | 29.4 | 23.5 | 17.6 |
| Languages | 50 | 41.1 | 41.1 | 47.0 |
| <i>Formats</i> | | | | |
| PDF documents | 25 | 41.1 | 76.4 | 70.5 |
| <i>Metatags</i> | | | | |
| Meta keywords | 12.5 | 23.5 | 41.1 | 35.2 |
| Meta descriptions | 18.7 | 23.5 | 35.2 | 29.4 |
| <i>Content</i> | | | | |
| Statistics, economic, and social data | 68.7 | 76.4 | 100 | 100 |
| Grants and subsidies | 68.7 | 76.4 | 100 | 76.4 |
| Official bulletin of the community | 68.7 | 70.5 | 88.2 | 100 |
| Presentation of head of government | 75 | 70.5 | 52.9 | 58.8 |
| Tourism | 93.7 | 100 | 100 | 100 |
| Databases on businesses in the region | 18.7 | 17.6 | 35.2 | 29.4 |

maintaining homogeneity in the hypertext informational structures that use the Web to make information available. It emphasizes some aspects that were used to elaborate the section “elements on the main page” (electronic mail address, link to the HIA, date of the last update) that the authors considered very interesting to apply to the regional governments. The HIA (Hipercentro de Información Administrativa or Administrative Information Hypercentre) is the Web page on which the Spanish government gathers together information linking to the Web sites of different public administrations.

The study team decided to complete the test with some items taken from their own experience. Thus, it was decided to check for the use of the PDF format, given the importance that this has acquired in recent years for Web publication. Other examples are the use of metadata to describe a page’s content and some aspects which have been placed under certain of the main sections taken from the GOL subprojects but that explicitly refer to the case of Spain, such as the use of the Official Bulletin of Government, which is the official record of each regional government.

The different items detailed below were aimed at assessing as fully as possible the content of each Web server and at determining the evolution of its content.

(1) Location of information:

links to other Web servers;
links to external information search engines; and
links to internal information search engines or existence of a Web site map.

The purpose is to analyze the mechanisms set up by the designers of the Web site as an information system, tending to make the internal information of the site more accessible by way of internal search engines or site maps. It is also to determine the degree of implementation of linkage with other information systems through servers of related content or through search engines.

(2) Directory services:

the organization’s own personnel directory;
a directory of political authorities; and
a directory of organizations or sections of the administration.

The purpose is to determine whether the Web site as an information system has a set of names and directories available, both of the staff of the administration whose site is being analyzed and of the political authorities and different departmental sections.

(3) Presence of documents of public interest (Online e-democracy).

documents (from the government departments of the Autonomous Communities);
public debates;
political diary;
speeches; and
press releases.

The approach here is to determine whether these Web-based information systems respond to the needs of the citizens by putting online documents that give the political decisions affecting public life. The item “public debates” was designed to check on the existence of citizen discussion fora, as materialized in electronic mailing lists, news groups, or other systems able to reflect citizens’ opinions, whether on already existing issues or with the possibility of raising issues concerning the reality of the political environment of the administration being evaluated.

(4) Teleadministration: bureaucratic transactions and administrative procedures:

transactions over the Internet; and
the existence of online information concerning administrative procedures.

One of the most interesting aspects dealt with was the use of Web-based information systems as platforms not just for providing “simple” information content, which is inexpensive to keep up to date, but also as providers of interactive media through which the citizens can perform a variety of transactions with the administrations maintaining the said services. There already exists the possibility of communication with the administrations via the electronic mail address on the site that identifies a contact. The real interest lies, however, in the idea of being able to do the same procedures from home as are done at the windows in the administration’s offices.

Spanish legislation, in Law 30/1992, has eliminated the ambiguities in this aspect for the totality of the public administrations (articles 35²⁶ and 45²⁷, on the rights of citizens and on the incorporation of technical means, respectively).

The purpose of the two items that we applied to the test is to reflect whether the Web-based information system has a description of the administrative procedures that citizens are to follow in their relations with the regional administration and whether they can carry out these transactions from home. The Green Book on Public Sector Information in the Information Society indicates that one of the main functions of electronic government is represented by transaction services used to acquire products or services online or to present data.

(5) Elements on the main page:

an electronic mail address;
link to the HIA;
date of the last update of the main page and on all pages; and
languages.

The purpose of this group of items is to determine (1) whether there exists an electronic mail address on the main page; (2) whether there exists a link to the HIA²⁸, as a way to create a hyperlinked system across all administrations; (3) date on which the main page or the totality of the pages has last been updated; and (4) Languages (English, French, and German) in order to evaluate the availability of information content in languages other than the official languages of the Spanish state.

(6) Formats:

PDF documents.

To determine whether there exist on the Web server some type of document in the format PDF (portable document format). The reason for including this item lies in the importance that this format has attained in recent years and which is used in a generalized fashion when documents have to be combined with the Web page's "html" format.

(7) The existence of elements (metatags) that facilitate indexing and Internet Web searches:

insertion of keyword metatags; and
insertion of description metatags.

This evaluates the existence of metatags in the "html" source document and in particular of those which contain the parameters keywords or descriptions, both of which allow the content of the pages to be described so as to facilitate their recovery.

(8) Public information of interest for citizens:

statistics, economic, and social data;
grants and subsidies;
official bulletin of the autonomous community;
presentation of the political head of government;
tourism; and
databases on businesses in the region.

The last section, expressed under the table heading "Contents," is aimed at determining whether or not there is content of public interest of some other type: (1) the existence of the official bulletin of the region or of information on grants and subsidies. (2) "Presentation of the political head of government." This is to estimate the degree of involvement of the political heads of their respective institutions (the presidents of the regional governments) with the virtual information units that are maintained under their auspices. (3) "Statistics, economics, social data, and databases on businesses." This is to reflect the existence of the region's economic and social data. (4) The item "tourism" in the tests applied to the regional government information units is aimed at determining whether this type of content has become the axis of the Web-based information systems. Fundamentally, the purpose is to find whether the institutional presence at the town council (municipal) level has no further interest than the mere publication of tourist resources, with information about monuments, routes, hotels, etc., or on the contrary, the virtual unit is involved in the dissemination of far more information, ultimately to become converted into an interactive resource service in its relationships with citizens.

5. Results and discussion

The results indicate that there has been a progression in the implantation and development of Web-based information systems in the aggregate of the Spanish regional administrations. The percentage implantation was 20.7 percent at the beginning of the study (1997) and is now

86.4 percent. The development was not homogeneous; however, it is mainly the historical communities which already have 100 percent of their regional organisms on the World Wide Web.

The results also indicate that a migration towards a 100 percent Web presence of all the autonomous community organisms according to different variables showed that:

- (a) By year of initiation of World Wide Web presence. This was not significant except for the historical communities.
 - (a.1) Some which were already present on the Internet in 1997 have now completed their presence (Cataluña, Galicia, and Madrid). Others have not yet attained that level (Andalucía, Canarias, Cantabria, Murcia, and Valencia).
 - (a.2) Others began the period with 100 percent of their organisms of government on the Internet (Castilla-La Mancha, País Vasco, and La Rioja).
 - (a.3) Others began later and are not yet completely on the Internet (Andalucía, Aragón, Canarias, Cantabria, Castilla-León, Murcia, and Navarra).
- (b) By GDP (general wealth of the region's inhabitants). There was no clear correlation since by June 2000, the regions with all of their departments on the Internet were those ranked 1, 2, 3, 5, 6, 12, 13, 15, and 16 with respect to GDP.

The four-by-four comparisons showed the evolution and relationship of the regions with the comparison variable. Segregating the four with the greatest value of this variable and the four with the lowest, we can determine the regional trend with a clear approximation for the rest of the regions:

- (a) In the four-by-four comparisons, there is an inversely proportional relationship between the initial variables representing each region's GDP and the development level by proprietary domains; that is, greater Internet presence is related to lower autonomous community GDP, except for the last period measured, June 2000 (Table 5 and Fig. 1). This may be due to the interest of the poorest regions in overtaking the richer regions in information society-related policies. Indeed, it has been customary in Spain to find politicians of the least favored regions strongly advocating their development by way of the information society.
- (b) On the contrary, the budgetary level of the autonomous communities is directly related to the development of their public systems on the Internet; that is, there is a positive correlation between the budgetary level and the Internet development of the regional government. In this relationship, however, the percentage differences become smaller with time (from an initial ratio of 3.5:1 to one of 1.4:1 in 2000). While the most favored in terms of budget evolve less, the least favored had very high levels of growth (Table 6 and Fig. 2).

The analysis of the information resources also reflects the preconception that the political authorities have of the Internet as an element of marketing and dissemination of information but at fairly superficial levels. This is shown, for instance, by the fact that the foremost services or information that are offered are a directory of the authorities (not of the

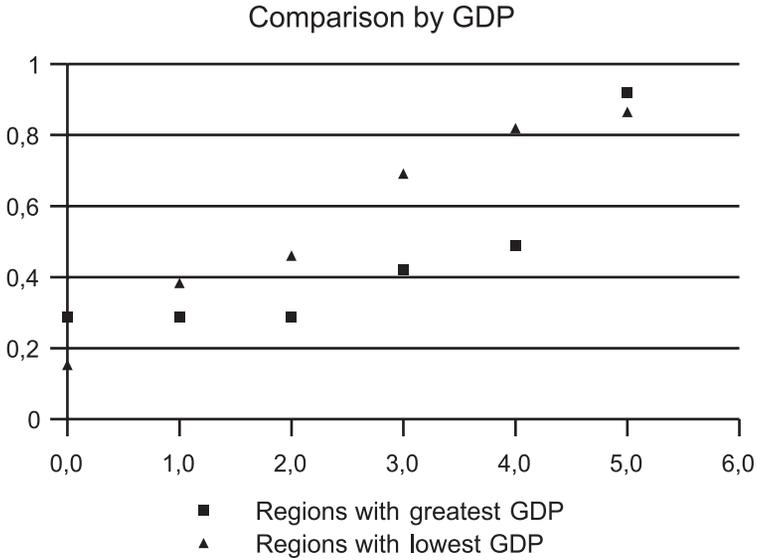


Fig. 1.

institution’s working staff), statistics, and tourism information. Most lack information on the public issues of debate that currently concern their respective organisms of administration. There is hardly any information on the personnel of their administrations. Only a very small percentage allow transactions to be carried out over the network. And there are very few which offer databases on their region’s businesses.

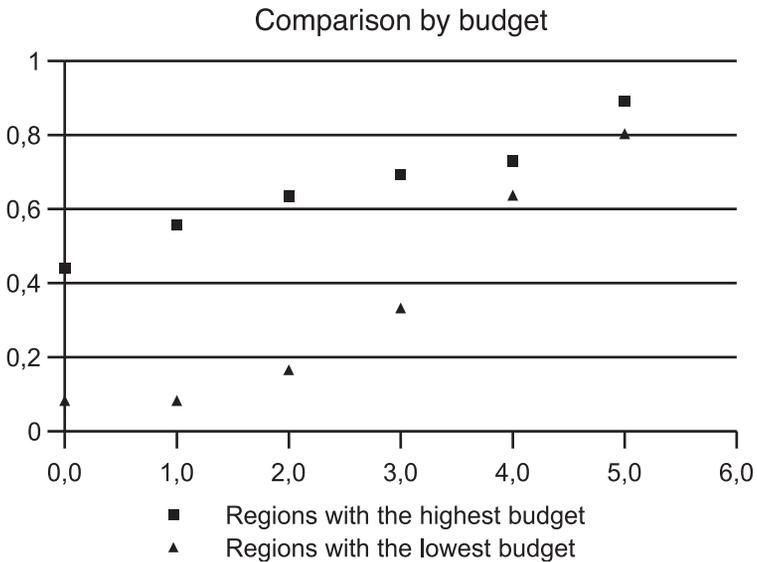


Fig. 2.

With respect to information resources, there has clearly been a major evolution of certain items, occasionally reaching 100 percent of the autonomous communities. These are links to other servers, directory listings of political authorities and of the section of the administrative unit, statistics, the official state bulletin, and tourism. There are, however, items for which none of the regions has included information, such as public debate. There is also the absolutely surprising fact that only one of Spain's regions has a personnel directory listing on its Web site. With respect to signs of quality, such indicators as the date of the last update, instead of becoming more usual, are beginning to disappear from the Web sites and fewer than 40 percent of the regional Web sites include metadata.

The authors believe that the real and effective use of the Web as a platform for communication with citizens is still very limited. Internet presence reflects above all issues of external image. It does not reflect any ongoing development of the content or any form of democratic participation of the citizens.

5.1. Implications for government Web site assessment and methodology

While the present study cannot be considered as a proposal for the analysis of Web content in the strict sense of the term, it does offer a model for measuring Web site evolution and for assessing the information resources provided by those sites. There is a need for additional research that further develops analytical tools that facilitate the assessment of government Web sites.

The collection of data in a Web study requires constant reevaluation due to the continual changes in domain names and in content. In this sense, it is interesting to emphasize that in the case of the regional governments, their Web addresses usually do not change. This is not the case for the town councils, however, for which the authors have been carrying out an exhaustive study over the last few years, as yet unpublished. Spain's town councils use domains that are different from the generic Spanish domain (".es"), such as .org, .net, or .com. They usually begin their Internet presence hung from ISPs as directories (e.g., <http://www.terra.es/ayuntamiento>) and later contract their own domain (e.g., <http://www.ayuntamiento.es>).

When the sample is very large, four-by-four comparisons have shown themselves to be quite a useful method for comparing variables; that is, taking the four highest values and the four lowest values of a variable, the conclusions that are drawn are very similar to those obtained when all the variables are compared. The result is major savings in time. The studies that the authors carried out on the Internet presence gave results that reflect a certain convergence in the final period. To determine the informational resources that are used inescapably requires accessing the Web pages directly since in the view of the research team, the ambiguities in their content do not allow the use of automatic tools.

6. Conclusion

The regional governments have established more or less rapidly (according to the region) Web-based information systems for Internet access to information. The evolution of the

content (Cornella's "infostructure") has not been so rapid. That is, once operational, there have not been any profound changes in their information resources and neither has there been the maintenance of keeping the information up to date that was to have been expected. The analysis shows that while the legal impediments have disappeared, the political authorities have become stuck in a view of the Internet as a simple possibility for marketing. They have not seen that it may be used as a true tool for access to information on the part of the citizen, that it really allows bureaucratic-administrative tasks to be expedited, that it may be a source of information concerning what is taking place in each regional administration, and that it also permits citizen-administration interactivity in a form which is at once more profound, more convenient, faster, and cheaper.

The study conducted by the authors analyzed an emerging sector in the informational configuration of public authorities in their relationship with citizens. According to Moore,²⁹ the information society requires a global infrastructure of information services. Hence, the authors' decision to study the Web-based information systems of Spain's public administrations lay behind the initial choice of analyzing a specific working environment, that of the seventeen Spanish regional governments. The authors, however, have also worked on Spain's central government and the governments of the more than 8000 town councils in Spain.

If something really defines the external flow of information from the public administrations' information systems, it is not their simple capacity to launch onto the outside world huge amounts of information generated by the administration itself. It is rather the possibility of channeling flows of information from other areas of interest to the citizen via links to the informational environment of public administrations, creating virtual information networks. Also important is the creation of interactive services targeted at the citizen.

The study has shown that the rapid acceleration in the rate that the regional governments' is bringing information services online on the Internet, although the authors believe that this is more for reasons of image and fashion than for any authentic need to create centers of information. There is especially no sign of any great desire to implement interactive services with the citizen. The importance of the studies reflected in the present work ties in with the analyses of information policies, opens up new avenues for future research on information retrieval and electronic information, and links to such other disciplines as political science, law, and sociology.

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12. Birkinshaw states that regulatory norms on professional secrecy such as those of the Treaty of Rome, article 244, or the Staff Regulations for Officials of the EC (articles 17, 19, and 21), which oblige community workers to maintain professional secrecy even after having left their positions, are still examples that the hoped-for transparency and accessibility are yet to come. See Sheehy, H. M. (1997). A community closer to its citizens: The European Union's use of Internet. *Government Information Quarterly* 14(2), 17; Birkinshaw, P. (1997). Freedom of information and open government: The European community/union. *Government Information Quarterly*, 14(1), 27.
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14. The UK, for instance, the nation of the EU that has most vetoed free access to public information, issued in 1999 a white paper on the modernization of the government, which states that the aim is to achieve 100 percent electronic accessibility to the services of the UK government by the year 2008. See Sellman, M. (1999, November 1). Digital subjects? Digital citizens. *New Statesman*, 128(4460), 22.
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19. The institutional framework consists of each Autonomous Community's regional government. The regional government is the collegiate organism that exercises the executive and administrative functions of each autonomous community's government. It is formed by

the presidency and the departments that are responsible for the execution of those policies on which they have competence vis-à-vis the central government.

20. The territorial framework in Spain is made up of the municipalities, the provinces, and the autonomous communities.
21. This was not the case in the tests of content whose survey template was applied exclusively to the central services of the regional governments.
22. Note for [Table 2](#). It has to be noted that the study performed from the first quarter of 1997 did not consider the central services of the autonomous governments as an object of study. This is the case of the governments of Aragón, Baleares, Navarra, País Vasco, and La Rioja whose central services have an institutional presence on the Internet but have no such presence in the ambit of departments (as was indicated in Methods). In [Table 2](#), these governments give the impression of excessively lagging behind the others.
23. Data of 1997.
24. For the regional governments, it was decided to use only their central services and not the departments. The regional governments and their domain addresses evaluated were the following: Junta de Andalucía, <http://www.caan.es>, <http://www.junta-andalucia.es>; Gobierno de Aragón, <http://www.aragob.es/>; Principado de Asturias, <http://www.princast.es>; Comunidad de las Islas Baleares, <http://www.caib.es>; Gobierno de Canarias, <http://www.gobcan.es>; Gobierno de Cantabria, <http://www.cantabria.org>; Junta de Castilla Leon, <http://www.jcyl.es>; Junta de Castilla la Mancha, <http://www.jccm.es>; Generalitat de Catalunya, <http://www.gencat.es>; Junta de Extremadura, <http://www.juntaex.es>; Junta de Galicia, <http://www.xunta.es>; Gobierno de la Comunidad de Madrid, <http://www.comadrid.es>; Gobierno de Murcia, <http://www.carm.es>; Gobierno de Navarra, <http://www.cfnavarra.es>; Gobierno del País Vasco, <http://www.euskadi.net>; Gobierno de La Rioja, <http://www.calarioja.es>, <http://www.larioja.org>; Generalitat Valenciana, <http://www.gva.es>.
25. Government OnLine Project of the G7 (GOL). Available at: <http://www.ispo.cec.beg7/projects/theme9.html>. There have subsequently arisen other schemes such as those used by Henon (1999) and Stowers (1999), which divide information resources into the three branches that represent public power: the executive, the legislative, and the judicial.
26. Article 35 reflects the rights of citizens to know the article of the procedure in which they are interested parties and access to information on the judicial or technical requirements of the acts (whether projects, actions, or petitions) that are to be carried out.
27. We refer to section 2 of article 45 which states, “When compatible with the technical means that Public Administrations have available, citizens will be able to relate with them to exercise their rights by means of electronic, telecommunication [“telematic”], or computer-based techniques and media [always] with regard to the guarantees and requisites foreseen in each proceeding.”
28. “Hypercentre of Administrative Information” of Spain’s Ministry of Public Administrations.
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