

# Website Production in Galicia and its Visibility on the Net. Moving Towards the Knowledge Society

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## Abstract

In the last few years there has been a remarkable progress in the diffusion of new technologies throughout the European Union, especially in equipment and connectivity. The number of households connected to the network has experienced a significant increase, but this progress is not enough to ensure advance towards full immersion in the Information Society. Good part of the Internet users make a very basic use of the Internet services, which are limited to information and communication consulting. It is necessary to encourage the use of advanced services such as e-commerce, e-learning or distance working. But for this, Websites that are able to harbour these services are needed. In this research, an information web audit has been carried out in Galicia, in order to evaluate the characteristics of their Websites and their visibility on the Net.

*Key Words: Digital Divide, Web, Advanced Services, Internet*

## Resumen

En los últimos años ha tenido lugar un notable progreso en la difusión de las nuevas tecnologías en el conjunto de la Unión Europea, sobre todo en equipamiento y conectividad. El número de hogares conectados a la Red experimentaron un notable incremento, pero estos avances no son suficientes para conseguir avanzar hacia la plena inmersión en la Sociedad de la Información. Buena parte de los internautas hacen un uso muy básico de los servicios de Internet, que se limitan a consultar información y a la comunicación. Es necesario impulsar el consumo de servicios avanzados como el comercio electrónico, el e-learning, o el trabajo a distancia. Pero para ello se necesitan portales web que sean capaces de albergar a este tipo de servicios. En esta investigación se lleva a cabo una auditoría web en la comunidad gallega con el fin de valorar las características de sus portales web y su visibilidad en la Red.

*Palabras clave: Brecha Digital, Web, Servicios Avanzados, Internet.*

## 1. Introduction

Having overcome the first decade of XXI century, the progress in the dissemination of the Information Society is extraordinary and, from my point of view, the concept of traditional digital divide has begun to be overtaken except in underdeveloped countries where the socioeconomic reality is very different compared to the Western world. It is evident that this phenomenon still has some presence in some sectors of society, such as the group of elderly and low-skilled people, who do not see value in this type of technology, as well as more peripheral regions with very aged population. But the progress in infrastructure, investment in technology in households and the number of users of the Net makes us question the relevance of the digital divide, nowadays, and in some way update this concept to explain the long way to go for a real integration into the Information Society.

Every day there are less of those who are outside of the Information Society for not having the equipment or access to technologies. If we consider the data for the European Union in the last five years, at the most basic indicators which measure the spread of Information Society, we can see the rapid advance in the dissemination of new technologies, despite the existence of still significant inequalities between countries. This progression denotes that the traditional digital divide that separates territories and population sectors outside the Information Society, those "decoupled" from the digital world, is increasingly narrow. These advances were much higher in those European countries lagging in the diffusion process in the Information Society and, in just five years, achieved a level of technological equipment, infrastructure and number of Web users that confirm that the traditional digital divide is becoming obsolete, at least in the Western world.

According to data consulted from Eurostat, in Greece in 2006 only 4% of households had Internet access via broadband and it was the European Union country with the worst data in this respect. In that same year in Spain, only 30% of households had broadband, and France and Germany had very similar values. Only the leading countries in the dissemination of the Information Society had in this indicator date that exceeded 50% of households with broadband, as was the case in Finland, Denmark and the Netherlands. Just five years later, in 2011, Greece, not only could exceed the values of Spain, France and Germany in 2006, but also was approaching the values of that of Sweden, Belgium and Luxembourg, who were in the leading nations five years ago. If we consider the number of Internet users, the situation is similar. In 2011, the countries with fewer Internet users were Romania, Bulgaria and Greece, with date between 18% and 23%. By then, the countries that led the Net user ranking with values above 70% and were Finland, the Netherlands, Denmark, and Sweden. Only five years

later, Romania had increased the number of users of the Internet by almost twenty percentage points, and in Bulgaria and Greece, nearly half the population are connected to the Net regularly. The data reviewed in this research show the rapid progress in population connectivity to new technologies and, as a result, the rapid contraction of the digital divide as we understand it today which does not mean that there was, in those years, dissemination of the Information Society of such magnitude.

Progress achieved over recent years in relation to the spread of broadband that allows quick access to the Net, the number of households connected and the proportion of the population using the Internet are not, by themselves, indicators that reveal a wide dissemination of the Information Society, or that this information could eventually generate knowledge. The majority of individuals who have joined to the use of these technologies, especially the Internet, are users that use the Internet for basic applications that are restricted to finding information, communicating through email or social networks and a reduced number of services. Evidence of this is attested data consulted from Eurostat, and show the following. For the whole of the European Union (27), more than 70% of individuals, who have stated to be Network users, were able to locate information through search engines, one of the simplest tasks on the Internet. But considering the use of more advanced uses like electronic commerce, in particular to make purchases through the Internet, only three out of ten Internet users make use of this service. Another example is the calls through the Net via voice IP, which it is used by only 20% of the users.

In view of this data, in my opinion the traditional digital divide, that we might associate with the digital divide in the access to the Internet, is giving way to a new digital divide and is linked to advanced services on the Internet. The latter is that which separates users who use the Internet almost exclusively to access information and communicate (either via email or emerging social networks) from those who use more extensively, for e-commerce, online training, online banking, teleworking, etc. In countries where the diffusion of new technologies is higher, the digital divide in access is reduced to a minimum expression, being relegated only to the elderly, while the digital divide in the advanced services still has a strong presence, especially in countries with a longer delay in the dissemination of the Information Society.

Even though the Net is becoming more popular, at present nearing two billion users, there are still regions and population groups who live outside of this technological revolution. On the other hand, there is also a considerable proportion of the population that makes a very limited use of these technologies by not knowing their potential. Today there are many services provided through the Net, either by the public or private sector,

ranging from simple hotel booking, or the weekly shopping in a supermarket, to multiple and varied administrative and financial procedures.

The progress that has taken place over the last decade in the process of diffusion of new technologies was considerable. But we must design policies to move towards full immersion in the Information Society. Access has been largely achieved in the digital divide, but where is still a lot to be done to do the same with this new second generation of the digital divide. It must reflect on the necessity of training citizens for integration into the Information Society. There will not be a full integration in the emerging society until the population is able to exploit the maximum potential of these technologies, and go far beyond simple consultation of information. It needs, on the one hand, that people make use of existing services on the Internet, and on the other, that both the public and private sectors create new services to improve the population's quality of life. In short, to try to make that information generate knowledge.

With regard to that described previously, it is hence necessary, to promote the creation of new services on the Net, apart from those based on consultation and communication information. These advanced services will serve both to promote their full integration into the current Information Society, and to improve the population's quality of life. In this paper we will analyse the web production in Galicia, the characteristics and the visibility on the Internet, in order to assess whether this region is taking the right steps towards reducing the second generation's digital divide.

## **2. The Web Audit as an indicator of the spread of the Information Society. Some background**

One of the most recent antecedents related to the analysis of the website is Macía Arce's research (2007). The author analyses the characteristics of websites in two Galician districts and two Irish counties with the aim of comparing the website production between the two countries, both in rural and urban areas. One of the conclusions reached is that Irish website production duplicates that of Galicia, which is an aspect aggravated considerably in the case of rural areas. In addition, almost half of the websites in Galicia have public origin, confirming the low penetration of information technology and communication in the private sector. In the case of Ireland, the business sector took advantage of the benefits offered by the new technologies in order to access international markets, create commercial website, accompanied by the necessary logistics so as to be competitive.

João Sarmento (2004) also analysed fifty five websites related to the tourism industry in the Azores and West Cork in Ireland. This study

presents the most relevant features of these websites. The author intended to reflect some spatial configurations that create virtual spaces, particularly on the Internet. The cases analysed in the two regions are created by business owner accommodation, transport companies from both regions, and even those created by tourism businesses outside these areas. According to the author, the role of the local government was particularly important in the process of representation and promotion of these spaces.

Other research in this respect is the Romero and Vaquero (2001) research, which presents some guidelines to analyse websites. This study has the particularity that influences the presence of the Galician language on websites. They analyse the websites considering seven variables: Structure, content, easy navigation, search engine, title, interactive help menus and links. In their study they review the contents of the main websites of Galicia throughout the years 1999 and 2000. They analyse their quality and the presence of Galician language in the public administration, university, the non-university education websites, in the media, the major social organizations, etc. Some of the conclusions reached were related to the delay suffered in the Information Society in Galicia.

Other background is the study of Ramilo Araujo (2001). This author analysed the production of websites in the municipalities of the Basque Country, locating two hundred and fifty webs of which the author analysed eighty-seven. The content was structured in four thematic areas; an overview of municipality, entities and facilities, domestic and institutional organisation, and functions and services of the municipalities. In addition, also the author assessed the design of the website and services offered electronically. Some of the conclusions reached by the author are related to poor penetration of new technologies in public administration, since only 35% of the Basque municipalities in 2001 had a website.

### **3. Brief methodological notes**

The first steps that took place to determine the characteristics of the Galician web production, was the search for websites on the Internet promoted from Galicia and, at the same time, harbouring content that made reference to any aspect of the community. For the location of the websites it was decided to use the Google search engine because it is one of the most popular and powerful search engines on the Net. This search engine has indexed, at present, more than one trillion URLs. The tracking process was conducted in three hundred and fifteen Galician municipalities through keywords coinciding with their place names. One hundred electronic addresses per municipality were reviewed in order to seek websites promoted from each one, and these webs must have content related to the municipalities. In total about 32,000 URLs were reviewed. Those websites

considered valid had been promoted from the municipality's territorial area and had to harbour contents related to them. Overall, about 1,200 websites promoted from different municipalities were located in the whole of Galicia.

The next step in this web audit was the calculation of the Internet's visibility of websites with their own Internet domain. This data visibility on the Internet was used to calculate the average traffic of the websites for each Galician municipality. To carry it out, data was used from Alexa, a business Internet service that allows one to know the position of a website in the world rankings from the number of visits received. The results showed that not all municipalities were visible on the Net, so it was decided to take those websites with Alexa data as a reference to the selection of the sample to be studied.

To analyse the results, the selected variables were grouped into six thematic blocks. In this way, the web production, the origin and theme of the websites, architecture, dissemination and visibility on the Net, information and multimedia elements, and finally, the elements of interactivity and communication were studied. In all, fifty variables were taken into account for the analysis that, with the ninety-six websites composed, the sample has resulted in a database that has amounted to over 6,500 records. All this data was processed with a statistical processing programme often used in the social sciences, SPSS, and for the subsequent elaboration of the maps, the GIS ArcMap was used.

#### **4. Web production in Galicia**

In the process of searching websites promoted by local authorities, three hundred and fifteen keywords were used, one for each municipality that matched with the local place names. The first hundred websites retrieved by the search engine to each municipality were reviewed, and those promoted by institutions, companies, individuals or any other organisation that had relation with each municipality were selected. The existence of a greater number of municipalities classified as rural, two hundred and sixty rural against fifty-five urban, made the number of displayed URLs also unequal. Despite this, in the urban municipalities four hundred thirty-three websites with own domains were located after tracking 5,500 URLs, compared to four hundred and six promoted from rural municipalities, after viewing 26,400 URLs. This factor shows that contrast between the production website of rural municipalities with respect to urban is strong despite rural ones covering more than 82% of the Galician territory. However, the greater demographic volume and economic dynamism of the urban municipalities have a positive effect at the time of those promoting the use of new technologies, which is clearly reflected in the volume of websites generated in each of these spaces.

To corroborate this fact and see the differences at municipal level, it was decided, in a preliminary assessment, to relate the number of websites located in each municipality with the number of inhabitants, although several anomalies that prevented use of this ratio were detected. Such anomalies were associated with the intention of comparing the different municipality's web production with a number of very different people for the same search criteria, the top 100 URLs listed by Google. Thus, rural municipalities, with few inhabitants and a very small number of websites, reflected a very high ratio per thousand. On the other hand, there were municipalities with large populations that had a low related website per thousand despite finding a considerable list of websites in the sample displayed. In order to correct this imbalance, we decided to include a correction factor. It was the percentage of websites found in the top 100 URLs displayed.

This index was called with the name of Web Production Index (see Table 1), and also the greater presence of websites in urban municipalities compared to rural made it clear. If the mean web production index is calculated in rural and urban municipalities, it is apparent that the latter value was placed at 4.49 compared to 2.87 for rural municipalities.

Table 1: Application Example of Web Production.

<i>Municipality</i>	<i>HB</i>	<i>WT</i>	<i>W/H</i>	<i>PM</i>	<i>IPW</i>
Vigo	294. 772	51	<b>0,17</b>	51	<b>8,86</b>
Chandrexela de Queixa	719	1	<b>1,39</b>	1	<b>1,39</b>

Note: Formula Web Production Index (WPI):

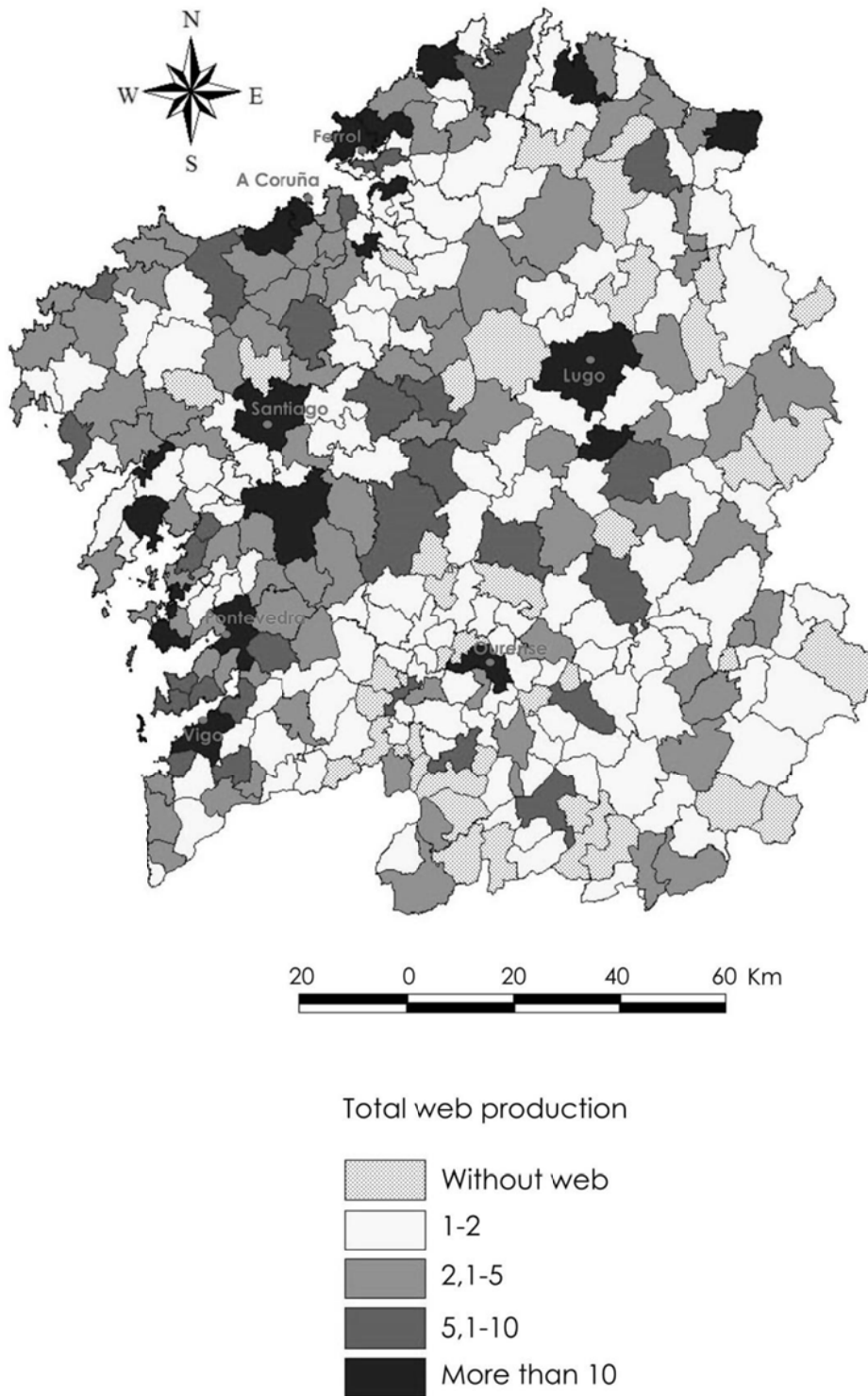
$$\mathbf{WPI = [(WT \times 1000) / HB] \times PM}$$

Being:

- HB: Inhabitants (2007).
- WT: Total websites found in the first hundred URLs displayed.
- W/H: Websites per 1,000 inhabitants.
- PM: Percentage of websites found in the sample displayed.
- WPI: Resulting web production index.

Figure 1 show, at a municipal level, all websites located after displaying the first hundred URLs retrieved by Google, using place names in each municipality as a keyword. The map clearly shows the greater presence of websites in urban municipalities versus rural municipalities,

**Figure 1: Total website production at municipal level, 2007**



Source: Own elaboration from Google and Alexa, 2007



highlighting the main Galician cities and towns. Besides these, more than ten websites in Naron, Arteixo, Oza dos Rios, A Estrada, Noia, Boiro, Sanxenxo, among others were located. These urban municipalities have a high web production because they are either emplaced near major metropolitan areas welcoming population and increasing economic dynamism, or are part of the group of municipalities that are tourist attraction par excellence, such as is the case located in the Rias Baixas. After analysing the data of website production in the urban municipalities, it was found that the population size is a decisive factor in the creation of websites. The most populated are often the most dynamic. There are some specific cases of municipalities that, despite being of urban nature and being among the least populated, they have a large number of websites due to demographic weight. Among these are those of Cambados, Bueu and Betanzos, although most of the websites created have not their own domain. They correspond to a personal websites with initiatives that have hardly any impact on local society.

Regarding web production in rural areas, there are few municipalities distinguished by their high number. It reduces to only four municipalities (1.5%) who received more than ten webs tracing the first hundred results retrieved by Google; Ribadeo Pontedeume, Cedeira and O Páramo. The first three stand out for being considered Municipalities with some attraction, both for their natural character and cultural landscape, giving rise to a greater interest in producing websites. The exception is in the municipality of O Páramo quintessentially rural. Its position in the website production map lies in the high number of websites found without own domain (over 90% of them). This fact indicates that there is a great motivation in this local society by using new technologies in this municipality. This type of web production usually corresponds to personal webs of critical opinion and varied subjects such as blogs. This fact led us to inquire about the training of the population and, in this respect, some correspondence was found. Although the percentage of the population which has as an education level, diploma, degree, engineering or doctors is very low, reaching queue positions in the context of the province of Lugo, there is a substantial proportion of the population with baccaureate levels or vocational training, either upper or medium grade. The municipality of O Páramo is among the first twenty five municipalities in the province of Lugo with the highest proportion of people with this type of training. This factor could explain the high number of websites without any own domain promoted from this space.

In summary, the palpable difference between urban and rural municipalities, and within the latter, those who have less demographic and economic dynamism should be noted. This disparity in rural urban web production, is also reflected in the total number of localised websites with

own domain. In urban municipalities 7.8 websites were located, and in the rural, this data drops to 1.5 on average for each municipality. To this data must be added the fact that more than a quarter of rural municipalities was not located on any website, while in the urban all of these have websites. On the other hand, the data analysis also allowed us to know the direct relationship between the number of websites created and population size, in both rural and urban character.

## **5. The visibility of the Galician websites on the Net**

The websites' visibility on the Internet is a factor to be taken into account when success or failure has to be assessed with the aim of connecting as many people as possible. The source that was taken into account for the study the websites' visibility for Galician sites was the Alexa index. This index provides information on website's visibility on the Internet through the number of visits received, at less value higher is their visibility on the Internet.

The results obtained in Alexa for the whole of Galicia, showed that there are few websites with a leading position on the Internet. Only one in ten websites produced in Galicia is in the top 100,000. This means that there is no website between the one hundred thousand most visited on the Internet. The greatest number of websites, about 50%, are positioned between one hundred thousand and one million, slightly more than 38% are placed in between one and three million, and there are hardly any websites that exceed the limit of three million in the Alexa index. The websites visibility on the Net, are powered by public agencies, especially those related to higher education and promoted by leading companies dedicated to electronic journalism.

The visibility of websites for the whole of Galicia hides great differences between rural and urban municipalities. If, for the whole Galicia, there were only among 100,000 more visits on the Internet, over 9.4% of its production, in rural municipalities that number drops to 1.9% and the urban supposes 18.6%. This difference is so marked because the rural websites are characterised by being simple, with static programming and content aimed mostly at the local level. This fact is associated with fewer users than sites created in urban municipalities. To a large extent these last host a lot of information, and have diffusion that goes beyond municipal limits and even provincial. This info-exclusion of rural areas in the Information Society is caused by the lack, in the majority, of trained people ready to seize new technology opportunities, such as teleworking, e-commerce, e-learning, among others. This fact could create, at the same time, websites with more visibility on the Internet.

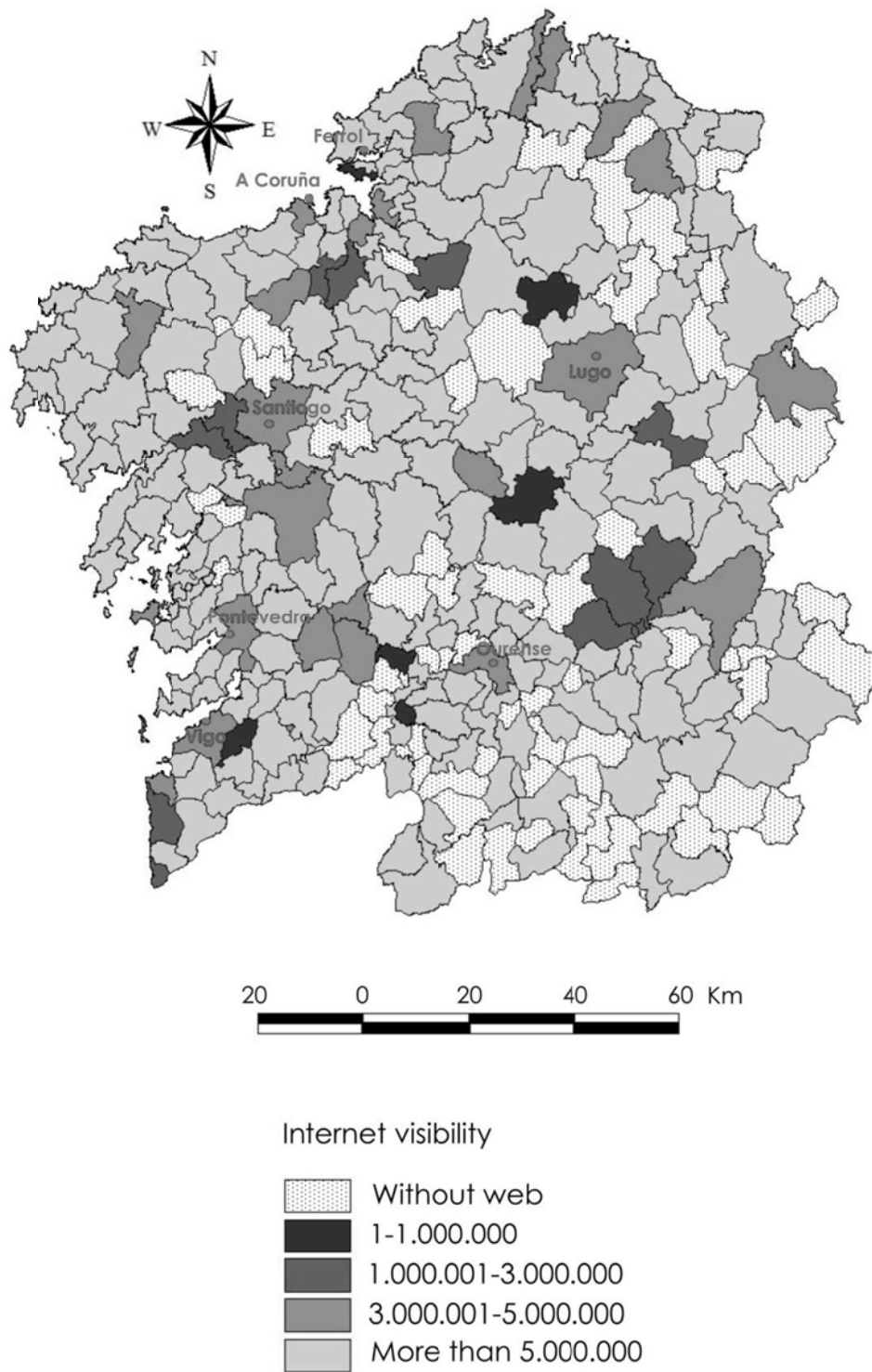
The differences in visibility of the websites in the rural and urban municipalities are observed not only in the range of peak traffic, but also in the following groups. Nearly half of the production of urban municipality's websites (46.5%) had an Alexa index of between one hundred thousand and five hundred thousand, and 34.9% are between five hundred thousand and one million. The situation of the websites created from rural municipalities was quite different because almost 70% are between one million and three million. The reality of the rural municipality's websites is even more worrying because this data corresponds with the websites with greater visibility on the Net.

With the aim of representing the data spatially from visibility of the Galician websites on the Internet, a map of the visibility of the websites for each municipality was produced (see Figure 2). Given that many municipalities are located in more than one website arithmetic average visibility registered by Alexa of all websites in each municipality was calculated. The value of ten million was assigned, to the websites in which no data was obtained. After collecting the values of websites' visibility at the municipal level, the data was introduced into a geographic information system.

One of the outstanding features observed in Figure 2 is the large number of municipalities that do not have any web production. There are sixty-seven Galician municipalities that satisfy this condition, but this situation becomes more worrying when all of them are of rural character and they represent a quarter of all rural municipalities. On the other hand, the small number of municipalities with high visibility on the Internet for all web production is also noteworthy. Only six municipalities were located with an average visibility of less than one million in Alexa, of which five are of rural character. This does not mean that rural municipalities have a greater number of highly visible sites on the Internet, but in these cases, these rural municipalities have little website production but high levels of visibility on the Internet. In the urban areas, despite having more web production, few have very high visibility (public administration, higher education, electronic journalism, etc.). However most have reduced visibility, which explains the substantial descent in the average values of Alexa and the small number of urban municipalities with high visibility websites on the Internet.

Another feature that was observed at spatial level is the high number of municipalities with an average very limited visibility on the Net, with Alexa index values above five million, both for rural municipalities and

**Figure 2: Internet visibility of Galician website production, 2007.**



Source: Own elaboration from Google and Alexa, 2007.

urban areas. In this respect, two hundred and six municipalities were located in Alexa with values above five million, of which forty-two belong to urban municipalities and one hundred sixty four to rural areas. In relative values, these figures show that 75% of urban municipalities and 63% of rural areas have a barely visible web production on the Internet as a whole. This situation is much more serious for all rural municipalities because one in four do not have any website production, and six out of ten have websites that are not visible on the Net, making them marginal spaces on the Internet.

To summarise the low visibility of websites promoted from the Galician municipalities should be noted, being particular worrying in rural areas. Despite urban municipalities having a number of sites on the Internet with very high visibility, such as the case of public administration websites, those dedicated to higher education, and those with a distinctly informative character, the data shows that there is a lot of websites that have a very limited visibility on the Net and that evidences the delay tendency in the spread of new technologies.

## **6. The weak integration of advanced services**

In order to achieve full insertion into the Information Society, the creation of dynamic websites with advanced programming that provide users with a range of services beyond communication and information consultation should be promoted. Websites that have the function of static brochures without communication and interactivity elements do not draw interest among the users. This type of websites is relegated to the last positions in the search engines, and end up invisible on the Internet and it is useless in the process of immersion in the Information Society. It is therefore essential that websites have interactive electronic services which raise the interest of users, integrating elements of communication and information exchange. Websites should not become mere information carriers, but must operate as interactive communication platforms between users, sites that currently respond to the characteristics of Web 2.0.

One of the most outstanding features of websites is the interactive services, allowing citizens to perform many transactions online without having to travel. An example of this type of service is electronic commerce. New technologies make it possible to market products from anywhere in the world, where companies have no boundaries when it comes to capturing customers. This very positively helps companies located in rural areas that had restricted its sales to local markets. On the other hand, there are electronic services related to public administration, which are designed to make a more agile and efficient administration and, at the same time, improves the citizens' quality of life.

The analysis of the data revealed that interactive services are becoming a gap between the Galician websites because six out of ten incorporate interactive services. But at the same time, many weaknesses that suggest that this process is still incipient were found. More efforts are needed to provide the websites promoted in Galicia with the most advanced interactive services in order to try to achieve full immersion in the Information Society. Most of the services identified in Galician websites are simply related to public administration, such as downloading documents and official forms, dossiers consultation and the like. This fact is reflected in the data on the type of interactive transactions, where 76% of them are linked to public administration. Another negative data that shows the low maturity in the diffusion of interactive services is the type of transaction. Not one interactive transaction in the websites from rural areas in which the mode of payment was made from the Net was detected, and only ten per cent in the transactions of urban websites opted for online payment.

## **7. To conclude.**

In the last few years the progression in the dissemination of the Information Society has been important, particularly in relation to the endowment of telecommunications infrastructure, especially the spread of broadband and technological equipment in homes. It has also significantly increased the number of users of the Net, and this has caused the digital divide to be understood until now, to be significantly reduced. However, the increase of connectivity and a larger number of users do not mean that a full immersion in the Information Society is being carried out. A large part of these new Internet users make a very basic use of the network, limited to communication services such as email or social networks, and simple information consultation. The data shows that consumption of advanced Internet services is still very limited, and these are the ones that encourage the dissemination of the Information Society. So there is a new digital divide that separates the Internet users that make basic use of the Net, and of those taking advanced services such as e-commerce, teleworking, e-learning, etc.

Nevertheless to promote the consumption of advanced services on the Net it is necessary to create dynamic websites that can house them. In this research, we carried out a web audit on the websites created from Galicia in order to evaluate their characteristics and their visibility on the Internet. The analysis of the web audit data revealed that only larger urban municipalities promote websites that reach a certain visibility on the Internet and they have some interactive services, but they are still too scarce. In the rest of the municipalities, the created websites have little visibility and are limited to mere information leaflets. The case is even more worrying in rural areas where a good part of them barely have website

production, except government sites and some companies in the tourism sector. It is therefore necessary to make efforts in this direction in order to achieve full integration in the Information Society. To allow users to be consumers of advanced services it is necessary to promote their creation, especially in remote rural areas. Some of these services can encourage processes of economic and social development, such as electronic commerce and teleworking.

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