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What municipal websites supply and citizens demand: a search engine optimisation approach

What municipal websites supply and citizens demand

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Abstract

Purpose – The purpose of this paper is to analyse if citizens' searches on the internet coincide with the services that municipal websites offer. In addition, the authors examine municipal webpage rankings in search engines and the factors explaining them.

Design/methodology/approach – The empirical study, conducted through a sample of Spanish city councils, contrasted if the information that can be found on a municipal website fits with citizens' demands. This has been done by comparing the most-searched keywords with the contents of municipal websites.

Findings – A positive relationship between the supply and demand of municipal information on the internet has been found, but much can still be improved. Analysed administrations rank the basic data of the organisation, as well as some of the fundamental competences thereof, at the top in search engines, but the results are not entirely effective with some keywords still highly demanded by citizens, such as those related to employment or tourism. Factors explaining internet ranking include the number of pages of the municipal website, its presence in social networks and an indicator designed to measure the difficulty of ranking the municipal place-name.

Originality/value – The results obtained from this study provide valuable information for municipal managers. Municipal websites should not only include information in which citizens are interested, but achieve accessibility standards, have a responsive web design, and follow the rules of web usability. Additionally, they should be findable, which also requires improvement in terms of the design of the municipal website thinking in search engines, particularly in terms of certain technical characteristics that improve findability. A municipal website that wants to have a good positioning should increase its contents and attain the maximum degree possible of visibility in social networks.

Keywords Search engine optimisation, e-government, Internet ranking, Municipal websites

Paper type Research paper

1. Introduction

Public administrations offer information and online services to citizens through their websites, improving their transparency (Tirado-Valencia *et al.*, 2016), allowing interaction on social networks (Gandía *et al.*, 2016), boosting the semantic web (Muñoz-Soro *et al.*, 2016) and even enhancing e-democracy (Fietkiewicz *et al.*, 2017). The number of citizens that connect to municipal websites is becoming greater and greater; in fact, municipal websites are the most common channel through which citizens communicate with governmental agencies (Ebbers *et al.*, 2016). In the European Union, the percentage of individuals using the internet for interaction with public authorities is about 48 per cent, with a maximum of 88 per cent in Denmark (Eurostat, 2017a, b). But doubts have arisen when attempts have been made to determine if citizens' demands coincide with what municipal websites offer, and also if municipal information is easy to find through the use of search engines. The main objective of this paper is to contribute to solving these doubts; and, to this end, three research questions are tackled.

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Testing how local governments respond to their constituents' priorities should be an important focus of research (Einstein and Kogan, 2016). Hence, the first research question analyses if that for which citizens search coincides with what municipal webpages offer. Perhaps citizens are worried about issues like job searches, leisure possibilities, or the procedure necessary to procure a grant; however, often such information does not appear on the website, or, if it does appear, it is not easy to find, even through the use of internet search engines. Municipal websites, especially those of a small size, usually exhibit deficiencies in many aspects (Gandia and Archidona, 2008; Feeney and Brown, 2017). This first area of research is explored by means of "keyword tools", resources provided by main search engines regarding the search average conducted for a keyword in a determined period of time.

Search engine optimisation (SEO) aims to achieve that a given website appears in the first position when a search involving specific keywords is employed by users (Evans, 2007). The study of Baye *et al.* (2016), which analysed 12,000 search terms used by 2m users on top retailers, confirms the importance of carrying out SEO actions, because most users find a website due to a search engine. Although there are no equivalent studies applying to municipal websites, it seems reasonable to think that, if city councils offering services to citizens want to attract tourists to their municipality or simply want to publish their history, they cannot only focus their activities on the creation of content or the design of questionnaires, but also have to worry about the positioning of their websites in search engines. Therefore, the second research question aims to analyse the positioning level of municipal websites. In order to answer this question, it is possible to simply introduce the keywords that best define the municipal competences into a search engine and then write down the positions they occupy. Although it is a laborious activity, it is possible to automate this process using SEO tools.

The third research question has to do with the factors that explain internet positioning. Although the algorithms employed by the main search engines are not known in detail, the fundamentals of the one used by Google were published in a conference (Page and Brin, 1998), and some empirical studies have analysed factors that determining the positioning of websites (Baye *et al.*, 2016; Moreno and Martinez, 2013; Evans, 2007; Luh *et al.*, 2016; Su *et al.*, 2014). According to such studies, a website's contents are a key aspect for search engines, both in terms of quantity and quality. Thus, it is expected that municipalities with a solid website, one in which both competences are reported and online procedures are possible, will rank top in search engines. Other hypotheses have to do with the extent of an organisation's social networks presence, the receiving of backlinks – links from other websites – and the difficulty of positioning certain terms that have very high competition. The identification of factors that favour positioning could help policymakers to improve municipal websites – such factors including transparency, citizen participation, the interoperability of the information, accessibility, usability and findability.

This paper makes various contributions. Numerous studies have analysed municipal websites, especially the disclosure of financial information (Armstrong, 2011; da Cruz *et al.*, 2016), the use of social networks (Bonsón *et al.*, 2012), or their accessibility (King and Youngblood, 2016). This research proposes a methodology to contrast if the information available on a municipal website fits with citizens' demands, comparing the most-searched keywords with the contents of municipal websites. We consider that findability should be one of the quality attributes of a municipal website, a line of investigation in which the work of Kopackova *et al.* (2010) on Czech municipalities stands out. The use of SEO tools is proposed in order to monitor the internet positioning of municipal websites. Furthermore, two indicators have been designed in order to measure the difficulty of positioning a municipal website, starting with the number of webpages indexed by Google as belonging to the public administration, the number of inhabitants of the municipality, and the number of results obtained when searching the place-name of the municipality in Google. Finally, the drivers of positioning have been analysed – an aspect that has previously been studied for online shops (Su *et al.*, 2014), but which we apply to the case of municipal websites.

The empirical research was conducted via a sample of Spanish city councils. A positive link between the supply and demand of municipal public information on the internet has been found, but much can still be improved. Therefore, it is recommended that municipal managers consult the words most-searched by citizens and then redirect the contents of their municipal website. It has been observed that public administrations rank the basic data of their organisation and some basic competences very well in search engines; however, the results are often not so good for keywords that are highly demanded by citizens, such as those related to employment or tourism. Municipal managers should adopt strategies to improve their website's positioning in search engines, which will result in a better service for citizens. They must consider that, as decisive factors of internet positioning, the number of pages that the municipal web has, the municipality's presence in social networks, and the indicators that measure the difficulty of positioning the municipal website stand out.

The rest of the research is organised as follows. Section 2 presents the literature review and the hypothesis development. Section 3 displays the empirical study. Finally, policy recommendations and conclusions are presented.

2. Literature review and hypothesis

Numerous empirical studies have analysed the content of municipal websites (Serrano-Cinca *et al.*, 2009; Armstrong, 2011; Bonsón *et al.*, 2012; Gandía *et al.*, 2016; Brusca *et al.*, 2016, among others). Alcaide-Muñoz *et al.* (2017) perform a meta-analytic review of such studies, concluding that the transparency of information about governments depends on both institutional and environmental factors. The size of the municipality stands out among the factors that explain the level of disclosure of public information (Ferraz Esteves de Araujo and Tejedo-Romero, 2016), but transparency is also best achieved when the government has no absolute majority (García-Sánchez *et al.*, 2013). Among the explanatory factors of municipal transparency, Cuadrado-Ballesteros *et al.* (2014) have studied political ideology and rivalry, and Caba-Pérez *et al.* (2014) have studied political competence. The percentage of the dependent population is also an explanatory factor in the case of information on sustainability (Alcaraz-Quiles *et al.*, 2015). The interaction of city councils with citizens through the use of social networks has also been studied; however, this a subject that still has a long way to go (Gandía *et al.*, 2016). Finally, e-democracy, which includes aspects such as electronic voting (Fietkiewicz *et al.*, 2017), is the last stage of e-government, according to a meta-analytic review of e-government by Lee (2010), which describes ten e-government stage models, ranging from stage 1 (simple information on the website), to stage 10 (e-democracy).

In addition to the content of municipal websites, the technological and formal aspects thereof have also been studied. Peristeras *et al.* (2009) review the use of the semantic web in public administrations. They find that the public administration domain still lacks commonly agreed-upon content standards, in spite of the advantages that the reutilisation of public data provides, especially due to the tendency of introducing open-government data programs (García-Tabuyo *et al.*, 2017). Accessibility stands out among the formal aspects of municipal websites that try to ensure that any person, including those with limitations, can browse municipal websites without a problem (King and Youngblood, 2016). Additionally, citizens are mostly connected to the internet via mobile devices, so municipal websites must have a responsive web design. Finally, the usability of municipal websites is important in terms of improving citizens' experiences and the impression that cities make on third-interest parties (Youngblood and Mackiewicz, 2012).

However, findability, another important aspect, has been studied much less than other factors. Findability is about making information easy to find; Hedden (2008, p. 1) claims: "if it cannot be found, it may as well not exist". Findability requirement could be considered as part of accessibility requirements (White, 2003). Websites must be easy for citizens to use,

but must also be designed to consider the characteristics that search engines value, such as employing friendly URLs, avoiding the use of rich media files and iframes, and adding relevant keywords in the meta description tag of the website (Su *et al.*, 2014). According to Kopackova *et al.* (2010), no regulation may command of search engines that municipalities' webpages must be shown in the first search position; findability depends upon a municipality's goodwill.

The first research question analyses if that which citizens demand coincides with the information municipal websites offer. According to Bearfield and Bowman (2017), community demand plays an important role in fostering municipal transparency. In the same way, it also seems reasonable to think that, in municipalities with a high percentage of internet users, the demand for municipal information will be high. Thus the local government would be expected to answer such demand through the provision of a wide variety of content and services on the municipal website (Serrano-Cinca *et al.*, 2009). High users of technologies of information and communication (ICTs) are more positive in terms of their attitudes towards e-government (Gauld *et al.*, 2010). However, McNeal *et al.* (2003) found that e-government implementation is driven by legislative professionalism and, to a lesser extent, state professional networks, rather than citizen demands. In the previously mentioned studies, the percentage of households with internet access is used as a proxy for public demand for e-government services, while, in our study, we analyse keywords used by the citizens in search engines, providing a more direct and complete approach. If the municipal website's objectives are aligned with citizens' searches, there will be a positive correlation between the searched words and the words that appear in the municipal website; therefore, the following hypothesis is proposed:

H1. A positive relationship between citizens' searches and the words that appear in the municipal website is expected.

In contrast to accessibility requirements, which are maintained in accordance with the law, no findability requirements are stated for e-government websites, and no findability tests are held (Kopackova *et al.*, 2010). In the same way that local governments are usually located in emblematic buildings and in a privileged part of the city, it should also be deemed as desirable that they take up a distinguished place in the results of search engines too, especially in terms of searches related to their competences. Some of the factors that explain internet positioning are well known (Baye *et al.*, 2016; Evans, 2007; Luh *et al.*, 2016; Su *et al.*, 2014). A wide array of content is a key aspect that search engines value; in fact, experts in online marketing claim that "content is the king". Google clearly affirms this position. Since the update of its algorithms in October 2014, websites with wide content have improved their positioning (Chandra *et al.*, 2015). Therefore, city councils with wide and well-documented municipal websites, which not only develop contents about municipal services but also other issues (such as tourist references of the locality, hiking routes, historical occurrences, or distinguished figures born in the locality), should reach a better internet positioning. Consequently, the following hypothesis is proposed:

H2. A positive relationship between the size of the municipal website and its ranking in search engines is expected.

Beyond the amount of information, the quality of a municipal website is measured using different attributes, such as the relevance, value-added, timeliness, completeness or accessibility. Academic literature has collected numerous indexes designed to evaluate the quality of a municipal website (Armstrong, 2011; da Cruz *et al.*, 2016; Miranda *et al.*, 2009). Search engines give more importance to websites that provide information than to commercial websites, which only exist to sell products (Chandra *et al.*, 2015). City councils

that own high-quality websites and accomplish accessibility standards should reach a better internet ranking. Consequently, the following hypothesis is proposed:

H3. A positive relation between the quality of the municipal website and its ranking in search engines is expected.

In contrast to the first generation of municipal websites, where citizens were limited to the passive viewing of content, a 2.0 website allows both parties to interact by means of social networks. Bonsón *et al.* (2012) studied 2.0 websites in city councils, finding that their use is related to previous e-government levels of development. Gandía *et al.* (2016) found an essential ornamental focus in 2.0 web implementation: city councils are more focused on promotional issues than on the disclosure of information about the entity's management. Search engines value the social aspects of webpages, such as the possibility of sharing contents; in fact, social media optimisation has become one of the emerging SEO activities. It seems reasonable to think that city councils should also have a good positioning in social networks; therefore, the following hypothesis is proposed:

H4. A positive relationship between the municipality's social networks presence and its ranking in search engines is expected.

The study of web impact factors has a long pedigree (Ingwersen, 1998; Ortega *et al.*, 2014; Vaughan, 2014). Generally, if a website has many backlinks, it is an important website. Hence, web search engines use backlink counting as a means to measure the importance of a website (Page and Brin, 1998). Usually, websites with sufficient content of high-quality receive links from other websites, but sometimes SEO practitioners also carry out strategies to increase backlinks in order to improve a website's positioning. Consequently, the following hypothesis is proposed:

H5. A positive relationship between backlinks to the municipal website and its ranking in search engines is expected.

Due to the competition that can exist, and taking into account the fact that there are many websites focused on the same subject, not all terms show the same difficulty when positioning, so the difficulty is even higher if competitors have important websites on the internet or, in Google's terminology, websites with a high page rank (Page and Brin, 1998). The empirical results of the study by Luh *et al.* (2016) reveal that page rank is still a dominant factor in Google's ranking algorithm. It should also be considered that domain authority is highly correlated with search engine rankings (Mavridis and Symeonidis, 2015), which gives city councils' websites an advantage. Domain authority is calculated by evaluating multiple factors into a single score, including linking root domains and the number of total links; hence, sites with a very large number of high-quality external links are at the top end of the domain authority scale (Zhang and Cabage, 2017). For online shops, keyword research software is employed to identify online niches; namely, searches with a high-demand, but low-supply (Wilson and Pettijohn, 2008). In the case of a city council, the positioning of words related to employment, sport, or tourism is more complicated than the positioning of words related to the municipal competence of cemeteries. Moreover, the municipality's name may cause additional difficulty. For example, Castelserás and Andorra are two neighbouring Spanish communities, but there is also a country called Andorra. According to Google, there are 285,000,000 websites containing the word "Andorra", compared to the 181,000 with the word "Castelserás", so the managers of Andorra's municipal website have a huge handicap when seeking to position their terms. Consequently, the following hypothesis is proposed:

H6. A negative relationship between the difficulty of positioning the place-name and its positioning in search engines is expected.

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3. Empirical study

We posited the possibility of conducting a cross-national study with major European cities, as with Bonsón *et al.* (2012), but this proposal was discarded for four reasons: first language is very relevant to this study, as it affects the searched terms in Google; second due to social and cultural reasons, what citizens seek may vary from country to country; for example, it seems reasonable to assume that, for a country with a high unemployment rate, the number of searches for municipal job offers would be high; third the study focuses on the competences assigned to local administrations, which vary from country to country; and fourth the results of an analysis carried out with a sample of large town halls cannot be extrapolated to small town halls, which also serve a considerable percentage of the population. In fact, the rural population in Europe constitutes 22.8 per cent of the total population (Eurostat, 2017a, b).

Therefore, a cross-national study was discarded and we chose to analyse a single country (Spain). We also thought about conducting the study via an analysis of the largest Spanish town halls, as in Serrano-Cinca *et al.* (2009). However, four languages are spoken in Spain and controlling that effect would have been very complicated – we would have had to search in Catalan, Galician and Basque, as well as in Spanish, which could have affected search engine positioning. Moreover, as has been said, we thought that it would be especially interesting to analyse the search engine positioning of small town councils, which usually face the greatest difficulties in technological terms (Feeney and Brown, 2017). This is why we chose to focus on a single Spanish region, Aragón, selecting a sample that included data from large, medium and small municipalities. Geographically located in the northeast of Spain, Aragón is a region that is usually considered trustworthy in terms of representing the Spanish average. Aragón has 731 municipalities, of which 708 have less than 5,000 inhabitants. All 23 city councils that have more than 5,000 inhabitants were chosen, and also another 33 smaller than those were chosen through random sampling. The study sample consisted of 56 municipal websites, which represent 90.14 per cent of Aragón's population. The study was performed in June 2017 (all the obtained data are available upon request).

Table I shows the variables used in the study. In the first place, a web content analysis was performed on the variables used in the municipal websites. To this end, a questionnaire with 98 questions – inspired by Serrano-Cinca *et al.* (2009), Armstrong (2011), Bonsón *et al.* (2012) and da Cruz *et al.* (2016) – was designed. Table II shows the 98 questions and the range of values.

Variable	Definition
Q-index	Quality index of the municipal website, obtained adding 98 variables pertaining to organisation, transparency, participation, compulsory competences, non-compulsory competences and 14 formal aspects about the accessibility and usability of the website
SITE	Number of webpages that the municipal website contains, measured using the command "site:" in the Google search engine
SOC-index	The active and updated municipal presence in six social networks (Twitter, Facebook, LinkedIn, YouTube, Instagram and WhatsApp) and the use of five tools that improve the social use of the web (wikis, blogs, podcast, mashups and RSS)
BACKLINK	Link popularity. Number of incoming links according to WooRank, an SEO service that is available for free
KE-index	Keyword effectiveness index: square number of monthly searches of the place-name divided by the number of results obtained when you search the place-name in a search engine
PLACE-EASY	Place-name Easy ratio: number of inhabitants of the municipality divided by the number of results obtained when the place-name is introduced in a search engine
SHARE	Internet Market Share ratio: number of pages of the municipal website divided by the total results that are obtained when the place-name is introduced in the search engine
POSIT	Municipal website positioning, obtained recording the position that the website obtains for 98 keywords, adding them and taking the reciprocal

Table I.
Variables employed for the hypothesis testing and their definition

Question	Search term	Number of searches	1st position (%)	1st page (%)	What municipal websites supply and citizens demand
<i>Organisation</i>					
The municipality has a webpage (0/1)	<i>ayuntamiento</i>	40,500	48	85.7	52 92.9
Contact information (0/1)	<i>sede electrónica</i>	60,500	12	21.4	36 64.3
Municipal regulations (0/1)	<i>reglamento</i>	2,400	18	32.1	30 53.6
Public job offers (0/3)	<i>oposiciones</i>	1,000,000	9	16.1	26 46.4
Contact form (0/1)	<i>teléfono</i>	49,500	28	50.0	39 69.6
Catalogue of procedures (0/1)	<i>oficina virtual</i>	22,200	7	12.5	17 30.4
Citizens can check the status of the procedures (0/1)	<i>trámites y servicios</i>	2,400	20	35.7	35 62.5
General request form (0/3)	<i>solicitud</i>	2,900	26	46.4	36 64.3
Electronic notifications (0/1)	<i>notificaciones</i>	110,000	14	25.0	26 46.4
Bulletin board (0/1)	<i>tablón de anuncios</i>	40,500	13	23.2	28 50.0
Verification point (0/1)	<i>código de verificación</i>	1,900	2	3.6	7 12.5
Citizen's charter and/or management indicators (0/1)	<i>carta de servicios</i>	320	9	16.1	20 35.7
Buyer profile (0/1)	<i>perfil del contratante</i>	4,400	25	44.6	45 80.4
Processing of public tenders (0/3)	<i>licitaciones</i>	2,900	15	26.8	34 60.7
Information about electronic invoice (0/1)	<i>factura electrónica</i>	6,600	10	17.9	24 42.9
Processing and payment of taxes (0/3)	<i>impuestos</i>	2,900	19	33.9	32 57.1
Processing of tax claims (0/3)	<i>recursos</i>	2,400	10	17.9	28 50.0
<i>Transparency</i>					
Transparency portal (0/1)	<i>transparencia</i>	3,600	17	30.4	27 48.2
Political organisational chart (0/1)	<i>organigrama</i>	9,900	17	30.4	26 46.4
Decisions on interest conflicts (0/1)	<i>resolución de conflictos</i>	1,300	9	16.1	15 26.8
Salaries of councillors and employees (0/1)	<i>sueldo alcalde</i>	70	5	8.9	14 25.0
Date and agenda of the next plenaries (0/1)	<i>pleno</i>	880	20	35.7	21 37.5
Minutes of councils (0/1)	<i>actas</i>	1,000	20	35.7	25 44.6
Videos of councils available online (0/1)	<i>video pleno</i>	10	4	7.1	16 28.6
Budget for the current year (0/3)	<i>presupuesto</i>	6,600	15	26.8	24 42.9
Budget settlement (0/3)	<i>liquidación</i>	2,900	8	14.3	23 41.1
Accounts for the current year (0/3)	<i>contabilidad</i>	8,100	2	3.6	18 32.1
Audit reports (0/1)	<i>auditoría</i>	4,400	8	14.3	16 28.6
Debt reports (0/1)	<i>deuda</i>	1,000	6	10.7	23 41.1
Average period of payment to suppliers (0/1)	<i>periodo medio de pago</i>	390	21	37.5	26 46.4
Inventory of goods and/or vehicles (0/1)	<i>inventario</i>	2,400	6	10.7	23 41.1
Offers to the public tenders (0/1)	<i>contratos</i>	2,400	18	32.1	30 53.6
Small amount contracts (0/1)	<i>contratos menores</i>	590	8	14.3	18 32.1
Agreements, with the amount and beneficiaries (0/1)	<i>convenio</i>	3,600	18	32.1	30 53.6
Subsidy calls, with the criteria (0/1)	<i>subvenciones</i>	5,400	27	48.2	39 69.6
Judgments that affect the entity (0/1)	<i>sentencias</i>	1,000	5	8.9	19 33.9
Processing of public information requests (0/3)	<i>información</i>	301,000	13	23.2	32 57.1
<i>Participation</i>					
Active discussion forums (0/1)	<i>foro</i>	22,200	2	3.6	16 28.6
Online surveys (0/1)	<i>encuestas</i>	12,100	9	16.1	24 42.9
Active chats (0/1)	<i>chat</i>	246,000	4	7.1	7 12.5
e-voting (0/1)	<i>voto por Internet</i>	2,400	5	8.9	11 19.6
Online participation in the plenaries or councils (0/1)	<i>participación</i>	1,300	20	35.7	27 48.2
Suggestions allowed in the budget preparation (0/1)	<i>presupuestos participativos</i>	480	8	14.3	16 28.6

Table II. Questionnaire with the keywords, monthly search average, and the city councils that appear in first place and page
(continued)

Question	Search term	Number of searches	1st position (%)		1st page (%)	
<i>Compulsory competences</i>						
Processing of changes of address (0/3)	<i>cambio de domicilio</i>	720	12	21.4	21	37.5
Processing of census certificates (0/3)	<i>certificado de empadronamiento</i>	6,600	14	25.0	21	37.5
Processing of partnership certificates (0/3)	<i>certificado convivencia</i>	1,300	13	23.2	19	33.9
Information about urban planning (0/3)	<i>PGOU</i>	2,900	22	39.3	27	48.2
Processing of building permits (0/3)	<i>licencia de obras</i>	590	18	32.1	23	41.1
Processing of urban information certificates (0/3)	<i>urbanismo</i>	2,400	24	42.9	30	53.6
Information about local history and heritage (0/1)	<i>historia</i>	27,100	15	26.8	33	58.9
Procedures about housing of public promotion (0/3)	<i>VPO</i>	1,600	4	7.1	12	21.4
Procedures about housing rehabilitation (0/3)	<i>rehabilitación vivienda</i>	90	8	14.3	15	26.8
Information about parks and gardens (0/1)	<i>parque</i>	12,100	7	12.5	27	48.2
Information about pollution and noise (0/1)	<i>contaminación</i>	5,400	4	7.1	21	37.5
Information about incidents in public services (0/1)	<i>avería</i>	1,300	5	8.9	15	26.8
Information about water quality (0/1)	<i>calidad del agua</i>	170	13	23.2	18	32.1
Procedures about water supply (0/3)	<i>agua</i>	33,100	15	26.8	26	46.4
Procedures about wastewater management (0/3)	<i>alcantarillado</i>	480	6	10.7	21	37.5
Street map (0/1)	<i>mapa</i>	135,000	4	7.1	24	42.9
Reservation of municipal facilities (0/3)	<i>equipamientos</i>	140	16	28.6	31	55.4
Information of social need situation (0/3)	<i>servicios sociales</i>	4,400	19	33.9	36	64.3
Procedures for immediate attention for people in situations of social exclusion risk (0/3)	<i>asistente social</i>	1,900	24	42.9	34	60.7
Claim and payment of fines (0/3)	<i>policía multas</i>	40,500	23	41.1	33	58.9
Complaints e-mailbox (0/1)	<i>comentarios</i>	5,400	9	16.1	25	44.6
Procedures about civil protection (0/3)	<i>protección civil</i>	6,600	7	12.5	22	39.3
Procedures about fire prevention and extinction (0/3)	<i>bomberos</i>	14,800	15	26.8	28	50.0
Up-to-date traffic info (0/1)	<i>trafico</i>	49,500	1	1.8	17	30.4
Public transport information (0/1)	<i>autobuses</i>	33,100	7	12.5	22	39.3
Information on urban mobility for disabled people (0/1)	<i>minusválido</i>	1,000	7	12.5	22	39.3
Geographical information about the city (0/1)	<i>como llegar</i>	201,000	10	17.9	23	41.1
Touristic offer (0/1)	<i>turismo</i>	9,900	9	16.1	29	51.8
Vacation activities (0/1)	<i>vacaciones</i>	40,900	1	1.8	8	14.3
Procedures to participate in fairs, markets, etc. (0/3)	<i>mercado</i>	9,900	12	21.4	28	50.0
Procedures about garbage collection and street cleaning (0/3)	<i>basura</i>	4,400	24	42.9	29	51.8
Procedures about dog census (0/3)	<i>perros</i>	165,000	3	5.4	11	19.6
Procedures about cemeteries and funeral services (0/3)	<i>cementerio</i>	5,400	12	21.4	34	60.7
Calendar with local festivities (0/1)	<i>calendario</i>	165,000	5	8.9	28	50.0
Agenda with municipal activities (0/1)	<i>agenda</i>	40,500	27	48.2	36	64.3
Consulting the catalogue of municipal libraries (0/1)	<i>biblioteca</i>	27,100	8	14.3	34	60.7
Reservations for the use of sports facilities (0/3)	<i>deporte</i>	40,500	25	44.6	38	67.9

Table II.

(continued)

What municipal websites supply and citizens demand

Question	Search term	Number of searches	1st position (%)		1st page (%)	
Register for municipal activities and courses (0/3)	<i>curso</i>	14,800	12	21.4	27	48.2
Information about school centres (0/1)	<i>colegio</i>	33,100	6	10.7	18	32.1
Information about ICTs (0/1)	<i>TIC</i>	18,100	10	17.9	20	35.7
<i>Non-compulsory competences</i>						
Directory of services (0/1)	<i>servicios</i>	6,600	26	46.4	35	62.5
News about city council and the city (0/1)	<i>noticias</i>	1,500,000	12	21.4	32	57.1
Meteorological information (0/1)	<i>el tiempo</i>	6,120,000	1	1.8	6	10.7
Information on Agenda 21 and similar environmental initiatives (0/1)	<i>agenda 21</i>	2,900	17	30.4	31	55.4
Information about business and employment (0/1)	<i>empleo</i>	4,090,000	10	17.9	24	42.9
Information about industrial land (0/1)	<i>empresas</i>	9,900	5	8.9	14	25.0
Information about development cooperation (0/1)	<i>ONG</i>	14,800	8	14.3	22	39.3
Procedures about infant and adult education (0/3)	<i>educación</i>	18,100	22	39.3	33	58.9
Procedures about associations (0/3)	<i>asociación</i>	6,600	11	19.6	27	48.2
Health-related services (0/3)	<i>cita previa</i>	550,000	2	3.6	10	17.9
Consumer protection information (0/3)	<i>oficina del consumidor</i>	8,100	14	25.0	24	42.9
Information on gender violence (0/1)	<i>violencia de genero</i>	18,100	13	23.2	24	42.9
Services for elderly care (0/3)	<i>cuidado de ancianos</i>	12,100	4	7.1	9	16.1
Procedures for promote equal opportunities (0/3)	<i>becas</i>	49,500	14	25.0	29	51.8
Request of birth, marriage and death certificates (0/3)	<i>registro civil</i>	27,100	2	3.6	21	37.5

Notes: $n = 56$. The first column shows the questions analysed, and the range of values. The 0-3 scale is used to assess procedures and services. The values that can be adopted are: 0, if the procedure is not present on the web; 1, when only website-based information is provided about it; 2, when it is possible to download forms; and 3, when it is permitted to submit completed forms and payments, if necessary. The second column shows the 98 keywords that have been analysed by category, but in Spanish. The monthly search average, obtained using Google's Keyword Planner, is shown in the third column. The next columns display the number of city councils that appear in first place in the search results and on the first page, in both absolute values and in percentage

Table II.

The variables were classified into five categories: organisation, transparency, participation, compulsory competences and non-compulsory competences. The first category, municipal organisation, includes aspects such as ways in which the administration can be contacted, if service letters are published, the availability of the buyer profile or if the payment of taxes can be conducted online. Transparency includes indicators like the publication of the organisation chart, municipal salaries, information about grants and agreements or municipal financial information. Participation includes aspects such as the existence of electronic voting or participatory budgets. Spanish law establishes 15 compulsory municipal competences, which are: a register of inhabitants, urbanism, urban environment, waters, infrastructures, social assistance, security, mobility, tourism, commerce, public health, cemeteries, free time, education and encouragement in the use of ICTs. Finally, non-compulsory municipal competences include benefits provided in order to offer a better service to the municipality's citizenry, for example, in services related to health, consumption claims, or meteorological information. In addition to the 98 questions about contents, 14 formal aspects about accessibility and usability were included, leading to 112 variables, which were added in order to obtain a global quality index of the website (Q-index).

The next variable (SITE) tries to measure the quantity of information a municipal website contains. For that purpose, we use the command “site:” of the Google search engine, which counts the number of webpages of the municipality indexed by the search engine. For example, if we write into Google “site:zaragoza.es”, it informs us that the search engine has indexed 1,060,000 webpages from Zaragoza’s City Council. If we write “tourism site:zaragoza.es”, it lets us know that 39,800 pages of the website containing the word tourism have been indexed.

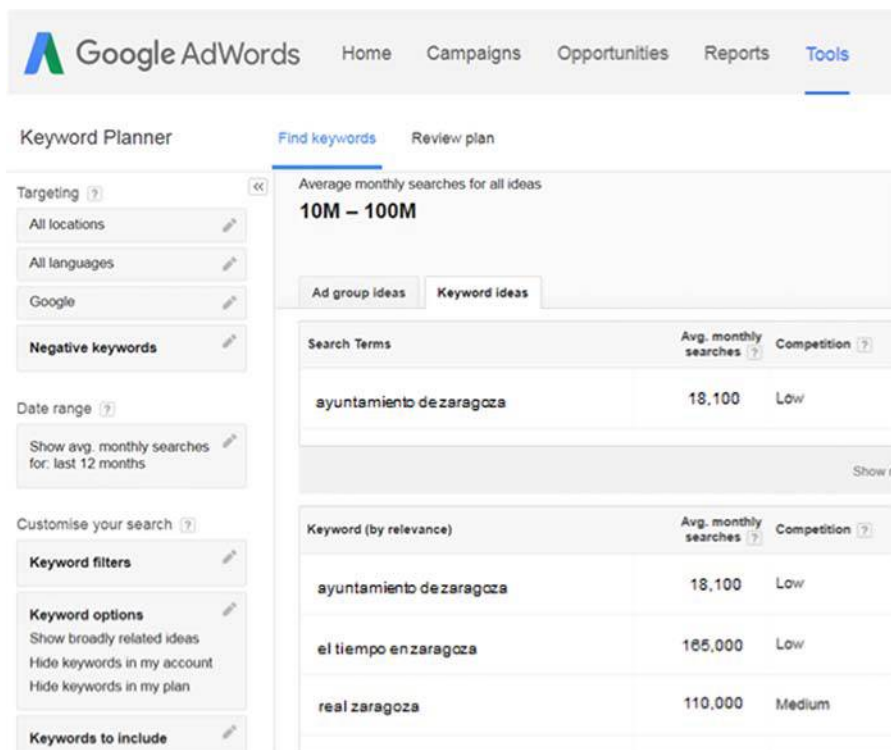
Third, in order to measure a municipality’s presence in social networks, an index inspired by Gandía *et al.* (2016) was designed, which takes into account 11 aspects (SOC-index). The SOC-index captures the active and updated municipal presence in six social networks (Twitter, Facebook, LinkedIn, YouTube, Instagram and WhatsApp) and the use of five tools that improve the social use of the web (wikis, blogs, podcast, mashups and RSS). The number of followers for each network and the number of posts were recorded, as well as the date of the last post. A value of zero was assigned to the municipalities that did not have any followers or that did not provide updated information. Fourth, the link popularity was measured via our recording of the number of received links (BACKLINK). Given the difficulty in obtaining the number of links to a website, the use of web mentions as accurate substitutes for inlinks has been proposed – an aspect analysed by Ortega *et al.* (2014). We compared three SEO tools (WooRank, Majestic and Alexa), and we were also able to contrast the results with data provided by the managers of some of the municipal websites. Both Majestic and WooRank showed a very high correlation. Ad Alexa’s data differed significantly, it was discarded. WooRank was chosen as it is a recognised SEO tool that has been used in various academic works (Mistry *et al.*, 2013; Ferraz, 2015).

The next indicators measure the facility to position a city council in a search engine. One widely employed method is based on the keyword effectiveness index (KE-index). There are several ways to calculate the KE-index (Wilson and Pettijohn, 2008); we chose to use Wylie’s (2012) definition (p. 258). The KE-index is computed by obtaining “the number of monthly searches of the keyword” and squaring it; then dividing this result by “the number of results obtained when introducing the keyword in the search engine”. In our case, the keyword is the municipal place-name:

$$\text{Keyword Effectiveness Index} = \frac{\text{Number of monthly searches of the keyword}^2}{\text{Total of results obtained when introducing the keyword in the search engine}}$$

The numerator “Number of monthly searches of the keyword” comes from Google’s Keyword Planner (Figure 1), but other services, such as KWFinder.com or Semrush.com, can also be used. The Google Keyword Planner can be configured in such a way that it only targets searches conducted in a specific location. This is a very useful option for municipal managers; nevertheless, it should be noted that although citizens are the most regular users of such webpages, tourists also use them. We considered that it was a good choice not to use the local filter for the empirical study, since analysed a set of municipalities, not a single municipality. The denominator “Total of results obtained when introducing the keyword in the search engine” comes from Google. In all the searches carried out in Google, the personalised search options were deactivated.

We designed two new indicators to measure the difficulty faced by municipal websites in terms of search engine rankings. The first one is calculated by dividing the number of inhabitants of the municipality by the total of the results obtained when the place-name is introduced in the search engine. We called it the Place-name Easy ratio (PLACE-EASY). The smaller a municipality is, and the greater the results obtained when the place-name is introduced in the search engine, the higher the difficulty of positioning will be. The second indicator is obtained by dividing the number of pages of the municipal website by the total of the results obtained when introducing the place-name in the search engine. This indicator



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Figure 1. Screenshot of the Keyword Planner tool, from Google, which allows the number of monthly searches for specific terms to be known

shows which part of the total presence of the place-name on the internet corresponds to the city council's website. For this reason, we named it the internet market share ratio (SHARE).

Finally, the dependent variable measures the positioning of the municipal website (POSIT). Google is able to obtain personalised search results by analysing cookies, the use of a Google account and the IP address. The computer used to perform the search could introduce biases by analysing cookies, the traces of Google search history and Google account, and IP location. But you can prevent Google from taking personalised search results into account by turning Google personal results off, deleting cookies and preventing the browser from sending location data following the guidance provided by Google Help documentation. In any case, the software used to analyse the search engine positioning, Rank Checker, offers an option to remove personalisation bias (Figure 2). Nevertheless, we recognise that it is possible that Google's local search capability could have biased the results in some way. Another possibility would be to use

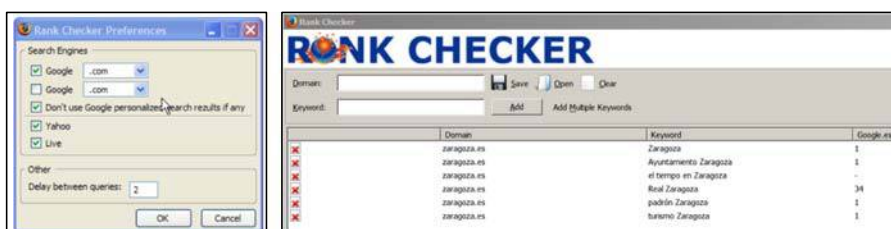


Figure 2. Screenshots of the Rank Checker tool, of SEObook, which allows researchers to calculate a search engine's ranking of a website from a list of keywords

an anonymous proxy server to hide the IP address when browsing the Web. An alternative approach would be to search each municipality using a device located in the same municipality or tools that simulate this. This would allow us to take into account the way in which each municipality uses local SEO, which is increasingly important. Nonetheless, considering that factors such as the IP address could influence the results, the fieldwork was carried out in a way that minimised biases. The methodology achieved this in two ways. First, all the municipalities chosen for analysis are located in a limited geographical space – they all belong to the same region, Aragón – and the differences between search results grow as physical distances between the locations of users increase (Kliman-Silver *et al.*, 2015). Second, the searches were conducted by the two authors in parallel in the two main cities of Aragón – Zaragoza and Huesca – and the results obtained were identical for all the municipal websites.

Municipal websites may compete locally and in a large geographical area. As an example of the latter, a tourist municipality can compete with other municipalities to attract tourists, trying to rank their offer in search engines with respect to other municipalities and using terms such as “the best Mediterranean beach”. However, for other terms, the competition is local, competing with private companies, other administrations, or even NGOs. An example is the competition between municipal and private schools, or a municipal cemetery vs a private cemetery. The approach followed in the paper is that municipal websites mostly compete locally and, therefore, we used the search term in combination with the city’s place-name (e.g. school + Zaragoza). Even in the case of tourism, we could assume that the person who searches is already interested in the specific city. As a result, competition among municipalities was not analysed, but the competition that takes place between the website of the municipality and other websites that deal with the same term.

For each of the 98 items about content in the global quality index of the website (Q-index), the most-searched word by citizens was identified through the use of the Google Keyword Planner. Table II shows the list with the 98 chosen keywords and the number of monthly searches. Fieldwork was carried out in order to verify the fulfilment of the 98 items of the questionnaire for each of the municipal websites. We decided that the two authors should complete the questionnaire separately, and the results obtained were very similar for both authors. The most common cause of mismatch was that one of the authors was not able to find the required information on the municipal website. In these cases, it was simply confirmed together. The questionnaire was subsequently delivered to those responsible for the municipal websites of the major city councils, who subsequently contacted the authors to inform them that some of the items did exist. In this way, we made sure that the data was consistent. After this, all keywords were analysed, one by one, adding the place-name of the municipality and recording the positions they had. When the municipal web did not appear in the first 200 results of the search engine, the number 200 was assigned. Later, the positions obtained by each word were added. The greater the value of the obtained variable, the worse the positioning of the municipal website; thus, the variable was transformed by taking the reciprocal.

3.1 *What citizens search for on the internet*

Table II shows that the most-searched terms related to municipal competences have to do with tourism, sport, mobility, and traffic states. Terms related to other competences, such as cemeteries, exhibited significantly fewer enquiries. Terms like how to go to attained 201,000 monthly searches, while cemetery reached 5,400. Among non-compulsory municipal competences, public jobs reached 1,000,000; news 1,500,000; and weather 6,120,000.

In order to know about the municipal information offered, the number of pages of the municipal websites that include the 98 keywords have been counted, one at a time, using the “site:” command of Google’s search engine. If the municipal website’s objectives are aligned with citizens’ searches, there will be a positive correlation between the searched words and the words that appear in the municipal website. For each municipal website, the Spearman

correlation coefficient between both variables was calculated. In 40 of 56 analysed city councils (71 per cent), the correlation coefficient was positive and statistically significant; the average being 0.339, which is both positive and statistically significant. To sum up, a positive relationship between citizens' searches and the words that appear in the municipal website was found within the analysed data (HI).

Figure 3 displays a scatter plot, with the X axis showing a ranking of the words searched by citizens and the Y axis showing a ranking of the words that municipal websites offer. Absolute values have been transformed to their ranks in order to help display the results. Four quadrants are shown: the upper-left quadrant shows words that appear in websites but are not often used by citizens, like plenary, participation, or equipment. The upper-right quadrant shows the words most searched for by citizens that appear frequently on the web, such as information, sport, news, or job. The lower-right quadrant displays words that are used frequently by citizens, but do not appear much on the website, such as public jobs, chat, appointment, and domestic violence. Municipal managers should make a stronger effort to take such subjects into account on their websites. Finally, the fourth quadrant, lower-left, shows words with a low number of searches that do not appear much on the website, like mayor salary or participatory budgets.

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3.2 SEO analysis

In order to analyse the search engine positioning of municipal websites, the ranking that each city council has in Google for each of the 98 analysed keywords has been noted.

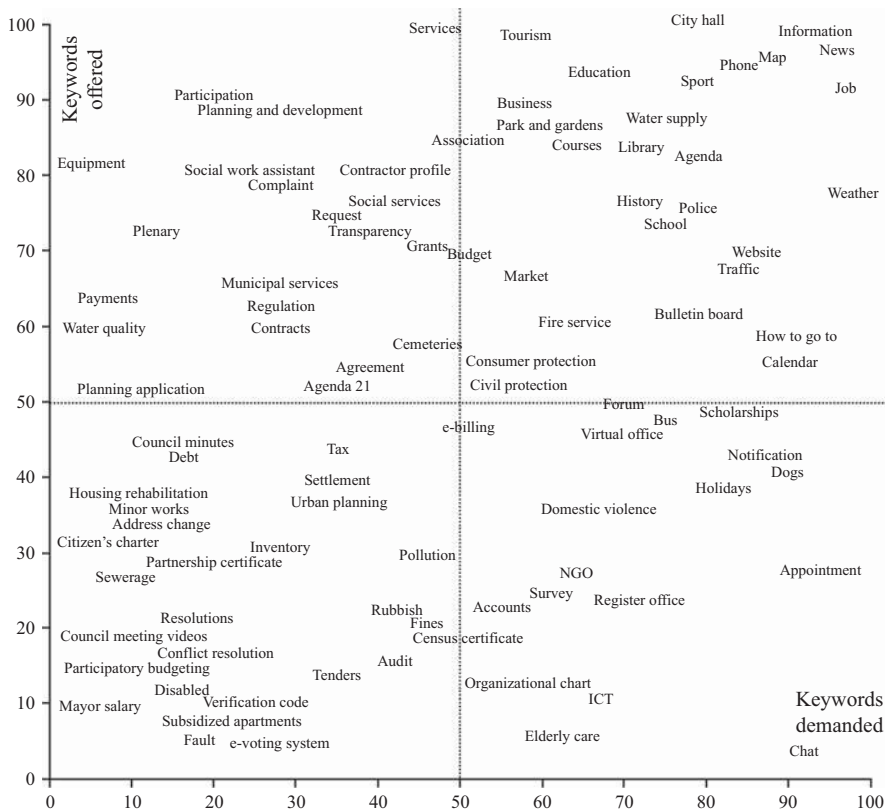


Figure 3. Supply and demand of municipal information: terms used in municipal websites against terms searched by citizens

Table II shows the words that rank the city councils as better or worse. The number of city councils that appear in the first place of the search results for each word has been counted, as well as those on the first results page, which means among the first ten positions. In terms of average values, municipal websites appear in the first position of the search engine in 22.18 per cent of searches for the 98 analysed keywords. In 43.88 per cent of cases, these websites appear among the first ten positions. Among individual results, Zaragoza, the capital of Aragon, with 700,000 inhabitants, ranks in first position for 50 of the 98 keywords (51.02 per cent), and ranks on the first page of Google for 82 of the 98 keywords (83.67 per cent). This is an indicator that municipalities should monitor in their dashboards.

By analysing the table, it is observed that, in general, city councils rank the basic data of their own organisation very well. For example, if we search for X city council, the city council's website will probably appear in the first place; this is the case for 48 of the 56 analysed city councils (85.7 per cent). The fact that city councils manage to rank important terms related to their compulsory competences correctly, like grants, urban planning, buyer profile, or social work assistant, is remarkable. Greater difficulties are found for terms like job or tourism, for which 16 per cent of the administrations analysed hardly manage to appear in the first place. However, these are very competitive words, so by applying SEO techniques, and with a great effort, councils could appear in the first position of search engines.

Search engine ranking is, in general, quite adequate for sections such as municipal organisation and competences, while transparency and participation are the categories with the worst rankings. In these two categories, the lack of municipal experience in matters like participatory budgets or e-voting system is added to the difficulty of ranking competitive terms like forum or accounts. Many terms that have to do with non-compulsory competences inhere serious positioning difficulties – for example, terms like holidays, in which just one city council was positioned in first place (ahead of travel agency portals).

Figure 4 shows a scatter plot, with the X axis displaying the ranking of the most-searched words by citizens, and the Y axis showing the ranking of the better-positioned words of municipal websites. It is possible to identify highly searched words by citizens that are not well positioned, like elderly care, chat, weather, appointment, or domestic violence. Similar figures constructed with data from their websites could be useful for municipal managers to detect the words that citizens use that are not well positioned.

3.3 Factors that explain the search engine positioning of municipal websites

In this epigraph, the hypotheses about the determinant factors explaining the internet positioning of municipal websites are empirically contrasted. In Table III, which shows the Pearson linear correlation coefficient between independent variables, a positive statistically significant relation is observed between quantity and quality (with a Pearson correlation coefficient of 0.565), as well as between quantity of information and backlinks (with a coefficient of 0.655). Additionally, the correlation between social networks presence and the Quality Index stands out, being 0.606. Regarding the indexes of difficulty, there is not much correlation. The only appreciable result comes from the KE-index ratio and the quality index, which is 0.430.

A regression taking search engine positioning as the dependent variable was also performed, employing the previous ones as explanatory variables. Table IV presents the results of nine models. The first seven models are univariant models and show each independent variable separately. Number 8 is the full model, and number 9 is a parsimonious model. All univariate models present statistically significant values, except model number 5, which enters KE-index. A positive relation between the size of the municipal website and its ranking in search engines was found within the analysed data (*H2*). A positive relationship between the quality of the municipal website and its ranking in search engines was also found (*H3*), along with a positive relationship between the municipality's social networks presence and its ranking in search engines (*H4*), and a

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Number of pages (SITE)	0.789**							0.927**	0.715**
Quality (Q-index)		0.694**						0.154	
Social network (SOC-index)			0.575**					0.257*	0.252**
Received links (BACKLINK)				0.717**				-0.323	
Keyword Effectiveness Index (KE-index)					0.281			-0.054	
Place-name Easy ratio (PLACE-EASY)						0.366*		0.300**	0.304**
Municipal Internet Market Share ratio (SHARE)							0.401**	-0.031**	
Adjusted R^2	0.614	0.420	0.315	0.502	0.057	0.114	0.141	0.806	0.807
F	69.388**	32.166**	20.797**	44.392**	3.588	6.516*	8.046**	26.504**	60.828**

Notes: $n = 56$. The table shows estimated standardized coefficients of the regression. *,**Significant at 0.05 and 0.01, respectively

Table IV. Regression that exhibits the explicative factors of positioning (POSIT)

with the KE-index. To sum up, according to the results of the study, all proposed hypotheses are accepted within the analysed data.

The full model (number 8) presents an adjusted R-square of 0.806, but some of the coefficients do not have the expected sign. Also, Table III reveals evidence of multicollinearity between some of the independent variables. These factors lead to some of the model's variables being discarded. In this way, we obtained the last model: a parsimonious model with a small number of independent variables, all of which present the greatest possible explanatory power. Using too many variables could lead to overfitting of data; hence, parsimonious models are useful to ensure validity. Another reason is to reduce the cost of measuring all of the variables for prediction purposes. Automatic model selection procedures could be used to obtain parsimonious models, but they have many limitations and have been criticised because they do not incorporate the judgement of experts (Huberty, 1989). Gelman and Hill (2007, p. 69) recommend starting with a simple model before building in additional complexity. Our choice was to generate a set of reasonable models, all of which rely on subject-matter expertise, and to compare their goodness of fit and their prediction accuracy, based on Akaike's Information Criterion (Akaike, 1974), Bayesian Information Criterion (Schwarz, 1978), and the least absolute shrinkage and selection operator (LASSO) (Tibshirani, 1996). LASSO shrinks the regression coefficients towards zero, and many of them to exactly zero, hence resulting in parsimonious models. Nowadays, these are the most-often used methods to obtain parsimonious models and, in addition, they follow systematic procedures. The same results were obtained using the three procedures. Three variables designed to explain municipal web search engine positioning entered the parsimonious model: the number of pages on the municipal website, the municipal's presence in social networks, and the Place-name Easy ratio. The adjusted R^2 presents a value of 0.807, which indicates a good adjustment.

3.4 Future research lines

As an attribute related to the quality of the municipal website, we propose further investigation into the design of the management indicators for scorecards that help the

managers of public administrations to track website findability. De Andrés *et al.* (2010) found a positive relationship between accessibility and findability, since meeting accessibility guidelines leads to a mark-up of the structural elements, which, in turn, increases the findability of the website. But the relationship between findability and other attributes that characterise the online information of municipal websites is not so clear. Hence, new studies can be conducted regarding the attribute findability and its inclusion in models of structural equations designed to analyse its relationship with the other attributes of municipal webpages, such as credibility, trustworthiness, authority, accessibility, or usability, among others. Municipal websites may rank well for some keywords and not so well for the rest, and it would be interesting to analyse the differences between the rankings as well as the explanatory factors. We are considering conducting future work which will analyse ranking differences among city councils' websites and the possible factors that influence these. The analysis of the competition between different municipalities within a specific geographical area and with respect to a specific search term such as "the best Mediterranean beach" would be also of interest. Finally, it would be interesting to adapt studies, such as the one by Tavares and Da Cruz (2017), on factors that affect transparency to the case of findability, in order to determine whether findability is driven by leadership, capacity and other political traits of local governments, or, rather, whether it hinges on other external factors.

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4. Policy recommendations

Some of the first academic approaches to website evaluation included searchability, along with content, authority, web organisation and accessibility amongst the criteria (Collins and Flick, 1995). Findability, as an attribute, is considered to be very important for online shops (Constantinides, 2002), but not so important with regard to the information provided by municipal websites – with some exceptions, like Kopackova *et al.* (2010). Municipal websites must not just achieve accessibility standards, but also have a responsive web design, and follow the rules of web usability. Additionally, we recommend they should be findable, which requires revisions to the design of municipal website thinking in search engines, particularly with regard to certain technical characteristics that improve findability.

Huang and Benyoucef (2014) established a positive link between usability and credibility. It is also possible to think that there exists a positive link between findability and credibility, since a website appearing in a prominent search engine place could be perceived by citizens as a sign of authority. According to Margetts (2009), governments are trying to influence social behaviour and shape the outside world through the use of four basic tools: nodality, authority, treasure and organisation. Nodality denotes the property of being "nodal" to information and social networks and having the capacity to both disseminate and collect information. She concludes that nodality is crucially affected by the decisions of the most popular search engines; thus, the nodality of a government will depend upon that government's ability to compete successfully in the online space. Hence, improving the findability of a municipal web not only provides a better service to citizens, but also promotes other important aspects, like the credibility of the municipality and its communication with citizens. In fact, city councils are often placed physically in emblematic buildings, usually in a prestigious city-centre location. However, in many cases, council websites have an internet presence that does not fit with their importance. If, whilst promoting their institutional credibility, local administrations want to provide services to their citizenry, attract tourists to the municipality, or publish their history and heritage, they should put effort into ensuring their websites rank correctly in search engines.

Finally, municipal website objectives must be aligned with the interests of citizens, which involves that municipal websites should clearly tend towards a user-oriented design. But how should municipalities obtain users feedback? Cegarra-Navarro *et al.* (2012) address the

need for local administrations to discover citizens' needs in real time, suggesting the use of groupware systems formed by both civil servants and citizens. Feeney and Brown (2017) describe some initiatives carried out by large municipalities, but they recognise that the building of this type of evolving, adaptable and responsive approach to e-government requires flexibility, innovation, and enormous resources, which many smaller cities may not have. In order to know citizens' needs, our proposal is that municipalities should analyse citizens' internet search data, something that all municipalities can do at a low cost.

5. Conclusions

This paper analyses if citizens' searches on the internet coincide with the services that municipal websites offer. In addition, we examine municipal webpage rankings in search engines and the factors explaining them. We propose identifying the keywords that best define municipal competences, analysing the keywords most searched by citizens, and studying website positioning in search engines in order to help local administrations to use SEO tools. The empirical study was conducted with a sample of Spanish city councils. These rank the basic data of their own organisations pretty well, along with important terms related to their competences, but they experience difficulties with terms like job or tourism. On average, in the analysed sample, municipal websites were able to rank 22.18 per cent of the 98 analysed terms in first place and 43.88 per cent amongst the first ten positions – that is, on the first page of the search engine. In the same way that online shops do not settle simply for showing their catalogue to customers and waiting for them to enter, municipal managers should make efforts to ensure their websites rank highly on the principal search engines, so that citizens can quickly find their services. It is proposed that local administrations set their own positioning objectives, and that they should add relevant SEO key performance indicators to their balanced scorecard.

According to the results of the study, two of the factors explaining search engine positioning are the number of pages that municipal websites have and their social networks presence. Therefore, a municipal website that wants to have a good positioning should increase its contents and attain the maximum possible visibility in social networks. Via this method, aside from providing citizens with a better service, the number of backlinks received will increase, a factor directly related to internet positioning. It is obvious that bad praxis, whose only objective consists of cheating search engines, must be avoided. These actions are called black hat SEO practices, and when they are detected, search engines punish their use.

Some city councils have a handicap if their place-name coincides with the name of a country, a region, another municipality, a surname or a common word. For example, there are dozens of cities in several countries that are called Washington, besides being both the name and surname of persons, as well as the name of higher education institutions and infrastructure projects throughout the world. These cities face additional difficulties in terms of appearing in the top positions of a search engine. We propose two indicators that measure the extrinsic difficulties that affect the positioning in search engines, the most relevant being the Place-name Easy ratio, which is obtained by dividing the number of inhabitants of the municipality by the total results obtained when introducing the place-name in the search engine. We have found a negative relationship between the difficulty of positioning the place-name and its ranking in search engines.

Moreover, the use of SEO tools, like the ones used in this research, can provide municipal website managers with guidance regarding the interests of citizens, as well as enabling a comparison between such interests and to the content of the municipal website in question. In this study, we have compared whether the information that can be found in municipal websites fits with citizens' demands. In 71 per cent of the analysed city councils, the correlation coefficient between citizens' searched keywords and what the municipal

websites offered was both positive and statically significant. It was observed that citizens often search for terms like elderly care, chat, weather, appointment, or domestic violence, but that such terms are not very often in municipal websites. Thus, the municipal managers should strive to include these issues on their websites. It should be noted that an SEO analysis should be done for each city council, because localisms are important. For example, in a touristic municipality, the search demand will focus on monumental routes, local festivities, weather, maps, postal codes, how to travel by bus or pictures of the locality. Finally, the fact that in an autonomous region of Spain many of the city councils' websites display the specific content their citizens demand cannot be extrapolated to other contexts. The use of one sample from one country, instead of multiple samples from different countries, is a limitation of the paper, which encourages new empirical studies, using samples from different countries.

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