

El profesional de la información (EPI): Bibliometric and thematic analysis (2006-2017)

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Abstract

The current research conducts a bibliometric performance and intellectual structure analysis of *El profesional de la información (EPI)* from 2006 to 2017. On the one hand, the *EPI*'s performance is analyzed according to the data retrieved from the database *Social Sciences Citation Index (SSCI)*, part of *Web of Science Core Collection*, putting the focus on the productivity of the authors, number of references, organizations, countries and main publications. On the other hand, the intellectual structure of the journal is analyzed with *SciMAT*, an open source (GPLv3) bibliometric software tool developed to perform a science mapping analysis under a longitudinal framework, identifying the main thematic areas that have been the object of research, their composition, relationship and evolution during the period analyzed.

Keywords

Academic journals; Bibliometrics; Authorship; Citations; Thematic analysis; Co-word analysis; Keywords analysis; Conceptual evolution map; Science mapping analysis; Library and Information Science; Communication; *SciMAT*; *Web of Science*; *WoS*; *El profesional de la información*.

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1. Introduction

It is well known that scientific journals constitute one of the main channels of communication to expose the results of scientific projects and research, which results in both the visibility of the authors and the participating organizations and, for this reason, they have become a key instrument to evaluate these researchers and organizations in respect of their knowledge field (Abadal, 2017; López-Ornelas; Cordero-Arroyo, 2005). Consequently, scientific journals are a priority object of study in bibliometric research (Callon; Courtial; Penan, 1995; Castillo-Esparcia; Rubio-Moraga; Almansa-Martínez, 2012).

In research whose object of study is the academic journals, three different approaches can be found:

- 1) Bibliometric performance analysis of authorship and production: they focus on analyzing the authors profiles according to elements such as affiliation, country, production and the production of articles, examining which are the most cited or relevant;
- 2) Bibliometric thematic analysis: they focus on addressing the main themes discussed, as well as their relationships or evolution;
- 3) Research methodology studies: these focus on the research methods and techniques used to develop the publications in journals.

There are publications that address one of these approaches (i.e. about the first approach Calderón-Garrido; Gustems-Carnicer (2018), López-Robles *et al.* (2019); two of them, the thematic analysis and research methodology by Guallar *et al.* (2017); López-Robles *et al.* (2018b); or all of them (Ferran-Ferrer *et al.*, 2017; López-Robles *et al.*, 2018a).

This article is placed in the second group, addressing the first and second approaches, this means, a bibliometric analysis of authorship and production and thematic analysis, with the particularity that it covers year by year the evolution of both approaches.

From another perspective, we can also find other different approaches:

- 1) Research that analyzes several journals or a significant group of them within a discipline or knowledge areas (Delgado-López-Cózar, 2001; Somoza *et al.*, 2017; Goyanes; Rodríguez-Gómez; Rosique-Cedillo, 2018).
- 2) Research focused on the in-depth analysis of a single publication, usually dealing with its evolution over a specific period of time, as an example, in the area of Library and Information Science: González-Alcaide; Gorraiz; Hervás-Oliver, 2018; Abadal, 2018; Arquero-Avilés; Del-Río-Sadornil, 2002; Pérez-Álvarez-Ossorio, 1997; López-López *et al.*, 2001.

The present article is placed in this second group of studies that deal with the analysis of a unique journal over a period of time. *El profesional de la información* (hereinafter *EPI*) is the journal chosen for the analysis. It has a highly relevant role in its area of knowledge, although it has not been the object of an exclusive bibliometric analysis covering a period of time, with the partial exception of the study by Ardanuy and Urbano (2017), which analyzes the journal authorship in comparison with a local congress, justifying the opportunity of this research.

Therefore, the aim of this article is to evaluate the *EPI* evolution from 2006 to 2017 by conducting a bibliometric analysis of authorship and production, emphasizing the identification of the main research themes, their relationship and main components. In addition, a longitudinal evolution map is presented year by year that groups the identified research themes according to thematic areas, establishing a reference framework for researchers and future research.

“ A longitudinal evolution map is presented year by year which groups the main research themes into thematic areas ”

2. Methodology and data preparation

2.1. Methodology

This article is framed within the field of bibliometrics (Glenisson *et al.*, 2005; Moed, 2009) and shows a longitudinal study which takes the case study as a research technique. In addition, it applies specific techniques of bibliometric studies, which are outlined below (Ferran-Ferrer *et al.*, 2017).

The bibliometric approach has been based on two drivers:

- The performance indicators analysis, evaluating the impact of authors and publications, as well as their evolution;
- The scientific map of the journal, representing in a space the relationship between publications and themes, which allows to visualize, to understand and to discover hidden connections between themes of interest for the development a specific scientific field (Cobo *et al.*, 2011b).

For this purpose, *SciMAT* has been used, which in comparison to other bibliometric software (Cobo *et al.*, 2012), it has been used to evaluate:

- The performance of a specific thematic or knowledge area (Alcaide-Muñoz *et al.*, 2017; Cobo *et al.*, 2014; López-Robles *et al.*, 2018c);

- A set of publications (**López-Robles et al.**, 2019; **Moral-Muñoz et al.**, 2016; **Perez-Cabezas et al.**, 2018);
- A journal.

The application of *SciMAT* under last-mentioned approach has been addressed in the literature in different forms:

- In the first case, we find an analysis in which the strategic diagrams group periods of time longer than one year, and it does not include a conceptual evolution map (**Cobo et al.**, 2015);
- In the second case, we find an analysis in which the strategic diagrams group periods of time longer than one year, and it includes a conceptual evolution map (**Cobo et al.**, 2018; **López-Herrera et al.**, 2012);
- In the latter case, we find an analysis in which the strategic diagrams group periods of one year each, and it includes a conceptual evolution map (**López-Robles et al.**, 2018a).

The latter variant hardly appears in the literature, and the publication cited above hardly evaluates a few publications in a short period of time. For this reason, this case has been selected to develop a complete analysis of *EPI*, a journal with a trajectory and a production considerably superior.

To that end, firstly, the journal's publications and their bibliographic information available in the database *Social Sciences Citation Index (SSCI)*, part of *Web of Science Core Collection*, have been compiled and analyzed. Furthermore, the h-index and H-Classics indexes have been applied to them. Secondly, the strategic diagrams and conceptual evolution map were developed using *SciMAT*, a software tool developed to perform a science mapping analysis. It is explained in more detail below.

On the one hand, the information available in *SSCI* facilitates the analysis of the main performance indicators: productivity of authors in terms of publications and citations, agents and countries. This part of the analysis has been complemented using the h-index and H-Classics indexes (**Alonso et al.**, 2009; **Hirsch**, 2005; **Martínez et al.**, 2014; **Schreiber**, 2007; **Schubert**, 2007). Firstly, the h-index has been applied, it allows to measure both the productivity and the impact of a set of publications, linking the number of publications and their citations. Then, the H-Classics has been applied, which is used as an impartial criterion to systematize the searching process through the h-index. The combination of both indexes reduces the discrepancy that may exist between the most cited publications and those that have not yet reached the same level, establishing a common reference point for publications within a specific knowledge area.

On the other hand, the main research themes within the *EPI* were identified and displayed as a strategic map using *SciMAT* (**Cobo et al.**, 2012), it facilitates the implementation of a four-stage methodology:

- Detection of research themes (**Powell et al.**, 2016);
- Visualization of research themes and their thematic networks (**Callon**; **Courtial**; **Laville**, 1991; **He**, 1999);
- Discovery of thematic areas (**Sternitzke**; **Bergmann**, 2009);
- Performance analysis (**Cobo et al.**, 2012).

Science maps allow to clearly visualize the evolution of a journal, delimiting research areas and its development, capturing its conceptual and cognitive structure (**Cobo et al.**, 2011a). Prior to the performance of the science map, each period is characterized as a thematic network and it is represented as a set of themes classified and positioned in a plane divided into four categories, called a strategic diagram (see figure 1a).

Thematic networks are structured according to the frequency of co-occurrence of keywords and are grouped using the algorithm of simple centers, one of the best known in the literature and used for co-word analysis. In addition, this algorithm returns groups tagged with the label of the most central node; it means, from the group of keywords the most relevant label groups the rest of labels according to its relations and importance. When the bibliometric network of co-words is completed, the similitude is calculated from the co-occurrence of the keywords identified in the set of publications. As a result, a set of keyword groups and their connections are identified, these groups are called themes, and are classified into four categories, according to Callon's centrality and density:

- Motor themes (Q1, upper-right quadrant): These themes are both well developed and important for the structure of the research field;
- Peripheral themes (Q2, upper-left quadrant): well-developed internal ties but unimportant external ties and so, they have a marginal role for the development of the scientific field;
- Emerging or declining themes (Q3, lower-left quadrant): They are both weakly developed and marginal;
- Basic and transversal themes (Q4, lower-right quadrant): They are important for a research field but are not developed.

It is important to mention that the motor themes and the basic and transversal themes are considered as those that favor the development and consolidation of a field of knowledge or a journal due to their density and centrality.

This is followed by the scientific map (see figure 1b), which lists each strategic diagram and relates its evolution over time. This map is classified by thematic areas

“ We obtain keyword groups and their interconnections. These groups are called themes, and are classified into four categories: Motor themes, Peripheral themes, Emerging or declining themes, and Basic and transversal themes ”

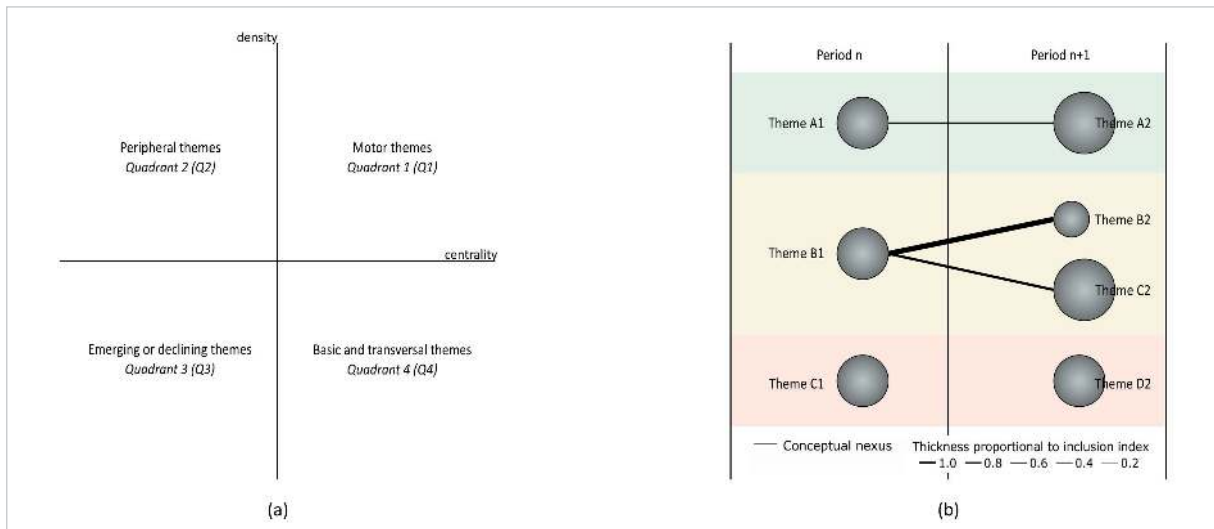


Figure 1. (a) Strategic diagram and (b) Thematic evolution

to facilitate its analysis and the relationship between different areas of research, including within a time frame the changes in the conceptual, social and intellectual structure, based on the available bibliographic information and its main bibliometric indicators (Cobo, 2012).

2.2. Dataset

As mentioned before, *EPI* publications available on the *Web of Science (WoS)* were retrieved. To do that, the advanced query used on the *Social Sciences Citation Index (SSCI)* was its ISSN: IS= "1386-6710".

This query retrieved a total of 1,078 publications, of which 1,038 were for the period 2006-2017. In addition, citations of these publications were also analyzed; they were counted up to 9th June 2018.

The publications identified in *SSCI* were downloaded as plain text and imported into *SciMAT* software to build the knowledge base for science mapping analysis. Thus, the bibliographic information stored by *SSCI* (affiliations, authors, references, date of publication, keywords and citations obtained, mainly) is available for each publication, which allows to analyze the data, identify relationships and, consequently, obtain better results in the analysis of the science map.

In addition, in order to improve and guarantee the quality of the data, a revision process was applied. It analyses and merges the concepts that have the same meaning or that represent the same subject (for example: "Knowledge Management", "Knowledge-Management" and "KM" were grouped as "KNOWLEDGE-MANAGEMENT-(KM)").

As a next step, the *SciMAT* period manager was used to avoid data flatness. The best approach when analyzing the evolution of the data is to evaluate them year by year, but sometimes it is advisable to group them in periods in order to generate a sufficient mass of publications for analysis. In this case, it has been decided to carry out an analysis year by year, so this study comprises twelve periods from 2006 to 2017.

3. Performance bibliometric analysis (authorship and production)

3.1. Presentation of the journal

El profesional de la información (EPI) is defined on its website as

"a journal on communication, information, indicators, libraries and information technologies".
<http://www.elprofesionaldelainformacion.com/presentacion.html>

In thematic terms, *EPI* proposes to the scientific community a main topic for each issue, calling for contributions about it (call for papers). However, each issue could include publications that cover other topics and that the authors send independently of the previous calls.

There are some facts about *EPI*'s evolution that can be highlighted. It was born in 1992 initially with the name of *Information world en español*. It's not until 1999 when it adopts its current name. Since 2002 it has been published bimonthly and since 2009 it appears in the *WoS Journal Citation Reports (JCR)* in the *Information Science & Library Science* category, also entering in January 2019 in the *WoS Communication* category (*El profesional de la información*, n.d.).

Table 1 shows the evolution during the analysis period of this research (2006-2017) of the *Journal Citation Reports (JCR)* indexes of *Web of Science* and *SCImago Journal & Country Rank (SJR)* of *Scopus*, the analysis period of this research.

Table 1. EPI's evolution in JCR (WoS) and SJR (Scopus) 2006-2017

Year	InCites Journal Citation Reports	SCImago Journal & Country Rank			
	Information Science & Library Science	SJR	Communication	Information Systems	Library and Information Sciences
2006	-	-	-	-	-
2007	-	0.163	Q3	Q4	Q3
2008	0.400 (Q3)	0.198	Q3	Q3	Q3
2009	0.478 (Q3)	0.254	Q3	Q3	Q3
2010	0.375 (Q3)	0.277	Q2	Q3	Q3
2011	0.326 (Q3)	0.271	Q2	Q3	Q3
2012	0.439 (Q3)	0.317	Q2	Q3	Q3
2013	0.402 (Q3)	0.379	Q2	Q3	Q2
2014	0.356 (Q4)	0.458	Q2	Q2	Q2
2015	0.710 (Q3)	0.433	Q2	Q2	Q2
2016	1.063 (Q3)	0.549	Q2	Q2	Q1
2017	1.318 (Q2)	0.652	Q1	Q2	Q1

EPI has the participation of 1,448 researchers from 436 organizations and 32 countries. In terms of countries, Spain concentrates 80% of the journal's publications and excluding Spain, United Kingdom, Argentina, United States, Mexico, Colombia and Chile are in the group of the most productive countries. These countries highlight for their constant activity over time, with percentages of publications each between 1% and 2% of the total.

Consequently, the analysis of the journal in terms of publications, authorship, citations and their impact is presented below. The indicators analyzed were: number of publications, citations received, most productive authors, most cited publications, geographical distribution and most productive organizations. The analysis is structured in three parts:

- Publications and citations;
- Most productive and cited authors, geographical distribution and organizations;
- Most cited publications.

3.2. Publications and citations

In January 2006 EPI begins to be indexed in the *Social Sciences Citation Index* database of the *Web of Science* and it appears in the *Journal Citation Reports (JCR)* corresponding to 2009 for the first time in June 2010, with an Impact Factor of 0.475. During that time, it has maintained a constant publication activity and it has increased the number of publications, recording two historical maximums in the last two periods analyzed: 95 and 115 publications, in 2016 and 2017 respectively. Table 2 and Figure 2 show the EPI publications in the *Web of Science Core Collection* and distribution of publications by year (1988–2017) for the period analyzed, respectively.

Figure 3 shows the distribution of citations per year for the defined periods. Similar to the case of the publications, the citation distribution showed a positive developmental trend during 2006–2017. During this period, a total of 2,585 citations (including self-citations) were recorded, and the total number of quotations (cited references) not including self-citations is 1,776. Finally, the *Web of Science* indicates that the average citation per cited article is 2.49.

Table 2. EPI publications in the Social Sciences Citation Index

Type	Publications (N = 1,038)	
	n	%
Articles	926	89.21
Editorial material	79	7.61
Book reviews	18	1.73
Review	9	0.87
Revision of software or database	6	0.58

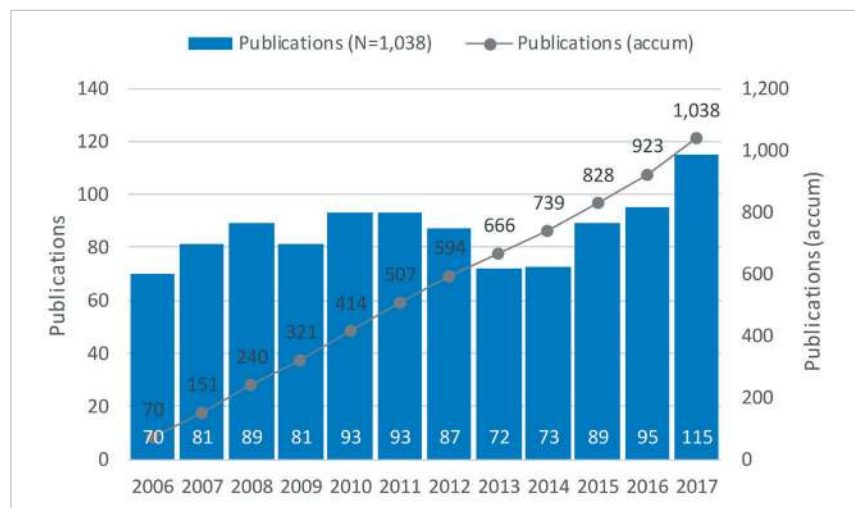


Figure 2. EPI distribution of publications by year (1988–2017)

Taking into account the evolution in terms of citations observed in Figure 3, it can be assumed that this positive trend will continue in the coming years. However, it should be noted that the citations collected in the last two periods show a trend towards fictitious decline; according to Wang (2013), the most cited publications are generally those that occupy previous years due to the time span between publication and reference. It is estimated that a publication needs between 3 and 7 years to reach its highest number of citations.

3.3. Most productive and cited authors, geographical distribution and organizations

Table 3 shows the most productive authors for the period 2006-2017 and Table 4 shows the most productive authors year to year. The data is arranged in descending order, and when was a tie between various authors; all of them have been included in alphabetical order. This criterion is applied to all tables included in this article.

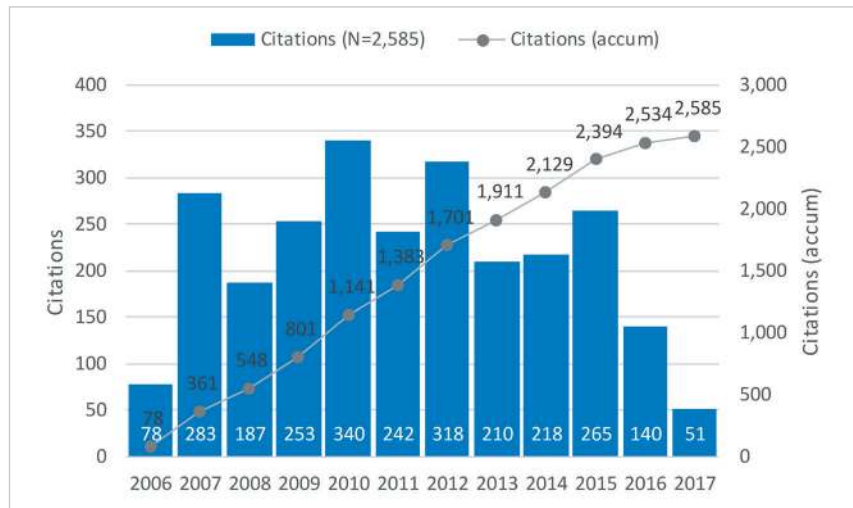


Figure 3. EPI distribution of citations by year (2006-2017)

Table 3. Most productive authors from 2006 to 2017

Publications (N = 1,038)		Authors
n	%	
28	2.70	Codina
22	2.12	Torres-Salinas
17	1.64	Guallar
15	1.45	Peset
14	1.35	Delgado-López-Cózar
13	1.25	Ferrer-Sapena; Marcos
12	1.16	Pérez-Montoro
11	1.06	Rovira
10	0.96	Abadal
9	0.87	Baiget; Eito-Brun; Jiménez-Contreras; Rodríguez-Gairín

Table 4. Most productive authors by year

Year	(Publications) Authors (N = 1,038)
2006	(4) Marcos; (3) Baiget; (2) Aguillo; Delgado-López-Cózar; Herrero-Solana; Ortega
2007	(9) Codina; (4) Monistrol; (3) Baiget; Ferrer-Sapena; (2) Marcos; Ortega; Peset; Rodríguez-Gairín; Rovira; Sánchez-Jiménez; SCImago; Torres-Salinas; Vives-Gracia
2008	(5) Ferrer-Sapena; (4) De-Moya-Anegón; Peset; (3) Codina; Delgado-López-Cózar; Eito-Brun; Redondo; (2) Carrato-Mena; Guallar; Lara-Navarra; Ribera; Torres-Salinas
2009	(5) Delgado-López-Cózar; Torres-Salinas; (3) Codina; Guallar; Ruiz-Pérez; (2) Caldera-Serrano; Hernández-García; Iglesias-Pradas; Jiménez-Contreras; Lloret-Romero; Merlo-Vega; Orduña-Malea; Ros-Martín; Serrano-Cobos
2010	(5) Marcos-Recio; Sánchez-Vigil; (3) Codina; Guallar; Marcos; Micó-Sanz; Olivera-Zaldúa; Rovira; Torres-Salinas; (2) Alexandre-Benavent; Cordón-García; Díaz-Noci; García; Giménez-Toledo; Gómez-Barroso; Jiménez-Contreras; Jiménez-Fernández; Masip; Nuño-Moral; Pedraza-Jiménez; Pérez-Montoro; Peset; Rodríguez-Parada; Salaverría
2011	(2) Barra; Codina; D'Alòs-Moner; Delgado-López-Cózar; Ferrer-Sapena; Fumero-Reverón; García-Marco; García-Moreno-Torres; Giralt; Herrera; Moreira; Peset; Rodríguez-Gairín; Said-Hung; Sánchez-Vigil; Somoza-Fernández; Torres-Salinas; Xifra
2012	(3) Abadal; Gonzales-Aguilar; Ramírez-Posada; (2) Anglada; Cabezas-Clavijo; Guallar; Hilera-González; Ivars-Nicolás; Ruiz-Ibáñez; Torres-Salinas
2013	(2) Aguilar-Moreno; Codina; Granell-Canut; Peset; Rausell-Koster; Saorín
2014	(3) Torres-Salinas; (2) Anglada; Jiménez-Contreras; López-de-Solís; Pérez-Montoro; Robinson-García
2015	(3) Kousha; Thelwall; (2) Giménez-Toledo; González-Fernández-Villavicencio; González-Teruel; Mañana-Rodríguez; Salaverría; Sturges; Tejada-Artigas; Yubero
2016	(3) Martínez-Fernández; Pérez-Montoro; (2) Aguilar-Paredes; Aguillo; Arcila-Calderón; Campos-Freire; Codina; Gómez-Domínguez; Hernández-Pérez; López-García; Martín-Martín; Masip; Orduña-Malea; Quintas-Froufe; Rodríguez-Vázquez; Rúas-Araújo; Sánchez-Gómez; Thelwall
2017	(2) Carratalá; Casero-Ripollés; Codina; Ferran-Ferrer; López-Meri; Manfredi-Sánchez; Martínez-Rolán; Merlo-Vega; Ortega-Mohedano; Palau-Sampio; Pérez-Montoro

The most cited authors during the period 2006-2017 are shown in Table 5, and the most cited for each year are shown in Table 6.

Bearing in mind the findings of Tables 3, 4, 5 and 6, it is important to highlight that several of the main authors of Table 3 coincide with Table 5, thus, reflecting a congruence between quantity and quality (impact) of the journal's publications. It can be specified that among the most cited authors (Table 5) there are not only several of the main authors in terms of production (Table 3), such as Codina, Torres-Salinas, Delgado-López-Cózar, Guallar, Peset, Abadal and Jiménez-Contreras, but similarly, other authors with fewer articles but who have obtained a relevant impact, such as Casero-Ripollés, Leydesdorff, Thelwall, Kousha, Aleixandre-Benavent, Pedraza-Jiménez and Díaz-Noci.

Table 5. Most cited authors from 2006 to 2017

Cites (N = 2,585)		Authors
n	%	
181	7.00	Torres-Salinas
155	5.99	Delgado-López-Cózar
107	4.14	Guallar
84	3.25	Codina
68	2.63	Leydesdorff; Peset
66	2.55	Ferrer-Sapena
65	2.51	Casero-Ripollés
63	2.44	Abadal; Thelwall
61	2.35	Kousha
56	2.18	Aleixandre-Benavent; Jiménez-Contreras

Table 6. Most cited authors by year

Year	(Cites) Authors (N = 2,585)
2006	(7) Ortega; Picazo; Tramullas; (6) Bonet; Fernández-Quijada; (5) Marcos
2007	(37) Aleixandre-Benavent; González-Alcaide; Valderrama-Zurián; (21) Ortega; (18) Bordons; Costas
2008	(16) De-Moya-Anegón; Ferrer-Sapena; (14) De-Nooy; Leydesdorff; Schank; Scharnhorst; (13) Peset
2009	(61) Delgado-López-Cózar; (56) Torres-Salinas; (31) Guallar
2010	(44) Torres-Salinas; (43) Díaz-Noci; (42) Casero-Ripollés
2011	(34) Ferrer-Sapena; Peset; (28) Delgado-López-Cózar; García-Moreno-Torres; Herrera; Torres-Salinas; (25) Said-Hung
2012	(24) Abadal; (19) Leydesdorff; (17) Greenberg; Méndez
2013	(27) Adams; Leydesdorff; Park; Wagner; (19) Jeremic; Jovanovic-Milenkovic; Martić; Radojčić; (12) Giménez-Toledo; Rodríguez-Yunta
2014	(26) Torres-Salinas; (21) Costas; Robinson-García; Zahedi; (19) Anglada
2015	(61) Kousha; (61) Thelwall; (18) Salaverría; (15) Campos-Freire
2016	(16) Delgado-López-Cózar; Martín-Martín; Orduña-Malea; (11) Beltrán-Orenes; Martínez-Pastor
2017	(9) Casero-Ripollés; (3) De-Frutos-Torres; Fuente-Cobo; Marcos-Santos; Rebolledo; Rodríguez-Virgili; Rom-Rodríguez; Vilajoana-Alejandro; Zamora-Medina; (2) Aguado; Boeykens; Delgado; Ferran-Ferrer; Manfredi-Sánchez; Martínez-Martínez; Molina-Rodríguez-Navas; Monteagudo-Barandalla; Moreno-Sardà; Navarro; Prado; Simelio-Solà; Torrecillas-Lacave; Vázquez-Barrio

In terms of internationalization, in regard to languages, the *EPI* publishes both in Spanish and English. Spanish is the main language used with 87.77% (911) followed by English with 12.14% (126) (it should be highlight that among the latter there are several non-Spanish authors, and they have gained presence in recent years in the journal). Table 7 shows the most productive countries from 2006 to 2017.

Table 8 presents the most productive Spanish and foreign organizations from 2006 to 2017.

It can be observed that the most productive organizations in *EPI* are *Universitat de Barcelona*, *Universitat Pompeu Fabra* and *Universidad de Granada*, followed by *Universidad Carlos III de Madrid*, *Universidad Complutense de Madrid*, *Universidad Politécnica de Valencia* and *Universidad de Navarra*. The most productive organizations outside Spain are *University of Amsterdam* (Netherlands), *Universidad de Antioquia* (Colombia), *Max Planck Gesellschaft* (Germany), *Universidad Nacional Autónoma de México* (Mexico) and *University of Wolverhampton* (United Kingdom).

Table 7. Most productive countries from 2006 to 2017

Countries	Publications (N = 1,038)	
	n	%
Spain	838	80.73
United Kingdom	21	2.02
Argentina; United States	18	1.73
Mexico	15	1.45
Colombia	14	1.35
Chile	10	0.96
Netherlands; Portugal	9	0.87
Germany; Brazil	8	0.77
Cuba	7	0.67
Italy	6	0.58

Table 8. Most productive Spanish and foreign organizations from 2006 to 2017

Publications (N = 1,038)	Spanish organizations
71	<i>Universitat de Barcelona</i>
68	<i>Universitat Pompeu Fabra</i>
60	<i>Universidad de Granada</i>
58	<i>Universidad Carlos III de Madrid</i>
56	<i>Universidad Complutense de Madrid</i>
43	<i>Universidad Politécnica de Valencia</i>
35	<i>Universidad de Navarra</i>
29	<i>Consejo Superior de Investigaciones Científicas; Universitat Oberta de Catalunya; Universidad de Salamanca; Universidad de Valencia</i>
22	<i>Universidad de Zaragoza</i>
21	<i>Universitat Autònoma de Barcelona; Universidad Rey Juan Carlos</i>
Foreign organizations	
6	<i>University of Amsterdam (Netherlands); Universidad de Antioquia (Colombia)</i>
5	<i>Universidad Nacional Autónoma de México (Mexico); University of Wolverhampton (United Kingdom); Max Planck Gesellschaft (Germany)</i>
4	<i>Université Paul Valéry Montpellier 3 (France)</i>
3	<i>Universidad Nacional de Córdoba (Argentina); Loughborough University (United Kingdom); Université Catholique de Louvain (Belgium)</i>
2	<i>Long Island University (United States); Universidad Nacional de la Plata (Argentina); Novosibirsk State University (Russia); Pontificia Universidad Católica de Chile (Chile); Universidad Autónoma de Occidente (Colombia); Universidade da Beira Interior (Portugal); University of Belgrade (Serbia); Universidad Católica Andrés Bello (Venezuela); Universidade de Coimbra (Portugal); Universidad Estatal de Milagro (Ecuador); Universidade Federal de Santa Catarina (Brazil); Universidad de La Habana (Cuba); Universidad del Norte (Colombia); Universidad de Piura (Peru); Universidad de Playa Ancha (Colombia)</i>

3.4. Analysis of most cited publications

In order to analyze the most cited publications, a two-fold approach is proposed based on h-index (Hirsch, 2005) and H-Classics (Martínez et al., 2014), respectively. To this end, the search query used in the database *Social Sciences Citation Index* has an h-index of 18. Using the value of h-index as a reference, the relevant publications have been identified and are listed in their original language of publication in Table 9. This list includes authorship information, type of publication (article refers to research paper published in the Articles or Analysis sections; Editorial refers to texts published in the Observatory section) and the number of citations registered in WoS. Figure 4 shows the distribution of the most cited publications for the period analyzed.

“The most productive organizations in *EPI* are the Spanish universities of *Barcelona*, *Pompeu Fabra* and *Granada*, followed by *Carlos III*, *Complutense de Madrid*, *Politécnica de Valencia* and *Navarra*”

In the same way as the distribution of publications, the distribution of citations shows a positive trend in the period 2006-2017. During this period, a total of 15 articles and 3 editorials were recorded, which include 428 citations (including self-citations) and 422 citations excluding self-citations. In addition, according to the *SSCI* database, the average number of citations per article is 23.78. Finally, it can be observed that there are articles that were kept for reference after the seven-year period, suggesting that these publications are part of *EPI*'s core (Wang, 2013).

Table 10 shows the authors with the highest number of most cited publications and Table 11 shows the countries from these authors are originate.

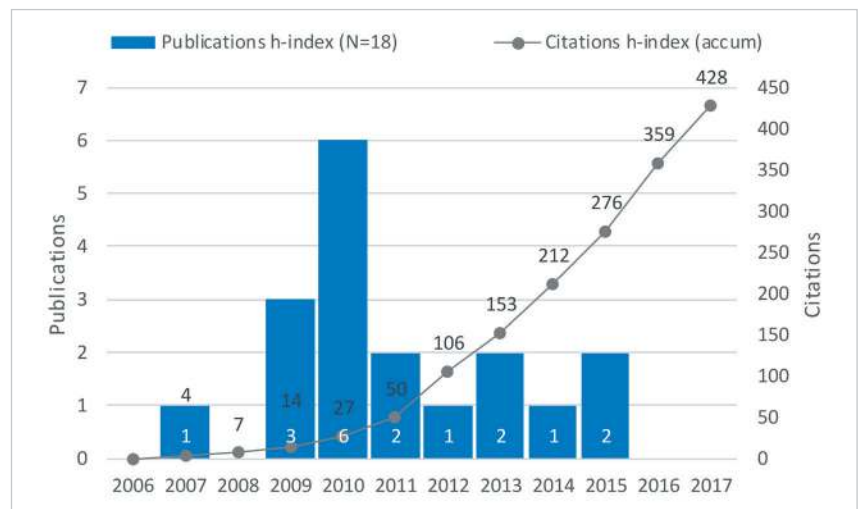


Figure 4. Distribution of most relevant publications by year

Table 9. H-classes of EPI

Rank	Title (author/s, year of publication)	First author affiliation (country)	Type	Cites
1	"Prensa en internet: nuevos modelos de negocio en el escenario de la convergencia" (Casero-Ripollés, 2010)	Universitat Jaume I (Spain)	Article	42
2	"El factor de impacto de las revistas científicas: limitaciones e indicadores alternativos" (Aleixandre-Benavent; Valderrama-Zurián; González-Alcaide, 2007)	Universidad de Valencia (Spain)	Editorial	37
3	"Cibermedios y web 2.0: modelo de análisis y resultados de aplicación" (Rodríguez-Martínez; Codina; Pedraza-Jiménez, 2010)	Universitat Pompeu Fabra (Spain)	Article	28
4	"International collaboration in science: The global map and the network" (Leydesdorff; Wagner; Park; Adams, 2013)	University of Amsterdam (Netherlands)	Article	27
5	"Evaluación de hemerotecas de prensa digital: indicadores y ejemplos de buenas prácticas" (Guallar; Abadal, 2009)	Universitat de Barcelona (Spain)	Article	26
6	"Web indicators for research evaluation. Part 1: Citations and links to academic articles from the Web" (Thelwall; Kousha, 2015)	University of Wolverhampton (United Kingdom)	Article	23
7	"Open data y Linked open data: su impacto en el área de bibliotecas y documentación" (Peset; Ferrer-Sapena; Subirats-Coll, 2011)	Universidad Politécnica de Valencia (Spain)	Article	23
8	"Web indicators for research evaluation. Part 2: Social media metrics" (Thelwall; Kousha, 2015)	University of Wolverhampton (United Kingdom)	Article	22
9	"Investigación internacional sobre ciberperiodismo: hipertexto, interactividad, multimedia y convergencia" (Masip; Díaz-Noci; Domingo; Micó-Sanz; Salaverría, 2010)	Universitat Ramon Llull (Spain)	Article	22
10	"Clasificación integrada de revistas científicas (CIRC): propuesta de categorización de las revistas en ciencias sociales y humanas" (Torres-Salinas; Bordons; Giménez-Toledo; Delgado-López-Cózar; Jiménez-Contreras; Sanz-Casado, 2010)	Universidad de Granada y Universidad de Navarra (Spain)	Article	22
11	"New data, new possibilities: Exploring the insides of Altmetric.com" (Robinson-García; Torres-Salinas; Zahedi; Costas, 2014)	Universidad de Granada (Spain)	Article	21
12	"Medios de comunicación en internet: algunas tendencias" (Díaz-Noci, 2010)	Universitat Pompeu Fabra (Spain)	Editorial	21
13	"Ciencia 2.0: catálogo de herramientas e implicaciones para la actividad investigadora" (Cabezas-Clavijo; Torres-Salinas; Delgado-López-Cózar, 2009)	Universidad de Granada (Spain)	Article	20
14	"Excellence with leadership: The crown indicator of SCImago Institutions Rankings Iber Report" (Jeremic; Jovanovic-Milenkovic; Radojicic; Martic, 2013)	University of Belgrade (Serbia)	Article	19
15	"World shares of publications of the USA, EU-27, and China compared and predicted using the new Web of Science interface versus Scopus" (Leydesdorff, 2012)	University of Amsterdam (Netherlands)	Article	19
16	"Uso de Twitter y Facebook por los medios iberoamericanos" (García-De-Torres; Yezers'ka; Rost; Calderín; Edo; Rojano; Said-Hung; Jerónimo; Arcila; Serrano-Tellería; Sánchez-Badillo; Corredoira, 2011)	Universidad CEU Cardenal Herrera y Universidad Internacional Valenciana (Spain)	Editorial	19
17	"Multimedialidad en la prensa digital. Elementos multimedia y sistemas de recuperación en los principales diarios digitales españoles" (Guallar; Rovira; Ruiz, 2010)	Universitat de Barcelona (Spain)	Article	19
18	"Google Scholar como herramienta para la evaluación científica" (Torres-Salinas; Ruiz-Pérez; Delgado-López-Cózar, 2009)	Universidad de Granada y Universidad de Navarra (Spain)	Article	18

Table 10. Authors with the highest number of most cited publications

Publications (N = 18)		Authors
n	%	
4	4 (22.22%)	Torres-Salinas
3	3 (16.66%)	Delgado-López-Cózar
2	2 (11.11%)	Díaz-Noci; Guallar; Kousha; Leydesdorff; Thelwall
1	1 (5.55%)	Abadal; Adams; Aleixandre-Benavent; Arcila; Bordons; Costas; Cabezas-Clavijo; Calderín; Casero-Ripollés; Codina; Corredoira; Domingo; Edo; Ferrer-Sapena; García-De-Torres; Giménez-Toledo; González-Alcaide; Jeremic; Jerónimo; Jiménez-Contreras; Jovanovic-Milenkovic; Martic; Masip; Micó-Sanz; Park; Pedraza-Jiménez; Peset; Radojicic; Robinson-García; Rodríguez-Martínez; Rojano; Rost; Rovira; Ruiz; Ruiz-Pérez; Said-Hung; Salaverría; Sánchez-Badillo; Sanz-Casado; Serrano-Tellería; Subirats-Coll; Valderrama-Zurián; Wagner; Yezers'ka; Zahedi

The findings described in the section 3.2 are related to the results identified in this section and EPI's performance too, but with some differential aspects of interest.

In terms of the publication language, 66.67% (12) of the most cited works published in the journal are in Spanish, while 33.33% (6) are in English. These percentages are favorable to the presence of English, but if we consider the total production of EPI (87.77% in Spanish and 12.14% in English). There is a higher presence of English-language publications in the most cited publications.

The organizations with the highest number of publications cited are *Universidad de Granada*, *Universidad de Navarra* and *Universitat Pompeu Fabra* with 4 publications and the *Universitat de Barcelona* and *University of Wolverhampton* with 2 publications each.

Table 11. Countries with the highest number of most cited publications

Publications (N = 18)		Countries
n	%	
13	72.22	Spain
3	16.66	Netherlands
2	11.11	United Kingdom
1	5.55	Argentina; Italy; Peru; Portugal; Serbia; South Korea; United States; Venezuela

4. Science mapping analysis of *El profesional de la información*

EPI's evolution is presented below, identifying and visualizing the main thematic areas year by year from 2006 to 2017 using *SciMAT*.

4.1. Analysis of the content of the articles published from 2006 to 2017

In order to visualize and analyze the evolution of the main themes within *EPI*, Figure 5 shows the strategic diagrams from 2006 to 2017, including the number of publications that each theme concentrates and the number of citations (in parentheses) achieved by each one according to the results obtained from the query applied in *SSCI*.

It is important to bear in mind that the one publication may be included in several themes, depending on their keywords used for its classification. In addition, the Motor themes and Basic and transversal themes are considered as the themes that contribute to develop and consolidate a knowledge field or a journal for their density and centrality.

Taking into account the strategic diagrams from figure 5, Table 12 shows the main research topics developed and their performance according to the number of publications from 2006 to 2017. On the other hand, Annex 1 details the evolution of each period and the research themes covered by each main research theme.

Table 12. Main research themes of *EPI* from 2006 to 2017

Themes	Publications	Cites	Cites/ publication	Quadrants			
				Q1	Q2	Q3	Q4
WEBSITES	73	189	2,6	3	1	-	5
SOCIAL-NETWORKS	67	310	4,6	2	-	-	5
INTERNET	50	155	3,1	2	-	-	3
BOOKS	50	183	3,7	4	1	-	2
ACADEMIC-LIBRARIES	43	137	3,2	-	2	2	3
JOURNALISM	42	107	2,5	-	-	-	3
TWITTER	38	27	0,7	-	-	-	2
WEB-2.0	37	162	4,4	1	-	1	2
REPOSITORIES	30	100	3,3	-	1	-	2
TELEVISION	30	92	3,1	-	-	-	4
DATABASES	27	76	2,8	4	3	-	-
ELECTORAL-CAMPAIGNS	26	12	0,5	-	-	-	1
NEWSPAPERS	23	24	1,0	1	-	-	2
INFORMATION-VISUALIZATION	22	47	2,1	-	1	1	1
OPEN-ACCESS	22	47	2,1	1	2	1	-
ONLINE-JOURNALISM	21	97	4,6	1	-	-	1
COMMUNICATION-STRATEGIES	19	13	0,7	-	1	-	-
DIGITAL-COMMUNICATION	19	4	0,2	-	-	-	1
DIGITALIZATION	19	61	3,2	3	-	1	-
EBOOKS	19	23	1,2	-	1	-	1
INNOVATION	19	27	1,4	1	2	-	1
BIBLIOMETRICS	18	73	4,1	-	3	1	-
BIG-DATA	18	51	2,8	-	1	-	2
MUSEUMS	18	30	1,7	-	-	1	1
LIBRARY-SERVICES	16	31	1,9	-	-	-	1
SOCIAL-MEDIA	15	39	2,6	1	-	-	1

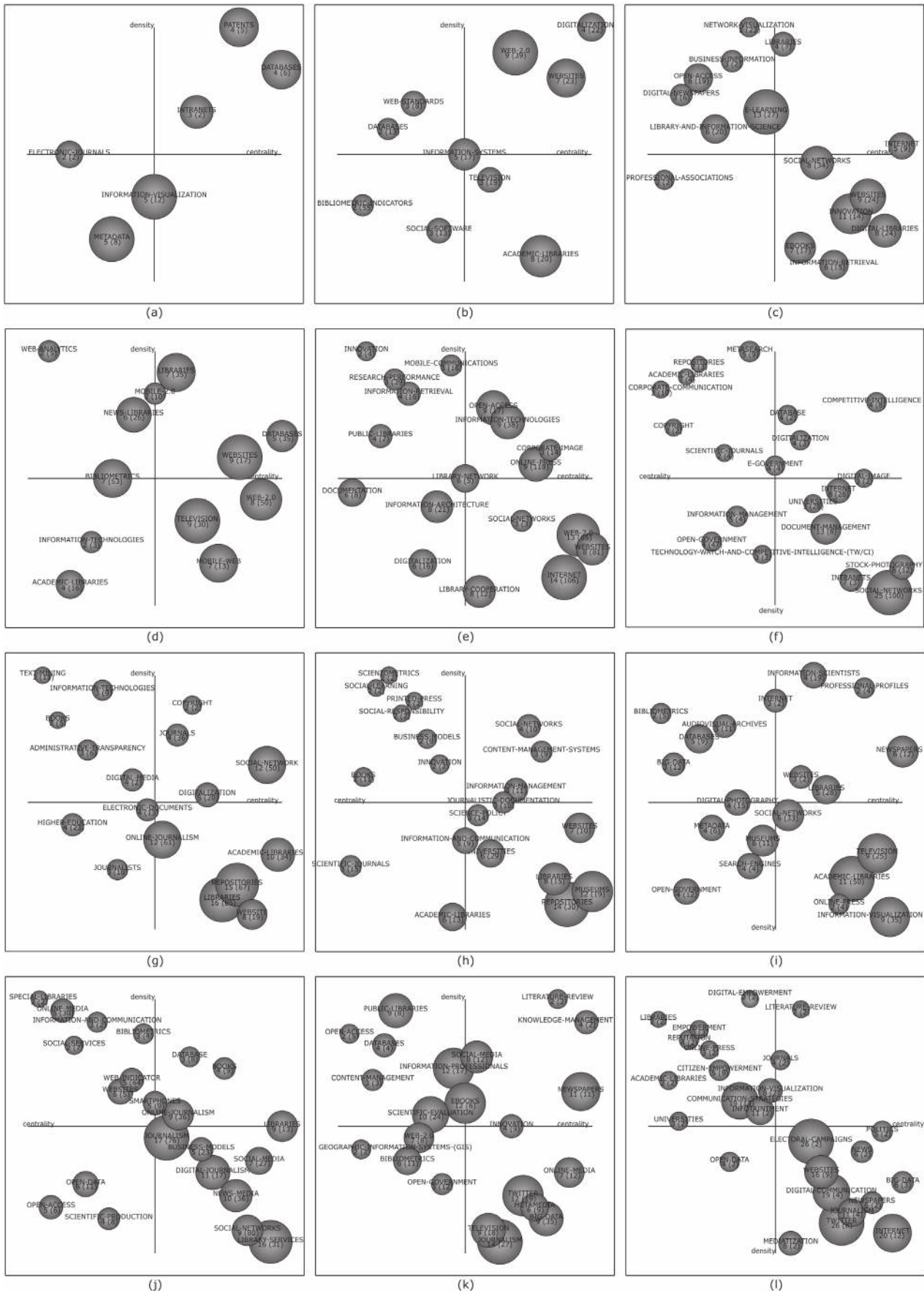


Figure 5. Strategic diagrams (a) 2006, (b) 2007, (c) 2008, (d) 2009, (e) 2010, (f) 2011, (g) 2012, (h) 2013, (i) 2014, (j) 2015, (k) 2016 and (l) 2017

These results are aligned with the analyses carried out by Ferran-Ferrer *et al.* (2017) and Guallar *et al.* (2017), in which are identified as relevant themes within the journal:

- Communication
- Information technologies
- Metric studies of information
- Resources and sources of information
- Information and services units.

Resources and sources of information is the most representative thematic area of the conceptual evolution map

4.2. Conceptual evolution map

In accordance with the strategic diagrams, Figure 6 shows the evolution of the main thematic areas in *EPI*, the relationship between them during the period analyzed (2006-2017) and the main performance indicators for each one. In addition, the quality of the relationship between the different themes is represented by the characteristics of the line (Cobo *et al.*, 2015; Sternitzke; Bergmann, 2009).

Considering the previous map and the thematic analyses carried out by Ferran-Ferrer *et al.* (2017) and Guallar *et al.* (2017) to the Spanish scientific journals of Library and Information Science as a starting point, the main themes and research lines related to the journal were identified and classified within six thematic areas:

- Resources and sources of information (green area)
- Auxiliary techniques and other disciplines (yellow area)
- Internet and web 2.0 (red area)
- Communication (purple area)
- Big and open data (gray area)
- Metric studies of information (blue area).

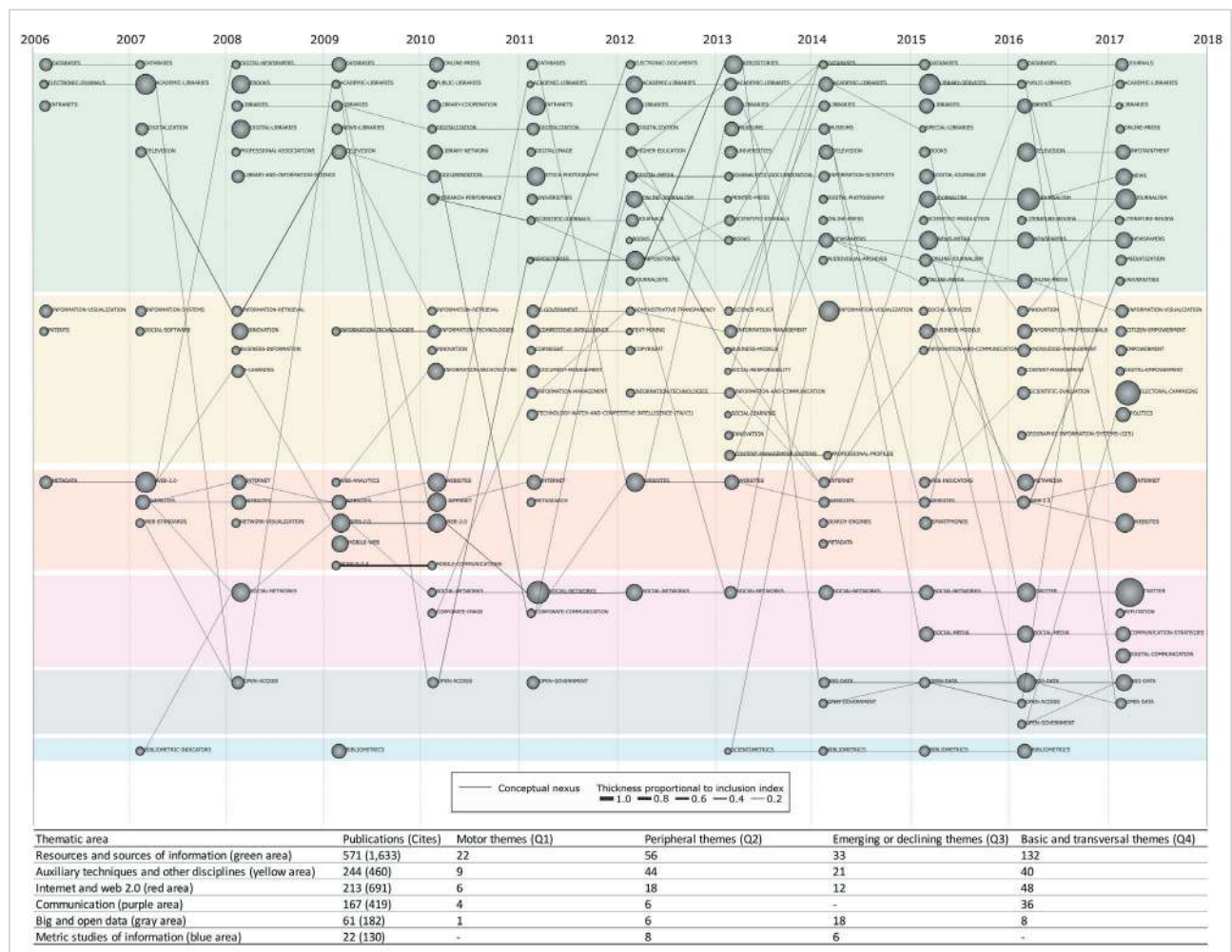


Figure 6. *EPI* conceptual evolution map (2006-2017)

Resources and sources of information (green area)

This is the most representative thematic area within the conceptual evolution map (figure 9). It accounts for 571 publications and 1,633 citations with regard to the total number of publications and citations collected in the analyzed period. In terms of structure and thematic composition, it is distributed in all four quadrants during all the years analyzed, which reflects a balance and constancy in its development. This thematic area covers motor themes related to:

- BOOKS
- DATABASES
- DIGITALIZATION
- INFORMATION-SCIENTISTS
- INTRANETS
- JOURNALS
- BOOKS
- LITERATURE-REVIEW
- NEWSPAPERS
- ONLINE-JOURNALISM

In this thematic area, information products or primary sources (such as books, academic journals and digital press), secondary sources (databases), professionals, methods and processes (digitalization) are appreciated.

Auxiliary techniques and other disciplines (yellow area)

It is the second thematic area within the map in terms of the number of publications, including 244 publications and 460 citations. Its structure and thematic composition behave in a similar way to the previous thematic area, in a balanced and constant way. Its themes are principally:

- INFORMATION-VISUALIZATION
- INNOVATION
- ELECTORAL-CAMPAIGNS
- INFORMATION-TECHNOLOGIES
- INFORMATION-MANAGEMENT
- BUSINESS-MODELS
- INFORMATION-ARCHITECTURE
- INFORMATION-AND-COMMUNICATION
- INFORMATION-PROFESSIONALS
- INFORMATION-RETRIEVAL

This thematic area covers a variety of themes, most of which are unrelated.

Internet and web 2.0 (orange area)

It is the third thematic area within the map in terms of the number of publications with 213 publications and 691 citations. Its structure and thematic composition are distributed within all four quadrants, especially in the second one. Its specific themes are:

- INTERNET
- METADATA
- METAMEDIA
- METASEARCH
- MOBILE-2.0
- MOBILE-COMMUNICATIONS
- MOBILE-WEB
- NETWORK-VISUALIZATION
- SEARCH-ENGINES
- SMARTPHONES
- TEXT-MINING
- WEB-2.0
- WEB-ANALYTICS
- WEB-INDICATORS
- WEBSITES
- WEB-STANDARDS

Their main research line is the design, development and use of websites, also highlighting research lines related to mobile technologies and devices.

Communication (pink area)

It is the fourth thematic area with 167 publications and 419 citations. Its structure and thematic composition are distributed in the first, second and fourth quadrant in a balanced pattern. This thematic area is covered specifically:

- COMMUNICATION-STRATEGIES
- CORPORATE-COMMUNICATION
- CORPORATE-IMAGE
- DIGITAL-COMMUNICATION
- REPUTATION
- SOCIAL-MEDIA
- SOCIAL-NETWORKS
- TWITTER

Social networks stand out as its main research line (including social media, reputation and *Twitter*) and communication and corporate communication appear as other guidelines.

Big and open data (grey area)

This thematic area covers 61 publications and 182 citations. Its structure and thematic composition are distributed in all four quadrants, particularly in the second and third during the last years of the evaluated period. This thematic area covers themes related to:

- BIG-DATA
- OPEN-ACCESS
- OPEN-DATA
- OPEN-GOVERNMENT.

This is a smaller thematic area with fewer themes than the previous ones.

Metric studies of information (blue area)

It ranks sixth with 22 publications and 130 citations. Its structure and thematic composition are concentrated in the second and third quadrants. This thematic area covers themes related to:

- SCIENTOMETRICS
- BIBLIOMETRICS
- BIBLIOMETRIC-INDICATORS.

Like in the previous one, it is a small thematic area quantitatively and it concentrates a few themes, but it highlights by its dynamism and significant citations.

It is important to point out that the first and fourth quadrants, relevant for the development of the journal, concentrate 52.17% of the research lines. This weight could be considered as a reflection of the interest of the academic, scientific and business communities in the thematic areas and research lines developed in the journal, which is also reflected in its growth and the continuity of the themes included in these quadrants.

“ Metric studies of information is a small thematic area quantitatively and it concentrates a few themes, but it highlights by its dynamism and significant citations ”

5. Conclusions

The evolution of *El profesional de la información* is positive since its launch to date. In addition, given the large volume of publications and citations received, as well as the research themes identified and their evolution in the main databases, it is expected that the scientific community interest for the journal continues or even keeps growing over the coming years.

In the bibliometric performance analysis, *EPI* covers 1,448 researchers from 436 organizations and 32 different countries from 2006 to 2017. It has published 1,038 publications with 2,585 citations according to *WoS*, which the most productive authors are Codina, Torres-Salinas, Guallar, Peset, Delgado-López-Cózar, Ferrer-Sapena, Marcos, Pérez-Montoro, Rovira, Abadal, Baiget, Eíto-Brun, Jiménez-Contreras and Rodríguez-Gairín and the most cited are Torres-Salinas, Delgado-López-Cózar, Guallar, Codina, Leydesdorff, Peset, Ferrer-Sapena, Casero-Ripollés, Abadal, Thelwall, Kousha, Alexandre-Benavent and Jiménez-Contreras. The correspondence between the most productive and most cited authors reflects the balance and quality of the publications included within the journal.

The most productive organizations in Spain have been:

- *Universitat de Barcelona*
- *Universitat Pompeu Fabra*
- *Universidad de Granada*
- *Universidad Carlos III de Madrid*
- *Universidad Complutense de Madrid.*

“ The correspondence between the most productive and most cited authors reflects the balance and quality of the publications included within the journal ”

At the international level they highlight:

- *University of Amsterdam* (Netherlands)
- *Universidad de Antioquia* (Colombia)
- *Universidad Nacional Autónoma de México* (Mexico)
- *University of Wolverhampton* (United Kingdom)
- *Max Planck Gesellschaft* (Germany)
- *Universidad Montpellier III* (France)
- *Universidad Nacional de Córdoba* (Argentina)
- *Loughborough University* (United Kingdom)
- *Université Catholique de Louvain* (Belgium).

In line with the above, the journal presents an h-index of 18, an indicator that reflects the number of reference publications for their impact on its development. This group of publications concentrate 428 citations (including self-citations) and present an average of 23.78 citations each. The authors with more than one publication within the most cited are Torres-Salinas, Delgado-López-Cózar, Díaz-Noci, Guallar, Kousha, Leydesdorff and Thelwall.

With regard to the organizations with the highest number of most cited publications, the *Universidad de Granada*, *Universidad de Navarra* and *Universidad Pompeu Fabra* with 4 publications and the *Universidad de Barcelona* and *University of Wolverhampton* with 2 publications each. This coincides with the results obtained initially, which reflects a coherence between productivity and the impact of authors and organizations.

On the other hand, the journal's conceptual evolution map reveals its specialization in themes such as: communication, information, indicators, libraries and information technologies, with important considerations to the use and treatment of data, as well as its storage and dissemination. It is important to point out that the evolution of the journal clearly shows a current approach, attending to the general needs of the scientific and academic community at all times. The main motor and cross-cutting themes are those related to internet, web 2.0, social networks, digitalization, libraries and databases, mainly. The most important peripheral and emerging themes include the use of information technologies, open access to data, visualization of information, open government and innovation.

“ This article is one of the first to evaluate the evolution of a journal using *SciMAT* ”

It has also been appreciated that the evolution of the thematic areas and their role in the development of the journal have been different:

- Sources of information and resources: this is the thematic area with the greatest weight within the journal, and it is mainly constituted by transversal themes that have been added in a constant manner during the period analyzed.
- Auxiliary techniques and other disciplines: it is the second area with the greatest weight and it is mainly composed for peripheral themes. This thematic area, in contrast with the previous one, it has shown an upward evolution until 2013 where it reached a maximum of 8 topics, to go down to a single topic in 2014 and start an evolution again.
- Internet and web 2.0: a thematic area composed mainly for transversal themes, which registered its main evolution from 2006 to 2010, recording a decrease in the number of themes in the following years.
- Communication and big and open data: these are two thematic areas that focus their evolution in the most recent years, and are mainly composed of transversal themes and peripheral themes, respectively.
- Metric studies of information: It concentrates a single theme per year, from 2013 to 2016 being its period of greatest activity, with mainly peripheral themes.

It is important to note that this analysis allows the identification of common themes that can be used to achieve the research lines related to the purpose and objectives of *El profesional de la información*.

It can be pointed out that this article is one of the first in the literature to present the use of *SciMAT* to evaluate the evolution of a journal, highlighting that this bibliometric software, unlike others, allows analyzing the evolution of the main research themes included in a publication or in a group of publications by periods and based on their centrality and density. The latter aspect can be considered the most relevant, since the organization of the themes into four categories: Motor, Peripheral, Emerging or declining and Basic and transversal, supports the identification and analysis of the journal's corpus, enabling a journal's managers to evaluate its evolution and researchers to guide their research.

For future research, the analysis of the main research themes identified is proposed from a more complete approach, with the idea of analyzing how they interact with the development of a knowledge area and how they are approached by other journals within the same region or at a global level. In addition, it is recommended to deepen the relationship that exists between authors and organizations, in order to identify the groups that promote development in the themes, in order to identify new trends and opportunities in these research fields, as well as the patterns of collaboration that may exist between them.

“ The organization of themes in the four categories allows the journal's managers to evaluate its evolution and the researchers to guide their research ”

6. Annexes

A.1. Year to year analysis of the main research themes from 2006 to 2017

In order to visualize and analyze the evolution of the main themes within *EPI*, the strategic diagrams are presented below. The strategic diagrams include further information about publications and citations, and these are arranged in four groups to facilitate the visualization.

Figure A1.1 shows the strategic diagrams for the period 2006, 2007 and 2008, in which 6, 10 and 15 themes were recorded respectively. In 2016, the themes were mainly Motor Themes and Emerging or Declining Themes. In 2007, the themes were divided into all four quadrants, in contrast with 2008, where the themes were mainly divided into the quadrants of Peripheral Themes and Basic and Transversal Themes.

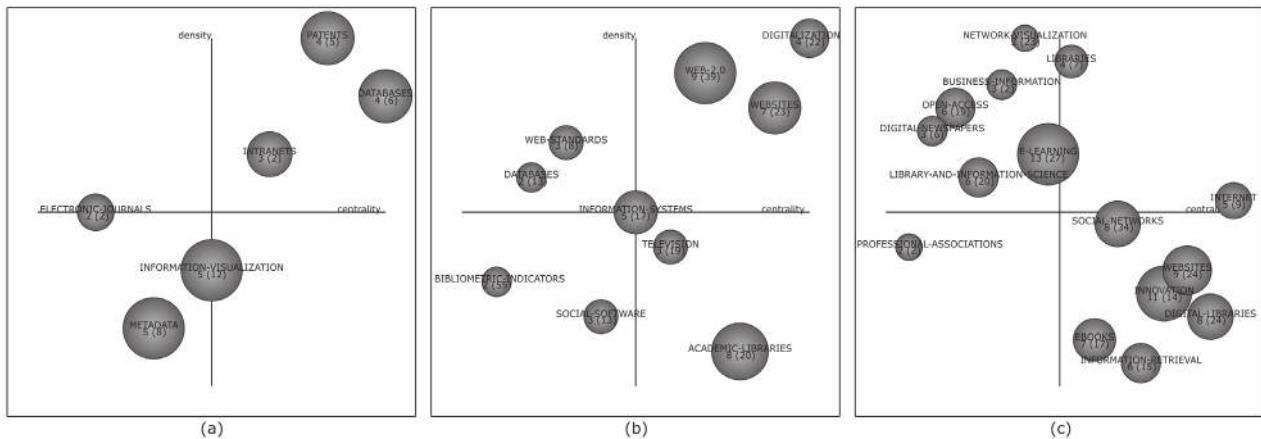


Figure A1.1. Strategic diagrams. (a) Period 2006 (b) Period 2007 and (c) Period 2008

In 2006, 6 themes are identified, but only DATABASES, INTRANETS and PATENTS can be considered relevant for the development and consolidation of the journal. The main components of these themes are presented below:

- DATABASES: Internet searching skills; Information retrieval; Information sources; Interfaces; Catalogues; Subject retrieval; Systematic reviews; Secondary literature; Public access catalogs; Optimal search strategies.
- INTRANETS: Content management; Information technologies; Management indicators; Knowledge management; Intranet management; Human resources; Document and records management.
- PATENTS: Information and communication; Bibliometrics; UNE 166006; Technology watch and competitive intelligence; Technological activity; Scientific production; Research and development e innovation.

In 2007, DIGITALIZATION, WEBSITES, WEB 2.0, ACADEMIC-LIBRARIES, INFORMATION-SYSTEMS and TELEVISION were identified as the key themes for the development and consolidation of the journal and its main components are listed below:

- DIGITALIZATION: Media asset management; Integrated systems; Professional profiles; Television archives; Radiophonic documentation; Public domain.
- WEBSITES: Internet; Information for companies; Information sharing; Information socialization; Information architecture; Social networks; Video on demand; Universal library; Television on internet; Social economy; Multimedia production; Mass media information management; Media libraries.
- WEB 2.0: Information managers; Information specialists; Digital newspapers; Information scientists; Librarians; Web browsers; Web embedded semantics; Usage analysis; User agents; RSS; Record managers; Professional directories; Metadata; Library 2.0.
- ACADEMIC-LIBRARIES: Library concept; Library resources; Hybrid library; Learning objects; Learning support; Repositories; Weblogs; University policy; User training; Strategic planning; Research support; Quality management; Pedagogical tools; Online public access catalog; Online help.
- INFORMATION-SYSTEMS: Enterprise content management; Content management systems; Web content management systems; Source description framework; Semantic web.
- TELEVISION: Documentation centers; Digitizing; Audiovisual documentation; Audiovisual information; Open archive; TV archive; Record selection; Multimedia content management; Document management.

In 2008, eight main themes were identified, and only WEBSITES repeats as the main research theme. Listed below are the most relevant themes of the period:

- LIBRARIES: Digital collections; Bibliographic heritage; Universities; Professional experience; Librarian and information professionals.
- INTERNET: Network society; Linguistic forms; Information technologies users; Financial information; Document type; Electronic newspaper; Library network; Union catalogue; Web services; User measurement; User perception.
- DIGITAL-LIBRARIES: Information visualization; Co-citation; Co-authorship; Electronic documents; Visual interfaces; Syndication; Selective dissemination of information; RSS; Recommender systems; Network effects.
- EBOOKS: Electronic ink; Collection development; Electronic content; Languages; Print on demand; Market strategies; International publishers; Information mobility.
- INFORMATION-RETRIEVAL: Audiovisual information; Scientific information; Co-terms analysis; Television; Online public access catalog.

- INNOVATION: Information in companies; Information needs; Information uses; Public libraries; Visualization of patent data; Talent management; Science policy; Patent information; Management of innovation; Patent analysis software.
- SOCIAL-NETWORKS: Communication research; Creativity; Bibliometric indicators; Social organization; Social behavior; Professional networks; Information science; Information structures; Facebook.
- WEBSITES: Collaborative environments; Computer attitudes; Content management; Cultural diversity, Webometrics; Visibility; Social network analysis; Search engines; Online social networks; MES centers; Library portal.

Figure A1.2 shows the strategic diagrams for the period 2009, 2010 and 2011, in which 12, 18 and 20 themes were considered respectively.

Between 2008 to 2009, a slight decrease in the number of themes caused by reduction in the number of publications was recorded. However, between 2010 and 2011, the number of publications significantly increases with respect to previous years

During the period 2009 and 2010, the main themes were distributed in all four quadrants, while in 2011, these were concentrated in the quadrants corresponding to the Peripheral themes and Basic and transversal themes.

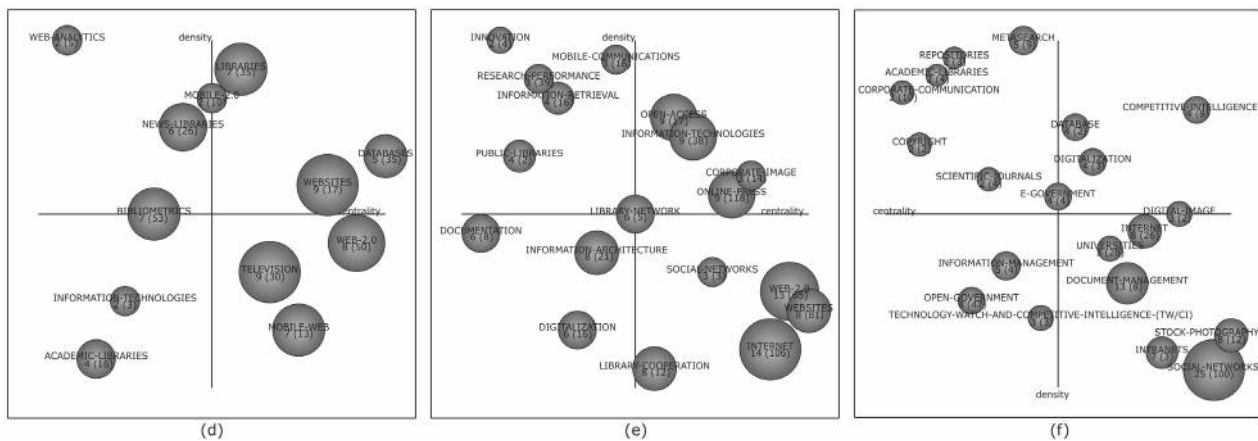


Figure A1.2. Strategic diagrams. (d) Period 2009, (e) Period 2010 and (f) Period 2011

In 2009, twelve research themes were identified, half of which may be considered relevant for the development and consolidation of the journal. The main components of these themes are presented below:

- DATABASES: Digital newspapers; Repositories; Web sources; Watch technology and competitive intelligence (TW/CI); Scientific production; Scientific and technical information; Search strategies; Search systems; Quality information; Patents; Online press; Online media.
- LIBRARIES: Distribution list; Digitalization; Content analysis; Information professionals; Librarians; Virtual communities; Technological changes; Scientific communication; Professional communication; Professional environment; Professional rethinking.
- WEBSITES: Internet; Google; Digital information sources; Information systems; Web analysis; Visibility; Social network services; Search engines; Sitemaps; Risk communication; Robots e International auctions.
- MOBILE-WEB: Mobile technologies; Local administration; Geolocation; Code transformation; Content adaptation; Mashup; Widgets; Ubiquitous connectivity; Use of mobile web; Browsers; Mobile devices.
- TELEVISION: Image description; Audiovisual documentation; Audiovisual information; Television archives; Press; Multimedia content management; Multimedia market; Media asset management; Journalism; Information retrieval; Information units.
- WEB-2.0: Logs; Datamining; Content syndication; Blogs; Social networks; Web mining; Social tagging; Social web; Science 2.0; Open data; Online reference management; News promotion.

In 2010, CORPORATE-IMAGE, INFORMATION-TECHNOLOGIES, ONLINE-PRESS, OPEN-ACCESS, INTERNET, LIBRARY-COOPERATION, SOCIAL-NETWORKS, WEBSITES and WEB-2.0 were identified as main research themes and its main components are listed below:

- CORPORATE-IMAGE: Customer relations; Business communication; Professional profiles; Information management; Image audit; Document processing; Corporate documentation.
- INFORMATION-TECHNOLOGIES: Domestic book market; Information professionals; Information seeking behavior; Social web; Publishing Industry; Picture archiving and communication systems; Knowledge management; Knowledge society; Health information; Foreign book market.
- ONLINE-PRESS: Digital media; Digital press archives; Cybermedia; Blogs; Web 2.0 adoption; Weblogs; Web newspaper; Online journalism; Mass communication; Credibility.
- OPEN-ACCESS: Library catalogues; Libraries; Repositories; Semantic web; Scholar communication; Professional future; Mobile devices; Conferences.
- INTERNET: Audiovisual management; Business models; Web visibility; Television; SEO; Place brands websites; Google; Email chain letters.
- LIBRARY-COOPERATION: E-learning; Education for knowledge society; Cooperation projects; Joint use libraries; Special libraries; Networking; Libraries networks; International cooperation.
- SOCIAL-NETWORKS: Creative commons; Audiovisual archives; Learning and informed environment; Content management; Cooperative network.

- WEBSITES: Press offices; Newspapers; Network analysis; Mobile applications; Academic libraries; Content management systems; Social media marketing; Search engine marketing; Promotion strategies; Productive routines.
- WEB-2.0: Mass media; Journals; Intellectual property; Cyberjournalism; Community managers; Electronic newspaper; Information scientist; User generated content; Users relationship; Social media; Science 2.0; Personal data; Newsroom.

In 2011, ten key themes were identified as key factor to the development and consolidation of the journal. The main components of these themes are presented below:

- COMPETITIVE-INTELLIGENCE: Human information sources; Environmental scanning; Early warning; Decision making; Weak signals; Text mining; Strategic information management; Online research; Media mining; Information extraction.
- DATABASES: Computer science; Bibliographic references; Advanced management of personal information; Information processing; Information search; E-commerce.
- DIGITALIZATION: Cultural heritage; Channels of distribution; Business strategies; Audiovisual documentation; Audiovisual archives; Information access; Education programs.
- DIGITAL-IMAGE: Documentary photography; Digital collection management software; Content DM; User profiles; User restrictions; Image databases.
- DOCUMENT-MANAGEMENT: Digital documents; Digital records; Archival science; Record management; Qualitative research; Metadata; Knowledge management; Electronic records; Digital access.
- INTERNET: Networking; Information and communication; Theoretical analysis; Time estimates; Sociability; Social capital; Search task; Participatory culture.
- INTRANETS: Learning management systems; Internal communication; Intranet development; Information management in the cloud; Government 2.0; Web services; Virtualization; Technology in the cloud; Open source software; Open source.
- SOCIAL-NETWORKS: Real time web; Recommender systems; Microblogging; Multimedia information service; Information sources; Facebook; Web 2.0; User generated content; Social web; Social media; Semantic web; Twitter.
- STOCK-PHOTOGRAPHY: Photo libraries; Open repositories; Online information storage and retrieval; News libraries; Research needs; Photographic documentation; Photographic management.
- UNIVERSITIES: Citation analysis; Bibliometric indicators; Academic network; Mass media; Information research.

During the period 2012-2014, a decrease in the number of publications with respect to previous periods was recorded, but the number of research themes did not decrease. The research themes identified for this period were 17, 20 and 20 respectively, as can be seen in the Figure A1.3.

In the same period, the most relevant research themes were concentrated in the Basic and transversal themes quadrant, yet all period have research themes in the three remaining quadrants.

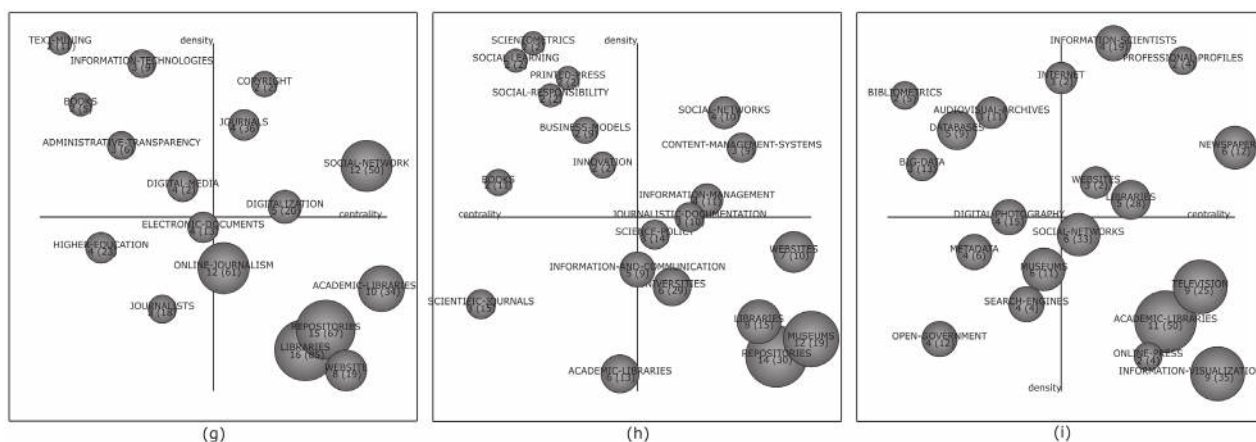


Figure A1.3. Strategic diagrams. (g) Period 2012, (h) Periods 2013 and (i) Periods 2014

In 2012, COPYRIGHT, DIGITALIZATION, JOURNALS, SOCIAL-NETWORKS, ACADEMIC-LIBRARIES, LIBRARIES, ONLINE-JOURNALISM, REPOSITORIES and WEBSITES were identified as relevant themes for the development and consolidation of the journal. The main components of these themes are presented below:

- COPYRIGHT: Documentary heritage; Data protection; Digital GAP; Trade secrets; Regulation; Patents; Personal data protection; Outsourcing; Open data.
- DIGITALIZATION: E-Journals; Data compression; Digital archives; Digital collections; Web based services; Tagging; Podcasts; Library collections; Library management systems; Integrated library systems; Images managing.
- JOURNALS: Code of conduct; Scientific publication; Science citation index; Scientific information; Publication ethics; Publication patterns; Journal performance.
- SOCIAL-NETWORKS: Image processing; Geolocation; Facebook; Face recognition; Web 2.0; Web analytics; Twitter; Public opinion; Online reputation; Online participation; Legal advising.
- ACADEMIC-LIBRARIES: Document delivery; Electronic content; Virtual services; Virtual references; Reverence services; Reading patterns.
- LIBRARIES: Discovery software; Cloud computing; Ebooks; Semantic web; Metadata; Linked data; Knowledge organization systems.
- ONLINE-JOURNALISM: Digital journalism; Digital Press; Digital Press archives; Circulation media; Business models; Digital content; Digital newspapers; News libraries; Search systems; Printed press; Online press; Newspapers; Internet.

- REPOSITORIES: *Google Scholar Metrics*; Data sharing; Democratic education; Discovery tools; Bibliometric indicators; Information seeking behavior; Scientific journals; Research data; Researchers profiles; Raw data; Open access; h-index; *Google Scholar*.
- WEBSITES: Journalism; Corporate communication; Databases; Museums; Web page design; Process map; Online new consumers; News sources.

In 2013, eight main themes were identified, and where SOCIAL-NETWORKS, LIBRARIES, REPOSITORIES, WEBSITES repeat as the main research themes. Listed below are the most relevant themes of the period:

- CONTENT-MANAGEMENT-SYSTEMS: Broadcasting companies; Broadcasting documentation; Professional profiles; Webometrics; Semantic markup; Media documentation; Documentary archive.
- INFORMATION-MANAGEMENT: Financial system; Decisional information; Categorization; Administrative structures; Information professionals; Risk management; Library science; Information science; Information studies; Financial information.
- SOCIAL-NETWORKS: Information services; Cooperative learning; Television; *Twitter*; Social media policies; Open educational resources; Multicultural education; Mass media; Learning technologies; Journalism.
- INFORMATION-AND-COMMUNICATION: Information technologies; Information technology infrastructure library; ISO/IEC 20000; Information technology service management.
- JOURNALISTIC-DOCUMENTATION: Document analysis; Statement; Information retrieval.
- LIBRARIES: Information visualization; Documentation; Visibility; Social return on investment; Return on investment.
- MUSEUMS: *Drupal*; Bibliographic heritage; Databases; Social web; Semantic web; Open source; Heritage libraries.
- REPOSITORIES: Data sharing; Digital preservation; Content management; Big data; Open archive; Scientific data; Research data; Professional publications; Open data; Open access; Linked data; Knowledge management.
- SCIENCE-POLICY: Databank; Data curation; Information policy; Scientific publication; National policy; International visibility; E-Science.
- UNIVERSITIES: Dashboards; Information systems; Quality assurance; Library and information science.
- WEBSITES: Data analysis; Digital archives; Content quality; Digital libraries; User evaluation; Geographic information systems; Search engine optimization; Search services; Information units; Information architecture.

In 2014, eleven key themes were identified as key factors to the development and consolidation of the journal. The main components of these themes are presented below:

- INFORMATION-SCIENTISTS: Documentation products; Critical thinking education; Critical thinking skills; Critical thinking training; Documentalists; Press rooms; Organization systems; Knowledge representation; Journalistic documentation; Historical memory.
- INTERNET: Information and communication; Gamification; Evaluation of digital sources; Digital influence; Social museum; Online courses; Information sources.
- LIBRARIES: Public libraries; Universal access; Social transformation; Science policy; Library statistics.
- NEWSPAPERS: Mass media; Content management systems; User generated content; Online journalism; Online media; Online communities.
- PROFESSIONAL-PROFILES: Content manager; Archive manager; News agencies; Digital archives; Digital newsroom; Content Management.
- WEBSITES: Co-citation; Consumption of scientific literature; Content representation; Webometrics; Journalism; Journal usage; Indexing; Documentary organization.
- ACADEMIC-LIBRARIES: Cyberinfrastructure; Digital libraries; Librarians; Special libraries; Social responsibility; Public policy; National information policy; Documentation center.
- INFORMATION-VISUALIZATION: Search and records retrieval; User centered design; Visual analytics; Visualization types; Text analysis; Text visualization; Storytelling; Social network visualization; Social network analysis.
- ONLINE-PRESS: Information overload; News interest; News overload; Consumer paying behavior; Community management.
- SOCIAL-NETWORKS: *Facebook*; Web 2.0; Task performance; *Twitter*; Social web; Social internet; Knowledge workers.
- TELEVISION: Broadcast advertising; Audiovisual documentation; Object classification; Managed document services; Information managers; Electronic press kits; Digital information.

Finally, during the period 2015, 2016 and 2017, an increase in the number of publications and research themes with respect to previous periods was recorded. The research themes identified for these periods were 22, 22 and 25 respectively, as shown in figure A1.4.

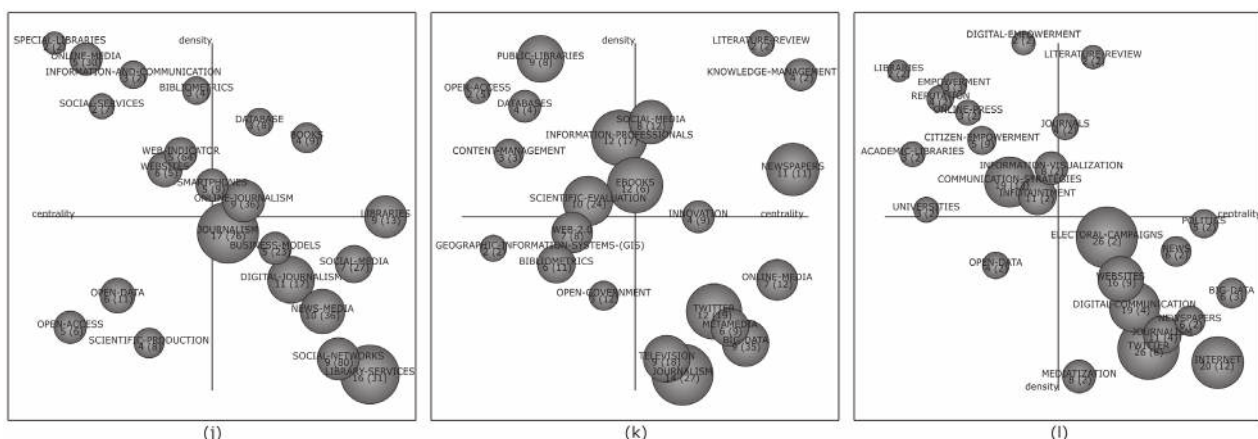


Figure A1.4. Strategic diagrams. (j) Period 2015, (k) Period 2016 and (l) Period 2017

In 2015, the main research themes were identified in the Basic and transversal quadrant, although it presents themes in all quadrants, which reflects a homogeneous development of the themes. In this context, during 2016 and 2017 the most relevant themes were peripheral themes and basic and transversal themes.

In 2007, eleven research themes were considered as key factor to the development and consolidation of the journal and its main components are listed below:

- BOOKS: Bookstores; Virtual reading; Social web; Interactive communication.
- DATABASES: Information policy; Scientific journals; International collaboration e International visibility.
- LIBRARIES: Personal archives; Universities; Marketing strategies; Learning resources.
- ONLINE-JOURNALISM: Cyberjournalism; Blogs; Web 2.0 Visual an interactive features; multimedia stories.
- BUSINESS-MODELS: Digital consumers; Digital newspapers; Audiovisual content; Streaming; Mobile devises; Entertainment industry.
- DIGITAL-JOURNALISM: Digital storytelling; Science journalism; Journal articles; Impact journal; Information sources.
- JOURNALISM: Internet; Innovation; Digital media; Audiovisual communication; News organizations; Entrepreneurship.
- LIBRARY-SERVICES: Social integration; Academic libraries; Librarians; Public libraries; Scientific publication; Virtual services; Teaching and learning services.
- NEWS-MEDIA: Informational empowerment; Entrepreneurial journalism; Digital narrative; Press; Media organizations; Media studies; Independent press.
- SOCIAL-MEDIA: Online communities; Digital marketing; Transmedia and storytelling; Social marketing; Social media marketing; Social media strategies; Relationship marketing.
- SOCIAL-NETWORKS: *Facebook*; Communication studies; User generated content; *Twitter*; Scientific social networks, Participatory journalism; Online measuring tools.

In 2016, INNOVATION, KNOWLEDGE-MANAGEMENT, LITERATURE-REVIEW, NEWSPAPERS, SOCIAL-MEDIA, BIG-DATA, JOURNALISM, METAMEDIA, ONLINE-MEDIA, TELEVISION and TWITTER were identified as relevant themes for the development and consolidation of the journal. The main components of these themes are presented below:

- INNOVATION: Digital transformation; Artificial intelligence; Information technologies; Interactive communication; Digital creativity.
- KNOWLEDGE-MANAGEMENT: Knowledge management maturity; Innovation management; Online reviews; Maturity models; Management and planning.
- LITERATURE-REVIEW: Comprehensive analysis; Concept maps; Semantic maps; Risk management; Learning strategy; Knowledge maps; Information security culture; Information security management.
- NEWSPAPERS: Digital media; Journalism online; News libraries; Search engine optimization; News media; Media business models.
- SOCIAL-MEDIA: Communication competition; Consumer behavior; Brand building; Marketing campaigns; Media innovation; Libraries management; Information society; Information strategies.
- BIG-DATA: Information production; Information retrieval; Human computer interaction; *Google*; Datamining; Business model; RSS; Public information; Personalized advertising; Open data; Machine learning.
- JOURNALISM: Document management; Communicators; Active audiences; Community managers; Web analytics; Public interest; News; News dissemination; Journalists; Entrepreneurship.
- METAMEDIA: Digital reputation; Digital social networks; Value networks; Scientific social networks; Scientific metamedia; Professional networks; Media management barometer; Journalistic curation.
- ONLINE-MEDIA: Data journalism; Data journalists; Cybermedia; Online journalism; Geolocation and Data geolocation.
- TELEVISION: Audiovisual documentation; Audience measurement; Audiovisual language; Social audience; Focus groups.
- TWITTER: *Facebook*; Digital convergence; Digital language; Social networks; Smart cities; Public opinion; Participation mechanisms; Mobile devices.

Finally, in 2017, thirteen key themes were identified as key factor to the development and consolidation of the journal. The main components of these themes are presented below:

- JOURNALS: Reference management software; Publishing practices; Open sources; Open access; Library and information science.
- LITERATURE-REVIEW: Content design; Web design; User centered design; Taxonomies; Neuromarketing; Interaction designs.
- BIG-DATA: Personal data protection; Personal information; Organization of information; Open government; Machine learning; Supervised sentiment analysis; Privacy self-management; Political opinion.
- DIGITAL-COMMUNICATION: Political parties; Humanization of politics; Digital narrative; Transmedia; Strategic impression management; Public opinion; Political marketing.
- ELECTORAL-CAMPAIGNS: *Facebook*; Political communication; Customization; National Election; Persuasion.
- INTERNET: Digital journalism; Digital services; Web 2.0; *YouTube*; Mobile devices; Media education; Journalists; Digital inclusion.
- JOURNALISM: Mass media ethics; Journalism deontology; Innovation; Social journalism; Search engines; Situated learning; Reference communities; Public management; Online Journalism.
- MEDIATIZATION: Digital media; Social mobilization; Populism; News media; Media coverage.
- NEWS: Consumption of information; Sensationalism; Public services; Push notification; Mobile apps; Journalistic genres; Human interest.
- NEWSPAPERS: News consumption; Millennial audience; Multiculturalism; Journalistic design; Digital press; Strategic communication; Printed press; Political journalism.
- POLITICS: Digital activism; Sub-activism; Political information; Memes.
- TWITTER: Electoral communication; Digital methods; Social networks; Social platforms; Social network analysis; Political campaigns; Fandom studies.
- WEBSITES: E-Government; Digital storytelling; Corporate brand; Public information; Local information; Management of local governments.

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