

Some research questions to frame a European Union overview on LIS research

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We would like to thank the LIS-ER organization for inviting us to deliver this framework, the twin in the field of research to the work presented yesterday by our colleague Angel Borrego.

Our intention is to share with you a work in progress, together with the doubts that we face, to feed the round table discussion that follows our presentation later this morning. Considering the expertise of the round table participants, Jordi and I prefer to think of ourselves as the "opening act" for the main characters: the roundtable participants and all of you.

Also, I beg your pardon, because for the sake of the understanding of our message I will read (slowly) our intervention. So that, an experience for you far from for instance a TED talks presentation. I apologize in advance.

We will focus on presenting the first results of the exploratory study, which offer data on production as a necessary element for better understanding the state of scientific cooperation in LIS within the European Union. Again, this is an initial approach, in which we still have not delved into institutional affiliation data due to standardization problems that affect this information as it appears in Scopus, our data source.

As expected, during our work we are facing three classic "methodological" questions in the literature on LIS research:

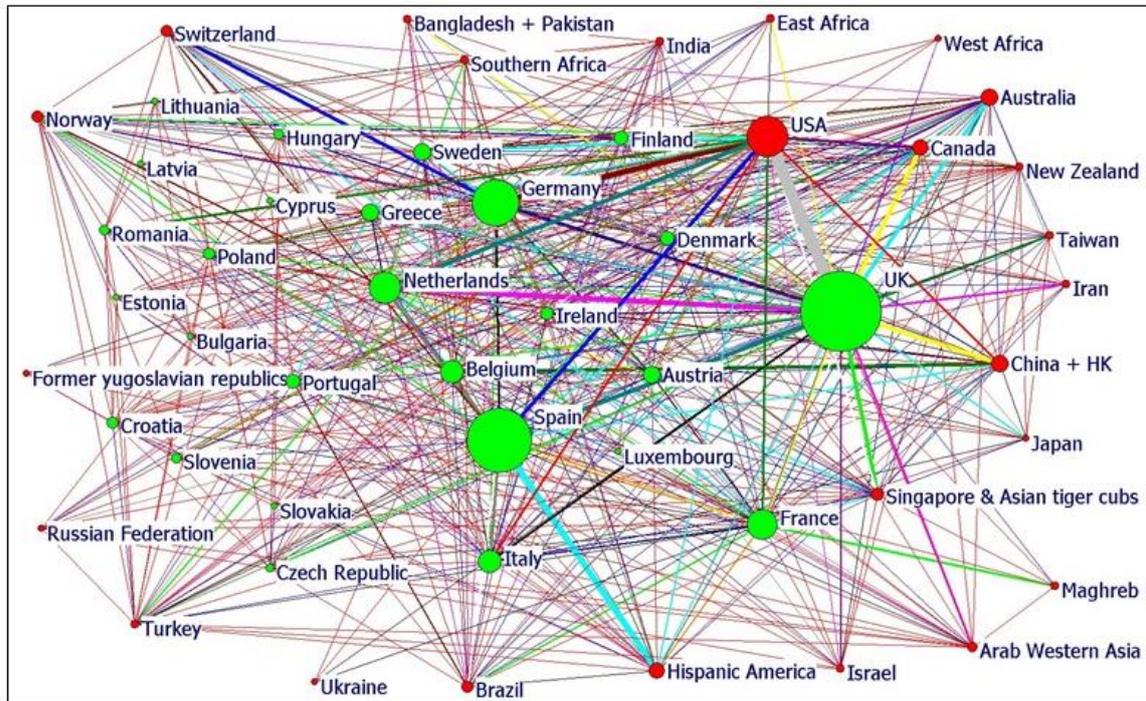
- How to delimit the LIS research field?
- How to define research?
- How to assess the research agendas?

To conclude, we have added an "open end" question to back the importance of a deeper interdepartmental, interdisciplinary, international and "practitioners to academy" cooperation: we argue that the weakness of collaboration is reducing opportunities for strengthening the quality and utility of LIS research in the European Union.

- Will we keep living apart together? (in other words: How to overcome the isolation of LIS researchers?)

Despite the existence of major European integration programs in research and development, it would appear that in the European Union (EU) overall, LIS research suffers from a certain international isolation, that we will try to demonstrate along our intervention, but we advance in this network of countries with works in collaboration with any EU country (green dots, figure 1).

Figure 1. EU map of LIS research.



Overcoming this situation is considered strategic at a moment in which the discipline finds itself at a crossroads due to the digital transformation that directly affects our field of research.

Therefore, the existence in a specific geographical area of a critical mass of human and material resources and of intellectual and professional interactions presents itself as a necessary condition for advancing the discipline in Europe, in response to the dual challenge of the digital revolution and globalization. While any type of international collaboration can improve the quality and impact of research results, we believe it is essential to focus on overcoming borders in the supranational sphere in which we share a closer and politically formalized relationship: the European Union.

The priority for studying this area of international cooperation stems from the existence of public policies in the EU aimed at strengthening synergies between the different members. Such public policies include --most especially since the Lisbon Summit in 2000-- research, development and higher education. However, although the Erasmus program has facilitated the exchange of teachers and students, and the Research Framework Programmes have brought together teams from different countries, we wonder whether all this has resulted in a stronger and more integrated position among different European actors regarding LIS research (both in academia and in the professional environment). Early indications suggest that it is not moving ahead in an optimal manner and that there is much room for improvement.

Although it is not our goal going into details about the methodology used in our bibliometric exploration, some lines of how we have worked with the data are essential for you to understand many of the results that we are presenting:

- Our work is an exploratory bibliometric approach centred on data from Scopus for the 28 EU countries, in two different periods: a long one (1990-2014) for some general trends, and a shorter one to focus more deeply in the study of collaboration networks and in the thematic focus of the research (2010-2014)
- As a lateral test, we also want to explore the feasibility to dig in the professional conferences data to study the academy/practitioners relationship. Because of that, all papers presented at the Spanish Biennial Conference on Documentation (1984-2013) were analysed for the presence and level of collaboration among authors from academia and those practitioners in the field.
- For the 2010-2014 period we have worked with 29,337 bibliographic records (8,732 of which are from the EU countries) taken from a selection of 151 titles (mostly journals, but also some proceedings) out of the total 210 indexed in Scopus within the category of LIS (Table 1).
- Excluded: titles that were also present in other thematic categories of Scopus and whose citing bibliography profile is very distant from the pattern observed for the total of 210 titles indexed in LIS category (above 0,08 in the correlation analysis performed). An exception was made for journals on archives and document management.
- We worked also with 15 core titles for the trend analysis of 1990-2014, selected upon the analysis of previous works that had done similar studies focused in a core list: it is a multicriteria and balanced selection, with an important presence of “traditional” outstanding titles (figure 2).

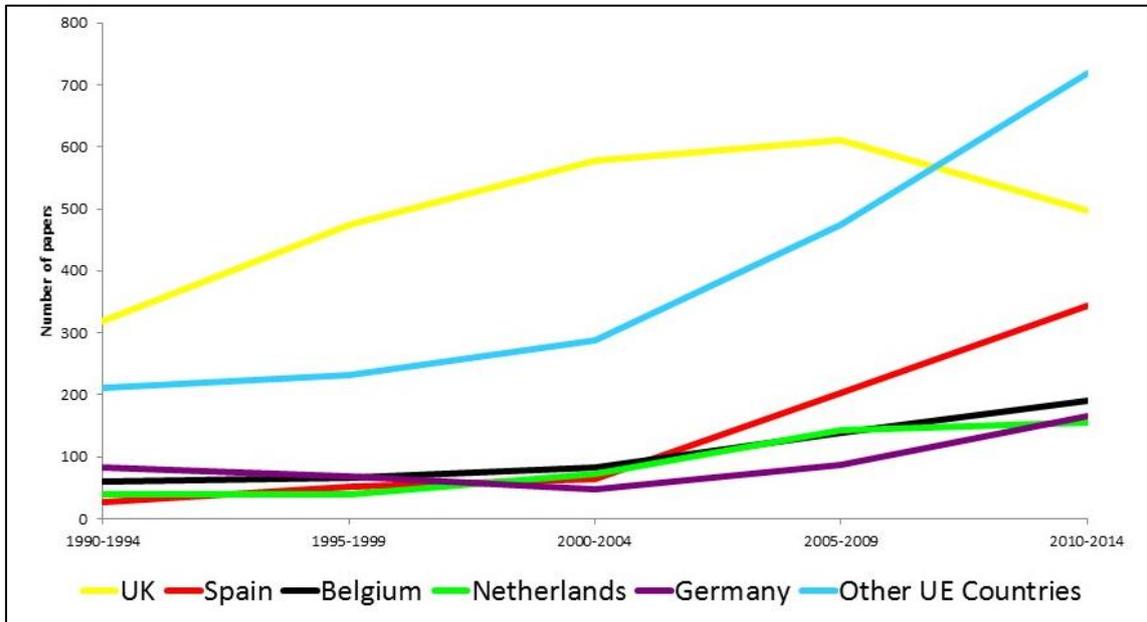
Table 1. Selected journals

Journals (151) selected on the basis of citation profile correlation for the period 2010-2014	Pearson Coef.	Representative core journals selected (15) for the period 1990-2014
Aslib Journal of Information Management	0,78	Aslib Journal of Information Management
Library and Information Science Research	0,73	Electronic Library
Library Review	0,73	Information Processing & Management
Journal of Librarianship and Information Science	0,70	Information Technology and Libraries
International Information and Library Review	0,70	Interlending & Document Supply
Journal of Academic Librarianship	0,68	JASIST
Proceedings of the ASIST Annual Meeting	0,67	Journal of Academic Librarianship
Journal of Educational Media and Library Science	0,66	Journal of Documentation
Information-Wissenschaft und Praxis	0,66	Journal of Information Science
Webology	0,66	Journal of Librarianship and Information Science
Canadian Journal of Information and Library Science	0,65	Library & Information Science Research
Information Research	0,64	Library Journal
Library Trends	0,64	Library Trends
Journal of Documentation	0,61	Libri
Library Hi Tech	0,61	Scientometrics
Up to 151 titles	> 0,08	

The contribution of EU countries to scientific production in LIS has experienced significant growth since 2000 (figure 2). However, it's interesting to note a certain "fatigue" in the

production of the most prominent country (UK), which translates lately into a drop. We have observed vigorous dynamics in Spain and among the other countries that initially were not among the top 5; Belgium, Holland and Germany experience also a slow rising trend.

Figure 2. Trends in total LIS output for EU countries (1990-2014: 15 core journals).

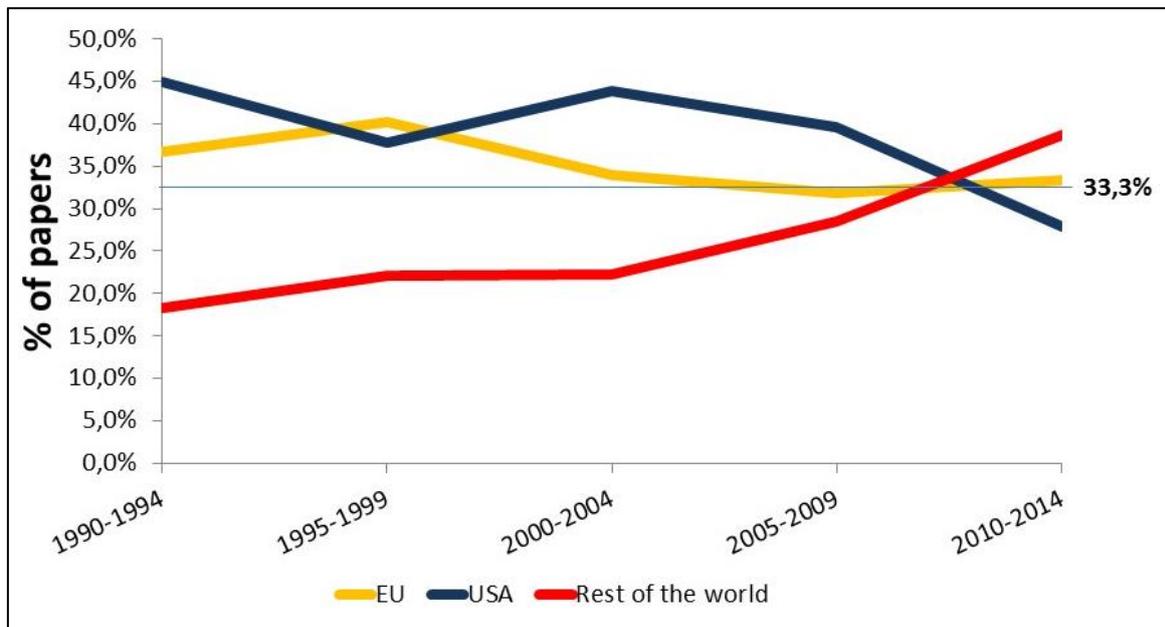


To our knowledge, the case of Spain can serve as an example to a more general interpretation. The growth has been due to three reasons:

- an explosion of bibliometric work as well as, to a great extent, studies related to the evolution of scholarly communication and research evaluation.
- a migration to international journals in English and indexed in WoS or Scopus in the case of authors from the academia, since the requirements of "promotion & tenure" have prioritized publishing in "journals of impact."
- The arrival of authors from non-LIS departments in the 15 journals selected, because of the cross-interest (mainly multidisciplinary, not interdisciplinary) for some of the leading research issues nowadays, such as those related to the field of ICT; digitalization; or the bibliometric studies, scientific evaluation and scientific communication analysis.

The phenomenon observed in Spain and some other EU countries that were not among the leaders in 1990, surely also explain the growth in the number of publications in rest of the world, which serves to interpret the turning point observed between 2000 and 2009 in the share of production from the rest of the world against the EU (33.3%) and USA (figure 3).

Figure 3. Papers: trends in the world share of LIS papers (1990-2014: 15 core journals).



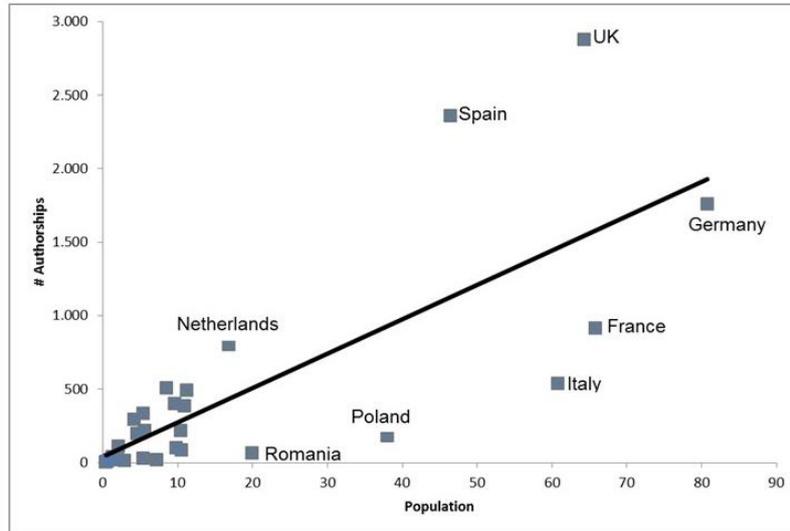
If we focus the analysis on the last five years (data from the 151 titles set) and on authorships counts, we observe a consistent situation with the previous chart, in which three countries (UK, Spain, Germany) account for more than half of authorships (table 2). In the case of Spain, together with the international opening of the publication observed in the 15 "core" publications, the Spanish output in this table can be explained by the inclusion in Scopus of 7 Spanish journals, mostly published in Spanish.

Table 2. Authorship: share by EU countries vs USA and rest of world (2010-2014).

	World share				
EU	12.957	30,1%	Ireland	194	0,5%
UK	2.876	6,7%	Poland	182	0,4%
Spain	2.358	5,5%	Slovenia	110	0,3%
Germany	1.756	4,1%	Hungary	99	0,2%
France	914	2,1%	Czech Republic	86	0,2%
Netherlands	800	1,9%	Romania	65	0,2%
Italy	539	1,3%	Estonia	36	0,1%
Austria	505	1,2%	Slovakia	29	0,1%
Belgium	491	1,1%	Bulgaria	20	0,0%
Sweden	400	0,9%	Cyprus	16	0,0%
Greece	385	0,9%	Latvia	16	0,0%
Finland	333	0,8%	Lithuania	12	0,0%
Croatia	294	0,7%	Luxembourg	10	0,0%
Denmark	215	0,5%	Malta	1	0,0%
Portugal	215	0,5%	Rest of the world	30.039	69,9%
			USA	15.089	35,1%
			Total	42.996	100,0%

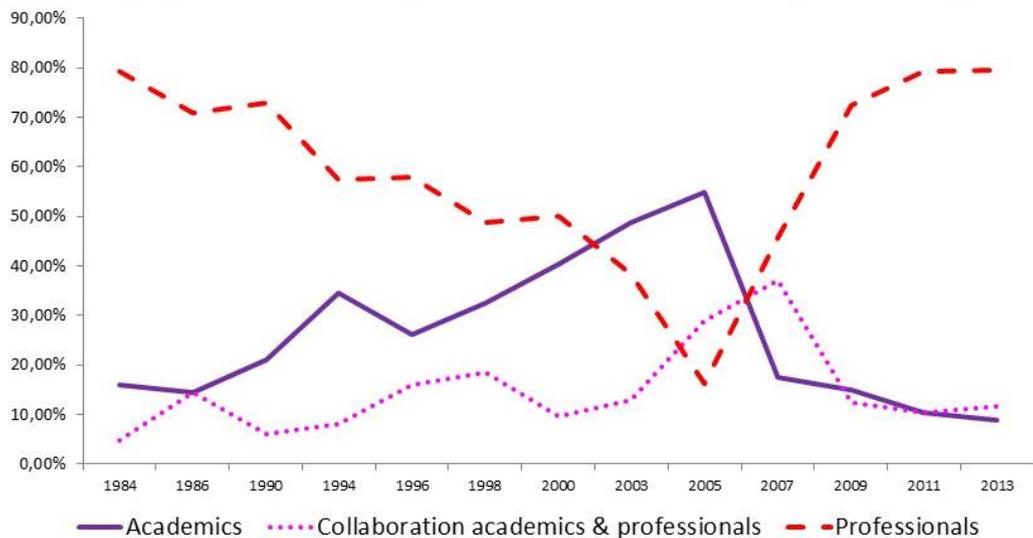
We can see that once the data are standardized regarding population ($R^2= 0,5796$), the production of UK, Spain and Netherlands is highlighted. Germany, France and Italy have an output below their potential by population, but also by their general performance in research in other fields (figure 4).

Figure 4. Authorship vs country population (2010-2014).



As mentioned, another area in which we want to develop our exploration is the relationship between the academic and professional environment. Surely, later in the following panel either Hazel Hall o Lynn Silipigni Connaway could comment on the importance of joining “supply and demand” research between academia and practitioners. In our findings, we also note the need to overcome the isolation of the LIS researcher in all directions, including to practitioners; also, and increasingly diverse environment (figure 5).

Figure 5. Share of papers in *Jornadas Españolas de Documentación*, 1984-2013. Academics vs professional (practitioners).



We do so from a perception largely confirmed by the analysis of presentations at the Spanish Conference on Documentation, in which the percentage of authors from academia, in collaboration with practitioners or not, has fallen sharply since 2005. This decline, attributable in part to the crisis being faced by the model of general conferences with a broad subject focus, also denotes and academic behaviour increasingly conditioned by the threat of “publish or perish”.

Returning to the general discourse, the EU output is concentrated in LIS journals on bibliometrics, computer science, management, and in more traditional LIS journals with open thematic scope, where the multidisciplinary or interdisciplinary approaches have more room. All those titles have wider target audience between authors and readers than the most “library” focused ones. As we can see (table 3) from the top 10 titles with more European works only one contains in title a word with the semantic root "biblio" (*Zeitschrift für Bibliothekswesen und Bibliographie*), while among the top 10 with less work (table 4) all but one has any related word, while in the tenth figure elided word.

These figures could be a clear indication that the more productive and dynamic group of European authors are researchers from non-LIS departments, or LIS departments researchers that have chosen to publish in journals with the highest impact and reach (that are not the classical "library journals"). The trend among USA authors is a little bit different, mainly because the tradition of library practitioners (mainly academic librarians) to publish for tenure and promotion.

Table 3. Top 10 titles with greatest number of EU papers (2010-2014).

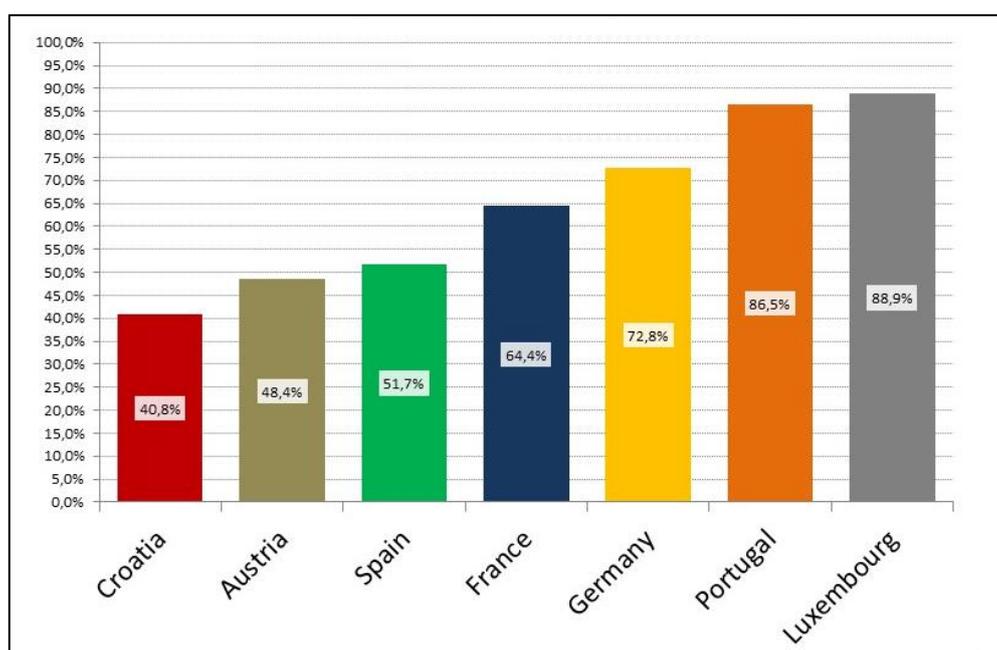
	ON EACH GEOGRAPHIC AREA				ON EACH JOURNAL	
	EU papers	% total EU papers	EU Rank	USA Rank	% from EU	% from USA
Scientometrics	707	8,1%	1	8	28,8%	12,2%
Americas Conference on information Systems	632	7,2%	2	1	22,2%	48,3%
JASIST	384	4,4%	3	3	25,5%	36,4%
Profesional de la Información	365	4,2%	4	122	84,5%	1,6%
Intelligent Systems Reference Library *	265	3,0%	5	24	33,2%	20,3%
VOEB-Mitteilungen	202	2,3%	6	145	97,6%	0,0%
Zeitschrift für Bibliothekswesen und Bibliographie	200	2,3%	7	141	95,2%	0,5%
Information-Wissenschaft und Praxis	176	2,0%	8	135	96,2%	1,1%
International Journal of Information Management	174	2,0%	9	49	28,7%	15,7%
Information Communication and Society	161	1,8%	10	13	30,3%	44,4%

Table 4. Top 10 titles with fewest EU papers (2010-2014)

	ON EACH GEOGRAPHIC AREA				ON EACH JOURNAL	
	EU papers	% EU papers	EU Rank	USA Rank	% from EU	% from USA
Journal of Interlibrary Loan, Document Delivery and Electronic Reserve	1	0,0%	134	40	0,8%	88,4%
Journal of Library and Information Services in Distance Learning	1	0,0%	134	51	0,9%	85,3%
Journal of Web Librarianship	1	0,0%	134	23	0,6%	96,4%
Library Resources and Technical Services	1	0,0%	134	49	1,0%	92,2%
Libres	1	0,0%	134	103	2,5%	52,5%
Pakistan Journal of Library and Information Science	1	0,0%	134	130	2,1%	6,4%
Reference Librarian	1	0,0%	134	16	0,5%	93,6%
School Library Media Research	1	0,0%	134	61	1,3%	89,6%
Science and Technology Libraries	1	0,0%	134	28	0,6%	87,0%
Technical Services Quarterly	1	0,0%	134	17	0,5%	94,7%

Another remarkable finding is the high concentration of authorship in a limited number of titles, which are quite different among the different countries except in the case of *Scientometrics*, which is always among the top 10, and that in 21 of the 28 countries is among the top three. In some of the countries with journals published in their national languages (Spain, France, Germany, Austria) the top three titles include those national publications. Moreover, in some countries, publication in languages other than English is noteworthy (figure 6). If we count only journals in English, *Scientometrics* would go up to the top 3 or top 10 for all countries. In the case of Austria and Spain, it would reach the first position.

Figure 6. Countries with less than 95% of papers in English (2010-2014).



Let us explore the main themes of research, as a potential way to contrast the publication outputs with the research lines drawn in the research agendas (when established agendas exist!). We recognize the purely exploratory value of those findings, devoted to have a context for the scientific collaboration analysis we are performing. Definitely our colleague Pertti Vakkari as a specialist over many years in the analysis of the thematic/methodological trends in LIS research could enlighten us on this issue later in his speech at the round table.

If we observe the following clouds of tags the situation is far from homogeneous among all of the countries. First, taking Europe as a whole, the keywords that appear in Scopus retrieved records show the importance of three areas compared to more traditional field of libraries (figure 7). Although the word "Libraries" appears, is not a tag located in a robust and central position, as is the case for other three areas:

- information systems and retrieval,
- information and knowledge management, and
- bibliometrics and research evaluation

Figure 7. Subjects reflected in keywords (2010-2014).



If we review in detail all the labels that appear among Clouds of Europe (figure 7), Spain and UK (figure 8), and Italy and Germany (figure 9) the "Public libraries" label only exceeds the "threshold" established in the case of UK. The "Libraries" label only has a significant size in the case of UK.

It is also striking the comparison between Italy and Germany or Spain and the UK: it seems that countries with a more consolidated scientific background in all research areas, grant less importance to bibliometric work. Could we say that the volume of the bibliometric study of

scientific production in some countries is inversely proportional to the generation of scientific knowledge?

Anyway, these keyword data distribution and rankings could be an evidence of loopholes in the research outputs or in the research agendas of some countries.

Figure 8. Subjects reflected in keywords: [Spain versus UK] (2010-2014).

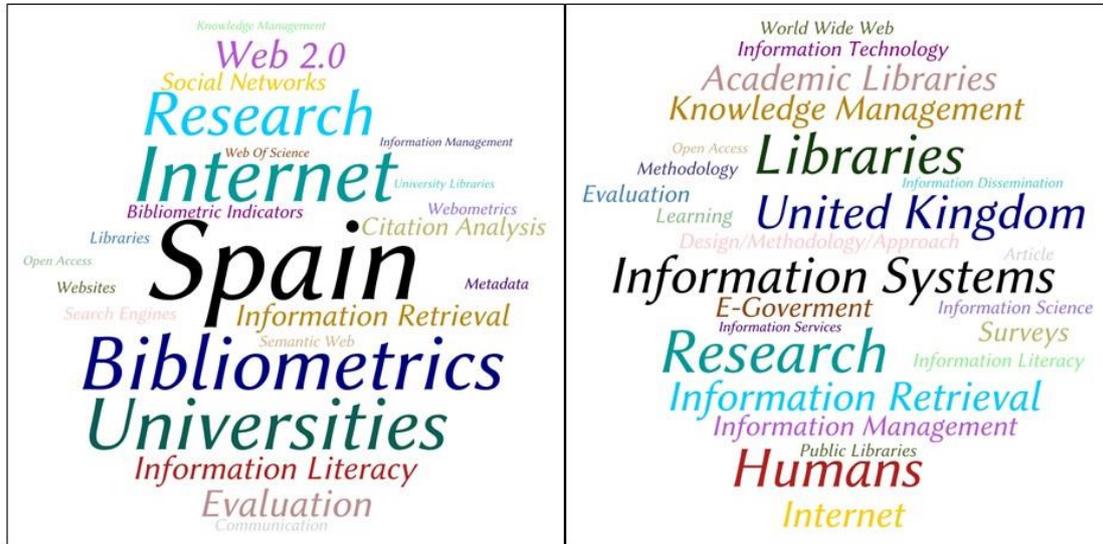
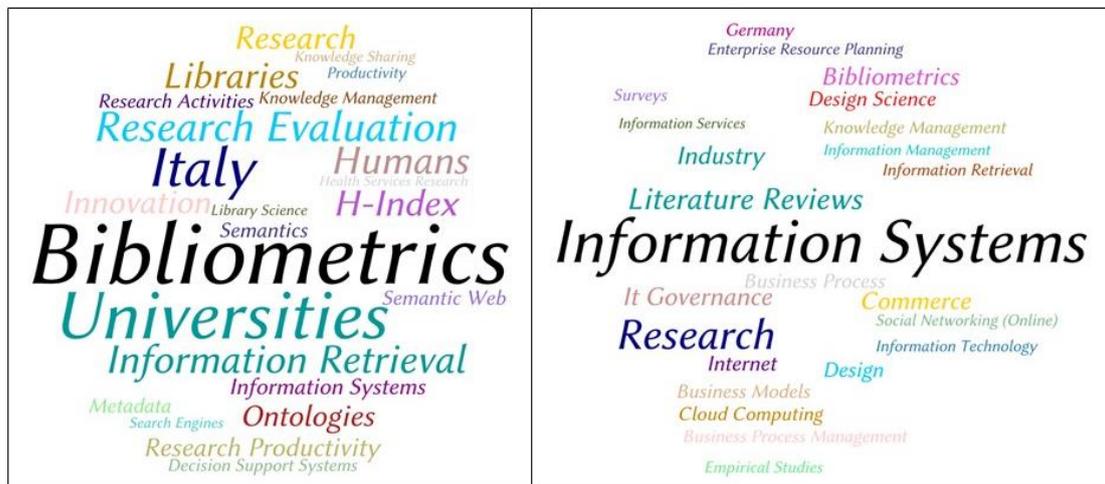


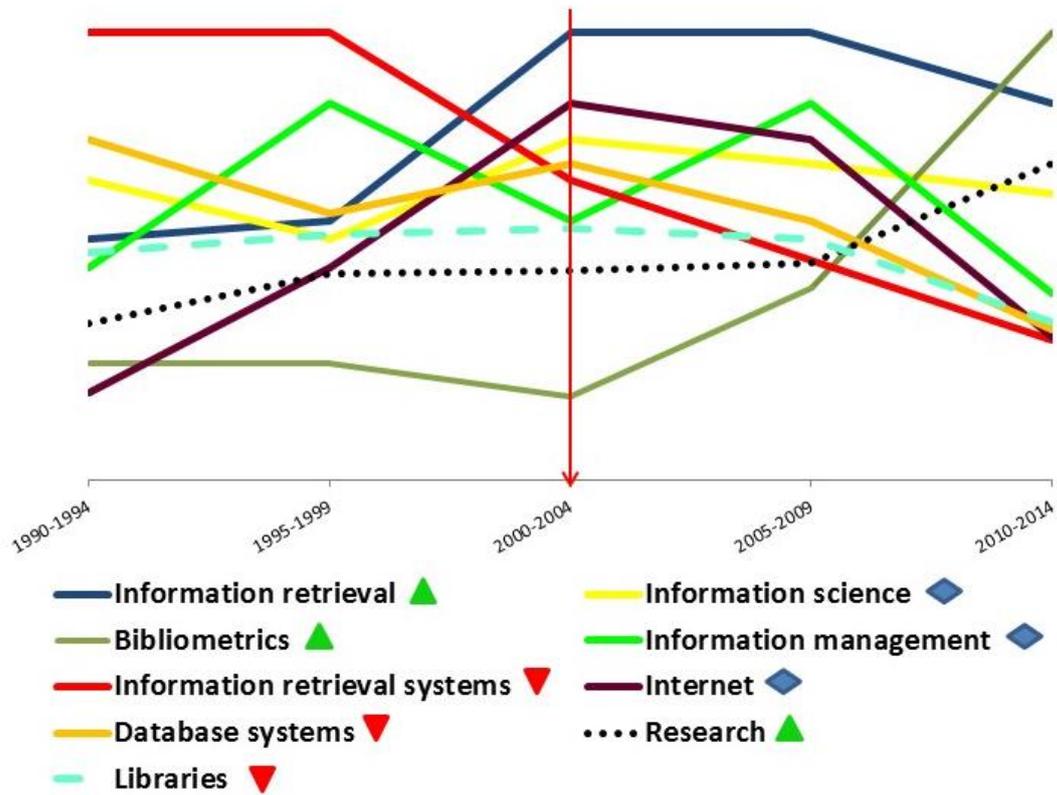
Figure 9. Subjects reflected in keywords: [Italy versus Germany] (2010-2014).



As seen earlier (figure 2), from the period 2000-2004 there is a continued growth in the production of all countries except the UK. It's a growth especially noticeable in the case of Spain and other non-leader countries at the beginning in the 90's.

In view of the comparative position in the ranking of keywords, and taking account of the papers output turning point 2000-2004 / 2005-2009, it makes sense the interpretation of tag clouds that we done above, with three keywords "winners" and three "losers" (figure 10).

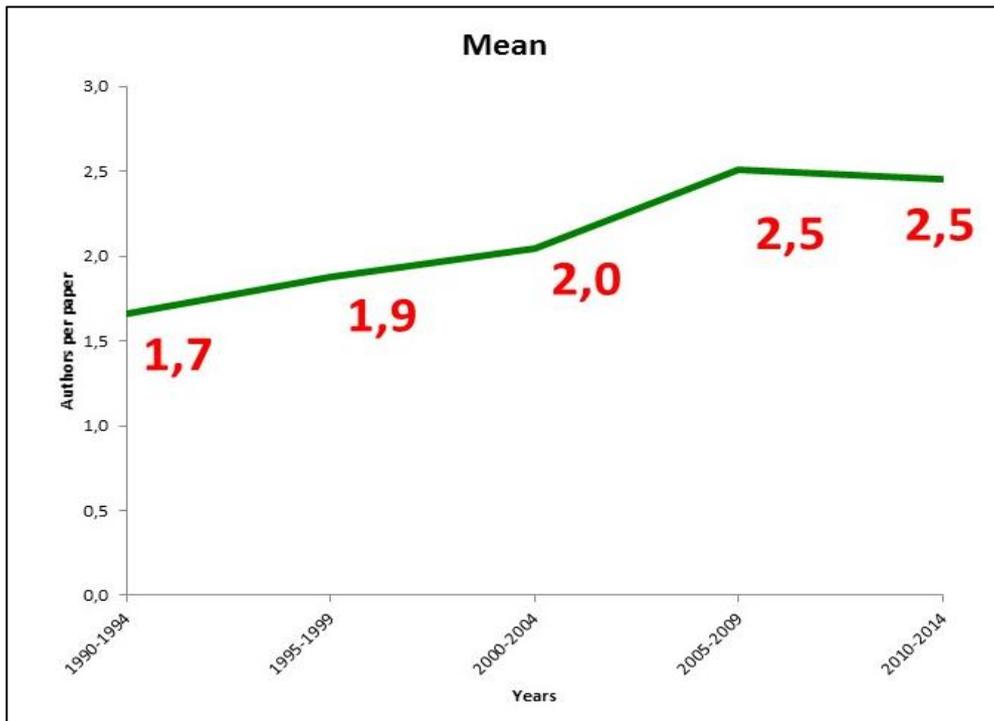
Figure 10. Subjects reflected in keywords (1990-2014: 15 core journals).



Our departure point in this exploratory work has been that the low level of scientific collaboration (international, interdisciplinary or interprofessional) represents an important challenge to LIS research future, mainly to the ability to raise funds in competitive calls for research funding that are becoming more and more problem oriented, no disciplinary.

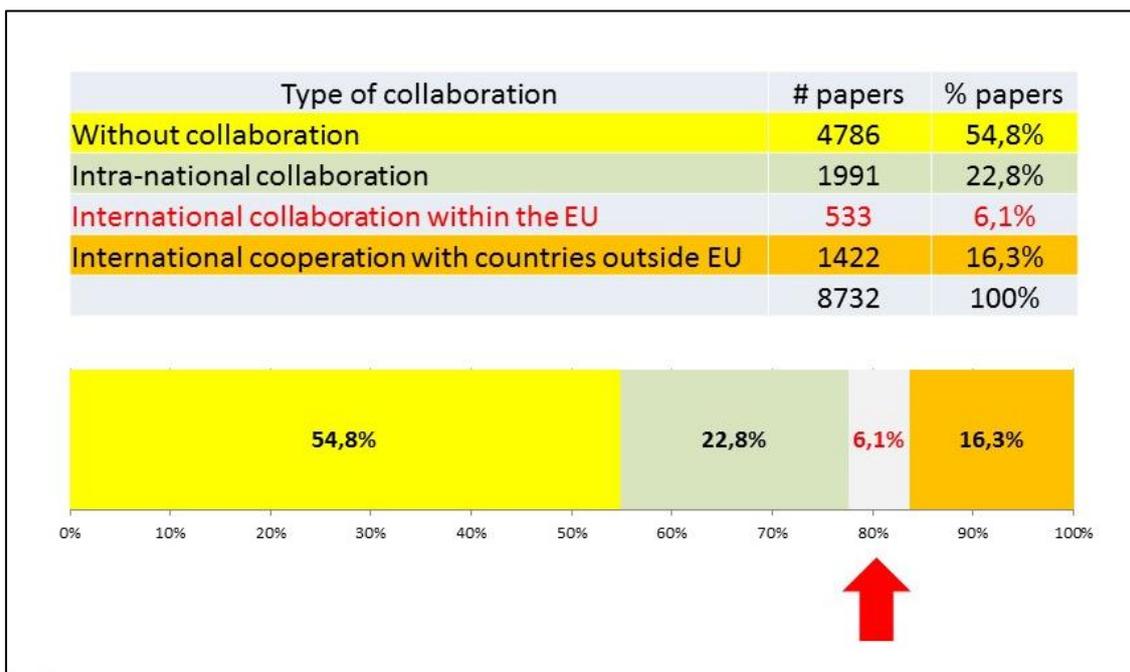
Simple maths shows us the gap we have against other research areas: 1,7 authors per paper if we consider the 151 titles set, although there has been an increase since 1990 (figure 11). The mean is 2,5 authors per paper in the case of the 15-core set.

Figure 11. Chronological evolution of the number of authors per paper for 15 core journals.



These are low figures that indicate that there is a lack of complex and diverse collaborations, in fact the 54,8% of papers are one person works. If we look at the type of collaboration, only 22,4% is international, which a poor 6,1% in the case of intra EU co-authorship (figure 12).

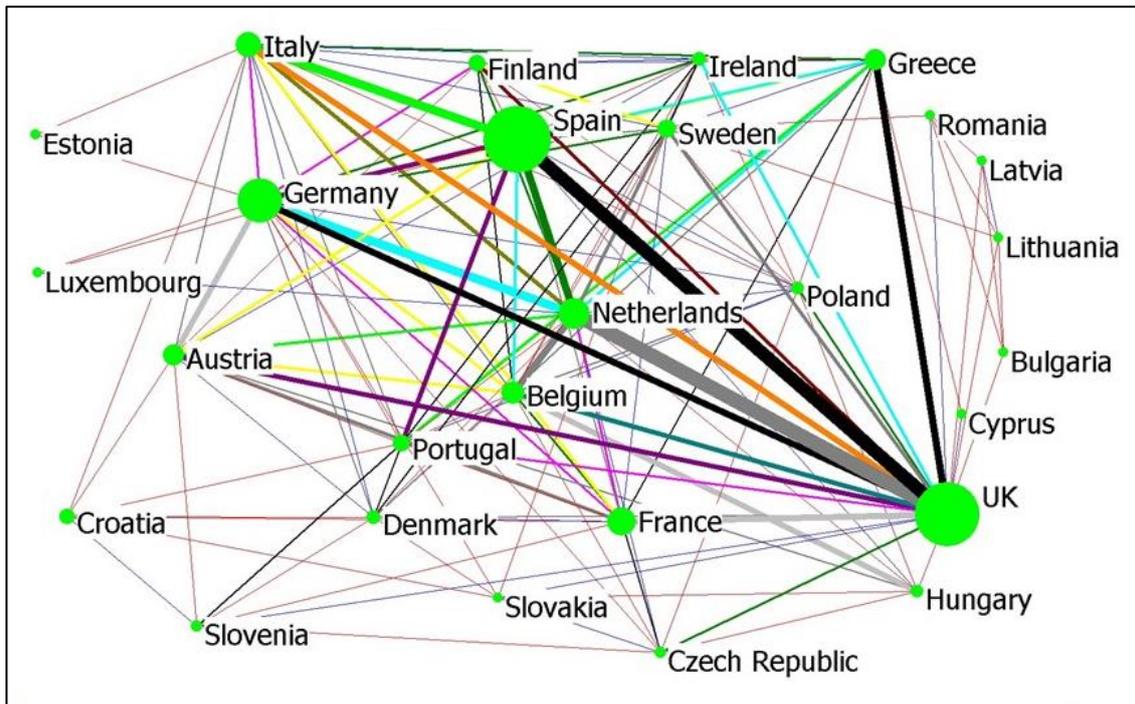
Figure 12. Level of collaboration (geographical reach).



In the light of these data, we should ask whether EU programs for academic exchange and research has failed in the area of LIS (and allied), or whether LIS area has not been able to take advantage of those programs because their weakness.

When compared, intra EU collaboration network against all Europe network is not observed a greater intensity and variety of collaborations at EU level (figure 13).

Figure 13. Network of Intra-EU collaboration (2010-2014).



This may be due to the EU policy to consider non-EU countries like Norway, Switzerland, Serbia, Turkey, Iceland and Montenegro as full participants in programs of the so called "European Research Area". This could explain the case of the strong relationship we observe between Switzerland and Germany, or between Denmark and Norway, alongside with the traditional bilateral links between those countries (figure 14).

In any case, an important number of full EU member countries have weak links, or no links at all, between them. In general, these collaboration networks show up that to be EU members is not a plus for mutual collaboration (figure 15).

This phenomenon of weak Intra-EU collaboration manifests itself even more clear if collaborative networks Worldwide are analysed: in general, is not observed among EU countries a greater volume of papers in collaboration with some other EU authors, neither more intense ties.

In the Spanish case the "Hispanic" is the strongest link, along with the US and the UK. It draws attention to the weakness of collaboration with France and Italy, and the total lack of cooperation with the Eastern European countries: Spain only collaborates, and very weakly, with 11 other EU countries (figure 16).

Figure 14. Network of EU & non-EU collaboration (2010-2014).

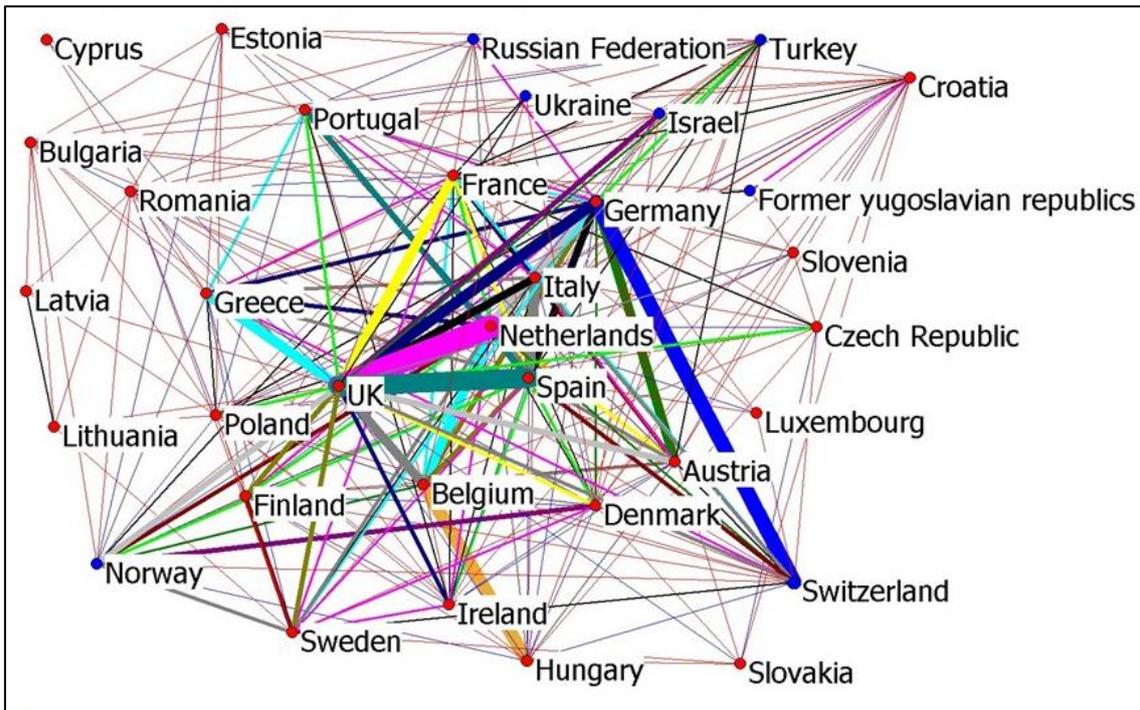


Figure 15. Global network of collaboration for EU co-authorships (2010-2014).

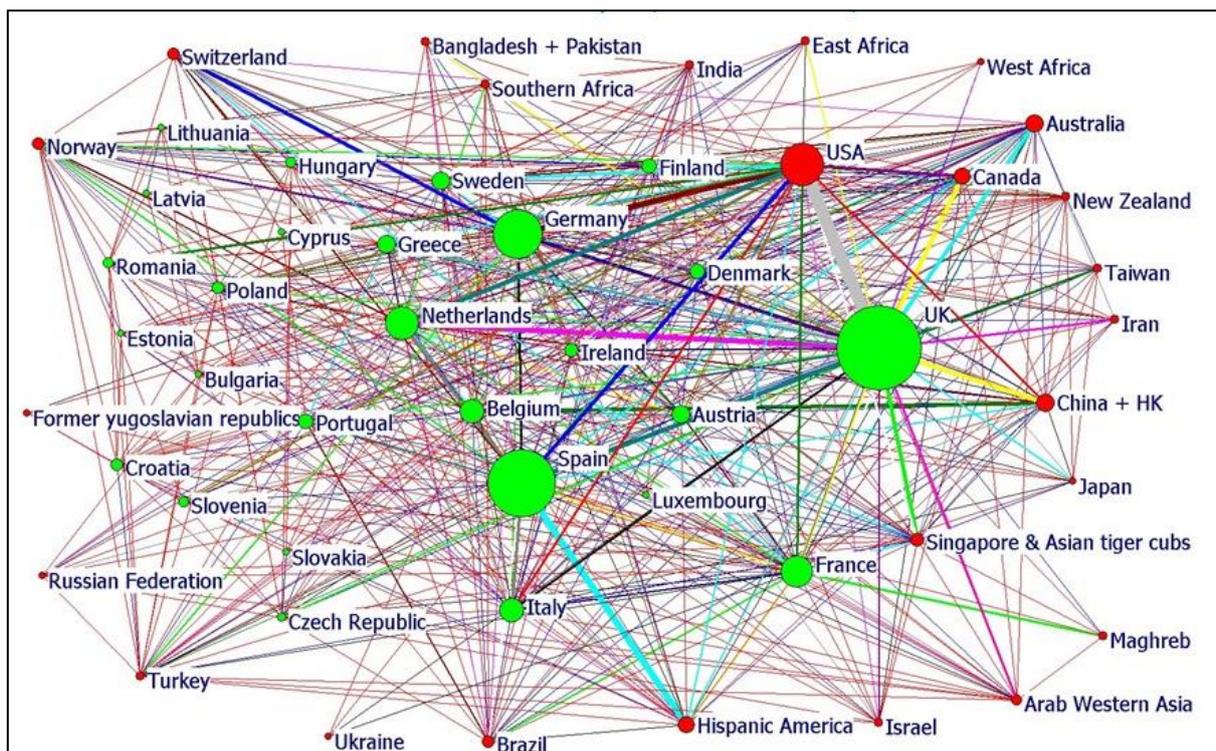
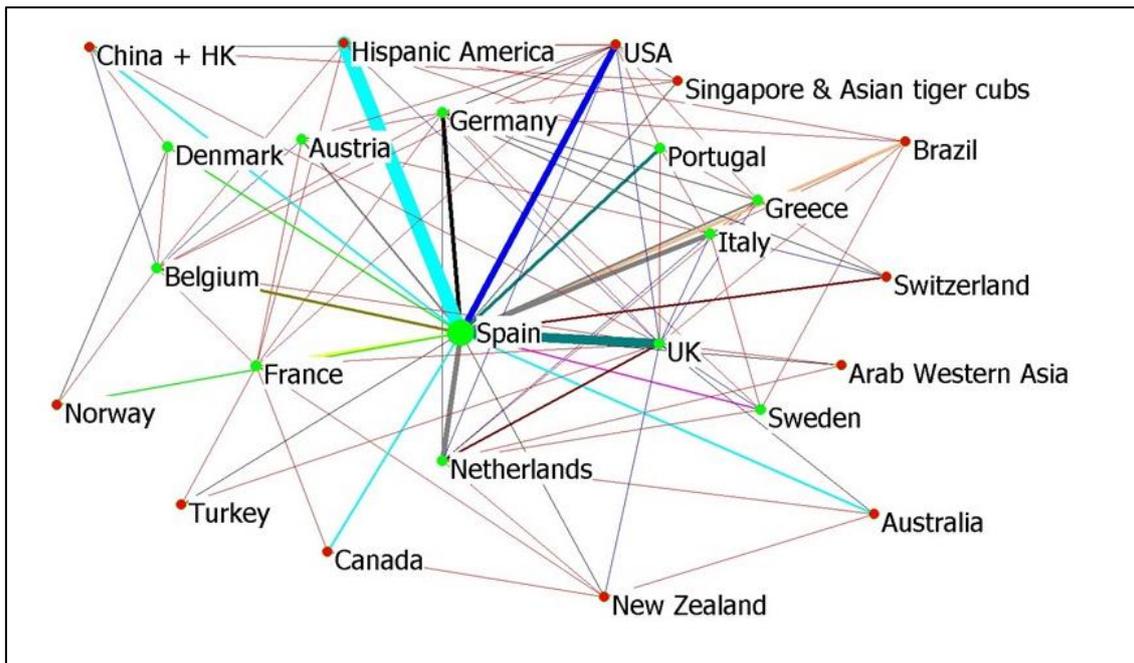


Figure 16. Global network of collaboration for Spain (2010-2014).



After seeing the picture that we have obtained from our exploration, and in order to consolidate and develop this work, we have formulated a number of questions that have been raised by many others who have preceded us in the study of LIS research. The reiteration of the epistemological debates on the boundaries of our field, and on what qualifies as research, are a clear manifestation of the dubious, uneven and changing nature of the research area in which we stand.

Spink and Heinström (2012) write similar words in the introduction to a work that preceded in similar goals to our Seminar today, are close to that Blaise Cronin spoke yesterday at the inaugural key note speech. Definitely a good diagnosis on LIS research requires working at different levels of granularity, with the three dimensions combined: subjects and issues associated with the LIS field in a broad sense, LIS institutions or persons linked organically, or publications classified as LIS.

Once read the great bulk of previous studies we believe that the challenge is not so much "how to narrow" the field but to "how to communicate" with other players: we mean, how to meet potential bridges to jump from the "multidisciplinary" to the "interdisciplinary" approach. To know the closest areas revealed in the many scientific studies that address LIS production in order to identify strong partners.

Throughout the literature review we are making to our study we have found a revealing obsession (almost pathological) to determine "what type of work qualifies as research".

Certainly, the classic definition of Shera in the memorable 1964 special issue *Library Trends* on LIS research methods, could still be a reference today. The problem in terms of evaluation and analysis of health of LIS research is how to operationalize this definition for filtering the output,

in a viable bibliometric way. In any case we are aware that we cannot equate research to publication.

Regarding planned research agendas we think Lynn Silipigni Connaway (for his career at OCLC Research), as well Hazel Hall (for its expertise in the UK LIS Research Coalition) may better illustrate us later this morning. But we have the suspicion there is a lack of planning and debate in the building of research agendas on LIS, if it's the case.

From our personal experience, examples of discussion and prioritization of research as Lynn and Hazel could comment are not common in Spain. We should benchmark the way we prioritize research with the best practices documented: for instance the case of the initiative promoted by the Swedish Library Association for *A Delphi study of research needs for Swedish libraries* (Maceviciute et al. 2009).

To assess whether the results published match the demand for research, we should have a synthesis of research agendas, sectorized as in the case of Sweden, or cross-disciplinary problem oriented ones as you can draw implicit in the EU Framework Programs or R&D.

In any case, a derivative of our exploratory work could be further research on this line to set the evidence of the presence, or absence, of such agendas, as well as their characteristics and the evaluation needed to measure the success and the quality in coping with the demands.

We end this “warm up” intervention for the next round table with the open-ended questions that brings implicit conclusion of our initial exploration:

- Will we keep living apart together?
 - We don't know, but we shouldn't

- How to overcome the isolation of LIS researchers?
 - Getting away from “our disciplinary delimitation game”
 - Building real planned research agendas

LIS spaces (research topics, publications, departments / institutions) are nowadays very pluralistic, with many varied contributions in their origin and in their methods. But inside the “cocktail” we don't have reached a strategic alliance between the different cultures: the academic versus the practitioner, the LIS (we cannot say in the case of I-Schools) departments versus other departments, or the different “national cultures”.

We hope we will confirm this rather pessimistic picture in future development of this work, if we can successfully exploit the data of institutional affiliation from Scopus records, but the first intuition is that we have various authors living in the same "neighbourhood" (see here neighbourhood as a metaphor for a set of LIS journals), but rarely in the same "house" (see here house a metaphor for article paper).

Following with the metaphorical approach, we think we are not in an interdisciplinary path to go beyond mere multidisciplinary, we are “living apart together” (but not much in the same problem-oriented research house).

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