

# Scientific Communication and Ontology: a Bibliometric Analysis of the Library and Information Science Abstracts (LISA)

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## Introduction

This paper describes an ongoing study on ontology and scientific communication at the Library and Information Science Abstracts (LISA) database. Its aim is to construct an ontology for scientific periodicals, enabling precise and efficient retrieval of their contents. It underlines the need to be familiar with information sources; in this case the LISA base, and the need for them to adopt standards and formats for their metadata which are interoperable.

It presents preliminary results which suggest the need for further inquiry in two different directions: the need to adopt clear standards and a higher quality of metadata insertion in the databases; and the more efficient use of bibliometric resources for tabulation and analysis of the collected data for specific studies.

With this, the results can be more clearly presented and argued, and thus provide a more efficient and relevant scientific publication.

In order to do this, this study has focused on the importance of documentary languages like indexes, thesauri, taxonomies and particularly ontologies. These last have emerged as a solution for precise and efficient retrieval of scientific information covering the length and breadth of the Web.

The World Wide Web Consortium (W3C) recommends and encourages research in the field of Web Semantics - ontologies, by making articles, models and tools available.

It stresses the importance of the semantic treatment of information available on the Web, especially the construction of indexes for efficient retrieval.

In this context, the field of Librarianship, and more specifically that of Information Science, contributes to studies of specific languages for the treatment, organization and retrieval of information on the Web, as well as to analysis based on bibliometric and scientometric resources.

It presents the collection, tabulation and bibliometric analysis of the inquiry on 'scientific communication' and 'ontology', in the LISA base. This base was accessed through the CAPES Periodical Portal at <http://www.periodicos.capes.gov.br/portugues/index.jsp>.

It was necessary to be familiar with the technological resources used by the base and the

standardizations adopted for the descriptive terms. For the analysis of the results, the bibliometric software Infotrans, Dataview, Excel and Statistic were used.

## Analysis and discussion of data

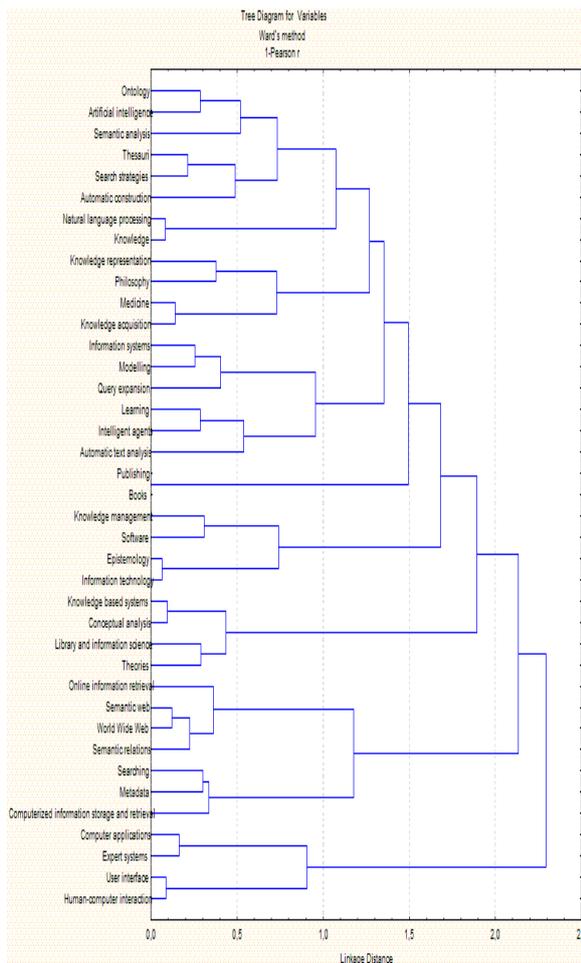
A thorough study was made of the adopted descriptive terms using the following syntax: 'scientific communication and ontology', followed by 'scientific communication and ontologies'. The results using the criterion of "peer review" were chosen in order to give greater certification to the research undertaken.

In this study at LISA in December 2008, there were 199 references to the subject 'scientific communication and ontology', tabulated in two files, as this base uses the descriptive terms 'ontology' – with 71 occurrences, and 'ontologies' – with 128, both allied with the descriptive terms 'information communication'.

The organization and the standardization of the data were done using the Infotrans software, comparing or eliminating interference or reference duplication.

The Dataview software was then used to generate the bibliometric data files, and to then export them to statistic softwares - Excel and Statistic, where it is possible to order, group, relate and visualize the results through graphs and dendograms, as can be seen in figure 1.

Conceptual dendograms and maps were created to demonstrate the associations found through analysis of the results. One can see from figure 1 that the descriptive term 'ontology' used by the LISA base refers to more theoretical studies and variables involving ontology creation, while the descriptive term 'ontologies' has associations that involve the applications and the use of technological resources for ontology development.



**Figure 1: Dendrogram showing the relations with the term “ontology”**  
Source: the authors

### Partial Considerations

This study shows the relevance and importance of the use of bibliographical, bibliometric and technological resources, as well as the need to study and comprehend the functioning of the database under investigation and of the resources that it makes available for more precise and efficient information retrieval.

The results presented here are partial and quantitative. They show that each database treats its indexes differently, and that this entails individual analysis on the part of each user.

The results obtained so far suggest that the descriptive term ‘ontology’ refers to the theoretical aspects in the construction of ontologies in numerous areas of knowledge, and the descriptive term ‘ontologies’ is related more to the applications and technological resources used by ontologies.

It now remains to retrieve and analyse the identified references, in order to verify if the adoption of the description used for ontology confirm the premise: ontology = theory and ontologies = applications.

Although the results presented are partial, it should be noticed that the same ones can be configured as a procedure to legitimize conceptual structures. The results obtained in this study are also presented in other studies by the authors.

### References

- CONSÓRCIO W3C. *Semantic Web* (2001). From: <http://www.w3.org/2001/sw/>.
- LIBRARY and Information Science Abstracts (LISA). (2009). From: [http://csaweb113v.csa.com/ids70/quick\\_search.php?SID=8go8qdfu4ket9nefg46qk2j2m7](http://csaweb113v.csa.com/ids70/quick_search.php?SID=8go8qdfu4ket9nefg46qk2j2m7).
- KOBASHI, N. Y.; SANTOS, R. N. M. dos. (2006). Arqueologia do trabalho imaterial: uma aplicação bibliométrica à análise de dissertações e teses. In: *ENANCIB*, 7, Marília (SP), 19 – 22 nov. 2006. CD-ROM.
- MEADOWS, A. J. (1999). *A comunicação científica*. Brasília: Briquet Lemos, 1999. 268p.
- PAEPEN, Bert. Ontologies at Work: publishing multilingual recreational routes using ontologies. In: *INTERNATIONAL CONFERENCE ON ELECTRONIC PUBLISHING*, 11, 2007. Vienna, Áustria. From: [http://elpub.scix.net/data/works/att/153\\_elpub2007.content.pdf](http://elpub.scix.net/data/works/att/153_elpub2007.content.pdf).
- PORTAL de Periódicos da CAPES. Brasil. (2009). From: <http://www.periodicos.capes.gov.br/portugues/index.jsp>.
- RAMOS, Hélia de S. Chaves. Potentialities of use competitive intelligence tools for the treatment of information in the formulation of S&T guidelines and policies. (*Dissertação*). Marseille, França, 1999. From: <http://193.51.109.173/memoires/HeliaChaves.pdf>.
- REENEN, Johann Van. (2006). Open access and connectedness: stimulating unexpected innovation through the use of institutional open archives. *Ci. Inf.*, Brasília: IBICT, v. 35, n. 2, p. 17-26, 2006. From: <http://www.scielo.br/pdf/ci/v35n2/a03v35n2.pdf>
- SARACEVIC, T. *Information Science*. From: <http://www.scils.rutgers.edu/~tefko/JASIS1999.pdf>.