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EVALUATION AND ANALYSIS OF OPEN ACCESS ELECTRONIC RESOURCES IN HIGHER EDUCATION LIBRARIES IN PORTUGAL

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Abstract

In this work, it is given public knowledge of a model that was built along the research carried out, with a view to evaluate the information resources in Open Access (OA) and present the results obtained by its application on a comparative study at the level of Higher Education Libraries (universities and polytechnics, public and private) in Portugal, more exactly concerning the Online Public Access Catalogs (OPAC) and Institutional Repositories (IR).

For the construction of this model and its application to the Higher Education Libraries in Portugal, 3 dimensions with 9 indicators each were designed, in a total of 27, adapted to the experience made explicit by authors who have tackled the topic of evaluating the Internet resources. However, this construction was especially based on personal experience with the benefits and difficulties detected in practical use of these platforms, in terms of personal, professional and academic level.

Using this model, the comparison and analysis of the positive and negative elements found, aim to suggest operating characteristics which could make the OPAC and IR platforms more reliable, simple and friendly, providing a quality and accessible service, empowering their users with effective results, and reversing the current trend of arbitrary use of existing information resources on the Internet. At the same time, the model aims to give clues that can protect the image and credibility of the institutions, giving them the visibility required in a world of increasingly competitive Information.

The results obtained have provided an update regarding the OPAC and IR of the Higher Education Libraries in Portugal, obtaining conclusions through quantitative and qualitative data, retreating still further information according to each type of Institution.

The research was generated during the author's Doctoral Thesis defended in Universidad de Alcalá, in Spain, December 2019.

Keywords: Documentation ; Information Systems ; Open Access ; Search Engines ; Higher Education Libraries ; Online Public Access Catalogs (OPAC) ; Institutional Repositories (IR)

Introduction

Higher Education Libraries are increasingly multidisciplinary and multifaceted spaces of knowledge, work, study, collaboration and scientific exchange. With all these valences, it is legit that, today, they are beginning to be internationally called Resource Centers for Learning and Research, having, in addition to the traditional bibliographic resources in physical/paper, the most diverse electronic information retrieval tools - databases, digital libraries, institutional repositories and even federated search aggregators of all these resources.

However, along with these changes, there is a growing recurrence on the use of online electronic resources available on the Internet (notably those with the highest popularity, such as Google), in detriment of information resources available in libraries. Egger Sider and Devine (2005) [10] refer that: "*Students start their research with a search engine on the Internet rather than a library's homepage*". But, as Anderson (2005) [3] states, these mechanisms are not always characterized by their reliability or quality regarding information retrieval. They are not always well organized, and their contents may not be reliable or scientifically valid - enough reasons for libraries to be more motivated to give more prominence to their electronic resources such as information retrieval tools with proper quality control. Brophy and Bawden (2005) [5], when comparing Google with library platforms, point out that "*The library databases are superior for quality of results*.".

With such evidences, there will be interest on the part of Higher Education Libraries to make its digital tools more accessible and more visible, including freely accessible online content, in order to reverse the current trend of arbitrary use by users of information resources on the Internet.

As Codina refers (2000) [9], as the Internet grows, it will be more and more necessary for documentation professionals to evaluate digital resources and determining their ability to fulfill the aims, so it is essential to understand if the technological potential is being sufficiently exploited to provide a quality, easy-to-use service that can empower the users, enabling them to conduct any kind of research, in an intuitive and effective way, while protecting the institution's image and credibility in an increasingly competitive world of information.

Objectives

The current study addresses two tools: the Online Public Access Catalogs (OPAC) and the Institutional Repositories (IR) made available by these libraries on their portals, pointing the relevance of the identified characteristics and, through the analysis performed with the use of indicators, to increase suggestions that can overcome problems, helping to deliver and achieve the highest quality objectives in content search, collection, organization, presentation and structuring, leading to easier and more effective use, greater and better results and thus ensuring higher utilization rate, benefiting users and the Institution.

It is therefore necessary to evaluate these platforms for their scientific and academic importance. In the case of IR, and as mentioned by Thomas et al. (2008) [25] "*Though institutional, disciplinary and other scholarly digital repositories certainly will be important parts of tomorrow's scholarly communication fabric; today they differ so much from each other that the statistics and measures they can produce do not conform to any common standards or definitions. (…) One of the many steps needed toward better comparison of IRs, is a shared understanding of how to evaluate them.*".

In this way, the objectives of the present work are:

- To make a proposal for the reformulation of the indicators to evaluate the 2 types of platform, which include the online resources search and retrieval, as well as their organization and presentation. We recurred to several authors, such as Nielsen (2006) [17], Pestana (2001) [19], Játiva Miralles (2004) [14], Walsh (2012) [26], Chambers (2013) [8], Price and Havergal (2011) [21], Agenjo Bullón and Hernández Carrascal (2010), Jasek (2004) [13] and Calvi and Geudens (2008) [7], García Melero (2009) [11] and standards-issuing entities (such as the International Organization for Standardization [12]), the adaptation of existing indicators, in addition to

necessary development of new ones. They were reviewed in accordance with the various Open Access guidelines (Budapest [6], Berlin [15] and Bethesda [4] Declarations).

- To evaluate the platforms, based on the proposed indicators, checking how they are organized, structurally and visually, the presentation of its content and usability.

- To suggest a model that includes a set of features that desirably should be contained in the resources and tools for searching, retrieving and displaying the information in a user-friendly, effective, reliable and complete manner.

Research questions

The questions to which the research intended to answer are two:

1 - *Do the Open Access search platforms provided by Higher Education Libraries in Portugal meet the aims for which they were implemented?*

2 - *Which features and functionalities should be implemented, or should be developed in all Open Access search platforms in use in Higher Education Libraries in Portugal?*

The two issues are interlaced, as it is intended to know the functionalities that should be part of both Higher Education Libraries OPAC and IR, in order to achieve the objectives for which these platforms are developed, to provide quality search, in an easy, efficient and effective way, achieving clear results, with a well-structured presentation and organization, ensuring a higher utilization rate that benefits both users and the Institution.

Research method

The research method adopted was based on the following:

1. Reviewing of existing literature on the timeliness of the topic and state of the issue.

2. Navigation on the OPAC and IR platforms, in OA of Higher Education Libraries in Portugal, verifying and recording its organization, structure and operation at the level of resources and tools for searching, retrieving and presenting information.

3. Construction of an evaluation table with dimensions of analysis to study the observed platforms. Each one of the 3 dimensions was divided into a set of 9 indicators that have common aspects, aiming to measure the information. The dimensions and indicators selected are based on the advice of authors consulted regarding the evaluation of websites, with appropriate adaptations and reformulations, according to the specificities of the resulting investigation.

4. Quantitative and qualitative evaluation, comparing the platforms, referring positive and negative aspects, potentialities and weaknesses found throughout the research.

5. Writing a model based on the ideal characteristics for these platforms, properly identified and critically analyzed.

6. Reviewing the evaluation, in order to refine the collection and analysis model.

Bibliography and state of the question review

In order to determine the dimensions of analysis and indicators to be used in the evaluation, we adapted criteria created by various authors, not only regarding OPAC and IR, but also for web pages and portals. Currently these platforms confer numerous functionalities, not being limited to the tools that until now were evaluated by some of the referred authors, making sense an update.

These two platforms currently allow, in addition to presenting bibliographic records, also to retrieve full-text documents in Open Access. Indeed, as stated by Suber (2012) [24] the goal of Open Access is to remove barriers, but not quality filters, helping to achieve the purposes of accessing quality information quickly and universally. In addition, Open Access is not the same as Universal Access, as there are, among others, language barriers, accessibility, and connection failures or poor connection.

After the bibliographic review carried out at the level of evaluation and use of indicators by several authors - namely, evaluations at a more institutional level, such as those of Orduña Malea (2011) [18] or Serrano Vicente et al. (2014) [23] we chose an evaluation that follows two lines given by Saracevic (2000) [22], focused on systems and usability (study related to the interface, tasks and contexts of use).

According to Alonso Arévalo et al. (1999) [2], indicators should effortlessly provide global, comparative and cumulative data.

Following the assumptions made by Poll (1996) [20], an indicator should be suitable for the study in question; Reliable (should not give ambiguous interpretations); Reproducible (same items should always be counted the same way); It should assist in decision making, for example by demonstrating user needs and ways to achieve better performance.

Some indicators are based on theories defended by various authors, and not on indicators they suggest/build. This is the case of Walsh (2012) [26], Chambers (2013) [8], Price and Havergal (2011) [21], Agenjo Bullón and Hernández Carrascal (2010) [1], Jasek (2004) [13] and Calvi and Geudens (2008) [7].

Previous studies have focused on the analysis of only one type of platform - either OPAC or IR - referring to their form and/or functionalities or, alternatively, to the contents, centered, for instance, on the control indexation policies.

Regarding the studies read, analyzed, and listed, the evaluation grid presented in this paper differs by not being exhaustive, summarizing in 3 dimensions of analysis and 27 indicators, the most important features of both platforms (OPAC and IR); It provides, through direct observation and analysis, a fast and easy-to-use mechanism that can be handled by researchers or the library's own staff at any time without the need for complex/technical instruments.

Dimensions of analysis and indicators

The dimensions of analysis (3) and indicators (27) for both platforms (OPAC and IR) are organized as follows:

Dimension of Analysis A (Consistency and Clarity in content availability)

1. Is visual communication simple and effective (the colors, contrast, size, character alignment and spacing, and other formatting used, allow good readability and differentiation between content and functionality)?

2. Enables previewing excerpts/summaries of works?

3. Is there an effective control of authorship?

4. Is there an effective control of subjects?
5. Is there a multilingual indexing according to document languages?
6. Is the terminology used for information retrieval appropriated for users in general?
7. Are search engines complete (allowing to search for the most frequent and essential access points)?
8. Is it possible to sort the search results?
9. Is there a clear identification of the available document typologies and their contents?

Dimension of Analysis B (Value Added Features)

1. Is it possible to refine the results retrieved after a search?
2. Is there a logical intersection of information adapted for good navigation, linking records?
3. Is it possible to freely export (via email, for example) record listings and bibliographic references?
4. Is it possible to download documents in full, in Open Access?
5. Is it possible to see statistics/rankings for loan/document downloads?
6. Is it possible to search on external search engines to retrieve a broader collection of elements?
7. Is there any system for subscribing alerts for new records/inserted documents (such as RSS or Email) in Open Access?
8. Do they enable the subscription and connection to Social Networks?
9. Is it possible to link to bibliographic reference management programs/platforms?

Dimension of Analysis C (Accessibility and Help Systems)

1. Are there no errors in accessing platform content or sections?
2. Does the system effectively help the user to recognize, diagnose and recover from error situations?
3. Doesn't the search require the use of word accents?
4. Is it possible to recover a history of research conducted during the session?
5. Are the navigation map, shortcuts, and other options that give you immediate access to the various sections, visible throughout the navigation in all sections, making it easier?
6. Are there instructions on how to use and access content?

7. Is it possible to effectively translate the platform into (at least) the most widely used languages internationally?

8. Are users allowed to post opinions/questions directly from the platform?

9. Is the platform adapted for use on mobile devices (smartphones, e.g.)?

Conclusions

The aim of the research was to evaluate and analyze two essential Open Access (OA) tools, specifically the Online Public Access Catalogs (OPAC) and the Institutional Repositories (IR), belonging to 48 Higher Education Libraries in Portugal, focusing on two research questions:

1 - *Do the Open Access search platforms provided by Higher Education Libraries in Portugal meet the aims for which they were implemented?*

2 - *Which features and functionalities should be implemented, or should be developed in all Open Access search platforms in use in Higher Education Libraries in Portugal?*

The research developed, made possible the answer these questions, by constructing a grid to evaluate the structure, organization and search operation of the two types of platform, using 3 dimensions of analysis, designed and refined throughout the work. Each one was divided into 9 indicators, out of 27, referring to characteristics that should provide a proper model to recover information and present results that would be reliable, intuitive and effective.

The model integrates, in the form of questions arranged in a grid, the list of characteristics that should, according to the theoretical collection of the reviewed authors, exist in the platforms here evaluated.

The evaluation was carried out directly through exploration and use of each platform, verifying its structure, dynamics and existing information, with insistent quantitative and qualitative analysis, carried out in self-critical manner, by designing and redesigning the dimensions of analysis and indicators whenever necessary, so that the model would become as rigorous as possible, so as to avoid interpretative subjectivities as much as possible.

Applying this model, and answering the **1st. question**, the evaluation results obtained led to the following conclusions, bearing in mind that the objectives for these platforms are essentially to provide efficient information retrieval, easily manageable and understandable, with quality structures and organized content, favoring a quality service to whom may use them. They were evaluated in terms of strengths and weaknesses that mostly characterize these platforms at Higher Education Libraries in Portugal.

Among the **positive points**, it was found in both platforms (OPAC and IR) that:

- Search engines are largely complete.

- There is a logical intersection of information adapted for good navigation, with links between records.

- The terminology used is proper for general users.

- Visual communication is simple and effective.

- Search does not require the use of accents.

- Navigation maps, shortcuts and other options that give you immediate access to the various sections, are visible throughout the navigation, making it easier.

- It is possible to organize the search results.

Regarding the **negative points** detected in the analysis results of the two platforms, it should be noted that:

- There is a poor control of both authorship and subject matters - although these two elements are nevertheless essential in retrieving information.

- Most platforms do not have multilingual indexing according to available records and documents.

- In many cases, there is a lack of connection with bibliographic management platforms.

Regarding **discrepancies** of results **between one platform and the other**, the following is true:

- While OPAC score poorly (5 out of 42), corresponding to 11,9%, on adapting the platform for use on mobile devices (such as smartphones), the opposite is true for the IR (with 26 out of 37 meeting this characteristic) (70,2%).

- Alert subscription systems for new records/inserted documents (such as RSS or Email) appear in 100% of IR, while in the OPAC appear in 19 out of 42 (45,2%).

- Search capabilities to external search engines is evident in 54,7% of OPACs, while none exists in any of the RI's.

- No errors in accessing platform content or sections are common to all IR with one exception, while 22 out of 42 OPACs (52.3%) have errors.

- The existence of instructions in the use and access to content are very positive on the IR, except for 2 Higher Education Libraries, totaling 94,5%, while on the OPAC the total score is 23 out of 42, (54,7%).

- Query history of surveys performed during a session is not possible in any of the IRs, while it exists in 69% of OPACs (29 of 42).

Regarding the **2nd. question**, the following was found:

- Above all, there should be a better quality control of the content provided, as well as its efficient standardization, in order to help to obtain good information retrieval during the searches made by the users, integrating good indexation, along with the respect for the authorship disambiguation. It is important to make information available on a multilingual basis, for a good understanding by all the potential public, with good tutorials accompanying each section of the platform, as is the need for interactive cross-platform (including references management) resources, making the work easier for the user.

- When building and developing a digital platform, it is necessary to take into account the various needs and expectations of users, and coherently establish mechanisms that allow a quick, or even immediate, learning of the inherent dynamics, with complete but straightforward tutorials as well as full assistance through information in all sections, such as navigation maps and mechanisms to auto-complete terms, so as alerts that appear whenever the user types words incorrectly.

- The idea that these platforms need to be reformulated to integrate the vast universe of the Internet and the new formats available on it has been substantiated over time. Moscoso Castro and García Ortiz (2008) [16] believe that even collaboration between different professionals is necessary to overcome this situation. It should be noted that, even platforms that already have significant quality can benefit from improvements if they adhere to certain rules that need to be

taken into account, which have been outlined here, ensuring their best use, along with the tools provided by new technologies to more easily achieve the goal of serving the public. And this can and should be done from the moment they begin to be designed.

The research also allowed, from the elements stated in the evaluation, and after comparing the results obtained in both the OPAC's and the IR, to show the contrasts related to each of the typologies of library: the libraries of public universities obtain better results, followed by libraries of public polytechnic institutes. The libraries of the private universities are in third place and, lastly, appear the libraries of the private polytechnic institutes.

In such an evaluation and in order to understand the reason for certain phenomena, it is always necessary to pay attention to the environment in which they are produced, as well as the most obvious particularities and needs. And this may include economic and contextual factors related to the institution in which the library operates, as well as those related to decision-making, human resources qualification, policies adopted, opportunities and constraints of various kinds, namely financial, size, organizational structure, degree of technical expertise and target audience.

Interpretation of results can obviously be subjective, however, it is recommended that institutions should take into account the factors necessary for the development of these OPAC and IR platforms to achieve a service of quality to their user community with effective results, protecting, at the same time, the image and credibility of the institution.

References

[1] Agenjo Bullón, X., & Hernández Carrascal, F. (2010). *La biblioteca virtual : función y planteamiento*. http://eprints.rclis.org/14352/1/La_biblioteca_virtual_final.pdf

[2] Alonso Arévalo, J., & Echeverría Cubillas, M. J., & Martín Cerro, S. (1999). La gestión de las bibliotecas universitarias:indicadores para su evaluación. *Seminario: Indicadores en la Universidad: Información y Decisiones*. Universidad de León. http://eprints.rclis.org/4285/

[3] Anderson, R. (2005).The (uncertain) Future of Libraries in a Google world. In *Libraries and Google*. Haworth Information Press.

[4] *Bethesda Statement on Open Access Publishing* (2003). http://www.earlham.edu/~peters/fos/bethesda.htm

[5] Brophy, J., & Bawden, D (2005). Is Google enough? Comparison of an internet search engine with academic library resources. *Aslib Proceedings: New Information Perspectives*. Vol. 57 (6).

[6] Budapest Open Access Initiative (2002). http://www.budapestopenaccessinitiative.org/

[7] Calvi, L., & Geudens, A. (2008). Expert evaluation of an institutional repository. In *Third International Conference On Open Repositories*. OR08 Publications. https://limo.libis.be/primo-explore/fulldisplay?docid=LIRIAS1701150&context=L&vid=Lirias&search_scope=Lirias&tab=default_tab&lang=en_US&fromSitemap=1

[8] Chambers, Sally, ed. lit. (2013). *Catalogue 2.0 : the future of the library catalogue*. Facet Publishing

[9] Codina, L. (2000). Evaluación de recursos digitales en línea : conceptos, indicadores y métodos. *Revista Española de Documentación Científica*, Vol. 23 (1). http://redc.revistas.csic.es/index.php/redc/article/view/315/479

[10] Egger Sider, F., & Devine, J. (2005). Google, the invisible web, and librarians. In *Libraries and Google*. Haworth Information Press

[11] García Melero, L. Á. (2009).La biblioteca digital revisitada. *Boletín de la ANABAD*. http://eprints.rclis.org/13628/

[12] International Organization for Standardization (ISO). (2012). *ISO 14721:2012 : Space data and information transfer systems - Open archival information system (OAIS) - Reference model.* http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=57284

[13] Jasek, C. (2004).*How to design library web sites to maximize usability*. Elsevier. http://digital.csic.es/bitstream/10261/2926/1/howtodesign%5B1%5D.pdf

[14] Játiva Miralles, V. (2004). Indicadores de calidad aplicables al análisis, evaluación y comparación de OPACs. *El profesional de la información,* Vol. 13 (1) http://eprints.rclis.org/19499/1/3.pdf

[15] Max-Planck Gesellshaft (2003). *Berlin Declaration on Open Access to knowledge in the sciences and humanities*. http://openaccess.mpg.de/Berlin-Declaration

[16] Moscoso Castro, P., & García Ortiz, F. (2008).Mensajes de error e información en los catálogos en línea de acceso público. *Revista Española de Documentación Científica,* 31. http://redc.revistas.csic.es/index.php/redc/article/viewFile/412/424

[17] Nielsen, J. (2006). *Designing web usability*. New Riders

[18] Orduña Malea, E. (2011). Visibilidad de los repositorios institucionales argentinos en la Web: Indicadores y buenas prácticas. In *2º Taller de Indicadores de Evaluación de Bibliotecas*, La Plata, Argentina. http://eprints.rclis.org/17569/

[19] Pestana, O. (2001). Elementos para uma avaliação de fontes de informação na Internet. Páginas a&b, 6

[20] Poll, R., & Te Boekhorst, P. (1996). *Measuring quality : international guidelines for performance measuring in Academic Libraries*. K.G. Saur

[21] Price, K., & Havergal, V, ed. lit. (2011). *E-books in libraries : a practical guide*. Facet Publishing.

[22] Saracevic, Tefko (2000). Digital library evaluation : toward an evolution of concepts. *Library Trends*, Vol. 49 (3).

[23] Serrano Vicente, R., & Melero, R., & Abadal, E. (2014). Indicadores para la evaluación de repositorios institucionales de acceso abierto. *Anales de Documentación*, Vol. 17 (2). http://www.redalyc.org/articulo.oa?id=63532718002

[24] Suber, P. (2012).*Open Access*.The MIT Press

[25] Thomas, C., & Mcdonald, R. (2008). In search of a standardized model for institutional repository assessment or how can we compare Institutional Repositories? *Proceedings of the ARL 2008 Assessment Conference*, Vol. 3 (10). http://escholarship.org/uc/item/9w1910rv

[26] Walsh, A. (2012). *Using mobile technology to deliver library services : a handbook.* Facet Publishing