Qualitative and Quantitative Methods in Libraries (QQML) 7: 481–487, 2018

From the Institutional Repository to a CRIS system: what challenges?

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Abstract: This article intends to present and reflect on the challenges of adopting a current research information system (CRIS) with the existence of an institutional repository (IR).
Higher education institutions, and its research centers, are facing increasingly needs to obtain information on the research undertaken and their results and performance. Most of the times, the answer has been given partly from the IR. The aggregation and availability of publications in one single place has helped to respond more easily to internal issues and external demands from evaluation and funding agencies, especially regarding open access publications.
However, needs have increased: research centers and higher education institutions need relevant information for strategic decision-making and guidance in such demanding times. Besides, institutions and researchers must be very responsive to the open access challenges brought by national policies.
This study pretends to share and analyze the main challenges that must be aware when adopting or implementing a CRIS if the community has already an IR.
The main concerns relate mainly to technological issues of interoperability that will make life easier for researchers: to deposit once and to reuse multiple times. There are also challenges in terms of the continuity of the repositories that will have to reinvent themselves in this new context.
Raising awareness and training issues for researchers and modeling processes at the institutional level are also important in facilitating the research management process and delivering successful results for the institution.

Keywords: Current Research Information System, Institutional Repository, Information Management, Research Management, Open Access

1. Introduction

IR has been the main tool supporting a researcher's activities. It is a key part in supporting the management of scientific production in universities, the

Received: 2.5.2018 / Accepted: 28.5.2018 ISSN 2241-1925

traditionally referred to as the "research lifecycle" (Pinto & Fernandes, 2011; Richardson & Wolski, 2012).

These systems have the ability to collect and preserve the scientific outputs and foster scientific communication by providing the open access option to its contents.

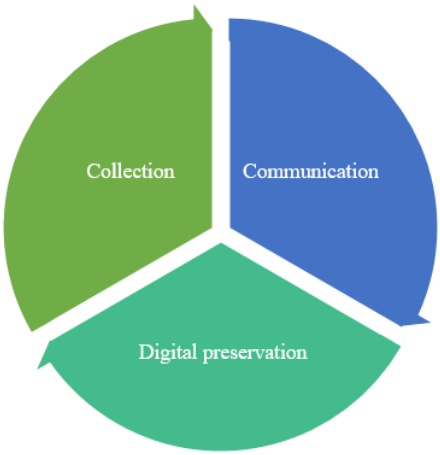

Figure 1 – Major roles and assets played by IR.

The IR has become essential in scholarly landscape because it fosters and maximize the access to research outputs and help to improve the pace of research and the creation of knowledge (Teja Koler-Povh, Matjaž Mikoš, & Turk, 2014).

Increasingly, the assessment of a researcher or institution performance rest on their outputs, mainly their publications.

Funding agencies had become more aware of the importance of Open Access (OA), primarily in public funding projects and begun to implement OA policies regarding those outcomes. Many of the outputs of public funding projects must become available by archiving in repositories (green OA).

Many major funders, national and international, are requiring open access publications and also started to advise the intention of extending to data because they are encouraging the grant holders to submit data management plans (Richardson & Wolski, 2012).

The research management is also essential for the strategic development and decision-making. The actual context has become more and more demanding

concerning these issues. The research institutions must collect and manage all the data and the associated workflow in order to accomplish all the demands mentioned above.

The CRIS emerged due to two main reasons: the increasing requirements about an institutions research landscape and the need of simplify the researcher's management of publications and curriculum vitae. Many universities has adopted a CRIS simultaneous to the IR because these two systems together can accomplish the challenges that universities and researchers are facing (Amante, M. J., Lopes, S., Marçal, B., & Segurado, T., 2015).

2. From the IR to a CRIS

The Universidade Católica Portuguesa (UCP) is a Portuguese university and decentralized in three Regional Centers (Braga, Porto and Viseu) and the Head Quarter, Lisboa.

It is an academic and administrative unit, without prejudice to the diversity resulting from decentralization. The Regional Center, which can cover one or more poles, consists of a minimum of three schools or courses, integrated in a project developed according to the environment in which they are inserted.

There are currently 15 basic teaching and research units and 2 similar departments; some of the units develop their activities in more than one Regional Center. The Regional Centers, in turn, may have one or more poles or campuses located in the same city or in different locations.

The UCP adopted an IR, named VERITATI, in 2010 and presented to the academic community during the celebration of the International Open Access Week in October that year (Pinto & Fernandes, 2011).

Eight years after, the VERITATI has more than 20.000 documents, including thesis and dissertations. Nevertheless, the research output of UCP is higher so we still have the need to gather information and use other systems in order to have valuable and exhaustive information.

The IR still do not have all the publications because of the multiple systems and platforms that researchers have to submit their scientific outputs: the IR, the research centers/faculties or department's webpage or database, the CV national platform, the ORCID registration, the institutional financial and/or the institutional project management system and the funding agencies platform.
In order to simplify and reuse information so the researcher should only submit once but reuse many times, so the answer is connecting all these systems (Lopes, 2017).

Besides, the higher education institutions need more accurate and comprehensive information about the research lifecycle and need to aggregate all the dispersive information of all stages.

The implementation of a CRIS in the UCP has the main objective of having a comprehensive, integrated and optimized management of the scientific research lifecycle in the university.

The concept of a CRIS started as a system for the purpose of storing and extracting information on research. Yet, its evolution over time makes it central to the management of all scientific research activity of a university:

- Help and improve the work of researchers (simplification of processes and systems, reuse of information, management of scientific production and their indicators);
- Improve the organizational management ("governance and value for money"), allowing the efficient administration about researchers (their CVs, scientific and academic production, research and knowledge transfer, entrepreneurship, among others), projects, financing, organizations, equipment, patents and publications (EUROCRIS, 2018; Schöpfel, Prost, & Rebouillat, 2017).

Figure 2 – Major roles and assets about a CRIS system.

Comparing with an IR, a CRIS system brings different assets to the institution, so they are equally components of the research landscape. A CRIS will help the registry and dissemination of its research information and publications because it connects with the IR and the other mentioned systems, can synchronize with

ORCID or import data from another system. Forward, the research will have only one-step for all the ending uses of that information. It will simplify the project management and the transfer of knowledge because of the association done with the outputs (publications). The institution will have accurate information in order to make strategic decisions and create services for the researchers. In addition, it will automatize and retrieve vital and customized information to use in research evaluation reports.

3. Exploring Main Challenges and Questions

As the IR and CRIS are not overlapped systems but complementary towards the research management and scholarly communication, the efforts and results achieved with IR are valuable to the implementation of a CRIS.

According to Nurminen (2014), integrating an IR with a CRIS into a single system, like extending the IR to a CRIS like DSpace-CRIS, would bring enormous advantages but also many issues, especially related to user interfaces and workflow developments about pre- and post- award managements.

Many institutions adopted commercial CRIS solutions because of the easy publication data import, flexible workflows and comprehensive reports. However, the need for the vendor intervention is a huge limitation to future customization.

The lack of human and technical resources is the large-scale limitation in "in-house" software development. Additionally, it is demanding to guarantee formal data structure that ensures data integrity and avoids multiples instances of the same attribute values. Related to technical issues, Nurminen (2014) also argues about the importance of a homogeneous and local interface to the end-user when facing a heterogeneous distributed CRIS and repositories.

One of the main challenges found in literature review is concerned to relationships. The research output should be understood in context. It means that a publication or dataset is related to the research projects, persons and their roles, organizational units, research facilities and equipment and funding. The establishment of an efficient data processing and the creation of a logical and a flexible and comprehensive relationship management allows the data integrity and the successful workflow. Nevertheless, it is a hard task in developing a CRIS (Jeffery & Asserson, 2009; Schöpfel et al., 2017).

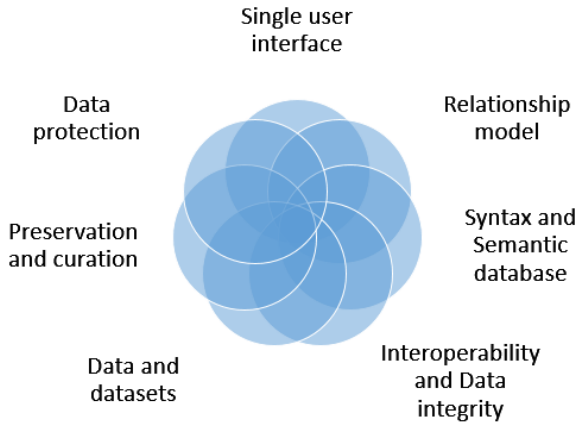

Figure 3 – Main concerns and challenges when adopting or developing a CRIS.

Further, one of the most concerned challenges of implementing a CRIS relates to select the best option adequate to your organizational context and needs (Nurminen, 2014).

Besides that, the institution faces another important issue applying preservation and curation of the research output (technical management legal and economic dimension) and concerning the "freedom of information" and the "data protection" or "privacy protection". These are also relevant questions when you are implementing a comprehensive and interoperable system regarding research development (Jeffery & Asserson, 2009).

4. Conclusions

IR is a key part of the research output management by allowing the researcher to respond to the funders open access requirements. The Library management of the IR provides a validation and guarantee the metadata quality.

CRIS are becoming more and more relevant to monitor research activities and outputs, providing useful information of institutional performance and giving insight for budget allocation, collaboration and funding opportunities, etc.

Proprietary CRIS are expensive and often compete with IR. Those are "closed systems", not allow the institution to customize without the vendor intervention. The development of a software CRIS "in-house", requires an extreme compliance with the internal and external systems and data models.

The infrastructure of the data model, the syntactic and semantic structure, the relationship patterns are technical challenges that enhances the interoperability

and the data integrity. The data protection must not be forgotten and will increase the challenge of foster the open access. Finally, the single interface for the end-user is determinant factor to the success of the CRIS.

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