FINAL REPORT

EUNIS – EUROCRIS JOINT SURVEY ON CRIS AND IR

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Lígia Ribeiro has been Principal Researcher at the Faculty of Engineering of the University of Porto since 2002. She was pro-rector at the University of Porto between 2006 and 2014, being responsible for ICT. Between 2004 and 2006, she was President of EUNIS, after being Vice-President for two years. She is presently a member of the EUNIS Board of Directors.

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Pablo de Castro works as Open Access Project Officer at LIBER, the Association of European Research Libraries in The Hague. He is an expert in Open Access and research information workflows and management systems, an area he›s worked at for GrandIR Ltd and the EDINA National Data Centre in Edinburgh. MSc/BSc in Physics from UCM, he has a background as Institutional Repository manager for the Spanish National Research Council (CSIC). Besides being an ORCID Ambassador, Pablo is also serving on the euroCRIS Board as leader of the CRIS/IR Interoperability Task Group

EXECUTIVE SUMMARY

The rising strategic importance of Current Research Information Systems (CRISs) and Institutional Repositories (IRs) for higher education and research institutions relates to the need to foster research and innovation and to provide a faster and broader technology transfer to industry and society. These are critical factors for global competitiveness, and the increasing competition among institutions to increase and disseminate excellence in research is another area where these systems provide a key contribution. Additional important elements with a strong impact on such strategic evolution are the new policies on Open Access, National Research Assessment and Research Funding. It is indeed from 2003 onwards that the increase in the number of repositories becomes apparent, together with the rise of the Open Access movement, as well as from 2010 on when new policies started to be implemented which affected the adoption of CRIS systems: %83 of the respondents stated that they are following Open Access policies within their own institutions.

Today we see CRISs acting as repositories, repositories with extended data models, a wide range of interoperability features between co-existing CRISs and repositories and even a new species in the ecosystem that claims to be both a repository and a CRIS.

The scope of this EUNIS and euroCRIS joint initiative, the CRIS/IR survey, was to collect information on CRIS and IR technological solutions that support Research and to analyse their links to other systems used at Higher Education Institutions: how they interoperate, which data and metadata are made available and how these are being used.

The CRIS/IR survey, which was launched in April 2015, was based on a previous initiative to collect information on the CRIS and IR infrastructure available in Portugal. The survey was distributed by EUNIS and euroCRIS via a number of national and international mailing lists and was open until mid-September 2015.

There was wide participation from the community, and we collected 84 full responses from 20 different countries.

The two main questions the Survey tried to answer were: are CRISs gradually replacing IRs? Are the two systems overlapping in their functionalities? From the results we have collected, both questions seem to get a negative answer. The two systems are clearly complementary: while IRs are the preferred choice for managing research publications and dissertations and thesis, CRISs are regularly chosen for managing the institutional research information as a whole including metadata for research papers.

Through the analysis of the collected results we can observe that %62 of the surveyed institutions have both a CRIS and an IR and that %18 of them use the same software application.

From the answers obtained, it is also clear that the range of databases, programming languages and frameworks used is very wide, with Oracle and MySQL as preferred databases and Java as the most frequently chosen programming language CRIS systems hold a large variety of contents, the most common being metadata for research publications (%81), projects (%76) and reporting features (%75).

Not surprisingly IRs mainly store both metadata and full-text for publications (%96) and dissertations and thesis (%86). Among the available repository solutions, DSpace is the most frequently adopted one, being used in %56 of the cases.

When analysing the interoperability aspects and the links between CRISs, IRs and external systems we noticed that: (i) almost %65 of the institutions have linked their CRIS and their IR, so both platforms are perceived to be closely

related; (ii) when it comes to interoperability with legacy systems such as Finance and HR, CRISs are the preferred system to link to because of the data and information contained in them; (iii) there is still very little integration between Learning Management Systems and either CRISs or IRs.

The analysis also showed that the most frequently adopted standards and protocols are the OAI-PMH protocol (%50), the CERIF format (%41) and ORCID (%32).

Another important aspect the survey collected information on was the management of CRISs systems. This will usually vary from one institution to the next, but we observed that Libraries and the Research & Innovation or Research & Development units have a prominent role on the different aspects of CRIS management.

A key conclusion of the replies we have collected to the survey is that both CRISs and IRs are considered valuable tools to support Institutions in the research assessment exercises for both university and author evaluation.

86 Respondents

20 countries

INTRODUCTION

Within the framework of a Partnership Agreement signed in 2014, EUNIS, the European University Information Systems Organization (www.eunis.org), and euroCRIS, the European Organization for International Research Information (www.eurocris.org) launched a joint survey aiming to collect as much data as possible on the information systems currently in use in Europe to support the Research Area.

Current Research Information Systems (CRISs) and Institutional Repositories (IRs) are two main components of the Research Information Management realm.

The rising strategic importance of CRISs and IRs for higher education and research institutions is linked to the need of fostering research and innovation. Providing faster and broader technology transfer to industry and society – a critical factor for global competitiveness – and supporting the increasing competition across institutions to increase and communicate excellence in research are additional relevant factors.

This survey aimed to ascertain how institutions through European countries are using their CRISs and IRs.

For the context of the survey the definition of a CRIS given by euroCRIS was adopted: a Current Research Information System, commonly known as "CRIS", is any informational tool dedicated to provide access to and disseminate research information. A CRIS consists of a data model describing objects of interest to R&D and a tool or set of tools to manage the data. CRISs implemented at European institutions are very often based on the CERIF data model (CERIF: Common European Research Information Format), meaning their data model architecture is both standard and interoperable. CERIF is the standard recommended by the European Commission to all EU Member States and it is supported, maintained and promoted by euroCRIS.

For IRs the following definition was adopted: an Institutional Repository commonly denoted by "IR", is a digital collection of research outputs (mainly publications and datasets) aiming to collect, preserve and disseminate the intellectual output of a higher education or research institution.

Both the CRIS and repository communities have grown remarkably during these last few years. The systems' features have gradually been extended and their role within the institutions is permanently evolving as an answer to new policies on Open Access, National Assessment and Research Funding. As a result of this evolution, we often see now CRISs acting as repositories, CRIS-like repositories with extended data models, a wide range of interoperability features between co-existing CRISs and repositories and even a new species in the ecosystem that claims to be both a repository and a CRIS.

The scope of this joint EUNIS and euroCRIS CRIS/IR survey, was to collect information on CRIS and IR technical solutions that support Research and to analyse their relations with other systems used within Higher Education Institutions: how they interoperate, which data and metadata are available and how they are used.

THE CRIS/IR SURVEY

The CRIS/IR survey was prepared by a joint EUNIS and euro-CRIS team including Lígia Ribeiro (EUNIS), Michelle Mennielli (EUNIS and euroCRIS), and Pablo de Castro (euroCRIS) based on a previous collaboration between FCT/FCCN, University of Porto (www.up.pt) and euroCRIS for carrying out a Portuguese CRIS survey in 2013.

The free open source software survey tool LimeSurvey was used to support this CRIS/IR survey, which was available at https://inqueritos.up.pt/limesurvey/index.php/727886/lang-en, between 7th April and 14th September 2015.
The survey was announced via email to EUNIS and euroCRIS members, and further distributed via local mailing lists to members of national associations like AMUE (Agence de Mutualisation des Universités et Établissements, www.amue.fr) in France, SURF (www.surf.nl) in the Netherlands, CINECA (www.cineca.it) in Italy and FCT/FCCN (National Foundation for Science and Technology/ Foundation for National Scientific Computation, www.fccn.pt) in Portugal. It was also announced on the websites of both EUNIS and euroCRIS.

The preliminary results of the CRIS/IR survey were presented in June 2015 at the 21st Annual EUNIS Congress "The Journey to Discovery" at Abertay University in Dundee, UK, http://www.eunis.org/eunis2015/wp-content/uploads/sites/3/2015/06/Parallel-2-Track-4-Paper-87-Surveying-CRISs-and-IRs-across-Europe.pdf

SURVEY STRUCTURE

The survey was structured in two main sections. The first of them aimed to collect a picture of the present CRIS implementation level at universities and research centres in Europe. The second section addressed IR systems.
The survey contained a rather comprehensive set of questions both for CRISs and IRs. Not every question was aimed to be applicable to every available system, since only the most advanced systems would be able to cover all the analyzed areas. The key questions to be answered for collecting the picture of CRIS and IR implementations were subsequently marked as mandatory, while the other ones could be left blank where not applicable.

In order to collect as wide an insight as possible, the survey addressed both fully operational systems and those under implementation or even under design, asking respondents to specify at which stage of implementation their systems were and allowing them to provide information that would not be made public. A checkbox was thus included at the end of the survey for those institutions willing to appear on the euroCRIS Directory of Institutional Research Systems (DRIS, http://dspacecris.eurocris.org/simple-search?query=&location=crisdris) to specifically agree with sharing the information they were providing.
The core structure of the survey is presented in Annex A of this report.

Both parts of the survey should ideally be filled in by a single institutional representative. However, the potential need to involve more than one institutional representative was taken into consideration.
The survey results are presented in the following sections.

SURVEY RESULTS

GEOGRAPHIC DISTRIBUTION OF THE COLLECTED ANSWERS

The participation of the community in the CRIS/IR survey was remarkably successful. The number of views, which was monitored from the survey platform, was around one thousand, with a tenth of them leading to submitted answers. This provides evidence of the interest arisen by the initiative and makes the survey results significant.

The responses considered for analysis amounted to 84, arriving from 20 different countries.

As the survey was designed for European institutions, answers collected from countries outside Europe such as Colombia were not included in the analysis. Likewise, answers arrived from organizations other than higher education or research institutions, e.g. international projects such as EPOS (European Plate Observing System) were not taken into account either.

For the purpose of the analysis it was also kept in mind that institutions already included in the euroCRIS DRIS Directory could disregard the survey, even if some of them actually provided updated information. The same applies to Portuguese institutions that had already answered the previous 2013 survey that led to the current one.

The geographic distribution of the survey answers is shown on Figure 1 below. The number of institutions that provided their information from Norway, Italy, France, Finland, the United Kingdom and Portugal were all above average.

The average time these institutions took to fill in the survey was 48 minutes, with an average of 17 minutes for Section I on CRIS systems and 27 minutes for Section II on institutional repositories. The remaining time was used for the institution identification and for finishing the survey.
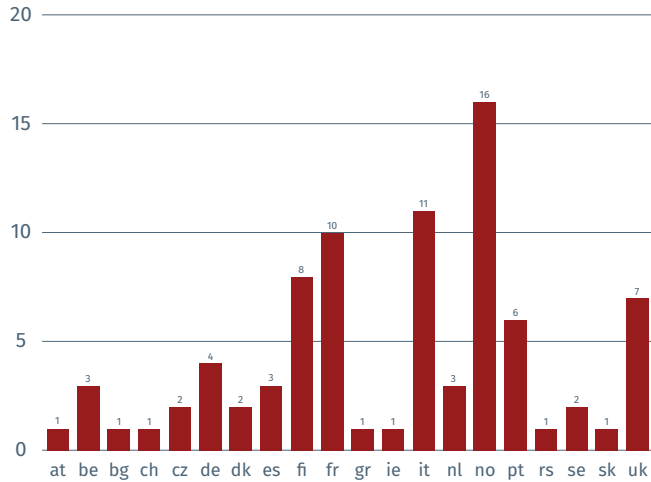

TABLE1: GEOGRAPHIC DISTRIBUTION OF RESPONDENTS

SURVEY RESULTS

AVAILABILITY OF CRIS AND IR SYSTEMS

Figure 2 below shows the percentage of Current Research Information Systems and Institutional Repositories among the respondents. It is interesting to observe that %62 of institutions have both a CRIS and an IR.

In %18 of the cases where both CRIS and IR systems are available a single software platform is used for both (Figure 3).
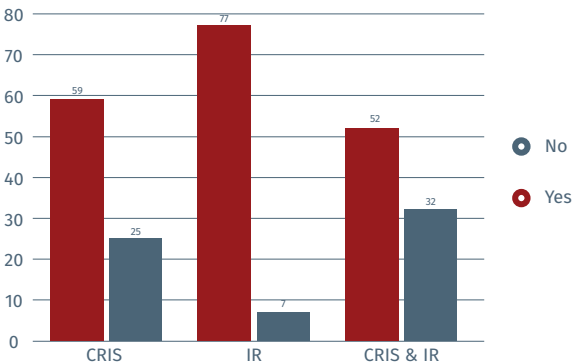
The most frequently used CRIS systems where the same platform supports both the CRIS and the IR are Elsevier›s Pure and CINECA›s IRIS. Several in-house-built systems are also fit for this double role. This is also the case for CRIStin, the national Current Research Information System in Norway (Figure 4).

When it comes to CRIS providers, in-house-built systems prove to be the most frequent case among the respondents who answered this specific question (Figure 5), although commercial systems like Elsevier›s Pure and Thomson Reuters›s Converis are also widely implemented. Another well-represented category is the one made up by systems developed by Consortia or similar organisations, involving institutions themselves and/or the Ministries of Science and Education, e.g. CINECA›s IRIS and the Norwegian CRIStin.
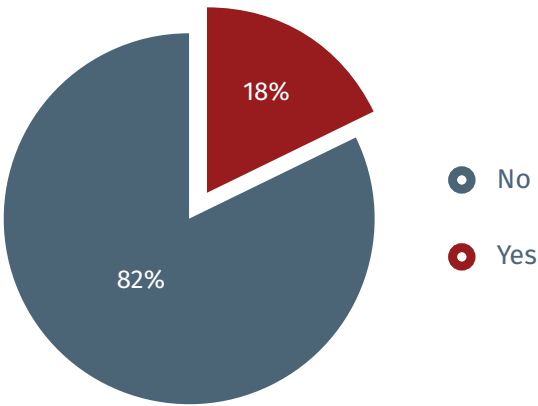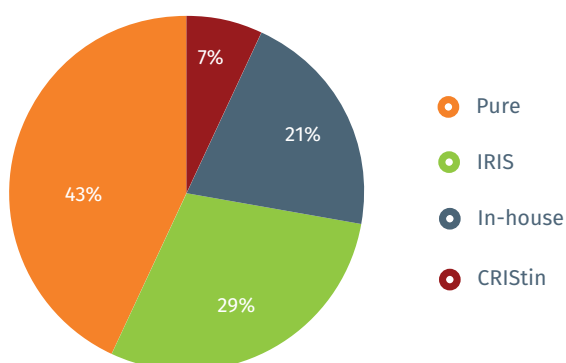

TABLE2: CRIS, IR AND CRIS & IR USAGE

TABLE3: SAME CRIS AND IR PLATFORM

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SURVEY RESULTS

TABLE4: SAME PLATTFORM FOR CRIS AND IR

Pure — 43%
IRIS — 29%
In-house — 21%
CRIStin — 7%

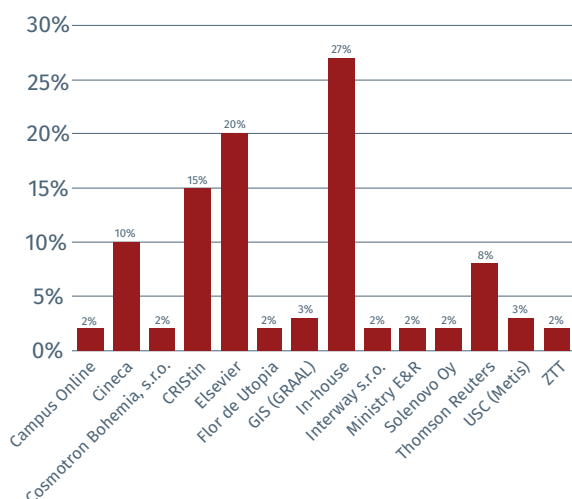## CRIS AND IR DATE OF LAUNCH

The number of institutional CRIS and repositories launched before 2000 is relatively small. The increase in the number of available repositories from 2003 onwards is quite evident, in line with the dynamics of the open access movement. Although some CRIS systems became operational as early as 1993, a new momentum took place around 2010. Over the past five years both CRISs and IRs seem to be clearly on the rise, with an increasing tendency towards the adoption of CRIS systems. This may be the result of the increasing needs of the institutions with regard to the implementation of new policies on Open Access, National Assessment and Research Funding. The year of launch for the CRISs and IRs whose data have been collected – covering from 1993 onwards – is shown on Figure 6.
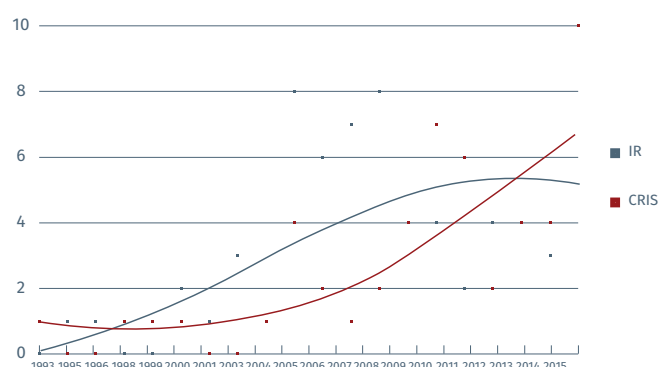

FIGURE 5 CRIS PROVIDERS

FIGURE 6 DATE OF LAUNCH FOR CRISs & IRs

CRIS SYSTEM FEATURES

CRIS TECHNOLOGIES

Not all institutions with in-house built CRIS systems or CRISs provided by national consortia answered the question about the technologies used by these systems.

From the answers obtained, it is apparent that the use of databases, programming languages and frameworks is wide-ranging. When it comes to databases, Oracle and MySQL are predominant, while Java is the most frequent programming language.

MAIN CRIS FUNCTIONALITIES

CRIS systems hold a large variety of contents, the most common being metadata for research publications (%81). It is interesting to see that full-text for research publications is also already available in more than %50 of the CRIS systems surveyed, as well as research data. Project information is available in a large fraction of the CRISs (%76) as it is also the case for reporting features (%75). Support for researchers› curricula (%53) and researchers› activity reports (%49) are less significant CRIS features, while the support for researchers› assessment (%31) seems to be just starting. Research analytics seems to be a more recent feature too, while bibliometric data is available in %46 of the systems. The use of CRIS systems for managing article processing charges (APC) or publication fees is yet emerging.

With regard to other research information management areas, data collection in CRIS systems on the research output of MSc and PhD students is less than %50, while information on research departments and/or units and researchers› webpages are present in %56 and %49 of the cases respectively.
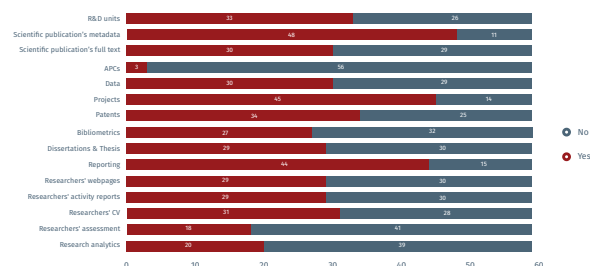

FIGURE 7 MAIN CRIS FUNCTIONALITIES

CRIS INTEROPERABILITY

LINKS TO INTERNAL SYSTEMS

As shown in Figure 8 below, the links between CRISs and Human Resources Management systems happen to be rather common (%68) as well as the links to Institutional Repositories (%63). Compared to these, the CRIS connection with student and with financial management systems is half as common. The liaison with library management systems is not a frequent one (%8), whereas the connection to learning management systems is practically non-existent.

Besides the already mentioned ones, respondents to the survey pointed out some connections to other systems, such as those for identity management, organisational management, project management, evaluation management, content management (CMS), research equipment databases, data warehouses, awards and honours, academic partnerships, appointments, grant proposals and research portals.
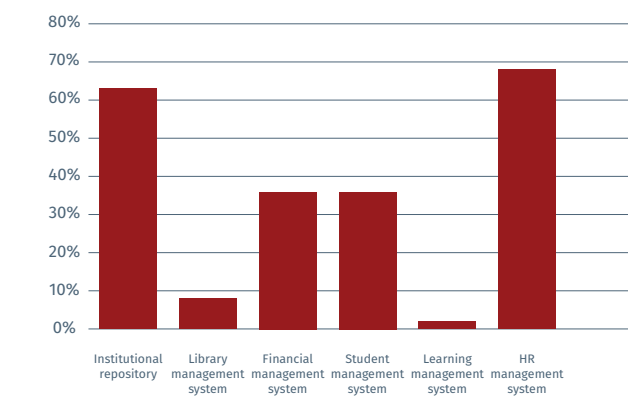
CRIS SYSTEM FEATURES

FIGURE 8 LINKS TO INTERNAL SYSTEMS

These links are relatively rare as shown in Figure 9, with the connection to research grant management systems being the most frequently reported one (%17). Is it worth noting that some connections for this type of systems are available internally, as mentioned in the previous section.
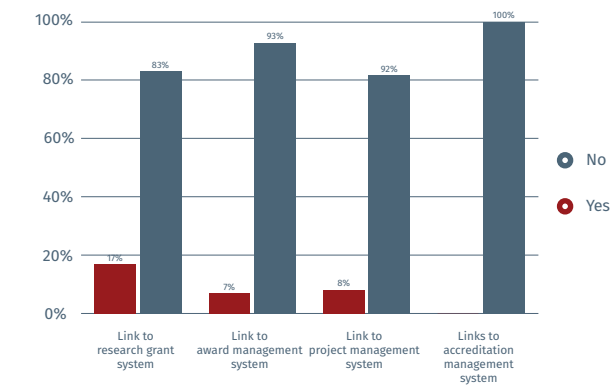

FIGURE 9 LINKS TO EXTERNAL SYSTEMS

LINKS TO EXTERNAL SYSTEMS

When examining the likelihood of connections between the CRIS and systems external to the institution, the survey questions focused on research grant/award management, project management and accreditation management systems.

CRIS SYSTEM FEATURES

PROTOCOLS, STANDARDS AND VOCABULARIES

As shown in Figure 10, more than %50 of the surveyed CRISs support the OAI-PMH protocol, while the CERIF format (%41) and the ORCID identification system (%32) are the next two most commonly applied standards. Shibboleth is available for %19 of the cases. Regarding vocabularies, CORDIS (%5) and FOS (%3) are the most widely used ones – even if not too frequently – in the domain of scientific area classification, as well as CASRAI (%5).

As for the use of CERIF versions, version 1.5 is the most frequently mentioned, but versions 1.4 ,1.3 and 1.6 are also cited.
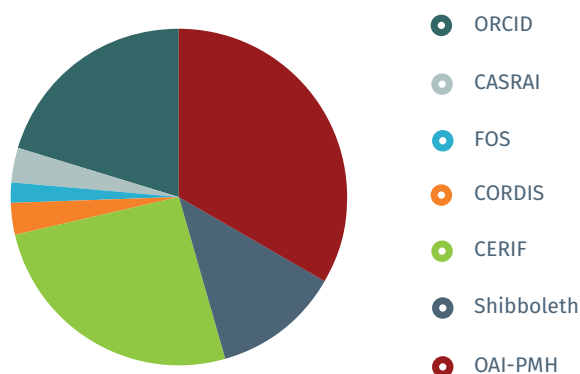

- ◉ ORCID
- ◉ CASRAI
- ◉ FOS
- ◉ CORDIS
- ◉ CERIF
- ◉ Shibboleth
- ◉ OAI-PMH

FIGURE 10 PROTOCOLS, STANDARDS AND VOCABULARIES

CRIS MANAGEMENT

The management of CRIS systems normally involves several departments or services, and only occasionally the board of directors or the top management of the institution (BoD). Besides the global management of the CRIS the survey looked into aspects related with strategic CRIS decisions, data quality and helpline.

The landscape arising from the collected responses is quite varied. Typically the areas involved in CRIS management are Information and Communication Technologies (ICT), Information Management (IM), Libraries (Lib.), Research and Innovation (R&I) and Quality or Evaluation. In several cases, ICT, Libraries and R&I units work together on a specific aspect of CRIS management. It›s also frequently the case for the four CRIS management-related services covered by the survey that even though a specific institutional unit may primarily be responsible for them, other ones may also be involved.

- ◉ Institutional service responsible for CRIS data quality
- ◉ Instutional service responsible for CRIS helpline
- ◉ Institutional service responsible for strategic CRIS decisions
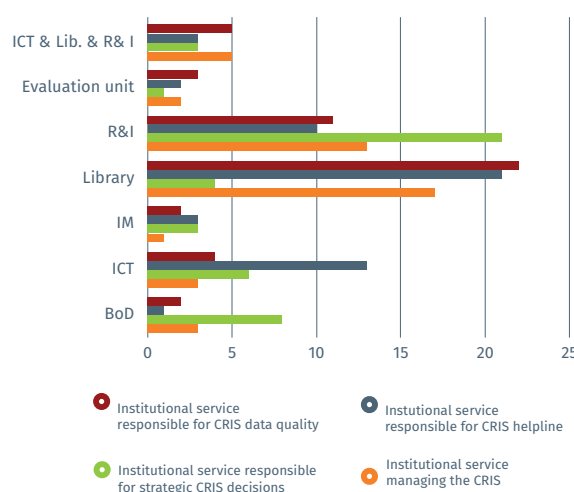- ◉ Institutional service managing the CRIS

FIGURE 11 CRIS MANAGEMENT

IR TECHNOLOGIES

It is also important to note that several universities have a distributed organization with faculties or departments having an important role in the management of CRIS. In these cases the roles performed centrally may be somewhat different from the roles assumed at faculty level.

The overall picture is provided on Figure 11. Libraries and the Research & Innovation or Research & Development units have a prominent role on the different aspects of CRIS management, while the helpline is mainly supported by the R&D units. ICT units are also often relied on, mainly to manage the CRIS or providing helpline services. For strategic CRIS decisions R&D units are the most frequently involved ones, as well as the top institutional management – mainly the Vice-Chancellor for Research occasionally together with other leadership boards.

The distribution of repository platforms resulting from the survey is shown on Figure 12 below. Most respondents (%56) mention using Dspace (including IRIS from Cineca) to support their institutional repository. In-house built IRs are used in %16 of the cases, and Eprints follows with %12. Other cited platforms are ARL, library information management system Brocade, CRIStin, Fedora, Invenio and HAL, as well as Pure (which is primarily a CRIS).

As mentioned in section 4 above on the use of CRIS and IR systems, IRIS, Pure and CRIStin are sometimes used as both CRIS and IR, as it is also the case for some in-house built systems.
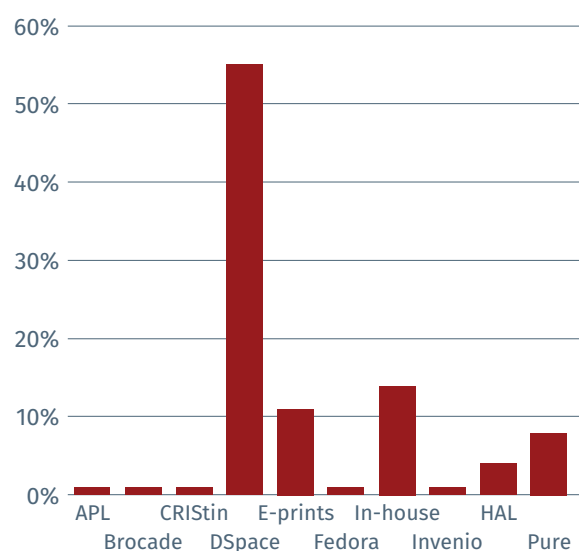

FIGURE 12 IR §PLATFORMS

OPEN ACCESS POLICIES AND MANDATES

Open Access policies are common among the survey respondents, with %83 positive answers. The number of mandates is significantly lower (%26), with some institutions mentioning having both types of principles.
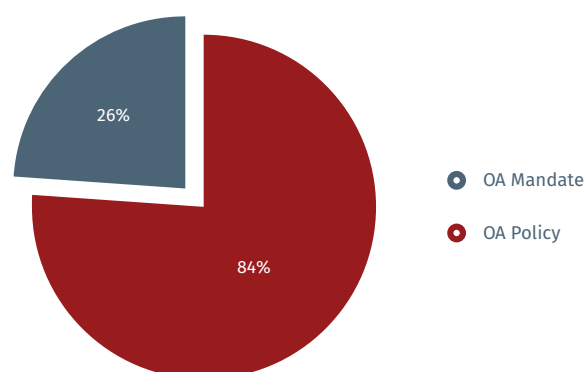

26%

84%

- OA Mandate
- OA Policy

FIGURE 13 OA POLICIES AND MANDATES

USE OF SYSTEMS OTHER THAN IRs TO STORE RESEARCH OUTPUTS

33 survey respondents answered affirmatively when asked about the use of other systems besides the institutional repository to store research outputs.

The most frequently mentioned additional systems were CRIS systems, specific systems for patents and thesis and national repositories. Other repositories – mostly discipline-specific ones – are sometimes used mainly at departmental or laboratory level. Research data and research reports were very rarely mentioned to be stored in specific systems.

CONTENT TYPES STORED IN CRISs AND IRs

Not surprisingly IRs store mainly research publications (%96) and dissertations and thesis (%86). Learning objects and datasets are less common, with %22 and %18 positive answers among the respondents, as shown on Figure 14.

Other content types were also mentioned, such as grey literature, artistic, cultural and multimedia works and patents, as well as – but less frequently – professional and research lectures, blog entries, grants, institutional documents, OERs, and software.

A comparison between the content types stored in CRISs and IRs is shown in Figure 15. This graph provides answers to two of the most pressing questions raised in the last few years, namely whether CRISs are replacing IRs and whether or not the two systems overlap in their functionalities. Both questions seem to get a negative answer.

The two systems are clearly complementary: while IRs are the preferred ones for managing full-text publications and dissertations and thesis, CRISs are regularly chosen for managing all the institutional research information data, also including metadata for research publications.

It is worth noticing that datasets are managed in a still very small percentage of institutions and that the only entity that sees a certain overlapping is dissertations and thesis.
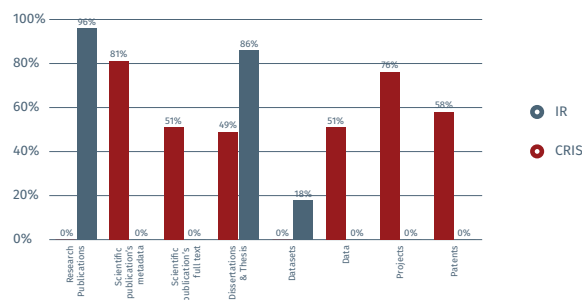

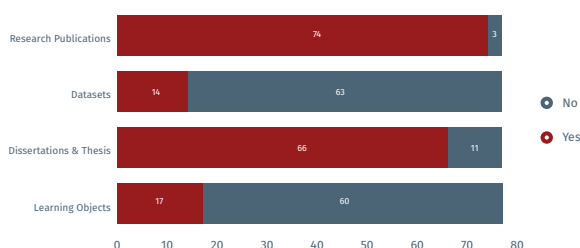**FIGURE 15 TYPE OF CONTENTS STORED IN CRISs AND IRs**

FIGURE 14 TYPE OF CONTENTS STORED IN IRs

IR INTEROPERABILITY

Institutional repositories also hold links to other institutional services for sharing of information. However, from the responses to this survey their implementation does not reach %50 for any of these interoperability features, which are listed in Figure 16.
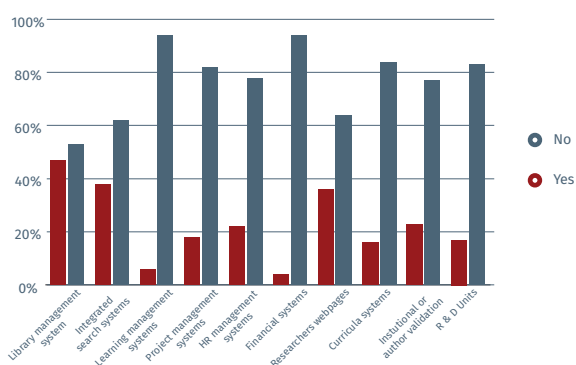

FIGURE 16 IR LINKS TO OTHER INSTITUTIONAL SERVICES

The most frequent link is to library management systems (%47), followed by integrated search systems (%38) and researchers' webpages (%36). The connection with financial systems is incipient (%4).

Of course there are also links between IRs and CRISs as mentioned previously and shown in Figure 17. Several respondents mentioned the intention to link their CRIS and IR in the short to medium term. A link to a student administration system was also pointed out.

Figure 17 provides an insight on how interoperability works within institutions. There are several interesting aspects in these results: (i) almost %65 of the institutions have linked their CRIS and their IR, so both platforms are perceived to be closely related; (ii) when it comes to interoperability with

legacy systems such as Finance and HR, CRISs are the preferred system to link because of the data and information contained in them; (iii) there is still very little integration between Learning Management Systems and either CRISs or IRs. This could subsequently be an interesting workline to devote some effort to.
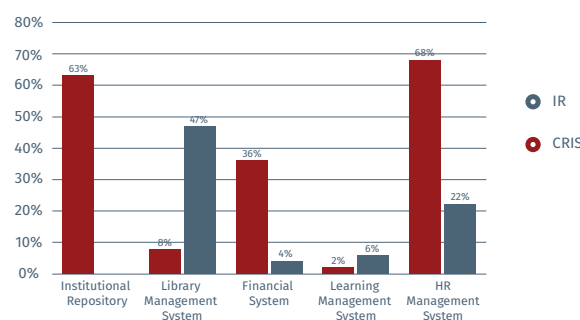

FIGURE 17 CRIS/IR LINKS TO INTERNAL SYSTEMS

OPENAIRE AND ORCID COMPLIANCE

Compliance with OpenAIRE is met by %69 of the IRs from which survey responses have been collected. As opposite to this, the use of ORCID persistent identifiers is still not very common (%23).

The ORCID implementation rates across CRISs and IRs is rather similar, as shown in Figure 19.
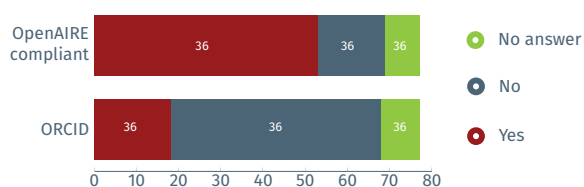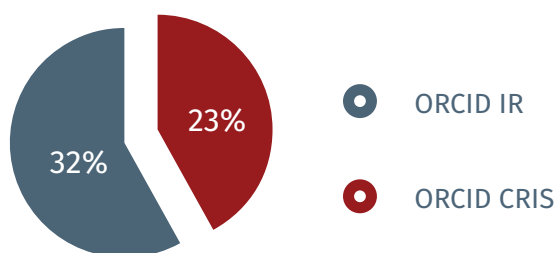

FIGURE 18 OPENAIRE AND ORCID COMPLIANCE FOR IRS

FIGURE 19 CRIS/IR ORCID ADOPTION

IR INSTITUTIONAL OR AUTHOR EVALUATION

Institutions are being increasingly compelled to internally implement assessment exercises both for overall institutional performance (including research) and for author evaluation. Furthermore, national and international bodies are asking for an increasing number of performance indicators in relation to research and innovation.

CRISs and IRs are excellent candidates to support these exercises because through those systems, Institutions can collect the data needed for the evaluation exercises, analyse those data, compare and benchmark them against historical data. As the Figures below show, those services haven't reached a high level of maturity and there is place for further implementations and enhancements, but the path seems to be clear now.

While Figure 20 shows that IRs are not yet fully exploited to provide this kind of support, neither are CRISs as shown on Figure 21. This is certainly a feature to explore so that both systems may eventually provide a useful support to these needs.
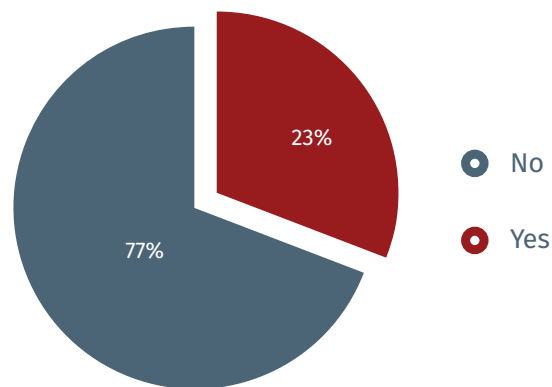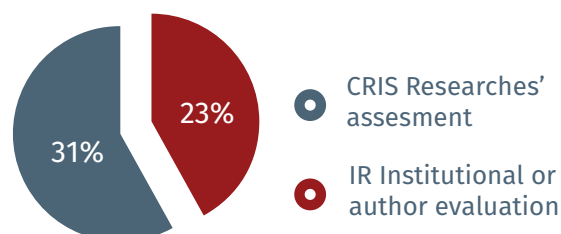

FIGURE 20 IR INSTITUTIONAL OR AUTHOR EVALUATION

FIGURE 21 CRIS/IR USAGE FOR INSTITUTIONAL OR AUTHOR EVALUATION

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ANNEX A: CORE SURVEY STRUCTURE

INSTITUTION IDENTIFI-CATION			Name of the institution URL of the institution
PART I – CRIS SURVEY	CRIS identification		Is your institution using a Current Research (Information System (CRIS Institution/company providing the CRIS Name of the CRIS Acronym of the CRIS URL for the CRIS
		Contact person for the CRIS	Name Email
	CRIS main functionalities		R&D units Scientific publication's metadata Scientific publication's full text (APC management (Article Processing Charges Research data Projects Patents Bibliometrics Dissertations and Thesis Reporting Researchers' webpages Researchers' activity reports Researchers' Curricula Vitae Researchers' assessment Research analytics Other
	CRIS Interoperability	Links to internal systems	Institutional repository Library management system Financial management system Student management system Learning management system Human Resources management system Other
		Links to internal systems	Research grant system Award management system Project management system Accreditation management system
	Protocols, Standards and Vocabularies		OAI-PMH Shibboleth CERIF CORDIS FOS CASRAI ORCID If the CRIS is compliant with CERIF, please indicate the version of CERIF

PART II – IR SURVEY	Institutional Repository Identification		Name of the repository URL of the repository Date of operation Repository Software Do you store institutional research outputs such as publications, patents or products in other systems other that the IR- If yes, which one(s)?
		Does your institution have an open access policy/mandate	Policy (Yes/No) Mandate (Yes/No) URL of the open access policy/mandate
		Contact details of the repository manager	Name Email
	Institutional Repository Content	What type of content does your Institutional Repository store	Research Publications Datasets Dissertations and Thesis Learning Objects Other
	Protocols, Standards and Vocabularies	Which other institutional services does your repository shares information with	Library Management System Integrated Search Systems Learning Management System Projects Management System Human Resources Management System Financial System Researchers Webpages Curricula Systems Institutional or Author Evaluation Research & Development Units Other
			Is your Institutional Repository OpenAIRE-compliant Does your Institutional Repository register researchers' persistent digital identifiers (ORCID) If any, please describe steps taken (or planned to take) in order to integrate IR with CRIS
DRIS			Please indicate whether you consent that the data of this survey is used for the DRIS

ANNEX B: LIST OF ACRONYMS

AMUE	Agence de Mutualisation des Universités et Établissements
APC	Article Processing Charges
BoD	Board of Directors
CERIF	Common European Research Information Format
CMS	Content Management System
CORDIS	Community Research and Development Information Service
CRIS	Current Research Information System
CRISTIN	Current Research Information System in Norway
DRIS	Directory of Research Information Systems
EPOS	European Plate Observing System
EUNIS	European University Information System Organization
FCCN	Foundation for National [Portuguese] Scientific Computation
FCT	National [Portuguese] Foundation for Science and Technology
FOS	Field of Science and Technology Classification
HR	Human Resources
ICT	Information and Communication Technologies
IM	Information Management
IR	Institutional Repository
OAI-PMH	Open Archives Initiative Protocol for Metadata Harvesting
OER	Open Educational Resources
R&I	Research and Innovation
R&D	Research & Development
URL	Uniform Resource Locator