Linking CRIS to Education

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Abstract

The paper contributes to the debate on the development and future of the CERIF model. In particular, it provides empirical elements to three questions: (a) How are existing CRIS projects connected to education systems? (b) Should the CERIF model be extended to education? (c) If so, how should this be done (entities, attributes, semantics)? The paper is based on a double methodology, an online survey with CERIF project managers and interviews with a panel of experts from euroCRIS. Survey and interviews have been carried out between February and April 2012. Results are indecisive – so far, the connection from research management systems to education related data seems not to be a priority, neither for the project managers nor for euroCRIS experts. When the systems are connected, simple data exchange between independent data silos appears to be the solution of choice. The results are discussed and perspectives for euroCRIS are suggested.

1   Introduction

The scope of current research information systems are research activities, with metadata about institutions, people (project manager, scientists...), facilities, equipments, funding bodies etc. Education is currently considered as in need of research information, not as an active stakeholder in research.

However, in many cases research is linked to education, through facilities (university campus), institutions (departments, graduate schools) and people (scholars, PhD students). Scholars may be scientists, lecturers are authors, departments are related to laboratories, and education programs may be backed by research projects. Research is also in need of education information.

On a more general level, universities have three missions, research, education and professional insertion. Activities related to financial management, human resources, investment and documentation are connected and often intertwined between research and education. Yet, those academic datasilos are not necessarily related to collective research activity.

Scientific production of knowledge reflects research and education. E-publishing and innovative teaching projects involve faculty and scientists. Evaluation focuses on both aspects, and impact measures of universities include more than research output indicators, for instance number of students or master programs, or rate of successful labour market integration. Does it make sense to separate research and education information systems?

1.1 State of the art

In her paper on research documentation at the Austrian Graz University, Diefenbach (2008) describes new software (CAMPUSonline) that "offers electronic support for the whole university's administration. Facility management is included as well as all academic and teaching issues."

Nixon (2010) mentions links between research and student systems at the University of Glasgow but does not specify the nature or importance of data exchange for the *Enrich* project. Likewise, Alroe (2008) identifies students as stakeholders for the project management of CRIS implementation but does not explain why, or how they are concerned. The Canadian CASRAI standard refers to education history but only as part of the description of people conducting research and for the generation of academic or student CV (Baker 2010).

The Italian CINECA consortium project developed an interconnected system with data on course planning, student services and student management (Bertazzoni & Zaetta 2010). Their research assets module includes "teacher" as personnel involved in research activity. Seminars are counted as part of scientific output, and the system is integrated with the universities' human resource database (Luglio 2011).

The European DRIVER project described the Academic Information Domain (AID) as one part of the CRIS architecture, with data from institutional repositories, eScience and learning management systems (Vernooy-Gerritsen 2009).

Recent JISC Research Information Management projects confirmed that universities expect CERIF to manage education, even if the initial project did not explicitly take account of related data (Bolton 2010). AVEDAS announced an integration of information on education for the 2012 release of the Converis software.

In our own communication at the Lille meeting, we argued for the integration and interconnection between research and education systems on the campus, based on specific, education-related needs such as development of programs and partnerships or recruitment (Schöpfel 2011).

1.2 Our approach

The following paper is empirical. Its objective is to contribute to the debate on the development and future of the CERIF model. Should CERIF include or support metadata on education? If so, which is the appropriate level?

New base entities (education)?

New result entities?

New second level entities (programs, diploma)?

New link entities (pers_education)?

Modifications of the semantic layer by creation of new roles, for instance for organisation units such as companies in partnership with education programs or for persons (lecturer, PhD student etc.)?

Should CERIF simply provide options for data exchange with education-related datasilos?

Another option could be a link via open access or e-repositories.

Our contribution is to provide empirical data that may be helpful for further debate, investigation and development of CERIF.

2   Methodology

The paper draws upon two complementary methodological approaches:

(1) Ten exploratory interviews with a panel of CRIS and CERIF experts from the euroCRIS community. The main purpose of these interviews is to evaluate the interest, utility, opportunity and feasibility of an educational extension of the CERIF model and to specify some options. The interviews have been conducted in a semi-structured format, by phone and/or email. The sample is composed by active people from the CERIF task group.

(2) A survey of 35 CERIF projects and implementations in thirteen European countries (United Kingdom, Scandinavia, BeNeLux, Germany...). The purpose of the survey is to provide an overview of how local (campus), regional (network), national and European current research information systems deal with metadata related to education, with special interest for the UK based projects. The project managers have been selected among the euroCRIS members and partners. The survey has been conducted online, on a server of the Lille 3 university, with information and reminders through direct email contact.

The paper presents a synthesis of both approaches. In particular, it tries to answer three questions:

(a) How are the existing CRIS projects connected to education systems?

(b) Should the CERIF model be extended to education?

(c) If so, how should this be done (entities, attributes, semantics)?

Planning: We carried out the survey between February 22 and March 28, 2012. The interviews were conducted end of March and early April, by telephone and/or email. The analysis, interpretation and validation of results have been done in March and April 2012.

3   Results

3.1   Response rate and overall interest

The survey was carried out between in February and March 2012. The response rate was 34%. We received sixteen responses from the thirty-five contacted CERIF project managers. Yet, four responses were incomplete and could not be exploited so that the real response number is twelve.

	No. contacts	No. responses	Response rate
Survey	35	12	34%
Interviews	10	3	30%

Table 1: Response rate

Half of the survey respondents (six) are from UK universities with JISC research information management projects. The others are from Germany (two), Denmark (one) and Spain (one) or are non identified (two).

At the date of submission, three experts have answered to our questions. Yet, this rate of 30% may not be definitive as we'll try to get more feedback before the Prague conference.

The contacted experts confirm that universities are generally interested to connect their education system to research information management, for at least two reasons, overlapping concepts and duplication of efforts. "*There is significant overlap in entities such as person, OrgUnit, publications etc particularly for postgraduates.*"

Another expert guesses that universities "*probably see a duplication of efforts when keeping a CRIS and an education management IS up to date and in sync.*"

Two models were cited: the Italian CINECA project[1] and the UK JISC funded Research Management and Administration System project[2]

Yet, the experts add that education obviously is not, at least up to now, a priority for CRIS projects.

3.2   Connection to education system in ongoing CRIS projects

Half of the respondents (six) answer that their CRIS does not integrate information on education, e.g. data on students, course programs, teaching activities, scholars, learning objects and so on, mainly because their system is designed only for research activities: "*the CRIS currently only records information about the institution's research activity.*" Another answer is that their system "*has been dedicated mainly as a decision makers tool and it will serve for scientific and research community.*"

Another reason is the limited purpose. They do not need to connect the systems so far because they do not need to aggregate complex performance data. "*The information about education - moreover about the whole students life cycle - is covered by a campus management system. This system integrates the master data of the students, the course plans and the examinations. Since we do not use our CRIS for an overall performance measurement in research and education, we actually do not plan to integrate information about education in our CRIS.*"

A third explanation is the implementation of an alternative software solution: "*We see CRIS dealing with the research landscape only. We can report across research and education where needed using our institutional business intelligence tool.*" The existing system architecture is sufficient for data production so that there is not real use for linking CRIS to information about education: "*We have various systems that support our research. We'd expect student info etc to be combined in workload modelling or data warehouse. Our systems are all linked as required e.g. student data to research system so students can be added as researchers or beneficiaries of awards. Awards from Research System flow to student system where appropriate to allow students to be paid/assigned etc.*"

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[1] http://www.cineca.it/en

[2] RMAS http://www.exeter.ac.uk/research/rmas/ and also

http://www.jisc.ac.uk/whatwedo/themes/informationenvironment/researchinfomgt.aspx

One respondent add that "*the connection is made indirectly via a central university-wide identity or user account of each researcher. I.e., each researcher uses the same identity/account to maintain research information in the CRIS and information about education in the campus management system.*"

Six respondents confirmed that they connect CRIS to education. How do they? Which are their choices and options? In fact, when connected to education, the CRIS integrate data on students and scholars (teaching activities, CV, student projects) and "*synchronise with HR, finance, funding, student records and press clippings*".

Only one CRIS links data on course programs, and no CRIS seems to integrate learning objects, at least not in this environment.

The connection is most often realized through data exchange between different data silos. One CRIS includes an institutional repository in this exchange.

3.3   CERIF extension to education

Only in one CRIS project, this connection will modify the standard format: "(...) *We will use CERIF to describe post graduate research students and how they link to their supervisors and potentially research project which find their work.*" In fact, this project is still going on and they are not quite sure about the final decision on the format extension: "*Not sure which of the above[3] apply, still planning.*"

In another case, future modifications of the standard format are expected from the software user group: "*We are currently implementing the PURE system from Atira and would not look to extend the CERIF format at present - the PURE user group might request functionality that might request extensions to CERIF.*"

EuroCRIS experts seem hesitating. The predominant idea is that "*CERIF should stay focused on research* (because it) *is not suitable for time-table organisation, room allocation, scoring and marking of student work etc.*" There may be an interest when the CERIF model "*overlaps with research in postgraduate and perhaps final year undergraduate education.*"

Nevertheless, a CERIF-based research information management system is not considered as an alternative to existing education information systems but may provide "*a useful set of data model patterns.*" For instance, a new education system model could be "*CERIF-inspired e.g. by copying the cfPerson and cfOrgUnit entites, and devise their own set of other base entities.*" In this case, the "*linking entity pattern would ensure the great flexibility CERIF transferred to the new domain.*"

3.4   Preferred options for extension of CERIF

We asked CRIS project managers how they would extend the CERIF model, by creation of new base entities ("education"), result entities, second level entities (programs, diploma), new link entities (pers_education), or by modifications of the semantic layer through new roles, for instance for organisation units such as companies in partnership with education programs or for persons (lecturer, PhD student etc.).

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[3] i.e., base entity, result entity, second level entity or link entity

But, as we already mentioned above, most of the contacted CRIS projects did not extend the CERIF model or do not intend to do so in the future. Also, we did not receive concrete suggestions or comments on how to extend the CERIF format, except one answer: "*We will use CERIF to describe post graduate research students and how they link to their supervisors and potentially research project which find their work.*" But even this respondent add that they are "*not sure which of the above apply, still planning.*"

Two of the three experts said that an extension of the CERIF model may not be useful for the development of the common format and that there is "*no specific perspective, no priority*" so far. Apparently they prefer another option, e.g. data exchange between different data silos (information systems on the campus). In this case, as one expert added, the work of the euroCRIS task group on linked open data could be the "*key factor*"

Only one euroCRIS expert detailed some ideas on potential options for an extension of the actual model to education. Instead of creation of new entities, results or links, he would prefer to modify the semantic layer. He thinks that "*the link entities required are already present but the roles need extensions in the semantic layer (...) Student maps to Person (in one or more roles). University, department etc map to OrgUnit (as does any associated industry). Learning material maps to Publication. Material the student produces maps to Publication or Product (the latter for sculpture, performance art etc).*" In other words, his belief is "*the syntax (structure) will not be a problem*" and that "*extensions to the semantic layer should enable a good representation of the education functions in the data model.*"

The interest of e-repositories seems limited. "*Certainly open access to research outputs can be utilized in education.*" Nevertheless, "*while both are useful in their own right, they won't provide true linking between research and education information management systems.*"

4   Discussion

The survey on linking CRIS to education suffers from some methodological shortfalls. The short time period (February-April 2012) did not allow for an in-depth study on implemented research information management systems, future projects or needs.

Second, the short period limited the exploitation of interview and survey data to preliminary results.

Third, we identified and selected the sample for survey and interviews via the euroCRIS and JISC (RMAS) websites, and via contributions to CRIS conferences and workshops. We wanted to contact people who know about CRIS and CERIF, e.g. mainly CRIS project managers from IT or library departments or from research management. This approach, of course, introduces a systematic bias. They may not be the right persons for strategic thinking about development and alternatives outside of research because too focused on research activities.

Finally, the small number of respondents reduces the validity and reliability of the survey results. Also, we preferred to report their reaction in an anecdotal manner, without statistical value or figure. Yet, on the other hand, so far as we can see, there are not a great number of people in Europe working on CRIS projects. So anyway, no survey on CRIS related topics would produce a statistical relevant sample.

Nevertheless, even with limited data we can interpret the results in the following way, highlighting four different aspects:

No priority: Linking CRIS to education is not on the top of the agenda of CRIS project manager or euroCRIS experts. Obviously, it is not a priority neither for the development of the campus research information management systems nor for the development of the CERIF model. Some people event doubt the interest of linking - why connect research to education? Why not keep both systems apart?

No integration: When linking CRIS to education, the preferred option seems data exchange between existing information systems, especially for information about students and their projects, rather than integration or merging of different systems. CERIF would be useful here as a middleware format. But as one of the respondents reminds, "*there are many ways to connect data and many interpretations of a research information system.*" The adequate level for this development may not be local but regional or national as one UK project manager suggests: "*this* (= the linking) *is being undertaken as part of the RMAS project.*"

CRIS rather than CERIF: This means, too, that further study on linking CRIS to education should focus on CRIS rather than on CERIF. Again, in the words of one of the respondents: "*We have a CRIS containing information related to PhD and researchers and their activities: thesis, publications, grants, ... We don't have a CERIF compliant CRIS, but our CRIS has a similar format to CERIF.*" The common European format can be helpful but is not necessary for the link between education and research data.

No repository: Following the survey data, e-repositories apparently would not be considered as added value to the connection between CRIS and education.

5   Conclusion

Linking of research information management systems to education related data and systems is on the agenda of euroCRIS. Our study was meant to provide some elements for the debate.

Now, our empirical data even with limited reliability are slightly different from the discussion at the Lille euroCRIS membership meeting in 2011. The least we can say is that there is no apparent consensus on interest, priorities, needs and perspectives so far.

In terms of marketing, extending CRIS to education would not necessarily open a new market to euroCRIS. But it would probably imply working with new customers who had not been associated to research management in the past. And it would probably imply, too, development of new and different products, e.g information management systems with other than (only) research-relevant functionalities and objectives.

Perhaps this is the main difficulty: should euroCRIS explore a territory beyond its traditional boundaries, previously out of scope? Or should euroCRIS leave the work to others, local project teams or national initiatives, and limit its action to council and advice?

For both options, we would make two suggestions:

CERIF model: Develop a draft version of an extended CERIF model. In the words of one of the euroCRIS experts: "*I believe the priority is to produce a first-cut datamodel demonstrating how CERIF as it is now can represent education (...) and to highlight areas where the representation in CERIF is not possible or difficult. Then solutions for those areas can be sought by discussion with the CERIF Task Group and others.*"

Needs analysis: Marketing of CRIS and CERIF means to adapt to customers' needs. So what does euroCRIS know about them, and about their needs for education related data, in the context of research? Probably more evidence is needed, especially through exploratory studies with scholars and managers of education information systems.

Our survey reveals some perspectives for future developments. It sets the stage for further discussion. It is up to euroCRIS to decide what to do and where it will go.

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