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# **Using a CRIS to reduce workload and increase quality for research reporting and university marketing**

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## **Summary**

Leuphana University is one of the pioneer institutions in Germany for the adaptation of a current research information system (CRIS). The CRIS has proven to be a good investment in terms of time and resources: Information registered in CRIS is used consistently. Over 30 report processes served in the first three years of operation illustrate the need for accessible research information within the institution. In our hands, acceptance of the CRIS has been achieved mainly through a considerate development of services and acceptance of the use cases for CRIS data. The CRIS support team aims to unburden researchers from additional data maintenance and put the data corpus to the best possible use. Institutional CRIS hold high potential for research-related services and marketing. However, technical barriers currently prevent systems and portals from exchanging data more efficiently. Leuphana has therefore joined national and international initiatives in order to foster standardization promote better dissemination of research information.

## **1 Introduction**

Leuphana University is one of the pioneer institutions in Germany for the adaptation of a current research information system (CRIS) for systematic use in research reporting and marketing. Research information system are IT solutions which provide access to and disseminate information about research entities such as persons (experts), projects, organizations (teams) and results (f.e. in form of publications, patents and products). The term “current” serves to indicate their dynamics and timeliness of these systems (Jeffery & Asserson, 2006). The purpose of an institutional CRIS, such as the one used by Leuphana, is to maintain a cohesive research portfolio both at organizational level and the level of the individual researcher, and to use the recorded information for reporting, assessments and marketing. At Leuphana, relational database technology is used in combination with web and information retrieval applications. Other CRISs may exist to manage projects, to advertise expert profiles or to record research output publications (see Jefferson 2010). Like Leuphana, universities in Germany and other European countries have begun to use CRIS in line with campus and student lifecycle management tools to support core processes and serve the manifold reporting requirements both internally and externally.

## **1.1 Research information management: Drivers in Germany**

German higher education institutions have experienced more than one decade of practice in output-oriented management, introduced in the course of the new public management concept. This has led to an increase in (IT-supported) documentation efforts, both in the student-related processes and in research. In the Federal State of Lower Saxony, where Leuphana is located, the Ministry of Science and Culture has established a performance-based funding scheme as well as subject-based research evaluations. These tools are also used for governance within the University.

Other drivers for advances in research information management are technical developments: Better tools for research recording and analysis are available than they were 10 years ago. However, the adaptation of these tools is still in progress. The German Council of Science and Humanities (Wissenschaftsrat) has recently recommended common standards of data acquisition and harmonisation of reporting systems to improve research documentation (Wissenschaftsrat 2011). A national project has been launched to specify a core data set of research information, which in future will enable public research institutions to produce common reports and indicators (Wissenschaftsrat 2013).

## **1.2 The case of Leuphana University**

Leuphana is a mid-size university in the metropolitan area of Hamburg, with 80% Social Sciences & Humanities and 20 % Natural & Technical Sciences, 140 professors and 8.000 students. The current structure is the result of a merger between the University of Luneburg, and the University of Applied Sciences Nordostniedersachsen. Since the merge in 2005, Leuphana has established a reputation as model university in terms of study concepts, following the Anglo-american model of College and Graduate School, with General studies and consecutive Master / Dissertation programs. Yet it is at present still a developing university in terms of academic reputation, with a growing, but still medium research intensity<sup>1</sup>.

Leuphana's development strategy aims to strengthen and increase recognition in the national and international research community, in line with raising key indicators like third party funding and publications. The development steps of the university are therefore closely monitored.

## **2 Implementation of a CRIS at Leuphana**

In 2008, the University decided to introduce a new research information system. An older inhouse application had been in operation until the merge of the two universities in 2005, but not been updated since. In 2007, an institutional bibliography had been established by the Library, using a by-product of their main tool, a Union Catalogue (GVK) based on the Dutch PICA system. Roughly 6,000 outputs of university members had been recorded by that time, mainly from the period 2000-2008.

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<sup>1</sup> Assessed using the QS (Quacquarelli Symonds) classification, a combination of size, subject-focus and research output (papers in Scopus) to rate a University's research intensity.

The new system was supposed to integrate the bibliography as well as data on third-party funded projects from the university's finance system SAP. The IT solution was obtained by a commercial provider, the Danish company Atira (now Elsevier). An 18 month implementation project was launched (Ebert et al. 2011), which resulted in an operational database with the following properties:

- Project directory (description, staff/partners, finance synchronized from SAP, outcome like publications, activities)
- Expert directory: Person profiles with CV, plus records of posts and offices, awards etc.
- Publication repository with integrated full text management
- Directory of Funders and external cooperation partners (registered as contextual information on projects and publication records)
- Tool for bibliometric analyses (Citations, journal ratings)
- Reporting and exhibition tool for generation of lists, statistics, analyses
- Webservices and xml exports for public exhibition of data on websites.

## **2.1 CRIS policy and day-to-day operation**

The CRIS project aggregates previously distributed information in a central data pool and facilitates reporting by re-using and completing the available records. The strategy used is decentralized data curation: Individual users and trained content editors register output and projects in institutions and teams. This process is aided by imports from external publication databases and internal finance and staff information systems. The outcome is a constantly growing corpus of institutional information that can be used for reporting and marketing.

Database registration is voluntary for researchers and relies on the general acceptance of the associated reporting requirements and services. Key users are Faculty and Institute managers as well as Research Department, Marketing and Press Office. An interdivisional CRIS support team ensures day-to-day operations, with staff contributions from Research Department (database management, validation of funding information), Library (validation of bibliographic data) and University Marketing (webservices, Typo3 plugins).

The Pure support team complements data on projects and publications through a two-step validation workflow. Data is registered as needed, f.e. for annual reports or for display on the web. After three years of live operation, 6 major business processes have been adapted, 700 active database users acquired, 100 content editors in university institutions trained and 30 use cases established. The size of the university bibliography was more than redoubled, from 6,000 to currently 15,000 records.

## **3 Use cases**

The consequent utilization of the recorded information helps to keep the information up to date and fosters acceptance of the effort for day-to-day operation. The transition from distributed to centralized data management is however a major and still ongoing challenge within the University. Much of the internal communication is directed at university managers and support staff, con-

vincing them to abandon their occasional collection of research information via e-Mail and in text files in favor of using the data corpus already collected in the CRIS. The main pro arguments are sustainability (data can be re-used), data quality (structured data recording forms) and services (the support team provides templates and training).

As a result of these efforts, 30 report processes were served in the first three years of operation (2011-2013). Some representative use cases are described in the following sections of this paper.

### **3.1 Academic reporting**

Academic reporting serves to monitor the Leuphana development strategy. A set of input- and output oriented actions has been implemented to develop the research performance: Scientists can apply for internal funding to explore new topics or prepare large grants, conference participation and organization as well as publications. Annual budgets, sabbaticals and bonuses are awarded based on performance bonds and measurable outcomes. Each year, academic achievements are highlighted by research awards. The CRIS delivers data for the output-oriented actions and the assessment of strengths and weaknesses in individual subject areas.

#### **Performance-based budgeting (faculty level)**

Each of the four Leuphana faculties has developed individual schemes for performance-based funding. Typical indicators are:

- Publications, weighted by type (sometimes by length, bonus for top journals)
- Grant income
- Offices & Posts in internal committees
- Doctoral, Master and Bachelor theses
- Teaching workload

All four Dean's offices have formally established the CRIS as the authoritative source for publications and grant income within their respective academic communities. One has also implemented recording for internal posts and offices in the CRIS. Feedbacks by the Deans offices are positive: The CRIS has successfully reduced the workload for data collection and analyses and increased the reliability especially of publication data. Researchers perceive the process as more transparent, as they can review the underlying data in the CRIS.

#### **Leuphana Research Awards**

Nominations for the Leuphana Research Awards are combined with an annual assessment exercise on key indicators fundraising, publications and citations. The initial assessments are performed by the Research Department. Outstanding performers and the author of the best monograph receive bonuses for their annual budgets and are highlighted at the annual academic ceremony.

For the "Best Fundraiser award", the income on third-party funded projects of the previous year is assessed per Principal Investigator (PI) and normalized to national benchmark in the subject area (average funding in Germany for Humanities, Social sciences, Natural Sciences, as recorded by the Federal Statistics Office). The assessment identifies the top performers in all four faculties and gives information on the overall fundraising activity within the University: How many Principal Investigators reach or surpass national benchmark in their field? How many professors generate

income from funding at all? While SAP is the main data source, the CRIS delivers contextual information on funders, funding programs and partners (international projects).

Nominations for the “Research award” are based on a) fundraising, b) citations in Scopus and c) weighted publication output of the previous year. Deans are provided with the Top Performer lists in these categories and select candidates for nomination. Additional scientists may be nominated with outstanding achievements not covered by the indicator assessment.

For the citation analyses, author information in Scopus is controlled and corrected. The CRIS delivers data on currently employed scientists. We aim to reduce the workload further by synchronizing Scopus citations into the CRIS. However the synchronization still holds some challenges regarding coverage of all Scopus-listed publications in the CRIS and correlation of Scopus publication ID's, which may prove a pitfall in comparison to using original data. For the publication outcome, a group of 50 scientists and about 500 publication records are analyzed each year. The CRIS delivers structured publication lists for the rating by category and impact.

The CRIS reduced the workload for the assessments to about 2/3 of the original effort. We estimate the current total workload to be ~ 1 person month and consider this a fair effort for the insights gained from the exercise.

### **Subject surveys and reports**

At Leuphana, the CRIS has proven to be especially useful for subject-based surveys across organizational units, and we observe a growing interest for such exercises among internal managers. Previously, researchers known to be active in a field would have been asked to provide files with their research activities, which then had to be assembled manually into a report. Such surveys are now simplified by using the built-in subject classification functionality of the CRIS, which allows to tag CRIS records and to build database reports by subject area.

The procedure for such surveys has been standardized and includes the following steps:

1. Production of a guideline: Legitimate purpose, time period to be covered and relevant indicators, description of analysis and recipients of the collected data
2. Setup of a report template: Relevant database content filtered by research area and period, sorted by organizational unit. Reports are set up as scheduled report (weekly) to monitor data collection. Corresponding webservice applications can be developed, f.e. to provide reviewers with actual data online in addition to the printed report.
3. Launch of data collection: Communication of guidelines to scientists and content editor network, request to register and tag relevant work and complete their bibliographies (time limit usually four weeks).
4. Final retrieval of data as text files, proofreading, production. The team takes care that errors are corrected in the report as well as in the original database records.

The surveys deliver good information for reports and contribute to the continuous improvement of the data corpus. In the course of six major reports produced so far, more than 3,000 records were quality-checked, enhanced or corrected. The CRIS uses a specific catalogue with currently about 60 subject areas. They can be searched in the Leuphana research portal (<http://pure.leuphana.de>).

### 3.2 Web integration and University Marketing

Leuphana's marketing team is a key user and strong partner in the CRIS support team. The built-in webservices of the CRIS were used to develop a Plugin and a public portal to display CRIS records on the website.

The webservices retrieve CRIS content with the visibility status "public". CRIS users can control their data in the backend by assigning individual visibility statuses to records (Public, Intranet or Database). The Plugin is a standard feature on all new websites, but has to be activated and configured by the responsible CMS editor. The Plugin reduces effort for website editing, as updates of publications or projects in the CRIS will also appear on a website, when the Plugin is activated.

The development and rollout of the Plugin on existing websites was a subproject over an 18 month period. The rollout strategy addressed different needs on different levels of the organization:

- Researchers prefer a high degree of individuality. This was addressed by making the plugins configurable (selection of content type, citation format, sorting options). Scientists preferring manual editing of their websites have the opportunity to do so.
- Institutes and teams needed to negotiate a common standard for citation formats and other configurations of the Plugin for use on the institutional portal. A Marketing Officer moderated round-table discussions where appropriate.
- Faculties needed to ensure broad acceptance and use of the CRIS, and thus good coverage of their bibliography, before activating the plugin. Configurations were decided in the Dean's offices.

The Plugin has effected visible improvements where websites were neglected, but publication records were available in the CRIS for performance-based funding. The service has also motivated institutes to organize continual update of the CRIS in order to re-use data on the website.

### 3.3 Further potential for Offsite Marketing

While the main efforts were initially directed towards onsite marketing, i.e. Leuphana domain, there is a growing interest to disseminate research information offsite, i.e. to regional or subject-related portals and web catalogues. Expected benefits are a) wider representation of the institution, b) increased click rates on the institutional webpage through backlinks to projects or publications.

A pilot project was executed with a regional marketing platform for research in the Federal State of Lower Saxony<sup>2</sup>. The platform runs on a central database and usually requires team leaders and institutions to register their research profiles and projects through an individual user account. At the start of the project, most of the about 100 team profiles were outdated and the motivation to maintain the data was low. The project aimed to unburden institutions from the effort of maintaining an extra user-account and to achieve higher compliance by aligning with the local CRIS maintenance. For the integration, a small change was made in the data model of the CRIS to align with the regional portal's format. Research profiles were recorded in the CRIS and a daily xml file transfer implemented to the regional platform. As a result 60 up to date institute profiles are cur-

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<sup>2</sup> [www.innovatives-niedersachsen.de](http://www.innovatives-niedersachsen.de)

rently transmitted, including direct weblinks to projects. Rollout of another 150 profiles from the next organizational level is already scheduled.

The CRIS support team currently investigates further opportunities to integrate data offsite. The well-established OAI-PMH protocol currently holds the highest potential for offsite marketing and can be used for dissemination and creation of backlinks to local publication records. There is an interest to increase representation in the two national research portals SOFIS (social sciences) and FIS Bildung (education and pedagogics), where Leuphana research activities are currently underrepresented. Scientists also request to re-use data from or in social networks, such as Research Gate, Academia.edu or Mendeley. We find however, that pathways for bulk transfer from local CRIS systems are usually lacking. Instead, individuals are required to register their own records, with some type of publication import usually being offered. CRIS data is still re-used, but by rather impractical copy-paste or textfile transfer.

## **4 Lessons learned**

Acceptance of the CRIS has been achieved mainly through a considerate development of services and acceptance of the use cases (reports, webservices). Acquiring report cases for the CRIS is an effective way to acquire new database users. High service level in the support team enhances compliance. Initial report cases have to be closely monitored to establish best practice and especially to ensure continuous improvement of the underlying data corpus.

### **4.1 Challenges and supporting factors**

The aggregation of distributed information in a central data pool requires good technical integration and communication with the data owners on the other end. Usually information from internal administrative systems had to be enriched for use in research reporting. Information from external sources was sometimes difficult to relate to internal records. Scientists may be reserved because they expect additional workload from CRIS maintenance. Living up to the promise of more efficient research documentation requires a network of many processes and players. It can prove difficult to convince internal managers to join in using the CRIS data corpus instead of launching own surveys via e-Mail and text files. Some managers foster disproportional expectations regarding the timeliness and accessibility of the data.

Supporting factors in our hands are:

- The CRIS tool is intuitive and easy to use
- Information already present at the University is made available for the scientists
- The CRIS offers standardized ways to access and reuse the data for different user groups
- The data quality is monitored
- Data in the CRIS is used consistently

Beyond the institutional level, challenges are face concerning the exchange of data with other systems: Researcher profiles cannot be transferred between institutions or into social networks. Project databases of funders are usually not accessible for institutions to retrieve data and subject-oriented information systems are not prepared to receive data from other CRIS systems.



## 4.2 The need for standardization

CRIS hold high potential for research-related services and marketing which can only unfold if systems and portals are able to exchange data more efficiently. National and international initiatives have already formed to standardize research information, enable interoperability and harmonize reporting.

euroCRIS, a non-profit organization, develops the Common European Research Information Format (CERIF) and fosters the uptake of CERIF both as data model and exchange format (CERIF xml) in several international projects and strategic partnerships. Leuphana has joined euroCRIS and encourages others to engage beyond their local projects and lobby for better pathways between research information systems, portals and social networks.

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