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Introducing CRIS at FAU

Project Presentation

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Abstract

We look at the process of introducing a research information system at a large German university with more than 40.000 students, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU). Background information about FAU is provided as well as a short overview of the historical development of the CRIS project and some technical details relevant to the system. The paper details the challenges that had (and have) to be overcome, taking into account general obstacles which could be encountered by any large research body implementing a CRIS, some challenges specific to the German university landscape and lastly those unique to FAU. We also focus on strategies to win the researchers for CRIS, some of which can be classified as general best practice, others are tailored to specific FAU demands.

Peer-review under responsibility of the Organizing Committee of CRIS2016.

Keywords: CRIS; Project; Introduction

1. FAU Background information

Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) is located in the European Metropolitan Region Nuremberg of Bavaria with 3.5 million inhabitants. The university itself is spread over the cities of Nuremberg and Erlangen, with most of the administration located in Erlangen.
FAU is among the Top 10 German Research Universities with more than 40.000 students, 5 faculties (including the university hospital with 25 clinics), 23 departments and 661 professorships. FAU was ranked 11th in Germany in third-party-funding by the German Research Foundation (DFG) and ranked 2nd in Germany (52nd worldwide) in the 2015 Reuters ranking of most innovative universities [8].
With more than 5.000 employees and over € 180 million generated in third-party funding in 2014, there is no shortage of information to gather for a CRIS.

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Reasons for the creation of FAU CRIS included the need for faster and more comprehensive evaluations and rankings, the generation of reports for both university administration, government and funding organisations. Better support of internationalization efforts is also at the heart of CRIS. Last but not least, a central platform for the presentation of FAU's research output was needed.
Introduction of CRIS systems is a being considered or already implemented in a number of German universities. Tobias et al. 2015 [5] mentions FAU as one of 22 Universities in Germany to have introduced a CRIS, which amounted to 43% of the poll.

1.1. FAU CRIS History

In 2011, FAU University management decided to launch the FAU CRIS project. In 2012, the software Converis 4 [9] was purchased from Avedas AG (which was bought by Thomson Reuters in 2013). In 2012 and 2013, the data model was specified, source systems were identified and the first interfaces with these were developed and implemented. During the implementation phase, the German Council of Science and Humanities released recommendations for a core data collection [7]. These were integrated into FAU CRIS as much as possible. After initial workshops and training sessions for one test department, the decision was made to upgrade to Converis 5. Most of 2014 was spent upgrading to the new version and adding bulk data imports from various source systems. 2015 saw the roll out for 4 of our 5 faculties for the publication core while more entities were added and filled. In 2016, research projects and patents, the next large entities, are being added.
FAU is a founding member of the Converis User Group Germany, visiting and hosting regular meetings of German universities working with Converis.

2. FAU CRIS Description

The aim of FAU CRIS is full coverage of all research output metadata. This includes publications (currently about 18.000 in CRIS), ranging from peer-reviewed papers in academic journals to online discussion papers. The second largest entity are research projects (currently 1.500), including third-party funded projects with private and / or public funders as well as smaller self-funded projects. Researchers are given the option of linking entities, for example projects and publications, thus creating a more and more complete map of research activity at the university.
Other entities include awards and grants (currently 200), researcher activities such as non-published talks or membership on editorial boards, and knowledge and technology transfer, i.e. patents and spin-offs.

2.1. FAU CRIS data sources

CRIS is connected to both internal and external systems via various interfaces: Converis uses Pentaho's Kettle data integration system [10], which allows the creation of flexible interfaces to several sources. Converis also utilizes hard-coded connectors to access outside publication databases. As the hard-coded connectors are part of the proprietary source code, configuration and changes of additional connectors are limited to the Kettle interface (in version 5.5).
Organisational information is taken from the university's central organization management system, FAU.ORG. This includes a full hierarchical tree of FAU's faculties, departments, institutes and chairs.
Personnel information, which is needed to both authenticate users via the University's shibboleth single-sign-on system and to populate the database with linkable authors, is imported daily via Kettle-process from a dedicated LDAP. This, in turn, receives its data from the University Identity management system (IdM). Personal information imported via this process is limited to that which is needed for identification: name, date of birth, IdM user name, email address, function and organization. FAU CRIS is in a continuous dialogue with the university data protection commissioner, making sure that any changes or alterations are legal and according to regulations.

Hard-coded connectors exist for Web of Science [11], Scopus [12], PubMed [13] and OrcID [14], allowing researchers to directly import their publication metadata from these sources.

2.2. FAU CRIS export options

FAU CRIS offers a variety of options for export and subsequent use of data: Publications can be exported into most popular bibliographic formats: BibTeX, Endnote, RefWorks and ReferenceManager. Raw data can be exported into an Excel file. Formatted lists and reports are available as PDF and RTF downloads. These have been created using Pentaho Report Designer [15] and are part of the Converis Research Analytics module.
All validated content is published on a central public website, the FAU research portal. This currently contains more than 17.000 publications. The portal displays all links between different entities, making it easy to jump from publication to researcher to organization, etc.
Most importantly, FAU CRIS also offers plugins for WordPress [16] and other PHP-based websites to automatically display content on other websites. This feature uses Converis' built-in API Rest Webservice. The plugins themselves are open-source [17]. We also offer a custom public BibTeX export option in addition to the standard Converis internal export.

3. Challenges

3.1. FAU specific

As a "full" university, FAU combines diverse subjects such as engineering, arts, science, accounting and law. All of these have their own culture, usage and necessities when it comes to publishing the results of their research. One of the challenges in designing FAU CRIS was to provide the flexibility and scope necessary to accommodate all of them, while keeping the system itself from becoming unwieldy and disorienting.
A second challenge is the organizational independence German universities traditionally enjoy. Since the university leadership cannot (and will not) dictate the direction of their research, a lot of researchers tend to be somewhat reserved when it comes to entering data into a centralized database. The main argument brought forward against a centralized research information system is fear of control by the university leadership.
Historically, each chair, institute, department and faculty has their own website, and while there are only two types (WordPress and NavEditor) that are supported by the university IT service (RRZE) [18], no restrictions are put on departments or chairs hosting their own websites. Currently, around 25% are using a Content Management System not supported by the RRZE [19].

3.2. General challenges

In addition to these FAU specific challenges, there are of course the usual challenges accompanying the introduction of most CRIS.
The change in processes leads to a fear that the new system will mean an increase in workload. Since the initial import can lead to a lot of work, especially where publication data are not digitally available, this is a valid concern. Although university policy at FAU requires researchers to enter only publications from 2015 onward, a growing number of professors opt for an "all or nothing" way, asking their staff to enter data back to the early days of their institutes in the last century. This approach often neglects to take into account the additional workload generated and has the potential to reflect badly on the CRIS as a whole.
One particular concern that is regularly voiced by researchers is that statistics do not take different faculty cultures into account. An example would be the comparison of a historian who published three books with 500 pages each and an engineer who publishes 20 papers at three pages each. To achieve "fair" results, reports need to take into

account a variety of factors. Publication type, pages range and peer-review status are just three examples of bibliographic metadata which can be used to qualitatively differentiate between publications.
Data security and privacy concerns are also challenges that need to be addressed. An open information policy about data security and privacy issues can go a long way toward acceptance here. For information purposes, a weblog [20] and a newsletter system are used.
One of the aims of FAU CRIS is the improved support of internationalization efforts. Cooperations with international partners, both as authors and in projects, need to be analysed to gain information for strategic planning and researcher support. To achieve this, it is important to identify the co-authors and organisations.

4. Incentives to use FAU CRIS

Several factors are contributing to the successful introduction of CRIS at FAU: high reusability of data, active and responsive support and broad availability of in-house training and documentation.
Data entered in CRIS is processed and re-used in a number of ways: Websites using the plugins are updated regularly with the new information. Lists and reports can be generated from within the system. The main advantage is the hierarchical structure of the university: A publication entered and validated by a single researcher will be automatically visible on his personal website as well as his chair's, department's and faculty's website. The same hierarchy is used for reports and other queries within the system. This also allows members of the research department to access the available data if the researchers apply for research grants such as the University's own Emerging Field Initiative. In the past, researchers were asked for separate publication lists for each application.

4.1. Accessibility

Due to the autonomous nature of the over 600 different chairs at FAU, the actual input work is completed by a variety of users (researchers, secretaries, professors, technical assistants, etc.). There are also notable differences between the faculties when it comes to computer skills as well as available source systems for imports. A system with a the size and scope of a CRIS with such a broad range of users necessarily struggles to achieve a balance between a quick and easy-to-use interface on the one hand and complete in-line explanations on the other hand.
It is therefore imperative that users receive direct and quick support for their questions. FAU CRIS uses an OTRS ticket system [21] for user support. In 2015, the average response time was under 2 hours.
A mix of regular open training sessions are held in a number of IT pools across the university. Since FAU is a decentralized university spread over two cities, it is important to offer training close to the users. This is achieved through cooperation with the IT training centre [22] and the use of their infrastructure. In addition, FAU CRIS offers training sessions for departments or chairs with their own IT pools. Users can sign up for courses individually or make appointments for a whole organizational unit at once.

4.2. Visibility

Offering improved visibility for FAU researchers is another incentive. The FAU research portal offers a central website able to display publications, projects and other areas. This gives outsiders a chance to browse the university's research output, find cooperations and / or inform themselves about current research at FAU. The website also offers a public BibTeX download of single publications as well as an author's or organisation's complete list, making it much easier for others to cite FAU researchers.

4.3. Reducing the workload

Manual identification of authors and their affiliations can be a time-consuming task. While it is still viable to enter two or three authors (or select them from a list), it becomes almost impossible as the number of co-authors goes up.

Large cooperations with international groups (e.g. joint use of Large Area Telescopes in Astrophysics or cohort studies in Medicine) often have more than a hundred authors. We have created a tool to read affiliations and authors from import sources such as Web of Science and Scopus and add them to publications automatically [7]. We are using this extensively to make data import as smooth as possible.
Members of the different faculties enjoy widely differing representation in online publication databases. The faculties of Engineering and Science are usually well represented in Scopus and / or Web of Science and the faculty of Medicine is covered by PubMed. The faculties of Humanities as well as Business and Law usually have their own, much more specialized databases, most of which offer little to no export options and hardly any interface options (Web services etc.).

5. Conclusion

Although the challenges of introducing a CRIS at a large and well-established university with a variety of faculties and research areas seem daunting at first, CRIS is gaining more and more users within FAU. The dual approach of a top-down management order and the reduction in workload for the actual users as compared to previous systems appears to be gaining more and more momentum. The biggest success story so far are the Wordpress and NavEditor plug-ins, both of which are implemented in university websites at all levels, supplying chairs, institutes and faculties with up-to-date publication lists.
The next challenge are the introduction and roll-out of the project entity type and the long-time support of CRIS.

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