Social Networking Tools and Research Information Systems: Do They Compete?

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ABSTRACT

Current developments in the area of research information have led to two different kinds of systems dealing with research-related information: Social networking tools for researchers have reached public attention through reports in mass as well as popular scientific media. Rather hidden from the public focus, universities and governments have pushed the implementation of institutional and national research information systems in recent years.

Unquestionably, research information systems and research networking tools show clear similarities, as the data modelled within both system kinds overlaps partially. Nevertheless, the application areas and current uses of these systems differ widely.

This paper examines the properties of research information systems and research networking tools. After identifying and taking into account the differences of both system kinds, the paper comes to the conclusion that research information systems and research networking tools currently live in coexistence and will foreseeably do so in the future.

Keywords

Research information, social networking

1. INTRODUCTION

Social networking tools enjoy a still increasing popularity with internet users. The number of providers has been rising within the last years, partially focusing on services for regional user groups or on services for users with particular (niche) interests. Recently, more and more investors see the potentials of addressing a huge number of users and invest capital into the development and enhancement of these tools.

One area of specialization for social networking is networking for researchers. Example providers include Academia.edu[1], Epernicus[2], ResearcherID[3], ResearchGATE[4], and SciSpace[5], offering discussion groups, collaboration tools, publication lists, conference lists, and job posts. The uses of such tools are manifold, reaching from finding researchers with similar interests (potentially from a completely different field) to promoting own research.

A concept looking strongly related to the research networking tools described before is research information systems: Abstractly, research information systems are software tools providing access to research-related information. Such systems ultimately contain information about researchers, research institutions, research projects, and research outputs. The requirement of research information systems is driven by various economic and social developments, for example, the demand of the public to get informed about research results, the goal of universities, departments, and researchers themselves to cut the costs and complexities of preparing grant applications and reports, and the need of governments to prove a reasonable spending of taxes. Research information systems are therefore a part of the system infrastructure of the actors in the research process.

The most striking similarity between both kinds of systems might be the networking component in both concepts. This networking occurs explicitly in these systems through the grouping of system users, for example, in discussion or interest groups. To a much larger extent, however, networking happens as implicitly as in real life, for example, through collaborating in working groups or in preparing publications.

Besides the similarities, this paper argues that current networking tools do not provide for the concepts and inherent requirements of research information systems. To make this case, we show the discrepancies in the directions of research information systems and research networking tools, for example, regarding data privacy issues. Apart from that, a central difference between both kinds of systems is what could be named as "bureaucratic" versus informal networking. We will elaborate on these differences later on.

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[1] http://www.academia.edu/
[2] http://www.epernicus.com/network
[3] http://www.researcherid.com/
[4] http://www.researchgate.net/
[5] http://www.scispace.com/

The remainder of this paper is structured as follows: Section 2 gives more details on social networking tools for researchers; an elaboration on research information systems is then presented in Section 3. Having introduced the backgrounds of both system kinds, Section 4 argues that both systems are suited to their own, yet different, use cases. Section 5 investigates the complex requirements for storing publications in research information systems. Finally, Section 6 draws the conclusions from our findings.

2. SOCIAL NETWORKING TOOLS FOR RESEARCHERS

Social networking tools for researchers [2] offer similar functionalities as networking tools for private or professional purposes (e.g., Facebook[6], LinkedIn[7], and XING[8]): Users are provided with functionalities to input data, share data with their peers, and collaboratively work on data of common interest.

Social networking instruments for researches specifically involve concepts and tools being fine-tuned to the needs of researchers, such as academic job boards, information on academic conferences, and collaboration tools for producing publications. Data and profile pages in these systems naturally focus on items of academic interest, such as research outputs, research interests, lists of academic output, and involvements in research projects.

As with other networking tools, social networking for researchers allows explicit links between users, creating explicit groups of peers. In some systems (e.g., SciSpace and ResearchGATE), the visibility of data items can be stated in relation to these explicit peer groups. Other systems (e.g., Academia.edu, Epernicus, and ResearcherID) do not consider information on peers when allowing users to specify the visibility of data items.

Networking for researchers usually happens on an informal basis. By this, we mean that no strict processes or fixed rules are imposed by the system itself (apart from the terms accepted before using the system), even though a certain code of conduct for acting within the virtual environment will develop over time. Similarly, system users do not assume that their actions (referring to ordinary actions) will have direct effects on their academic progression, such as decisions on tenure tracks or research funding[9]. By using networking systems, researchers rather aim at informing their communities and other researchers about their research results and interests, thus increasing their visibility within the academic arena. They may also hope to identify potential collaborators and to collect new ideas and approaches when browsing information provided by other system users, that is, researchers.

Universities or organisations might decide to utilise the functionalities of social networking tools as an internal means of communication among colleagues. An example is the adop-

tion of ResearchGATE by the Max Planck Society (MPG)[10]. Nevertheless, such initiatives aim at improving the communication processes within institutions. These networking systems are not considered as replacements of institutional (or national) research information systems, rather focussing on administrative and managerial issues. We elaborate on the concepts and uses of this related system kind in the following section.

3. RESEARCH INFORMATION SYSTEMS

Research information systems, also referred to as Current Research Information Systems (CRIS) [4], are software tools used by the various actors in the research process. Their uses are manifold, ranging from the documentation of research projects and their results over easing the management of research to simplifying research assessment. In doing so, various parties are involved in the application of research information systems, including funding agencies, assessment bodies, policy makers, research institutions, and researchers themselves. We refer to [3] for a detailed overview of research information systems.

Some countries provide a common research-information infrastructure for their research institutions. Examples include Frida [6] in Norway, FRIS [7] in Flanders, and NARCIS [1] in the Netherlands. Other countries, such as Denmark, use the same local research information system within all their universities, allowing for a relatively straightforward combination of the information provided in individual systems. Federal structures and strongly independent universities, such as prevailing in Germany, might make such approaches infeasible, though. Under such circumstances, the common development of software systems, as undertaken by the Kuali Foundation[11] in the United States, might be a viable option.

There are approaches to unify the data stored within research information systems, with the most prominent example being the Common European Research Information Format (CERIF) [5] that is being maintained by the European organisation euroCRIS[12]. Also the Canadian Consortia Advancing Standards in Research Administration Information (CASRAI)[13] aims at standardising research data and has now become a member of euroCRIS.

Even though research information systems naturally contain linkages among persons, these linkages are implicitly generated, for example, through a membership within the same research project, a supervisor-supervisee relationship, or a co-authorship of a publication. The building-up of peer groups through an explicit concept of "friends" is of subordinate or no significance in the context of research information systems.

The determination of the visibility of data items in research information systems is driven by their focus and application: Data items should be accessible by a selection of the relevant actors in the research process. This could be the fund-

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[6]http://www.facebook.com/
[7]http://www.linkedin.com/
[8]http://www.xing.com/
[9]We do not refer to indirect effects, such as advantages of a larger network or a greater visibility within the community.

[10]http://www.mpg.de/en/
[11]http://kuali.org/
[12]http://www.eurocris.org/
[13]http://casrai.org/

ing agency financing a particular project or the assessment body undertaking the annual research assessment exercise. Other examples are the exclusive provision of particular data items for the administration of a research project and the provision of a restricted set of items for the members of the same project. The provision of access rights in research information systems is thus focused on actors in the research process and, potentially, further differentiated among the user groups belonging to these actors.

Networking in research information systems takes place on a basis we refer to as "bureaucratic" or formal networking. In contrast to informal networking described before, research information systems are applied in order to fulfil administrative and managerial purposes. Some examples are as follows: Data provided by individual project members is aggregated in the context of creating an automatic project report for the funder of this project. The dean of a faculty is provided with a recurring management report, containing data from all faculty members.

Users of research information systems are well-informed about the purposes of the applied system. A user needs to be aware of the processes being implemented with the help of the system and the rules that have to be followed when using the system. For example, if the information provided within the system is used as the basis for performance-based research funding or is accessible within the context of refereeing grant applications, it is a valid expectation that the correct provision of data has direct effects on the own academic success and progression.

Potentially, research information systems might be extended by social networking components, as we have presented in Section 2. It is questionable though, whether a mixture of formal and informal system uses can be effectively applied in practice.

4. THE MISMATCH OF BOTH SYSTEM KINDS

As we have illustrated within the previous section, research information systems inherently need to be formalised and categorial in order to be applicable to their intended use cases: As official and binding decisions will be based on the information provided within the system, all data items need to be gathered unambiguously. Ultimately, the subsequent data analysis will be performed in an automatic or at least semi-automatic way. Research networking tools, conversely, are informal and descriptive. Their goal is to inform other system users, and to present the own person as a researcher and their activities in a way appealing to human system users.

For research information systems, there must further exist a clear focus on a bounded and agreed on set of indicators or items of interest. Otherwise the intended processes cannot be successfully and transparently modelled by the help of the system. With research projects, multi-leveled research institutions, funding agencies, and governance bodies, it is easily assumed that particular interests vary greatly. Research networking tools, on the contrary, allow for, and live from, flexibility in this respect – new functionalities are introduced in some update of the system and might be utilised

by more and more users over time.

The actual system users thus play a rather different role in these systems: The development of research information systems is primarily driven by the needs and wishes of governance bodies; system users need to provide the required information in order to fulfill their part in the research process. Research networking tools mainly cater for user needs and try targeting these needs in their development processes. These systems are in fact driven by the goal to satisfy their users, as user satisfaction directly influences the revenue of the companies providing such systems.

In Section 2 and Section 3, we described the approaches for the users of both system kinds to determine what data items should be accessible by other users of the system. These distinct functionalities are suited to the respective use case of the system. As providing data in a research information system is essentially a mandatory obligation, data protection and access control mechanisms are more crucial than it is the case for social networking tools, where data is provided voluntarily. Even though the matter of data protection must not be defined down in networking tools, informed users are generally aware that the data they provide, in essence, is suitable for (semi-)public display. In research information systems, internal and confidential data might instead be part of the data that needs to be provided by researchers, for example, for evaluation purposes. This data would usually not be fed into a social networking tool.

The distinction between mandatory and voluntary data provision in itself is a crucial distinction between both system kinds. Policy makers might decide to introduce a compulsory system, but only if they stay in control of the direction this system is taking. As soon as other parties might take over control and affect the system focus, the interests and intended goals of official bodies might be at stake. Apart from this conflict of interests, there are simple questions that arise if considering the implications on the research process when envisaging the use of research networking tools as "official" research information systems: Is it advisable and justifiable to both researchers and the public to distribute research funding based on information essentially provided via a social networking tool? Does it make sense to embed official and formal structures (such as institutions, funding agencies, and research projects) into the inherently informal concept of social networking?

Considering the following analogies, the distinctions between research information systems and research networking tools should become obvious: Should professional networking tools, such as LinkedIn or XING, be applied as the main human-resources management system of a company? Or should general social networking platforms, such as Facebook, be applied as customer-relationship management systems?

Having considered the mismatch between both system kinds in an abstract way, the following section looks into the extended requirements of research information systems for the concrete, seemingly obvious example of storing publication records.

5. AN EXAMPLE FOR COMPLEX REQUIREMENTS: PUBLICATIONS

While at first sight everyone will opt for the inclusion of publication records in research information systems, there is an amount of additional information concerning each publication, which is not covered by its raw publication record. Projects, research units, and funding agents may all be interested in having publications attributed to them, following a "work done at" or "work financed by" schema. This requirement may even result in several attributions per author per publication. Only if this information is provided correctly, evaluations of projects, research units, or funding programmes can be undertaken successfully by the help of the research information system.

Furthermore, knowledge on the rule applied to the order of authors, and the Web of Science[14] or Scopus[15] identifiers are of interest to some performance-based funding efforts (e.g., LOM in Germany). A disciplinary classification may also be required and its schema has to be agreed upon, including whether one or several classification entries may be given per publication. Similar considerations hold for entering keywords for publications.

Apart from that, authors need to be able to assign some ranking metadata to their publications, as for certain purposes only a limited set of publications is considered for evaluation. For example, for some purposes of the German Research Foundation[16], a maximum of five publications shall be named for assessment. The system thus needs to offer the functionality to provide such specifications.

Scientists may wish to announce their publications as early as they are accepted for publication; some agencies may only want to accept publications that actually are in print.

All the publication metadata mentioned before needs to be considered separate from the actual publication record; furthermore, it requires a detailed rights management.

Thus, on closer inspection, the seemingly simple task of storing a publication entry holds complexities that provide organisational obstacles for any generic and widespread adoption. Obviously, a research information system cannot just settle for the maximum set of attributes, satisfying every institution and governing body but exasperating the authors when entering and maintaining their publication lists. Research networking tools, clearly, do not focus on all of these organisational requirements.

6. CONCLUSION

Summing up this paper, in comparison to a research networking tool a research information system is, at least, prone to require:

- extensive efforts in developing a widely-accepted dataset suitable to all relevant actors in the research process

- rather accurate data entries, entailing more information than a researcher would just like to provide freely

- extensive mechanisms to manage access rights

The two latter points are direly in the way of any integration of a research information system with a social networking platform that is freely accessible and has any chance to be considered easy and reliably to use.

In consequence, we believe that a social networking tool could be a "client" to some subset of the data provided in a research information system. However, an effort to combine both worlds would have to fail because of the complexities and restraints involved in formal research information systems. Of course, the social network tool may be used as a resource for data integration as well, but that would certainly require adding further information to the data imported.

Despite our reasoning that research networking tools and research information systems do not share a common future, it seems foreseeable that both kinds of systems will have a future: It will be a future in coexistence though.

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