



# Is there any user for this CRIS?

Benedetto Lepori, Lorenzo Cantoni

Facoltà di Scienze della comunicazione, Università della Svizzera italiana, Lugano

## Summary

In this paper, we will analyse the issue of how research information services build their relationship with their public and, in particular, if (and how) they try to target specific user groups, rather than publishing information for everybody. An analysis of some Swiss experiences brings us to define two basic models, which we call corporate-oriented and market-oriented CRIS. The first category includes services where publishing information on the Internet is mainly guided by the visibility needs and the corporate image of the organisation, e.g. to present their own research or funding opportunities. On the other side, the second category includes a small number of services which are clearly targeted towards specific user groups and where contents and information layout are specifically designed to match the needs of these users.





We also argue that it is very difficult and conflict-laden to try to reconcile these two models in a single information service, since the organisational and economic logic behind are clearly different. We then conclude that the issue of targeting users could be at best addressed by a two-layer structure of research information services, one layer composed by (mostly public) organisations which produce information according to their corporate orientations and for a “generic” public and a second layer which exploits, rewrites and re-groups this information according to the needs of very specific user groups.

## 1 Introduction

The aim of this paper is to analyse the implications of some recent developments in Internet communication for the development of Research Information Services. In fact, recent research shows that Internet communication is rapidly evolving from a model where information is published for a generic public (for everybody, i.e. for nobody in particular) and where the amount of information and its quality are considered the most important success factors (i.e., in the realisation of Web sites) to a much more structured model where publishers increasingly target the needs of specific publics and their success is measured by the capability of building stable relationships with a group of customers (which, possibly, are ready to pay for the delivered services).

This is of course a consequence of the growing amount of information available on the Internet (i.e., increasing competition for visibility among information providers), but also of greater cleverness among users, who are increasingly able to distinguish between different information sources and their quality. Since in many areas Internet has become a professional tool to support work, users measure the quality of a given web site in terms of the relevance of the information for their specific activity (its pragmatic function; see section 2). The major implication is that to be a successful provider on Internet is not any more sufficient to publish large amount of information, even of very good quality, but one needs to draw from this information very specific services tailored to the needs of specific user groups; moreover, these services have to be better than those which can be obtained through other communication tools.

Our thesis is that many of the problems which were found in the exploitation of data contained in CRIS are due to many CRIS overlooking this structure of Internet communication. In fact, a



look to available literature on CRIS<sup>1</sup> shows that most of the efforts in this area were (and still are) devoted to improve the quality of the collected information (e.g. through standards like CERIF) and to find good semantic descriptors (e.g., thesauri or ontology) and efficient ways to generate and implement them on large sets of data (e.g., through metadata standards or XML). It then seems that the ideology behind the development of many CRIS, especially at the national level, was that a very large and good-quality database of information on research activity, once collected, would automatically find its users, either at the level of the science policies (to monitor use of funds and to avoid duplications) and of the researchers themselves (to find out other projects in the same area).

It is not of course our intention to underestimate the importance of building good-quality data sets with a wide coverage of research activities and the complexity of the (technical and semantic) problems of retrieving and managing these data. But we wish to stress that these data are going to be useful only if they are exploited to deliver services to the main target groups for CRIS and that this activity entails a good deal of expertise and knowledge of the users' needs. For instance: the mapping of the quality of research activities in Europe, being one of the major support instruments for the European Research Area, relies on soft methods like questionnaires and panels of experts; one may wonder if all existing databases on European research are of any use for this exercise, since they are not at all mentioned in the methodological document of the Commission (European Commission 2001). Thus, as we will discuss in our paper, user-centeredness is a crucial issue for CRIS also from the point of view of their political legitimacy and thus of the support they can gain from decision-makers<sup>2</sup>.

The rest of the paper will be divided into three sections.

- (1) First, we briefly discuss the concepts of user-centeredness and user-targeting, introducing some conceptual tools for the analysis of the Internet communication.
- (2) Secondly, we analyse how existing Research Information Systems in Switzerland address this issue and which structural elements determine their ability to respond to the user's needs.
- (3) Finally, we draw some conclusions on different possible architectures of CRIS and we show that a multi-layer model seems to be much more efficient in responding to users' needs.

## 2 User targeting and Internet communication

### 2.1 Syntax, semantic and pragmatics

According to a famous distinction done by Morris (1957), human languages can be studied from three main points of view: *syntactic*, *semantic* and *pragmatic*. While syntax takes into account the message in itself, semantics looks at the relation between text and the world, and pragmatic at the relation between language and its users.

Over the Internet many studies have focussed on the syntactic/semantic aspects: electronic text is completely available for automatic analysis, allows for new (hypertextual) organization and (hypermedia) representations of the world (Cantoni & Paolini 2000). Also in the area of document retrieving the syntactic/semantic point of view offers many new and challenging research

- 1 See for instance the reference documents available on the Eurocris Web site [www.eurocris.org](http://www.eurocris.org) and the presentation at the European Conferences on Research Information Services CRIS '98 in Luxembourg (<http://www.cordis.lu/cris98/>) and CRIS2000 in Helsinki (<http://www.cordis.lu/cris2000/>); an area of major concern of both conferences was how to exploit the information contained into existing CRIS. All on-line references have been checked April 30, 2002.
- 2 The decision of the Commission to abandon the ERGO project (<http://www.cordis.lu/ergo/>), aiming to build a comprehensive database of research projects in Europe, shows that failing to prove a real usefulness for policy-making can result in lack of support to such services.

opportunities: let's think, for instance, of xml for data interchange or metadata in semantic mapping.

Recently, also the role of the user, hence the pragmatic facet, is attracting the attention of people who study the net (and operate in it). An example taken from the field of Internet search engines can help to explain this sort of paradigm shift. While at first search engines relied, in order to answer user queries, on ranking algorithms based mainly on the analysis of the html pages themselves, more recently, they are moving to take into consideration more and more their users. This is done in different ways: considering people who produce the websites (the senders) – almost all search engines allow for or require the payment of a fee by a website either for being analysed, or spidered or to get a better ranking –, or taking into consideration people who make queries, integrating their usages of responses into the ranking algorithm itself. Moreover, both Internet Explorer and Netscape have integrated in their interface a service offered by Alexa, which provides – when surfing a given website – information about related websites. These data are not calculated on the basis of computational linguistic algorithms; instead, they are taken from the database of actual navigation paths of Alexa subscribers (something like the “Customers who bought this book also bought...” service offered by amazon.com).

Google takes into consideration the actual communication paths over the Internet considering links as being sort of votes, so that the more links there are toward a website, the more important it is considered, something similar to the citation impact factor used in the analysis of scientific journals (Brin & Page 1998).

The consideration of people involved in communication acts pushes Internet actors towards a careful analysis of the *relevance* (Sperber & Wilson 1995) of information for given, selected publics – *pragmatic focus* – and also of the quality of what is published – *semantic focus*.

## 2.2 Towards a social shared hierarchy of Internet sources

The public perception of what is published over the net is paralleling in some way what already happened in the history of the radio. When the radio was born, there was one tool, the radio apparatus, which was the single gate towards very different information sources – as now the computer connected to the Internet is an open window on an infinite number of websites – and it seemed impossible to assess information quality: everything seemed to be condemned to remain in a flat world without any difference. But in some years, due also to technological evolutions and governmental regulations, people became able to reconstruct and internalise a new hierarchy of information sources, including radio (Gackenbach & Ellerman 1998).

So users are constructing, according to their needs and experiences, as well as relying on others' accounts, a hierarchy of Internet sources that suit their information needs.

## 2.3 Two opposing forces

In human languages, two opposing forces are at work when communicating (Uspenskij 1996). The first one is toward simplification and standardisation, and pushes to avoid any un-necessary redundancy; this force suits mainly the need of the sender: she knows exactly what she wants to say and tries to save resources in term of time (oral communication) and space (written communication). On the contrary, the second opposing force pushes toward redundancy: it is in defence of the receiver, who does not know in advance which meaning the sender wants to convey; the receiver needs hence more time and more clues to better get and interpret the message.

Human languages are shaped by these conflicting forces; let's take a very simple example: the –s ending in the third person of English verbal conjugation. Of course, it is not necessary in order to convey the meaning of a sentence (anyway, not more than other possible endings for all the other persons, as it happens in different languages), if I say *\*she study English* the meaning would be quite clear. Anyway, and in particular for oral language, every redundant element helps

to better reconstruct the sentence (to test the meaning hypothesis the listener does when understanding), and gives more time for the interpretation process. All grammars are shaped by these opposing forces.

The same can be said about the Internet communication we are studying here. On one side, communication senders try to reduce and standardize their outputs – it is one of the main efforts of database designers – while on the other side receivers need more pieces of information to get the proper meaning. For example: if the European Union stores in its database the information about a new call, it could write something like:

*8th IST Call published on 16.11.2001*

An information broker could translate this text – in order to meet her clients' information needs, thus to make the same information relevant to them – as follows:

*The European Commission launched on the 16<sup>th</sup> November 2001 a call for new research projects in the field of communication and information technologies.*

### 3 A case study for Switzerland

In this section we shortly review some existing research information services in Switzerland and examine how they address the needs of specific user groups.

The first important feature of Swiss CRIS is that there is no central repository for information on research activities, like the national information services present in other European countries.<sup>3</sup> Research information is available on the following web sites:

- the Federal Office of Education and Science (FOES; [www.admin.ch/bbw](http://www.admin.ch/bbw)): this site contains, besides some general information on research funding, all the data on the participation of researchers to European projects;
- the Swiss National Science Foundation (SNF; <http://www.snf.ch>) holds a database of all the projects it funds (about 1000 new projects every year);
- the web sites of the 10 cantonal universities and of the two federal institutes of technology ([http://www.switch.ch/edu/educ\\_orgs.html](http://www.switch.ch/edu/educ_orgs.html)); most of them have on-line research reports with description of individual research projects.

Other information is to be found on the web-sites of the federal offices financing research in specific areas (like energy: <http://www.energieforschung.ch> or environment: <http://www.umwelt-schweiz.ch/buwal/de/fachgebiete/forsch/index.html>).

To improve this situation, the Swiss government launched in 1996 a project for a central database of all research activities funded by the state; the major objective of the ARAMIS project (<http://www.bbw.admin.ch/f/forschnat/aramis/aramis.html>) was to give a complete overview of the publicly funded research in each sector to allow for better coordination; a secondary objective was to produce better statistical information of public research funding<sup>4</sup>. Until now, ARAMIS has succeeded in collecting many of the data on research financed by the federal administration, but not on research financed by the SNF or by the Swiss federal institutes of technology; the cantonal universities are also not obliged to provide their data to ARAMIS.

Looking at these services from the point of view of a user interested to find more information on research activities one could get disappointing results; let's give some examples:

3 In the Eurocris map (<http://www.ub.uib.no/avdeling/fdok/cris/EuroCRIS/map.htm>) there is simply a link to a web page where all Swiss research institutions are presented and a link to their websites is provided.

4 Existing data are produced by the Federal Office for statistics only every second year through a questionnaire distributed to all public institutions financing research activities (<http://www.statistik.admin.ch/>).

- SNF: the project database gives some very basic possibilities of searching for different project (according to the project leader, the institution, the scientific area); it offers also a full text search, but the website itself discourages the user because it is quite slow; the description of each project contains very little information, basically of administrative type;
- FOES: information on European projects with Swiss participation is to be found (with some difficulties) under “publications”, where an Internet version of a CD-ROM published each year by the FOES is available; search tools are quite limited (only full-text search and by programme); information on the projects is more complete than in the SNF case (including a project abstract), but unfortunately no contact address for each project is given.

The conclusion is that these two services are basically Internet versions of the annual report of the institutions and that no effort has been made to adapt and to organise this information to the need of (possible) users; they mostly respond to the (legal) obligation to document which projects were funded or to the wish to publish the funding activity of the institution<sup>5</sup>.

The situation is partially different with ARAMIS; the Web search interface (<http://www.aramis-research.ch/>) is not very sophisticated – being impossible to search in specific fields, like project responsible, or through disciplines –, but the available information on the projects is quite complete and also classified according to the CERIF standards. The major flaw of the system is of course its incomplete coverage, since the major funding organisations of research activities in Switzerland are not yet covered; in fact, ARAMIS, is by now essentially an information service on research financed directly by the public administration. It seems also that most of the effort has been devoted until now to develop tools to administer research projects, rather than to deliver information to the general public (this probably explains also the quite limited search interface on the Web).

The basic move behind ARAMIS seems then to be that of better managing publicly funding research, a rationale that may partly explain the resistances of institutions like the SNF to deliver their data.

### 3.1 User-centred information systems

However, in our review we could find a small number of services which are built according to a quite different purpose; these include:

- The Swiss portal on science Swiss-science ([www.swiss-science.org](http://www.swiss-science.org)). Swiss-science has been developed by a private company (Science Com AG), which is specialised in the publication of information products on science, its main product being the monthly magazine Vision. The web site offers a news service on science, as well as a series of dossiers on specific subjects; it hosts also other specialised services, like the web sites of different research programmes. Information is gathered from many official sites like CORDIS, SNF, FOES, but also from (specialised or general) newspapers, and then edited by a team of scientific journalists. Swiss-science is financed by sponsors (e.g. the ticker of the Union Bank of Switzerland on the homepage) and by selling specialised services (e.g., the publication of a dossier on technology transfer in Switzerland financed by the Federal Office for Professional Training and Technology).
- The Swiss Information Network on European Programmes Euresearch ([www.euresearch.ch](http://www.euresearch.ch)). Euresearch has the mandate from the Swiss State to promote the Swiss participation to European programmes and to inform the researchers on the opportunities for participation. The web site offers information on European programmes, including announcements of events, news, frequently asked questions; a new information platform is planned for 2003: among other features, it will offer the possibility to subscribe to a push service, delivering information

<sup>5</sup> For example, the SNF web site has a section where successful projects are presented in a journalistic style.

according to specific user-profiles. Information is mostly drawn from CORDIS, but edited and tailored to the specific interests of Swiss researchers.

- The research information service for the Italian-speaking researchers in Switzerland ([www.ticinoricerca.ch](http://www.ticinoricerca.ch)). This service, managed by the university of Lugano, offers to researchers a quick access in Italian language to research funding opportunities in Switzerland and in Europe; available services include news, events, calls for papers and for research programs, as well as a push service that delivers weekly updates to subscribers (<http://www.ticinoricerca.ch/swisscast/>). Information is mostly gathered from different web sites, including CORDIS, SNF, FOES through an automatic gatherer module and then edited by the service responsible (see Lepori 2000 for full details).

All these services target explicitly a specific user group and, thus, they define accordingly their information content, that is:

- Researchers and other people interested on a “general” view of the Swiss research system for Swiss-science;
- Swiss researchers interested in participating to European programmes for Euresearch;
- Italian-speaking researchers wishing to participate to Swiss or international research programmes and who need first information in their mother language for ticinoricerca.

As we will discuss more in depth in the next section, their organisation and business model is also quite different from the more generic services discussed previously.

#### 4 Structural consequences for CRIS

We may interpret the observed patterns for Swiss CRIS in the light of the model presented in section two. Thus, the development of Swiss CRIS can be interpreted to be subject to two opposing forces:

- The push from the information providers, i.e. institutions active in science policy, which have a need to diffuse information on research activities either as a legal obligation or simply to promote their activity and their image.
- The pull from (potential) information users, who ask for information and services which are tailored to their needs.

The first movement promotes the development of CRIS which are strictly bound to strategies and the needs of their father institution; this means also that, for the sake of simplicity, they tend to contain generic information (without reference to a specific user groups) and in a very standardized form (e.g., records in databases). Limitation of resources means also that the information content is defined more from its availability (e.g., having this data in the corporate database) than from the assessment of user needs. The information services of the Swiss National Science Foundation and of the Federal Office for Education and Science correspond to this model; also the public part of the ARAMIS service show the same pattern<sup>6</sup>. These services don't have to care very much for their actual impact (e.g., if potential users are really exploiting the data); they simply fulfil the mandate to publish information on how public money is spent. We call this model *corporate-oriented* CRIS to emphasize that these services are mostly tools at the service of the objectives of their father institutions, like to promote their image and functions in the research policy or activities like research funding for researchers.

On the contrary, the second movement gives rise to services which are explicitly tailored to the needs of specific user groups, like researchers interested in European programmes for www.

<sup>6</sup> For instance, the actual coverage of research activities in ARAMIS depends very much on its institutional structure (being a project of the Federal Office for Education and Science) rather than on considerations on the relevance of the data for the public.

euresearch.ch or people interested in general information about the Swiss research system for [www.swiss-science.org](http://www.swiss-science.org). This means that the structure and the content of each information item is defined according to its users' needs (e.g. to participate to European programmes); using the categories presented in section 2, we may say that the pragmatic function of the information determines its semantic and syntactic structure. This implies also that the contents and the structure of the same information could vary widely, because it is focussed on a different public<sup>7</sup>; the ideal of a central database on research information fails thus to take into account the heterogeneity of its potential publics.

We call this model *user-oriented CRIS*, to stress that their function is to deliver information which is useful for specific user groups and that their business model is built according to this function; this means that these services, in order to receive funds, have to demonstrate their ability to improve the information status of their users and that this improvement has practical consequences (e.g., increasing the Swiss participations to the European programmes for Euresearch). For Science Com AG, being the proprietary of the portal [www.swiss-science.org](http://www.swiss-science.org), the selling of information services is in fact the major business and source of revenue.

However, these two types of CRIS are strictly linked, so that we can describe them as two different layers of a chain bridging the gap between the information providers (wishing to promote their activities and their corporate image) and the information users (seeking for relevant and targeted information). Corporate oriented-services tend to be linked to a specific provider and to define the scope of the information and its format in terms of its needs. This is the case of CORDIS for the European Union or of the ARAMIS service for the Federal Office for Education and Science. On the contrary, user-oriented CRIS are defined in terms of a specific user group. To this aim, these services gather the available information from the corporate-oriented CRIS, select it according to the interests of their users and, finally, rewrite the information in order to suit their needs and to make it understandable (see figure 1).

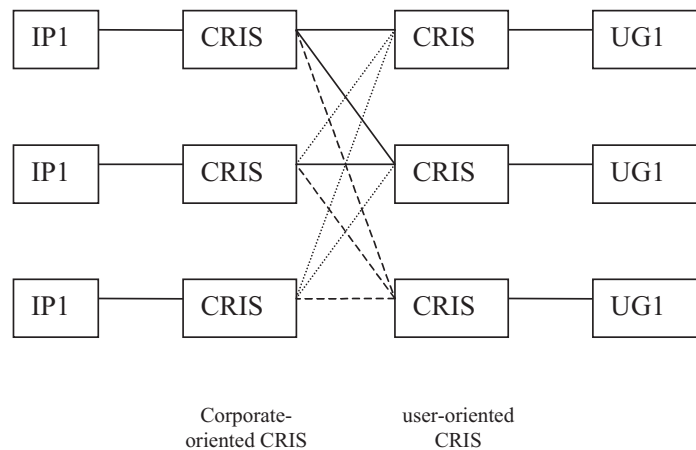


Figure 1. Two different models of CRIS

<sup>7</sup> Let's give an example. The information on a call for proposal for European programmes delivered to Swiss researchers must indicate if the call is accessible or not to Swiss researchers (give that Switzerland is not part of the European Union). This information is essential in the Swiss context, but of course secondary in the European context; thus, it will not be available on CORDIS, but it must be added on [www.euresearch.ch](http://www.euresearch.ch)

## 5 Concluding remarks

Thus, the major conclusion of this paper is that user-centeredness is not an issue that can be addressed at the level of a single CRIS only, since there are structural factors which may limit the capability to respond to users' needs. The coexistence of services which are different not only in respect to the information content, but also to their mission and institutional binding seems to be a very promising avenue; these services will compete to get information users, but also to get recognition and financing from different information providers.

In our opinion, this institutional diversity opens also very interesting avenues for the future development of CRIS. In fact, as we have documented in this paper, the syntax and the semantics of the information contained in a CRIS are directly linked to its functions (both for the users and for the information providers) and to its organisational structure; this means also that suitable technical solutions to handle information cannot be designed in a generic way, but will be very sensitive to the specific organisation of each CRIS and to this function as a communication and working tool. In other words, the pragmatic function of a CRIS precedes its information contents or technical specifications (see Lepori 2000 and Lepori et. al 2001 for more details and for an example). This means that the design process of CRIS needs the integration of a wider range of competences than in the past, ranging from communication sciences to organisational sciences and to informatics.

An important implication is that CRIS will probably resist each attempt to standardize contents and information formats, because this would destroy their link to specific information providers and/or users and thus destroy their *raison d'être*. If we agree that the future of CRIS will be a system of services linked through Internet (Adamczak 1998), it then becomes clear that the real challenge will be to find suitable communication tools which allow information to circulate between different CRIS, being translated to each specific communication context. A task that in our opinion can be realized only through a careful integration of human competence with technical tools (see Lepori et al. 2001).

## 6 References

- Adamczak W. (1998): The future of CRIS: a „LINK“ system, *Conference on European Research Information Systems CRIS98*, Luxembourg, 12th-14th March 1998. Available on-line at: <http://www.cordis.lu/cybercafe/src/adamczak.htm>.
- Brin, S.; Page, L. (1998): The Anatomy of a Large-Scale Hypertextual Web Search Engine, *7th International World Wide Web Conference*, Brisbane, Australia, 14-18 April 1998, available online: <http://www7.scu.edu.au/programme/fullpapers/1921/com1921.htm>.
- Cantoni, L.; Paolini, P. (2001): Hypermedia Analysis: Some Insights from Semiotics and Ancient Rhetoric, *Studies in Communication Sciences*, vol. 1, N. 1, p. 33-53.
- Commission of the European Communities (2001): *How to map excellence in research and technological development in Europe*, Brussels, march 2001 (available on-line at [http://www.cordis.lu/rtd2002/indicators/projects\\_era.htm](http://www.cordis.lu/rtd2002/indicators/projects_era.htm)).
- Gackenbach, J.; Ellerman E. (1998): Introduction to Psychological Aspects of Internet Use, in Gackenbach J.: *Psychology and the Internet: Intrapersonal, Interpersonal, and Transpersonal Implications*, Academic Press, San Diego (Ca) – London.
- Lepori B. (2000): , *Conference on European Research Information Systems CRIS2000*, Helsinki 25-27 May 2000 (available on-line at: <http://www.cordis.lu/cris2000>).
- Lepori B., Cantoni L., Mazza R. (2002), Push Communication Services: a Short History, a Concrete Experience and some Critical Reflections, *Studies in Communication Sciences*, vol. 2, N. 1, p. 149-164.
- Morris Ch. W. (1957): *Foundations of the Theory of Signs*, The University of Chicago Press, Chicago
- Sperber, D.; Wilson D. (1995): *Relevance. Communication and Cognition*, Blackwell, Oxford, 2nd edition.
- Thévignot C. (2000): The redesigned CORDIS web service contributes to the Commission's eEurope Initiative, *Conference on European Research Information Systems CRIS2000*, Helsinki 25-27 May 2000 (available on-line at: <http://www.cordis.lu/cris2000>).



Uspenskij B. A. (1996): Problemi di tipologia linguistica alla luce della differenziazione fra “chi parla” (mittente) e “chi ascolta” (destinatario), in Uspenskij B. A.: *Linguistica, semiotica, storia della cultura*, Il Mulino, Bologna, pp. 39-62.

## 7 Contact Information

Benedetto Lepori  
Facoltà di Scienze della Comunicazione  
Università della Svizzera italiana  
via G. Buffi 13  
6900 Lugano  
Switzerland  
phone +41 91 912 46 14  
e-mail: [blepori@unisi.ch](mailto:blepori@unisi.ch); [lorenzo.cantoni@lu.unisi.ch](mailto:lorenzo.cantoni@lu.unisi.ch)