

Bench philosophy (8): Design of efficient websites

“This Page is under Construction”

On a lot of websites, including scientific ones, you can see warnings, that the page is not ready. Others are ready, however, they are harder to penetrate than a jungle. Geoffrey Richards and Guntram Bauer from the Human Frontier Science Program report on their experiences with academic websites and give some advice for website design.

The way scientific research is done is evolving rapidly and, perhaps not surprisingly, communication is an important element in bringing about the changes. After nearly half a century of increasing specialisation, the last decade has seen the emergence of interdisciplinary research. This requires the building of bridges between different disciplines and, more importantly, between individuals whose initial training has given them very different skills and who may live and work on different continents. In this context meaningful websites are very important sources of information for scientists to present themselves to the scientific community at large, to colleagues who may have an interest in collaborating, or to students who are searching for laboratories they may want to join.

For more than 15 years the Human Frontier Science Program (HFSP) has been making annual awards of both fellowships and grants so as to support interdisciplinary training and collaborations involving scientists from different countries. As such, the HFSP secretariat in Strasbourg is well placed to follow developments in communication at the international level and this article is based on our recent experience with scientists' websites. Each year the scientific directors of the HFSP consult sever-

al thousand websites looking for information on candidates, reviewers and committee members. We have been struck by the significant differences that exist between institutions and countries in the quality and usefulness of websites, which, we suggest, has important consequences on scientists' potential as global players in this new era of research. In general, users browsing the web have a built-in limit to the time that they are prepared to spend searching for information and most expect to find an answer to their query on the first or second page of the search results. There is little reason to believe that very different rules apply when the problem is finding academics and exploring their websites. If we can find the institution relatively easily, very often the real ordeal starts once we try to locate a scientist within their university or institute website.

Current state of affairs

In the interests of impartiality we search for expertise throughout the world and have been struck by the major differences between countries in the ease of access and usefulness of institutional websites. In general, we can classify these into three basic types, although within each country there are obviously exceptions:

- ▶ Open, scientist friendly with a high level of interconnectivity. These are the ones that come up immediately with a general search engine. Most of the major institutes in Australia, Canada, the UK, the USA and some of the leading institutes in France and Germany are of this type. Starting from a name on a publication we can assess the person's expertise in less than five minutes by finding the team website, a CV including important aspects of their training, a list of publications and a description of the person's current research interests.
- ▶ Administrative and difficult to penetrate. These websites were conceived by the administration essentially for their own purposes and very often are a simple



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copy of the old-fashioned university structure onto the web. Mapping the administrative structure onto a web portal is, however, very user-unfriendly. When trying to follow the “Research” link, one may end up in the Technology Transfer Office before finding out what research is being done in the institution. If you don't know the exact name of the department or of the person for whom you are searching you may need to scan three or four major regroupings, laboratory by laboratory (Biology I, Biology II, Biomedicine etc.). On entering the surname into the front-page search engine you often obtain a list of assistants in the administration who have that same name. This is typical in northern Europe.

▶ Inward looking. Again built by the administration, such sites are characterised by the lack of a basic English version. Often one needs to have a high proficiency of the language and intimate knowledge of the country's research structure to reach



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the scientists. As we have spent considerable time on websites of Italian, French and German universities, we eventually find colleagues but never fail to be amazed as to the difficulties that we encounter. Scientists in such institutes have access to the web and their colleagues within their organisation but it's largely one-way traffic, as they cannot be easily accessed from the outside via the web.

In France, one often needs to know the current number of the specific Research Unit or its title and pass via the central server of a research organisation to reach a web page, which may open with general research themes rather than the names of PIs. Try the local search function and one is back to the administrative assistants (who may be more permanent members of the institute than the scientists). In these systems, there are institutes that post a formal annual (or bi-annual) report rather than a 'live' web and these are of limited interest as structures are now evolving more rapidly. In such cases a 'new' recruit may not appear on the website until two years after moving to the institute.

Many Japanese sites are similarly impenetrable but major institutes are making an effort to adopt the first 'open' model. They also suffer from a statutory requirement to rename or renumber laboratories every few years. Japanese sites often have delightful personal philosophical statements on the opening page, which is one of the more extreme cultural variants we have encountered. While this is clearly important for students seeking a new men-

tor, for the international visitor it is equally important that there is a button linking to a distinct English language site, which follows a more international structure (see next section).

It will take between twenty and forty-five minutes to assess the expertise of scientists in institutes having the second or third type of structure compared to five minutes in the first type. The problem is compounded in certain countries, notably in Asia, where a restricted number of family



Searching for useful information on scientific websites is sometimes a time consuming and frustrating job.

names may lead to several homonyms within the same university, or indeed the same department. In this case the problem is on a different level as one finds the scientists but needs more help to be sure that this is really the person that one is looking for – for this it is important that the scientist's own page is helpful (next section).

Innovation but not revolution

It depends, of course, on the University or Institute leadership as to what the main goal of a website should be (attracting more undergraduates from foreign countries, providing online information and/or tutorials for current students, presenting results of ongoing research). But no matter what the intention is, there is no need to re-invent the wheel. Web tools and service providers are available in abundance and at all levels of sophistication and pricing. It is money well spent because users of websites feel much more inclined to spend more time reading the information on display if the site is both visually innovative and designed in a logical way.

From our point of view it seems obvious that a research institute/university places a strong emphasis in presenting the researchers and their results at the highest level, followed by information for students (courses, new programmes, etc.), postgraduates and post-docs, albeit that the latter are all too often forgotten. We believe that arriving immediately at the level of research is of utmost importance. There is no need at all to link to administrative services right on the entry portal, which incidentally should

fit onto a single screen without the need to scroll (if programmed properly). The number of buttons to be shown at this level should be limited as they lead to sub-menus with more specific information:

- ▶ ‘Research’ in case of an institute or ‘Departments’ in case of a university. Following this link should lead directly to the different laboratories even if they are responsible for maintaining their own websites. With no more than two clicks a lab should be found!
- ▶ Students/Graduate Programmes
- ▶ Postgraduate Work/Post-docs
- ▶ Resources (administration, contacts, etc.; eventually available through an intranet access for staff and students)
- ▶ A news column that may highlight up-to-date campus news.

Once you have arrived at the level of the research unit, i.e. head of laboratory/department, a short paragraph describing the research focus in the unit is useful for a quick overview. Further buttons linking to the individual laboratories or projects should follow so the user ends up at the lowest hierarchical level, i.e. the lab of interest. For the smallest research unit we see three menus of great importance:

- ▶ Research or research projects with detailed summaries (!) of present and past work
- ▶ A list of all current staff and students in the lab (preferably linked to CVs if appropriate – see below)
- ▶ Publications starting from the most recent or an automatic link to a major literature database that spits out the publication list of a lab or a person.

While a picture on this first page is always a plus, keep it simple. Don’t post a complex video that must be loaded before the essential buttons or menus listed above appear. Leave it as an option for those who are genuinely interested in your latest breakthrough. Similarly, while it is always nice to read about the most recent lab outing together with picture galleries showing the lab’s students gathered around a BBQ, it is preferable that these stories appear further down in the menu hierarchy (maybe right after links to collaborators or funders that support the lab!).

Not all lab members have a CV that warrants public display but it seems beneficial if the PI and senior staff (including post-docs) in the team have a link to short professional CV’s. There is

no need to start way back at Kindergarten level. A few lines listing the major steps during higher education, previous positions held, followed by fellowships and grants will do the job. As a general rule sufficient information should fit on one screen without having to scroll down, so that the reader is informed at a glance about the person’s educational background and research interests.

The role of websites during career development

If having a good lab website is important for a research unit, it is certainly a ‘must’ for an individual scientist in this era of fast scientific development. The traditional student placement as we know it from 20 years ago has largely been replaced. Students may still follow the recommendation of their current advisor to work in the lab of a project collaborator but a significant portion of graduates actively search online for the best places to go just as they search for funding (which organisation pays how much for how long?). Good websites are an ideal way of attracting talents from within your country as well as abroad.

What is still a challenge to many senior colleagues is a matter of common sense for young researchers who “grew up” using online resources. A website that advances along with the career is something to consider and we recommend that young researchers set up a website as soon as possible. For us it is conceivable that at the post-doc level a website (or a web entry on the lab’s portal) may be a good start and we would encourage mentors to encourage post-docs to display their research online (which, by the way, is also a good writing exercise as the content has to be understandable to the scientific community at large). The old argument of limited availability on hard disc space should no longer present a barrier since hard discs that approach terrabyte size are becoming affordable. At this stage finding time to learn the ‘how to’ is still available and the sooner one becomes acquainted with programming tools (“drag & drop”) the better because once one is the leader of an independent research team time is always in short supply.

Young investigators who are just starting with their new laboratory are faced with many new challenges. At this critical point scientists must provide evidence of their achievements so as to build up an international reputation for their research programme. Hence, an up-to-date website is a ‘must’ not only to please funding agencies (!) but also to attract students to select the new laboratory as a place worth considering when searching for mentors. For up and coming leaders in the scientific arena, websites are also important elements to find collaborators in other disciplines and countries. The experience from the HFSP grant and fellowship programmes shows that finding collaborators for interdisciplinary research is one of the great challenges for new investigators. From exchanges during our annual meetings that bring scientists from different fields together, we know that making contact across borders is much easier if useful information is readily available in the public domain.

Conclusion

Academic websites are not gimmicks but essential communication tools for scientists locally, nationally and internationally and the once amusing message ‘this page is under construction’ is no longer acceptable.

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