

A Client Driven Approach to Web Development - A Higher Education Case Study

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Abstract

All large international organisations face the dilemma of how to deliver information and services to their clients - when their clients want it, where they want it and how they want it. In our global village this means 24 hour per day seven days per week access from and to anywhere in the world. Innovative use of the Internet provides the key and building client focussed Web systems gives the competitive edge.

Funding cuts and increased international competition for clients have seen Higher Education institutions face the same battle for survival and turn heavily to Internet-based client-driven solutions.

In 1998 the University of Queensland commenced a revolutionary project to rebuild its site to meet client rather than administrative needs. This paper explores that process.

The need for change

When you want to get the 'voice of the client' into your organisation the first thing to do is ask clients what they think and want. The second is to observe what they are doing when they hit your site.

The UQ Web project began with a series of focus groups. An experienced market researcher was employed to run a number of focus groups with existing and potential domestic and international clients. The following client groups were involved:

- ❑ Students -- undergraduate, postgraduate, high school students and their guidance officers
- ❑ Staff - academic, research, administrative, general
- ❑ Alumni

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- Community - business, general, government, educational institutions and the professions.

A mix of experienced and inexperienced Internet users, males and females, young and old were involved to ensure that a wide range of clients was canvassed.

Key senior University staff were also interviewed - they are important internal clients and hold the purse strings.

The focus group findings were invaluable and provided the evidence needed to trigger funding for a major rethink and restructure of the University's Web site.

While there was some positive feedback about the existing site there was overwhelming evidence that fundamental changes were required. The site was seen to be difficult to navigate. Its structure reflected the University's administrative infrastructure and its navigation was not at all intuitive even for staff with a detailed knowledge of that infrastructure. There were many dead links and access to key information was often many mouse-clicks away. The lack of a search engine, web site map, standard navigation buttons and consistent layout resulted in users having little sense of where they were, how to go back or where to go next.

Terminology used throughout the site was inconsistent. Headings often bore little relation to the content they described and were not expressed in the language of our clients. Site content was seen as incomplete, out of date and often inaccurate and there was widespread uncertainty about the authority of information. This uncertainty was increased when print based and Web based information appeared contradictory.

The brief

The focus group data provided the trigger for change. A Reference Group was established to guide the project. Funding was made available to second a Project Manager to drive the project and establish the project team that would build the vision.

The project's brief was simple:

- Enhance the UQ web site layout and corporate content from a client perspective
- Identify electronic services required by UQ clients
- Establish mechanisms for ongoing site maintenance and development.

The team

Many information technology (IT) projects are rendered impotent by inadequate resources and internal politics. These had minimal effect on the UQ Web project for three reasons. The first was due to its Reference Group being a group of four of the University's most senior staff. This provided backing for the project at the highest possible level, enabled strategic decision making and overruled departmental politics.

The second was having a project manager to drive the project, pull together a team of people with a wide range of skills from a variety of disparate areas, house them in an

independent project location, handle the politics and become the bulletproof vest, enabling the team to get on with the job.

The third critical advantage was having a visionary technical manager with a wide range of technical knowledge and a passion for using technology to meet user needs.

While initially problematic, the team's mix of HTML, database development, graphic design, instructional design, user-interface design, editing, and indexing expertise enabled outcomes beyond those of any purely technology team. Such a model is increasingly acclaimed as the most effective for Web site development (Siegel, D., 1997, p.153) [[HREF9](#)].

The plan

Building the new client focussed UQ Web site involved:

1. Identifying 'best practice' in web site design and maintenance
2. Feeding focus group findings into web site development
3. Developing prototypes of the top level pages and templates for corporate information
4. Trialing these with client groups
5. Implementing the preferred prototype
6. Developing site maintenance procedures that include recommendations regarding authority for site content, design and technical maintenance

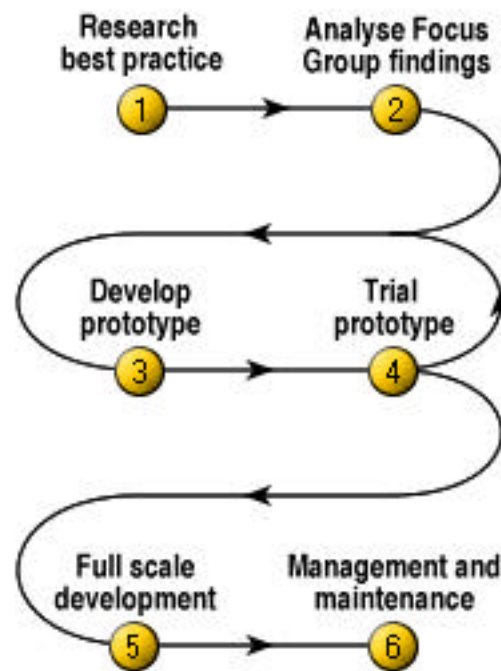


Fig 1. The plan.

Best practice

Identifying 'best practice' in web site design and maintenance involved:

- An extensive literature search
- Identification, examination and assessment of:
 - award winning national and international web sites
 - designers of award winning web sites
 - leading international company web sites e.g. Sun Microsystems, Apple, IBM, Microsoft, Cisco Systems
 - leading international advertising company web sites e.g. Poppe Tyson, Digital Pulp
 - major Australian government web sites
 - all Australian university web sites
 - all Universitas 21 web sites
 - all major search engine Web sites (after all that's where the research money is invested).

What did pursuit of 'best practice' reveal? We found that leading Web sites have a high level of technological integration (for example, Web based databases, call centres, e-mail, electronic forms, and e-commerce) and are increasingly striving to provide "seamless means of online access to information and services through a single official entry point" (Government Technology and Telecommunications Committee, 1998).

They have consistent, comprehensive navigation systems that include elements such as: standard navigation buttons throughout the site; consistent layout; a site index; and a search engine (DSTC Pty. Ltd. & Mojo Partners Pty. Ltd., 1997, p. 3). Many provide Frequently Asked Questions for all key web pages – reportedly the most heavily accessed part of any site.

Other initiatives common to leading Web sites include:

- Automated Web document management system
- Controlled vocabulary
- Metadata
- LDAP based Web directories for central storage of personal information such as phone, e-mail, username, password, digital signature, affiliation details
- Single e-mail contact mechanism on all pages
- E-commerce
- Personalised information
- Interactive discussion/chat room facility
- Foreign language option

Commercial organisations, unlike most Higher Education institutions, invest heavily in ongoing evaluation and market research in order to identify usage patterns, refine their Web site accordingly, retarget services and retain their competitive edge. Surveys, focus groups, e-mail analysis and tracking software are widely used.

Many commercial organisations appeared to have adopted a centralised restricted model of Web publishing and maintenance where Web publishing is undertaken by a team using well defined publishing guidelines and well defined templates, the end product being a tightly controlled, highly-structured Web site. This team is usually funded centrally, consists of a mix of project management, technical, design, indexing and content expertise and often reports to the Communications/Marketing Director rather than the IT Director. This change reflects the Web's evolution from technological to information to service delivery phenomena.

Focus group findings

One of the key findings of our focus group research was that each of our client groups has different requirements, so much so that one could never build a site that met every client's needs. The old 80:20 rule came to the fore and we decided to aim to meet 80% of our client's needs knowing full well that the extra 20% was not cost effective (i.e. the cost of striving for that extra 20% might well absorb 80% of our total budget).

Apart from identifying problem areas with the existing UQ Web site, the focus group research provided an insight into our clients' expectations. All clients wanted comprehensive, current and accurate information. Information must:

- ❑ Be accessible in minimal keystrokes (i.e. ideally no more than 4 clicks away)
- ❑ Contain no dead links
- ❑ Indicate the content authoriser
- ❑ Indicate the currency of content
- ❑ Provide content that is short, clear, relevant, and structured logically
- ❑ Use terminology that is simple and commonly understood

Information had to be quickly downloadable. Interestingly many clients did not want the 'bells and whistles' provided by multimedia plug-ins, Java and frames. They told us very clearly not to develop a gimmicky site because it would not suit the image they had of the University as a place of sandstone, status and tradition.

Information had to be personalised information (reflecting numerous 'what's in it for me' comments) and easy to find information. To facilitate ease of access they wanted: a search engine; clear terminology and logical headings and subheadings (preferable no more than 8); easy consistent navigation; minimal clicks to information; short, scannable content.

Our clients wanted a wide range of information, not just academic information but information on how to contact people, day-to-day information e.g. bus timetables, what's on, and lifestyle information.

The Web Project Reference Group adopted all recommendations arising from the focus group research.

Building the prototype site

After considering both best practice and focus group findings, a top-level site map along with mockups of a new UQ home page and seven information streams were created. The prototype pages introduced the new look-and-feel and standard corporate header and footer.

Once approved in principal by the Web Project Reference Group, the prototype site was made available (complete with feedback button) and client opinion was actively sought. The whole process of communicating with a large number of highly diverse clients is highly problematic, hence a multipronged approach was used. This included:

- ❑ Additional focus groups
- ❑ Letters to every head of department from the Senior Deputy Vice-Chancellor

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- Announcements on the existing UQ Web site
- Information sessions
- Press releases in the University's official newsletter
- Establishment of a working party for each information stream.

Each working party consisted of clients from a wide range of areas. This strategy was a particularly useful means of disseminating information, breaking down departmental barriers and building widespread ownership.

The prototype site was available for a period of four months over which time some heading modifications were made and much content was created to address deficiencies identified. Feedback on the prototype site was generally very positive and the communication mechanisms established allowed many client needs to be discovered prior to going live with the site. A key need identified was the need to help other areas in the University fix their web sites. A series of guidelines, templates and a toolbox were developed to help meet that need.

The 'live' site

The enhanced [University of Queensland Web site \[HREF1\]](#) went live on 1 February 1999. The style of the new site is deliberately conservative to match our client's expectations, to ensure fast download time and compatibility with all browsers from Netscape 1.1 onwards.

All corporate pages contain the standard header and footer to reassure clients that they are indeed in the University of Queensland site and that the information contained is authorised. Navigation is consistent throughout each information stream, each corporate page providing a similar heading, sub-heading structure as well as access to the search engine, site index, contacts directory, Frequently Asked Questions database and Library.

The corporate header developed contains the University logo in a standard form in a standard position, a link to the search engine, site index, contacts directory, Frequently Asked Questions database and to the Library. The corporate footer contains the relevant physical, e-mail and telephone contact address for that information stream, its creator, authoriser, last date of modification, links to legal notices and the feedback mechanism.

The seven information streams developed were:

1. About UQ
2. News and events
3. Student information
4. Staff information
5. Research
6. Services and facilities
7. Departments, faculties and centres.

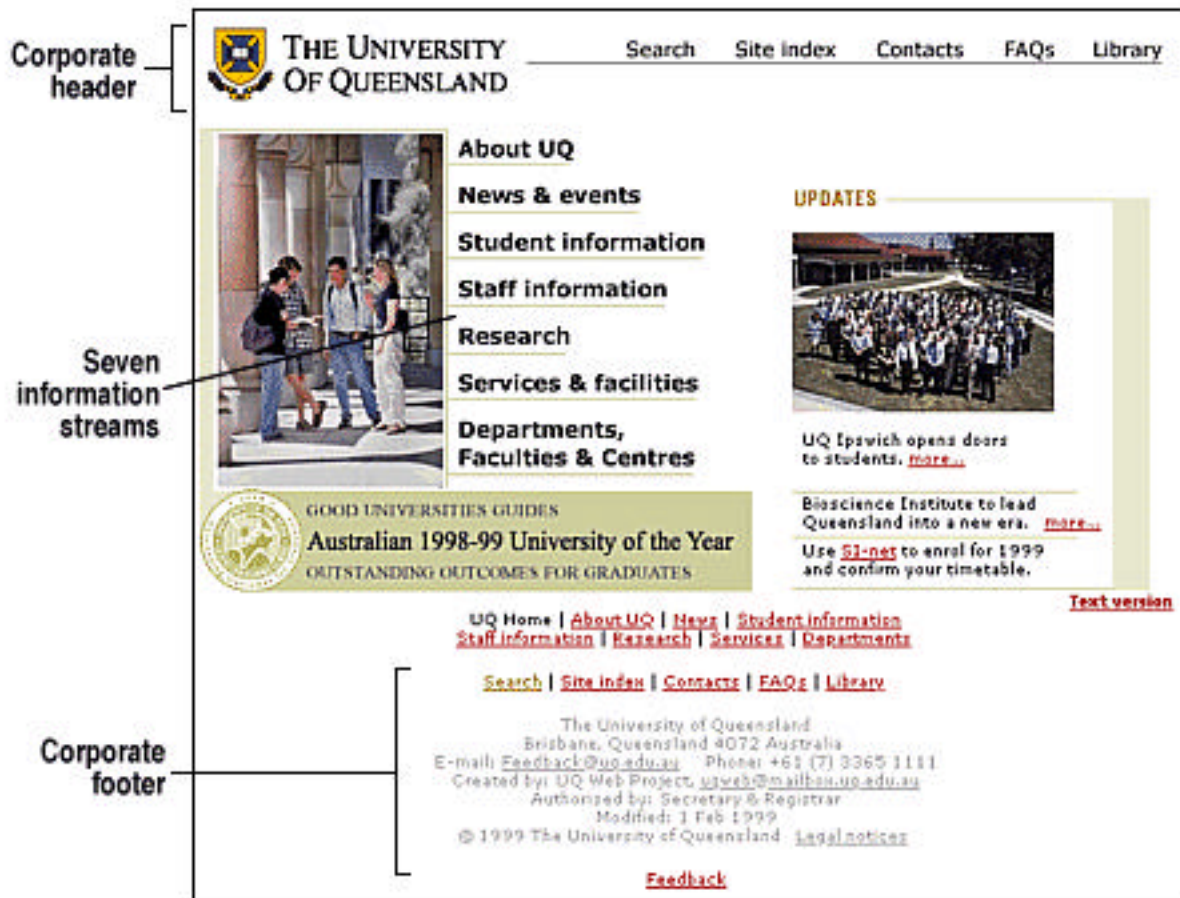


Fig 2. The revised UQ home page.

All information streams developed incorporate the terminology and scope of information revealed by the focus groups research. For example, the About UQ information stream contains information on the University's profile, its locations, organisation, financial matters, policies and procedures, publications and campus life.

The inclusion of information on Campus Life at UQ was a direct outcome of the focus group research that stated that the old UQ Web site gave no feel for what it was like to be at UQ and no indication of where to eat, what's on, where to go and how to get there. Both current and prospective students and staff stated that such information could influence their decision about coming to the University of Queensland.

Another example of focus group data being fed back into development of the Web site can be seen in the 'Student information' stream. The headings used are 'Getting into UQ', 'Courses and subjects', 'Assessment', 'Support services', 'Campus life', 'Graduation and beyond', reflecting the headings and range of content that students expected to find.

All information streams on the site are underpinned by a series of authoritative databases that are 'owned' by an 'information custodian' who is responsible for the accuracy and currency of the data contained therein. Seven authoritative databases have been built:

- ❑ Frequently Asked Questions [[HREF2](#)]
- ❑ Services [[HREF3](#)]
- ❑ Maps [[HREF4](#)]
- ❑ News & events [[HREF5](#)]
- ❑ Courses [[HREF6](#)]
- ❑ Organisational Units [[HREF7](#)]
- ❑ Controlled vocabulary

All of the databases allow you to browse or search for information and provide help on how to use them. Some such as the Services Directory, the Frequently Asked Questions database and Events database allow clients to add an entry. Entries added in this way are auto-forwarded to an editor who validates content, standardises terminology and authorises their publication.

All of the databases are interlinked, for example, if the answer to a Frequently Asked Question includes a department name that name will be linked to the organisational units database for further information on that department. If an event is mentioned that will be linked to the events database for further information. If a physical location is mentioned that will be linked to the maps database, and so on.

These authoritative databases help to ensure that key content is complete, current and accurate.

Ah maintenance!

The success of any Web site rests on whether it is regularly maintained. For a variety of historical reasons, many higher education Web sites have been poorly maintained and, as Hinton (Hinton, S., 1998) suggests, appear to follow a decentralised autonomous model where Web publishing is undertaken primarily by keen amateurs and few standards, guidelines, corporate style or templates appear to be recommended or followed.

The existing (pre 1 February 1999) UQ Web site followed such a model, its lack of a formal authority system resulting in ad hoc development and maintenance and a highly fragmented site. To ensure that this did not continue to occur a system of Information Custodians was proposed and Corporate Procedures and Guidelines for Web Site Development and Maintenance were drafted.

The system of Information Custodians provides a mechanism of ensuring ownership of data in the revised UQ Web site. Information Custodians are responsible for the development and maintenance of information in their area of responsibility, its currency, accuracy and comprehensiveness and its compliance with corporate guidelines. Each information stream on the revised Web site has an Information Custodian and ultimate authority for Web content is now vested in the Secretary and Registrar.

Developing Corporate Procedures and Guidelines for Web Site Development were critical to providing information on the required standards for UQ Web publishing.

These guidelines define:

- ❑ Standard features required of web sites (e.g. Search, FAQs, Feedback and Contact buttons)
- ❑ Browsers supported
- ❑ Graphic design standards
- ❑ User interface design standards
- ❑ Metadata standards
- ❑ Authentication standards
- ❑ Navigation standards (e.g. link to home page back buttons)
- ❑ Preferred typefaces and styles
- ❑ Web site management and maintenance expectations (e.g. link checking)
- ❑ Editorial conventions followed (in Australia the AGPS Style Manual for Authors, Editors and Printers and the Macquarie Dictionary are widely followed)
- ❑ Corporate policies on issues such as advertising, personal home pages and copyright.

Where to next?

Phase one of the UQ Web Enhancement Project finished when the site went live on 1 February 1999. Phase two finishes in August 1999. The primary focus for this second phase is imbedding the maintenance mechanisms and devolving maintenance and development to the authorised Information Custodians. Developing mechanisms to provide basic personalised information, a need identified by the focus group research, is also a priority for this phase. The time constraints of phase one made this impossible to achieve earlier. However the project plan, like the web site itself, is changing to reflect emerging client needs.

Feedback generated via the feedback link on every corporate page along with analysis of search engine success rates, transaction logs and other usage statistics, provides invaluable information about the University's users and its Web site.

The data gathered includes information on who is searching on what terms in what information streams/databases, whether they get any hits, how long it takes them, what browser they use, what country they come from, what time of day/night and day of week they use the site.

Date/time	Search term	Records found
26 Feb 1999 9:33 pm	accomodation	25
28 Feb 1999 2:21 pm	gym	0
01 Mar 1999 3:14 pm	gym	1

Table 1. Search terms are logged and fed back into the various databases and general web content. Commonly misspelt words or alternative spellings are added to the Controlled vocabulary database, and missing web content is created/linked.

Such feedback/data while sometimes overwhelming provides important clues to Web site success and it is taken very seriously with most feedback being responded to within 12 hours and most errors being fixed within 24 hours. Needs identified are fed back into web site development. For example, synonyms are added to the controlled vocabulary database to increase the search engine pick up rate, content and related links being added where required.

Not all needs can or should be met by the Web team. Often the feedback mechanism is used as a generic communication mechanism with the wider University. Queries range from course admission advice, to pleas for help in finding lost friends, to queries about the weather in Queensland and so forth.

Lessons learned

Our experience suggests that there are six critical steps to ongoing Web site success:

1. Get backing at the highest level
2. Build a team with project management, technical, design, indexing and content expertise
3. Communicate relentlessly (use a [Project Web site \[HREF10\]](#))
4. Look (at what your clients are doing, at what works for others)
5. Listen (to what your clients are saying, to what the experts say)
6. Ask (ask your clients what they want, what they think, what they need and ACT on it - ask for help in order to minimise reinvention of the wheel!).

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Hypertext References

HREF1

<http://www.uq.edu.au/>

HREF2

<http://www.uq.edu.au/faqs/>

HREF3

<http://www.uq.edu.au/services/>

HREF4

[http://ausweb.scu.edu.au/aw99/papers/
darch/paper.html](http://ausweb.scu.edu.au/aw99/papers/darch/paper.html)

- HREF5 <http://www.uq.edu.au/maps/index.phtml?menu=1&z=2&id=70>
- HREF6 <http://www.uq.edu.au/new/>
- HREF7 <http://www.uq.edu.au/courses/>
- HREF8 <http://www.uq.edu.au/departments/>
- HREF9 <http://www.killersites.com/>
- HREF10 <http://www.secretsites.com/>
- HREF10 <http://www.uq.edu.au/project/>
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