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Introduction

Australian Policy Online is an open access digital library and information service focussing on research and opinion relevant to Australian public policy. Although it is a popular service amongst a broad constituency interested in policy issues, it has become clear that the current system is inadequate on various levels. Thus in 2008 we began the process of considering how to upgrade to a new content management system and what new content, architecture and functionality the upgraded site should have. This paper looks at the process of upgrading an existing website heavily populated with content. In particular it will examine the goals and audience for the site and how the upgrade uses a variety of tools and methods – from taxonomies and controlled vocabulary to user-generated tags and bookmarking - to open up the APO database so that readers are better able to access the information that is relevant to them.

Background to Australian Policy Online

Australian Policy Online (APO) is an open access digital library specialising in Australian public policy research and opinion. Established in 2002, the website is maintained by an editorial team based at the Institute for Social Research, Swinburne University of Technology.

Australian Policy Online is a unique research resource allowing academics, policy makers and the general public free access to public policy reports, articles and other publications via the site’s archive and distribution services. Each week the site’s editors add around 30 new report listings and the library now has links to over 6000 research articles, providing free access to full text pdf or html documents. Along with reports, new comment and analysis articles, event and job listings are added every week.

The content on the site encompasses most contemporary social, economic, health and environmental issues which allows a great breadth of subject matter. The cross disciplinary nature of many social issues means the site has to cover a wide range of specialist subjects as well as those of broad community interest. The important point is that the research aims to have some applicability to policy practice.

APO has a membership base of 170 academic centres and institutes, think tanks and organisations from around the country that forms the core of its content sources. The site also collects details of government reports and relevant scholarly publications from non-members including associations, charities and commercial research companies. The publications listed on APO are known as ‘grey literature’ - reports, articles, analyses, working papers and statistical documents, typically published by research institutes, non-governmental organizations, and other agencies and not controlled by commercial publishers, making them difficult to find individually.
One of APO’s most popular services is its regular email newsletter, known as the Weekly Briefing. This has proved to be the crucial communication resource for many readers of the site, which also provides updates via RSS feeds. Subscriptions are free and now number over 10,000, while the website itself receives around 32,000 visits per month.

Unlike a public or research library-based service, APO is not bound to any geographical, financial or institutional definition of users. It is a national resource with its content focussed on Australian publications and issues and, by collecting this content according to recognised web standards, promotes the dissemination of Australian research across the world. The APO readership is primarily Australian with around 10% of readers based in other countries. The website is specifically targeted to the interests of those engaged with the development of public policy in Australia however the site also attracts a sizable general interest audience.

APO’s strength is that it solves a long-standing problem in public policy – ensuring that those that make and implement public policy have access to the latest research findings produced by academic institutions and other organisations; and conversely, that researchers and writers are able to disseminate their findings to policy makers in a timely and effective manner. In the words of one reader, APO is “a great way to get research into policy and programs.”

Why the need to upgrade?

Over the last few years APO’s readership has grown by over 25% annually and the number of newsletter subscribers has similarly increased. Word-of-mouth has been the primary promotional tool and from an online survey of readers conducted in 2007 it is clear that the site has a loyal and appreciative audience.

Readers particularly like the simplicity of the design and the immediacy of the information provided. Unlike many online databases new material is always presented on the home page and the style of presentation is more like a news site than a library catalogue.

Yet while there is no doubt that the site has continued to grow in popularity, aspects of it had become more difficult to use as the amount of content on the site grew. This reflects Bates’ comments on the implications of the size-sensitivity of information retrieval (Bates 2002). As she writes, “That cute little classification scheme you devise when you have 1,000 records will be driving you crazy with its inadequacies by the time there are 10,000 records.” The search function on APO had became incredibly slow, the browse categories were too limiting (neither broad enough nor narrow enough), the capacity to make improvements was restricted by the functionality of an early model content management system, fields needed reconfiguring and a number of technical issues with interoperability did not function well. So although it wasn’t exactly broken, it was time to make improvements.

As well as the institutional support of Swinburne University and other partner universities, the development of the archive has been generously supported by the Australian Research Council under the Linkage, Infrastructure and Equipment (LIEF) grant scheme. As a result of project funding in 2008, APO began the process of selecting a new content management system and planning for new features.
The upgrade process

The process of researching and planning for a website upgrade is a complex one. Many methodologies exist for this process however the basics remain the same; first comes the research phase where the goals of the organisation and the website are identified and audience analysis is carried out. This is followed by the strategy and documentation phase, including the design of the information architecture. Finally the site is built, tested, edited, maintained and continually improved (Morville and Rosenfeld 2007). This paper explores this process, particularly the analysis of the site’s goals and audience, and the content and functionality strategy.

The research phase

Identify organisational and website goals

Until the website upgrade project APO had no explicitly stated goals, no published content policy and no audience analysis had been conducted. Despite this it had gone from strength to strength in terms of readership and website visits and was manifestly providing a useful service. Reader feedback, via unsolicited emails, was almost always positive and the number of member organisations was also growing.

The first step in the process was therefore to explicitly identify the goals of the site and where it should be heading. A SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) was conducted followed by a brainstorming session with the site’s editors and other stakeholders. After considerable discussion, and tweaking the following vision and goals were identified.

Australian Policy Online’s vision is to be the best online source for Australian policy information.

APO’s goals are to:

- Provide free and open access to the latest Australian public policy research and information.
- Provide relevant, high-quality content across the full range of public policy areas.
- Provide information services and functions that help sustain the network of public policy researchers.
- Allow readers to easily browse, search and manage information on the site.
- Establish a sustainable financial model and strong national and international partnerships.
- Comply with international standards of website design, information management and interoperability.
- Continuously maintain and improve the website, its content, features and services in line with the interests of our readers, the public policy environment and technological change.
In going through this process we questioned many of the assumptions contained in these goals including whether the whole site should be free, what was the meaning of open access, what breadth and depth of coverage the site should aim for, and the million dollar question, what financial models work for website content providers? It was valuable to remind ourselves why APO is an open access archive – primarily because the research we catalogue is freely available online and publicly funded and it would be unethical to collect it and charge for it, particularly when APO is itself a publicly funded resource! It would also go against the interests of achieving better public policy outcomes for Australia.

**Audience analysis methods**

As with physical libraries, audience analysis and information behaviour is a major research focus for digital libraries and websites and there are many options for gathering feedback from readers about their needs, tasks and ways of thinking about and using the site. Some of the most often suggested, from easiest to hardest, include: site and search analytics, card sorting, task analysis, surveys, usability testing, interviews, contextual analysis and mental models.

While it would have been preferable to conduct contextual analysis, involving site visits and interviews with readers, prior to the site redevelopment this was not possible within the limited resources of only 3 part-time staff. It is hoped that in the future we will be able to undertake a detailed project investigating the specific needs of policy researchers and bureaucrats in situ, and their use of online research resources. Instead we chose an assortment of techniques to gather information on our audience and their needs including web analytics, academic research, an online survey, personas, use cases, search term analysis and nomenclature. The results of this analysis were then fed into the design via the development of blueprints and wireframes.

![Audience analysis and user-centred design steps](image)

Figure 1. Some of the main audience analysis and user-centred design steps, the highlighted boxes being used in the APO upgrade project. (Young 2008)

Importantly for a project with a small budget, a great deal of useful information on the APO audience was able to be gathered from secondary sources - the wealth of research published on the information seeking behaviour of academic researchers, students, journalists, and even
public sector officials. A survey of the literature available in this area is provided in *Looking for information: a survey of research on information seeking, needs, and behavior* (Case 2007). These researchers have often participated in the kind of contextual analysis and indepth interviews advocated by information architects and yet their research results and conclusions often seem to be overlooked by practitioners in the field.

Over the last 30 years many information science researchers have sought to identify models, patterns or methodologies for the typical ways people seek information and these can also provide a helpful guide, particularly for task-based and contextual audience analysis (Fisher et al. 2005). For example Ellis’ model (1989) has been adapted by various people, particularly Choo for website browsing behaviour (Choo et al. 2000) since it was first published. The model identifies key tasks of the social science researcher as being: starting – using a source, a person or reference to begin searching; chaining - following up references from useful sources; browsing; differentiating; monitoring and extracting. While some researchers have added other items to this task list, the list itself has been reinforced by many studies, meaning that at the very least, the APO system should be able to readily support these behaviours.

Also useful was Donna Maurer’s description of four modes of information seeking behaviour: known-item searching, exploratory, don’t know what you need to know and re-finding (Maurer 2008). A system needs to make sure it can assist users when they are using any of these common behaviours, no matter what audience segment or profile they may have. We will continue to monitor the research being conducted in this area to learn more insights that we would not have the staff time or expertise to garner for ourselves.

**APO reader survey results**

In September 2007 APO conducted its first online reader survey in preparation for the site’s redevelopment. The results were extremely encouraging. Over 800 readers completed the survey, most of these being readers of the *Weekly Briefing*, APO’s weekly email newsletter. From the survey we gathered a much better idea of who the APO audience is and why they read the newsletter or come to the website.

**Who is the APO audience?**

A third of the audience is within the education sector, at least another third come from local, state or federal government sector, with the final slice of pie being a mix of NGOs, charities, media, professionals and librarians. By definition, public policy is of concern to the public, as well as specialist researchers, which means that a broad range of people engage with APO for a wide variety of reasons in a way that is different to proprietary research databases or specialist subject archives. As a result the service is particularly appreciated by those unable to access alternative sources of scholarly material. And its timeliness is appreciated by everyone.

The primary audience can be divided into 5 main categories: education, government, non-government and community, media and information managers and professionals. The following breakdown of these categories includes comments from the 2007 APO reader survey indicating their reasons for using the site.

**Education sector:** includes researchers, lecturers, teachers, students – secondary and tertiary, and university management.

*Very useful, often refer students to it, use it for my own research.*
The APO is an invaluable quick guide to contemporary policy debates in Australia and its region. I circulate relevant items to all my students, and indeed encourage them to subscribe.

Contains very useful information - it assists a number of colleagues in developing reliable planning advice for our TAFE delivery points.

Great for keeping up to date especially as I am an external student living in a remote regional area.

**Government:** Federal, State and Local bureaucrats and researchers, government organisations (eg ABS, AIHW); librarians and information managers

It's a major asset to me. It has opened up links with all sorts of researchers with my govt health work...Outstanding.

**NGOs and Community Organisations:** this includes think tanks and advocacy groups eg The Climate Institute; charities such as the Brotherhood of St Laurence; lobby groups; associations (eg Business Council of Australia); community groups and the community services sector

I like being kept up to date regarding policy. It helps in my research of the Welfare to Work legislation and its affects on people with physical disabilities.

**Media and information management:** including print, radio, television and online services, libraries, information resource centres and websites.

I use this site to garner radio interview/story possibilities for community radio station

I frequently quote parts from articles in my own newsletter for info sharing to my networks.

I have found this an excellent resource for keeping an eye on what is being published - have frequently found out about reports from APO rather than the original source, many of which I DO monitor. Have recommended this site to other librarians.

**Professions, corporations and business:** legal professionals, health professionals, corporate researchers and marketing departments.

As a community lawyer I cover a wider range of areas than a lot of others in the legal profession and being able to access current reports over a wide range of relevant topics is really important. I've also lost count of the number of times colleagues have been impressed by how on top of things I am!

**General readers**
I've recently emigrated here form UK and APO has become my portal to the Australian system. I've not found anything better.
How readers use APO

Regular users of APO (weekly briefing subscribers) visit the website weekly. They mainly like to browse new reports but usually also download a report. The often read the comment and analysis pieces and occasionally browse the topic archive. They are less likely to use the search function and hardly ever do an advanced search. They sometimes check out events but rarely the jobs or research tools (possibly partly due to the lack of content in these sections). Overall they find the information very or fairly useful (99%) and the layout and design of the site to be good to very good.

Interestingly reader’s use of the search box was low with less than half using it at all, while advanced search features were hardly ever used. Browsing the archive was actually more common, with 64% reporting they did this most or some of the time. This may reflect the initial motivation of Weekly Briefing readers to come to the site, inspired as they are by a new research item of interest, rather than any specific search need. Or it may be indicative of what one reader described as the ‘glacially slow’ search results!

When asked what new content they would like the top items (over 90% very or somewhat interested) were specialist subsites focussing on major policy topics, research guides/introductions to key policy areas, news items about research and policy issues, website listings and report reviews or analysis.

Functionality did not get quite the same level of unanimous endorsement. The clear favourites however, with over 80% interest, were more specific subject categories for browsing and full text searching of pdf attachments. Bookmarking items and personal libraries were also supported. Notably over half were not interested in being able to comment on reports or articles – flying in the face of current trends in online media.

Some typical survey responses about the site and it development ranged from the totally positive:

*The best online source of Australian policy information*

*how can you improve on perfection?*

To the don’t change…

*I am concerned that several sites I use regularly have recently attempted to 'improve' their site (presumably driven by some type of poll-driven survey) and the result is that the usability of their sites have trended toward the anti-intuitive.*

*Quality site and worth reading and using. Keep up the good work but avoid the temptation to 'improve' something that works.*

*Keep it as simple as it is now to read and download articles.*

On to specific change requests…
I find the three steps to the actual report content time wasting. I usually know from the first listing that I would want to look at the full report, not just the summary.

Which sometimes contradicted each other…

Downloads of full text articles take a while which can be frustrating. Appreciate the longer summary of articles to determine if a download is relevant.

But were generally full of great suggestions and helpful advice…

I find it overwhelmingly long, perhaps if I could filter out some of the subjects I'm not interested in it would be more manageable

It is greatly appreciated and very useful! Maybe there could be links from current items to recent related reports / pieces?

Ways to contact experts

Video podcasts would be amazing! I frequently download video podcasts and have found them to be a wonderful insight.

Despite the limitations of the survey method, APO readers were generous in their comments and provided a wealth of feedback which we have continually mined for insights and suggestions in the strategy phase.

Part 2. The strategy phase

With the results from the reader survey and an understanding of general models of information seeking, it was possible to begin examining the content to be included in the site and any particular characteristics that might have. At the same time we examined the kind of functionality that would be useful. This was done using use cases and key task analysis charts.

Key tasks and information needs
By analysing the result of the survey and web analytics it was possible to come to a list of some of the most common tasks readers performed or wanted to be able to perform. These could then be written in terms of user statements.

As a researcher I want to
- access new reports easily and immediately from the website or newsletter
- be informed about relevant new research within and across disciplines
- read the key points or executive summary of a document without downloading it
- access the full text of a document directly from the email
- search and get results quickly
- be able to find the key research reports on a given topic
- see related documents on a topic
- read, watch or listen to relevant material
- filter only relevant content
- keep up with events, jobs and news in my area
- disseminate/advertise events, jobs, news or research to the policy community
- identify and contact experts and organisations
- etc etc

This process was then repeated with other reader groups and the lists were able to be prioritised, deduplicated and tested against the system requirements needed to achieve them.

**Content**

The APO survey asked readers about the kinds of content they valued on the site, both existing content and new types. As a result the types of material catalogued and published on APO in 2009, following the upgrade will be:

- **Research**: this is the main part of the APO collection and covers a diverse range of written research including reports, papers, articles and journal articles, submissions, conference proceedings, briefings and e-books. The format of text research material is primarily PDF and HTML documents with some word or power point formats. Crucially the decision was made to begin holding full text pdf documents within the database to enable full text searching.

- **Comment and analysis**: these are original opinion pieces, either commissioned by APO or reproduced from newspapers or other sources. They are all html documents with a print friendly option provided.

- **Policy snapshots** (formerly research tools): this redeveloped section of the site will be ‘Wikipedia’ style entries summarising current policy issues in Australia and their key documents. This idea generated strong interest in the 2007 survey and is designed to help readers quickly get an overview of an unfamiliar research topic or issue, or check particular facts relating to a policy.

- **Web resources** (formerly Links): this is a new section of the site where websites with high-quality policy-related content, data or services will be catalogued according to the site’s 10 new subject categories. Websites included will need to provide some level of access to high-quality, research oriented content, tools or services to be included. Organisation or company sites will not be included unless they contain detailed resources.

- **Audio**: a new section featuring podcasts of talks, seminars, conferences, radio reports and lectures. Students in the 2007 APO survey expressed a distinct interest in podcasts and many excellent lectures and policy discussions are now available on audio. This will be a select list to avoid duplicating other podcasting services.

- **Video**: similar to audio, this new section will include lectures, talks, reports, documentaries and visuals relevant to Australian public policy. The internet is a visual medium and it will be increasingly important to provide alternatives to written material, particularly as the amount of video content available increases in the next decade. Videos will need to be high-quality, in-depth, issues-based material.
• **News feeds:** news reports and articles from external sites will be published on APO via a news feed aggregator, with some monitoring by APO’s editors to ensure relevance.

• **Advertising:** existing job, event and other advertising will be improved with online credit card payment and better layout and browse features. New opportunities for advertising and site sponsorship will also be explored as APO seeks to meet its goal of financial sustainability. The place of Google advertising is still to be decided.

**Selecting a content management system**

Choosing a content management system (cms) was one of the hardest parts of the upgrade process. There are literally hundreds of existing software systems with new ones seeming to sprout daily. A list of vendors in Australia is provided by Step Two Designs on their Australian CMS marketplace page along with helpful tips on the selection process. However this list does not include companies implementing open source cms solutions. With a limited budget, and access to computing students, open source software appeared attractive, if a little daunting. Despite claims to the contrary, setting up a site with open source software such as Drupal, Joomla or Plone requires considerable technical knowledge and a great deal of time to customise specific features.

Yet the thought of paying licensing fees year upon year, and being locked into one particular company, was also unappealing and didn’t seem to fit with our financial goals. The answer lay in finding a company to implement our requirements and continue to help us to maintain the site, while using the open source software of our choice. In the end we chose Drupal as it appeared to be more sophisticated than Joomla but not as complex as Plone to implement. In particular it was the closest match for meeting APO’s specific requirements including the capacity to set up subsites from a single database, search full text pdf attachments, and build a sophisticated taxonomy and classification system. It had also won a number of supporters in the library community which was encouraging.

**Improving the navigation and browsing experience**

The focus then turned to the challenge of working out how to reorganise the content that we had in order to improve the browsing experience for our readers. Readers of the *Weekly Briefing* had expressed frustration at receiving a long, unclassified list of items. While it was possible to fix this with the existing system it would have meant any item classified under more than one topic would be repeated. With the existing site structured around 25 topics this solution would have seen the newsletter explode in length with reports appearing multiple times.

On the other hand having only 25 topics and no subtopics on the website meant readers had to wade through pages and pages of listings under very broad categories such as health or education with no way, apart from using the (very slow) search box, to narrow their browsing.

It was clear that improving the delivery of information was very closely tied to the classification system. The answer involves moving in (at least) two directions. The first is to reduce the number of top level categories which will allow for the construction of subsites around key subject areas. Currently the main 10 categories are: Citizenship and Migration, Creative Industries, Economics and Employment, Education, Environment and Planning, Healthy Communities, Indigenous issues, International issues, Law and Justice, Politics and
Government. This structure will also mean that items can be listed with less repetition in the Weekly Briefing newsletter and that readers can subscribe to specific topic area newsletters and avoid being swamped by irrelevant material.

In the other direction, there needs to be many more subcategories (tags) within these large topic areas so readers can easily narrow their browsing to specific areas of interest. Items will be able to have multiple top and second level categories, essential for the many cross-disciplinary reports catalogued on APO. However to avoid the cataloguing process becoming too lengthy an initial cap on the controlled vocabulary has been put at around 100 terms plus synonyms. It is hoped that the combination of user-generated tags will help to expand this list over time without the need for additional editorial classification.

Subscribers will be able to select any topic or tag to receive a more targeted weekly newsletter however, at this stage, we believe they will have to receive multiple emails if they are interested in more than one of APO’s topics. We have recently been impressed with various targeted email software systems that allow readers to select various topics of interest with the email newsletters then being created dynamically each week (see University of California Press as one example of this.) This will be an ongoing point of research and development for the next stage.

In terms of the information architecture, we have been working on a model of reduced navigation options (or clutter), with the home page navigation centred around the top 10 topic areas rather than content types such as reports or events etc. Instead these areas are accessible from the layout on the page. When readers want to access specific content they can, via global navigation, go to a pop up site map, as well as from the footer at anytime. The navigation on each topic page only has the subtopic tags and all content is related to that topic. These subsites will mirror APO’s home page but with distinguishing design elements.

Related links are provided at the individual report page along with a range of story tools now common on most publication websites – email, print friendly, share, contact us, subscribe and APO bookmarks for those who want a site-based collection of references. Comments will be able to be made on research listings and comment and analysis articles. Although there was a lack of interest in this feature in the survey it is easy to implement so we will experiment and see if it does get used or if it should be removed to avoid unwanted feature clutter.

**Tools used**

In order to work out the final structure of the database fields and the site architecture, a range of techniques were used. A content analysis of the existing site was carried out and blueprints of the site structure were created. The classification scheme was developed simply using an excel spreadsheet. Work-flows were plotted with Microsoft Visio, then detailed database field mapping was done interlinking with wireframes which were also created using Visio. Requirements were developed along the lines of an agile modelling process with the primary method being the development of use cases mentioned earlier which were then plotted against a hierarchy of priorities. The wireframes and database fields were continually revised against these cases and to each other in order to ensure that all relevant items made it to the prototype.

**Opening up search results**

As was previously mentioned, readers had found the speed of the search results incredibly slow so this was the number one improvement for the search facilities on APO. Beyond this important point, we wanted to look at some of the more sophisticated ways search is being
used to provide access points for browsing as well as known-item searching. Faceted search is one of the most interesting new developments in website searching and has been picked up in the last few years by both libraries and media organisations such as the Guardian online. Basically it involves providing post-search content filters next to search results allowing searchers to narrow their search results in many ways – by date, topic, author, content type, geography etc. Drupal has its own module of faceted or filtered search results, but there are also proprietary and other open source versions available.

Implementing faceted search has involved re-examining an item for some of the other access points that may have previously been missed – geographical location will allow results to be narrowed by state or country, item type and organisation type will assist with differentiating and evaluating resources. We also have to make sure the information we now have (including author, year of publication and publisher) is able to be presented effectively within the filters.

Readers vs contributors

Ultimately web 2.0 tools are about enabling readers to become contributors and APO is considering a number of ways this will be possible with the upgraded site. At a relatively simple level readers will be able to contribute comments on reports and articles, notify editors of deadlinks or problems, collect, tag and share items with each other, and see what everyone else has been reading via ‘most popular’ lists.

More complex decisions are still to be made around reader contributions of reports, and the development of wikipedia style policy guides. Like any cultural institution, the quality of APO’s material is one of its most prized characteristics. Because it attracts informed and expert readers there is enormous scope to harness the expertise of the APO readership, spread as it is across government, academia, community organisations, the media and other professions. At the same time it is important to find a balance between taking the contributions of well-informed experts and running the risk that loaded or partisan opinions may also find their way onto the site.

One model for soliciting quality contributions of research material is to commission an extended editorial base of expert contributors from related organisations, libraries and online portals. A second model is to have an online form for reader suggestions and contributions, to be reviewed in some way by APO’s editorial team. I imagine we will try both of these and get back with the results at the next Information Online conference in 2010.

Conclusion

There are as many tools available for the strategy and planning of a user-centred design as there are new technologies for those users to interact with on a website. Finding a way through the maze to the tools that will be useful in the website development (and for the user community) can be very difficult and time-consuming. This case study has tried to show the process that APO’s editors have gone through and the outcomes we arrived at. Ultimately there is no escaping the necessity to define a site’s goals, its audience and their information or task needs. It is hoped these changes will help the database to be more open to its readership, assisting them to connect with the research, the news and the people of interest, and thereby help to improve the quality of Australian public policy debate, decision-making and implementation. Finally, we expect to have many things wrong and look forward to hearing from our readers and making many changes to our website over time. That will be truly opening up APO to its readers.
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