

STAFF PAPER



## Music Australia: from development to production service

[www.musicaustralia.org](http://www.musicaustralia.org)

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## 1 INTRODUCTION

Music Australia is an online service that showcases Australia's musical culture across contemporary and historical periods, from the earliest published music to the latest hit. It is a free resource discovery service, hosted by the National Library of Australia that helps people to find, explore and locate all types, styles and genres of Australian music – whether created, performed or published in Australia or by Australians, or associated with Australia's musical culture.

Music Australia was a key platform for innovation in national discovery services when it was first conceived in 2001. The vision encompassed a long term plan to grow the number of organisations in Australia contributing music records to the national bibliographic data-set; to develop online Australian music content (of which there was almost none in 2001); and to showcase, network and build an audience for our rich, but dispersed and often inaccessible, Australian music collections. Music Australia's subsequent development was driven by three service-oriented questions tailored to the needs of users:

- Do you want to find and access Australian music resources, both digital content and bibliographic records?
- Do you want to find out about and be directed to services and information about Australian musical activity, people and organisations?
- Do you want to participate by borrowing, buying, asking us, annotating or contributing content?

We had only just released the pilot demonstrator of Music Australia when we first exposed the service to international review at the IAML conference in Berkeley in August 2002. The pilot specifically aimed to test the delivery of musical content using a selected set of digitised and born digital scores from the National Library of Australia [NLA] and the Australian Music Centre [AMC], and sound from the National Film and Sound Archive [NFSA], trialing data exchange and digital delivery across music formats and institutions. Since then, the service has grown and changed in some significant respects, in part motivated by the need for sustainability amidst rapidly changing digital information business models and in part in response to external demands, challenges and user feedback. It has developed over four stages:

- Pilot demonstrator service: November 2001-August 2002
- From pilot to project development: March 2003-February 2005
- First production release Music Australia 1.0, launched March 2005

- Second production release Music Australia 2.0, launched April 2007

This paper analyses the process of development from pilot to production, addresses the achievements and the challenges, discusses directions and future enhancements and offers some personal reflections about the lessons learned along the way. First, though, a brief depiction of the web service as it is today will place these reflections in context.

Music Australia crosses the boundaries of formats, as well as institutions, to present a comprehensive picture of Australian musical resources, musical information and research about Australian music, past to present<sup>1</sup>. It is a collaborative service developed by the National Library of Australia in partnership with more than 50 cultural organisations around the nation. The vision grew in part out of the National Library's leadership role in coordinating national services that make Australian culture, collections and information more easily accessible to the world. Though the National Library hosts the service, it is federated and depends upon the cooperative endeavour of music, data and information technology specialists across multiple institutions. These include the National Library and the National Film and Sound Archive, Australia's state and territory libraries, specialist music organisations such as the Australian Music Centre, academic and public libraries, archives, museums (including the Grainger Museum at the University of Melbourne), special collections and research projects funded by the Australian Research Council or the Australia Council for the Arts; and most recently a government-commercial partnership drawing on the new digital music and media business. Music Australia's innovation, then, especially lies in the way it crosses the boundaries of the arts, academic, cultural, information and business sectors to provide a coherent vision of the nation's music.

Music Australia functions as a top-layer, federated discovery service to metadata with digital content created, archived and delivered by individual organisations. It provides the user with the facility to search and find music and music-related resources physically scattered across the nation, where vast geographical distances, remote locations, dispersed collections and low level of community funding mitigates against easy access to music resources. Music Australia, in this sense, creates and displays to the user a 'virtual' national collection, where the metadata is aggregated centrally by the National Library but returns the user to the home institution to access the resource.

The service is not a single format site akin to the growing number of commercial sheet music or digital download music sites. Rather, it integrates both resources and information about Australian music seamlessly through a single point of access for the user. It allows for

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<sup>1</sup> [www.musicaustralia.org](http://www.musicaustralia.org) A search on *Waltzing Matilda*, searched directly from the home page, will suffice to demonstrate the wide range of formats, functionality, institutions and resources – from heritage to contemporary – represented in the service.

discovery and exploration at multiple levels, either at a basic level for the general user or supporting the sophisticated researcher to ever widen or deepen their search. Where a digitised or digital object is available online, people can view, listen, download, print and use musical resources online. Where resources are not online, the service provides more information and guides the user as to how and where to access or 'get a copy', whether by borrowing through interlibrary loan or buying from an institutional copying service or commercial supplier. For the casual user, perhaps not knowing where to start, several themes or topics are displayed as curated online content, selected and partially interpreted. These suggest to users, especially to users unfamiliar with Australian music research, a range of cultural perspectives, educational approaches or musical interests by which to approach the content.

## 2 PILOT TO DEVELOPMENT

After the demonstrator service was released in 2002, the Music Australia Project Board<sup>2</sup> confronted some key challenges and questions learned from the pilot before agreeing to proceed further:

- How could we build a dynamic, national and sustainable service that would remain free to users, be automated as much as possible and that could be funded and managed largely within existing staffing, resources and programs?
- What business model should we adopt? Could we justify and maximise the investment in building a music subject specific service or should we instead align the service with existing generic infrastructure? How could we leverage off and repurpose existing resource descriptions in a range of different formats aggregated from the databases of participating organisations?
- How would we generate online content when there was virtually none at the beginning of the pilot? Would we include only online content or also bibliographic records for physical collections with pathways to access them? Would we include only music resources or also information about Australian music? How would we define 'Australian' content?

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<sup>2</sup> At that time, the Project Board consisted of senior management of the National Library and the National Film and Sound Archive (chaired by the then NLA Deputy Director-General, David Toll. Project Directors were Robyn Holmes and Tony Boston, and the Project Manager was Marie-Louise Ayres, NLA. This Project Board managed the development of the service through to the launch in March 2005 when the management of the service became the sole responsibility of the National Library, under the direction of Robyn Holmes and Production Manager Kaye McIntyre. In July 2007, formal responsibility for the service was transferred to the Libraries Australia division at the NLA.

- How could we enable users to navigate relationships across resource types, multiple formats and multiple records across institutions, especially when confronted with the incompatibility of many data sets or insufficiency of data to expose relationships between materials, as discovered through the pilot?
- How could we deliver in-copyright music, or should the online content be confined to sources in the public domain? Given the complexity and expense of clearing individual rights, could we develop comprehensive licensing agreements with copyright agencies and with creators, performers and publishers?

In response to such thinking, the key decisions made along the way to enable the release of Music Australia as a production service in March 2005 have proved critical to its subsequent growth and sustainability. The major decisions were that:

- Music Australia would be discipline based as well as format based – that is, it would include everything related to Australian music as well as actual music resources in score, sound and other mixed media, and in archived websites.
- Music Australia would include both bibliographic records and online music objects.
- There would be two Music Australia databases, one for Bibliographic Resources and another for People/Organisations, which the user could search seamlessly as a single search from the Music Australia interface.
- The architecture would be designed to efficiently share data between Libraries Australia, the generic cooperative library infrastructure<sup>3</sup>, and Music Australia.
- It would be essential to work across both library and non-library sectors. If we wanted comprehensive coverage of the musical landscape, we would have to expand outside the library sector and facilitate the growth of data and content across a wide range of specialist music organisations, communities and archives, research and arts projects. This meant working out how to support a centralised data set in MARC, when many music organisations were creating and using data in a myriad of ways and data types.

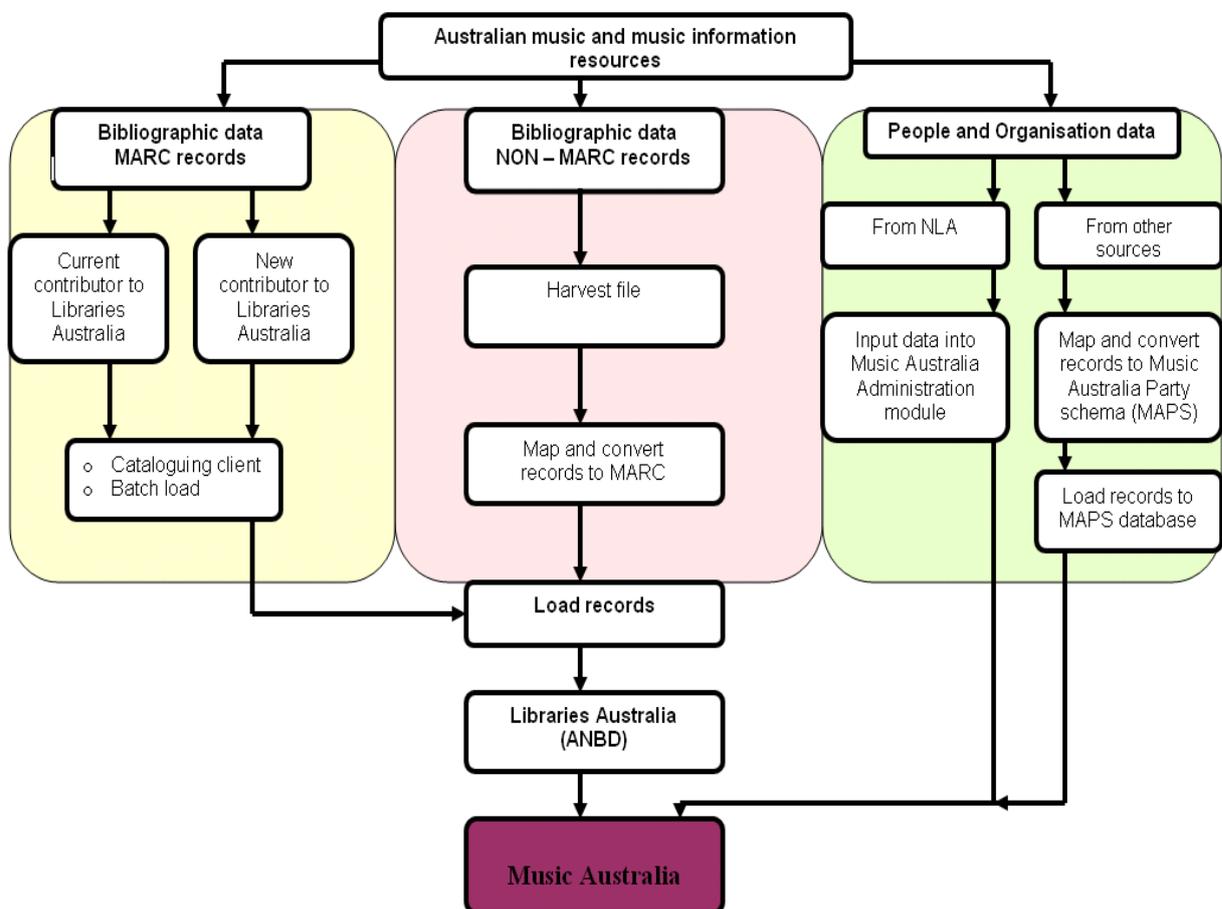
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<sup>3</sup> Libraries Australia is a resource sharing service coordinated by the National Library of Australia for Australian libraries and their users. It is used for reference, collection development, cataloguing and interlibrary lending. The heart of Libraries Australia is the [Australian National Bibliographic Database](#) (ANBD), which records the location details of over 40 million items held in most Australian academic, research, national, state, public and special libraries. Libraries Australia is available 24 hours a day, seven days a week. The Libraries Australia service replaces earlier systems, Kinetica and the Australian Bibliographic Network (ABN) which was created in 1981 to foster resource sharing by Australian libraries.

In reality, these decisions required us to develop methodologies and systems to support the complexity of multiple formats of music and to generate content across institutions at the same time as we were developing the service. The aim was both to build a cooperative Australian music data-set as well as to develop a sustainable service model, with Music Australia functioning as both a content provider to the Australian National Bibliographic Database [ANBD] and becoming a sub-set of it.

To develop the architecture and generate content, we built the workflows across four areas of activity, as represented in Figure 1.

Figure 1: Workflow chart



Firstly, we worked closely with the library sector to significantly increase the cataloguing of music collections and their representation in the ANBD. In particular, there were some large collections held in Australian Conservatoria or special resource centres that used only local cataloguing systems. Where possible libraries were brought into Music Australia using the existing contributor model to Libraries Australia: in other words libraries did not have to contribute separately to Music Australia, a significant incentive to contributing to the national

data-set. The National Library also developed a cooperative plan with the state libraries<sup>4</sup> to commence digitising Australian sheet music within their emerging digitisation programs and build delivery systems to make these accessible online, thus achieving almost comprehensive coverage of heritage Australian printed music held across the nation. Some state libraries, such as Queensland and Western Australia, developed arts initiatives to perform and record hitherto unknown historic musical works pertaining to their regions, and others, such as the State Library of South Australia, also commenced programs to digitally preserve and deliver sound recordings.

Secondly, for music organisations, communities and special projects that were generating shareable data but in non-MARC format, we developed a methodology to harvest, map, and convert a wide range of data types into MARC (initially converting via MODS<sup>5</sup> to MARC, but stored in MARCXML<sup>6</sup>) so we could load all these records into the ANBD. Most notable was the Australian Music Centre which won the 2004 Libraries Australia (then Kinetica) innovation award<sup>7</sup> for the conversion of its very rich but non-MARC data that represented the work of Australia's living composers. The National Library also entered into partnerships with various researchers at universities and arts organisations to establish, at the point of design of projects, best practice research methodologies that would ensure that data and research outcomes could be captured within the national infrastructure.<sup>8</sup>

At the same time, mechanisms to extract all these records from the ANBD into a Music Australia resource database were established by using selection criteria that would

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<sup>4</sup> The National Library of Australia is a statutory authority of the Commonwealth Government of Australia, and located in Canberra, the nation's capital. Each of the 6 States and 2 Australian Territories manage their own state/regional libraries and cooperate through 'National & State Libraries Australasia' (NSLA).

<sup>5</sup> Metadata Object Description Schema <http://www.loc.gov/standards/mods/>

<sup>6</sup> Robyn Holmes and Marie-Louise Ayres. "Music Australia: Towards a National Music Information Infrastructure". *5<sup>th</sup> International Conference on Music Information Retrieval Proceedings*. Audiovisual Institute Pompeu Fabra University, Barcelona, 2004. p15-21.

<sup>7</sup> "Over the past year, the Australian Music Centre, in partnership with the National Library, has used the new OAI standard to harvest the rich records from the...Centre's AdLib catalogue and convert them through MODS (Metadata Object Description Schema) into MARC for inclusion in the [National Bibliographic Database](#) and [MusicAustralia](#). The project has demonstrated a very innovative use of new technology to significantly improve access to this very special collection by sharing resource descriptions of two major resource-discovery services." *Gateways* NLA, Canberra, No. 71, October 2004, ISSN 1443-0568. [http://www.nla.gov.au/pub/gateways/archive/71/8music\\_centre.html](http://www.nla.gov.au/pub/gateways/archive/71/8music_centre.html)

<sup>8</sup> Exemplified by the *Australian Sound Design* project at the University of Melbourne; the *Preservation of Australia's Sound Heritage* and the *Sound Footings* projects at the University of Western Australia and Monash University; and the PARADISEC and indigenous music projects led by the University of Sydney.

automatically identify in-scope records through fields and terms in the MARC records. This selection process is automated and the records are updated daily.

The Library also built a second database for people and organisations related to Australian music. We initially populated this with ANBD authority records, thus forming a skeleton names database for Australian music. We were able to enrich this with biographical data created both by writing entries and by harvesting entries from a wide variety of other sources using a structured data schema, the Music Australia Party Schema (MAPS). This included harvesting data via the Open Archives Initiative<sup>9</sup> from new projects such as the Australian Music Online project that had been funded by the Australia Council for the Arts to assist the contemporary music industry. The Music Australia experience in establishing a methodology to support the harvest of people and organisational information has informed the development of a new People Australia service (in progress).

### 3 MUSIC AUSTRALIA 1.0 TO 2.0

Music Australia was launched as a production service in March 2005, with a wide and substantial range of content from major and minor partner institutions. It has been immensely successful since its launch, measured by both quantitative and qualitative evaluation. So why then did we undertake a second release of Music Australia in April 2007?

The context for further development was:

- The rapid changes and volatility of the music industry: just think of Napster, the i-Pod, mp3.com, MySpace Music; Sheet Music Direct; Rhapsody. Online; and online communities like Second Life, to name a few of the new challenges!
- We needed to find a solution to the copyright barriers Music Australia was stuck behind; we had built a great online showcase of heritage music, but what about that contemporary content that users wanted to access directly online?
- Technology upgrades and fixes were needed to support more effective searching and navigation, better results sets, and to entice users to explore the full richness of the site.
- The NielsenNet//Ratings User Satisfaction Survey and Expert Usability Review of Music Australia that we undertook in 2006 had given us useful feedback about what users said

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<sup>9</sup> <http://www.openarchives.org/>

they valued and wanted. In particular, they wanted more guidance around the site, more online content and better getting options to borrow, copy and buy.

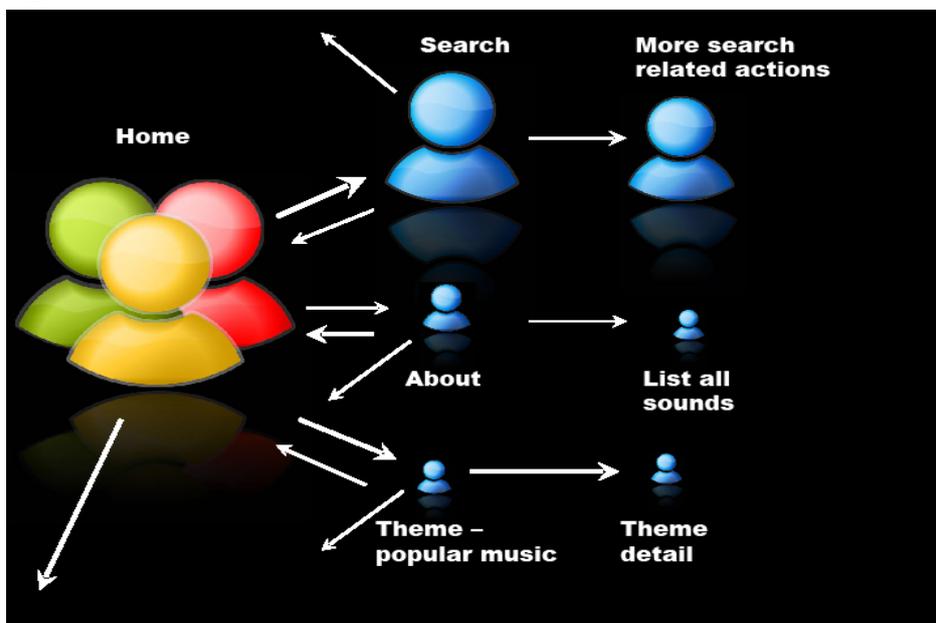
- And we applied Google Analytics to Music Australia to find out more about how people behave on the site.

What have we discovered and what has informed our second release?

**Who are our users?** Our users are predominantly professionals, 65% with tertiary qualifications, and including artists, researchers and students, and not primarily librarians! 43% of users find MA via search engines, and also via Wikipedia, Mutoopia (an international sheet music referral service) and other tools. Interestingly, 32% are using the site from rural and regional Australia and 20% from overseas. A staggering 65% are using it from home, especially on Saturdays and evenings, suggesting high recreational use.

**How are people using the site?** Google Analytics has helped us observe users patterns on the site: most typically, people undertake a search directly from the home page and then explore further with more search related actions. A few opt out at this point. Some use the 'Find out About' option and explore the format links to browse all online items, especially sound. Some use the themes to navigate the site, most notably popular music and folk music, suggesting new users often think simply in terms of musical styles.

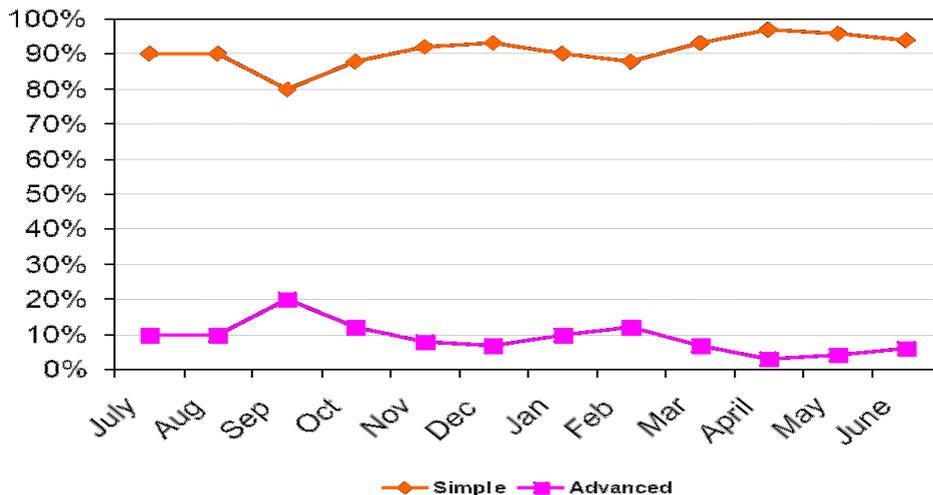
Figure 2: User behaviour



**How are users searching?** More than 90% use the simple search option and only about 6% initially refine their search using the various check-box options. Less than 10% undertake an

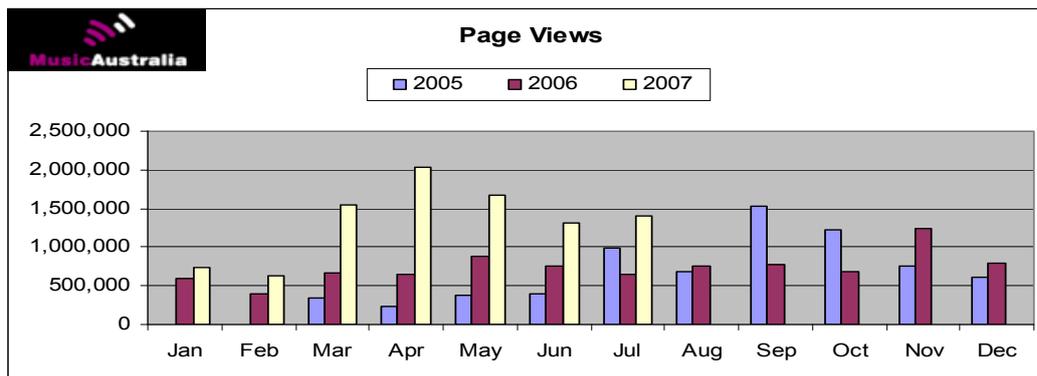
advanced search. These patterns are even more observable since the second release in April 2007 when the search options became clearer on the home page.

Figure 3: Searching patterns



**What is the usage?** Usage consistently grew over the first two years of the service, with some notable peaks that correlated with major radio promotions. Since the second release in April this year, usage has virtually doubled, attracting new audiences with a significant new contributor of contemporary content.

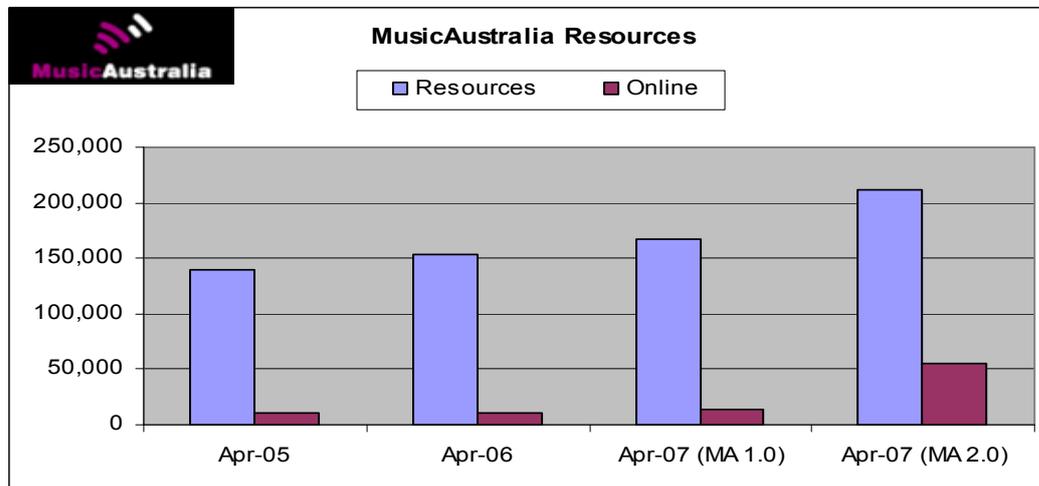
Figure 4: Usage



**What has been the content growth?** When Music Australia commenced in 2002 there was very little online content and no people and organisation records. During the five years of development, content has grown to +221,000 items, with over 60,000 containing some online component, and almost 5000 people and organisation records. The proportion of new records contributed from other organisations each month has now overtaken those of the National Library. Figure 5 outlines the growth from the launch in 2005, through to the release of the

new version in April 2007 and shows the percentage increase of online content notable in the new release.

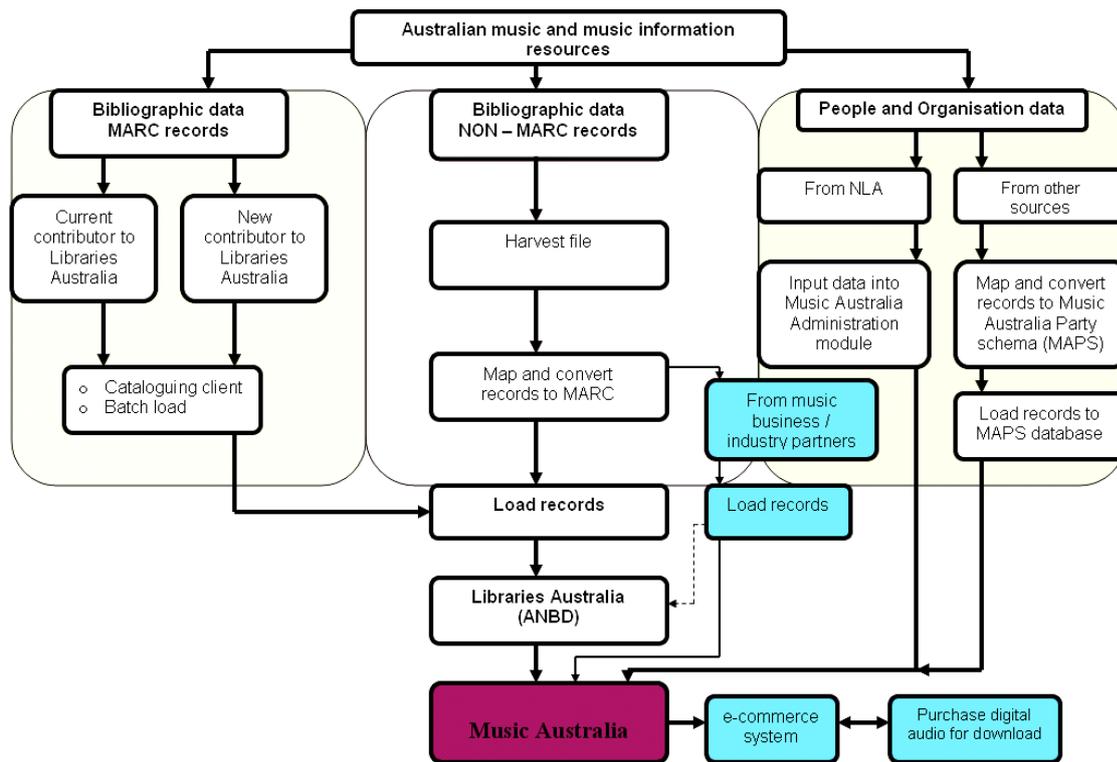
Figure 5: Content growth



The increase in content has especially been facilitated by a new partnership with the music industry, allowing us also to engage new audiences. A non-exclusive contract with a leading Australian digital music distributor, *destra Media*<sup>10</sup>, has enabled us to acquire their rich metadata for contemporary Australian music. This provides direct online access to more than 45,000 in-copyright contemporary Australian sound recordings via sound samples, artist information and cover art, and this content is being updated daily. We have built in some new user options, by the addition of a legal digital download, using Digital Rights Management to securely deliver digital content via an e-commerce service hosted by the industry partner. Figure 6 shows the refinement of the Music Australia architecture to cater for this new approach, harvesting data directly and daily from the music industry. Currently we are loading these *destra* records directly into the two Music Australia databases, but the longer term view is to load these records into Music Australia via the ANBD and People Australia, enabling data sharing across the library sector.

<sup>10</sup> <http://www.destramedia.com.au/>

Figure 6: MusicAustralia architecture with music industry partnerships



This new partnership has therefore enabled us to:

- Provide online access to a growing ‘virtual’ collection that exists wholly outside institutional collections and is generated directly from the publishers and artists.
- Break through the copyright barriers to contemporary music, with the industry partner managing all the artist and publisher rights and royalties through digital rights management and licensing.
- Provide an e-commerce service to enhance users ‘getting’ options, with the industry partner managing the commercial download transactions behind the scenes, hosted as the Music Australia download service.
- Aggregate more artist information about contemporary music, often unavailable in traditional sources.
- Move towards a new collecting and access model, to ensure we capture both a permanent bibliographic record of Australian ‘hot off the press’ music as well as promote direct contributions by artists, creators, publishers and distributors. We are working with partners like the Australian Music Centre and potentially new industry partners to build this mechanism for digital sheet music and scores in the future!

In addition to the new contemporary content and features, there are some other improvements in the interface and functionality. New design, navigation and interface features guide the user how to use the site more effectively and the functionality has been pushed up a layer to appear immediately in the results set. The results set pages have been redesigned to add life, colour and sound, creating the sense of a dynamic service in which the user can actively participate and readily get what they want. The user can also navigate between track and album level bibliographic records (akin to chapters in books, or articles in journals), as well as people and organisation records, a level of granularity that has not previously been possible within the ANBD.

Where to next? There are some outstanding enhancements yet to be implemented, such as relevance ranking, clustering and topic searching, as well as support for FRBR<sup>11</sup> data. There are some new imperatives that will be driven by the music industry as it fully transforms into the digital realm and refines business practices, as well as opportunities for user-generated content, scholarly annotation and user interaction. Overall, we are working towards being able to more flexibly implement regular service enhancements as the National Library's resource discovery services move towards an integrated service-oriented architecture and environment.

## 4 REFLECTIONS

Finally, it is worth reflecting on the lessons learned over the five year period of development of Music Australia, in the hope that these may be useful to others.

The first is that collaboration is essential. Music Australia represents not just the work of the National Library but a commitment from multiple organisations and people around Australia to the concept and development of a national information infrastructure for music. The notion of Australian music as a collective of shared, distributed collections brought together virtually in one space for the user is fundamental. So is a 'federated' service model, where each organisation retains ownership and responsibility for delivering its own materials and services while being a part of the larger whole. Additionally, each organisation brings to the table its own multiple relationships and networks and serves different communities and users: the whole is immensely enriched by the sum of the parts. However, in turn Music Australia has been a catalyst for organisations to build their capacity in music and a means to attract funding and support both inside and outside the library sector. The library sector has pushed into the Australian music space, generating activity rather than standing as a passive though useful servant.

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<sup>11</sup> Functional Requirements for Bibliographic Records <http://www.ifla.org/VII/s13/wgfrbr/>

What has made for great partnerships? Two brief case studies are indicative of the kind of partnerships we have found to work best, and where both the Library and the partner organisation have benefited.

The Australian Music Centre, partly funded by the Commonwealth Government as the key music information agency for the composition, performance and promotion of Australian contemporary music, though small, is nimble, responsive, creative and committed. It brings links to established networks and other agencies, shares interests and values in supporting user access, and creates rich content. In turn, being part of Music Australia has generated more exposure to the Centre's resources, has brought the often intangible benefits that come with being part of a national infrastructure, and has provided the backdrop to the Centre's development of a 'whole of business' online strategy with its planned Virtual Repository.

The Library's relationship with the industry partner, destra Media, has brought the library sector directly into the realm of music business, especially with legal solutions to the management of rights and e-commerce. This has opened up the possibility for seamless access, from free discovery right through to download and purchase, when libraries are normally constrained from providing access because of copyright provisions. Destra, the earliest entrant into the digital music distribution business in Australia, was willing to generate an Australian sub-set from its global music databases and to share its intellectual property in the form of a rich XML data set of contemporary Australian recordings and associated artist and publisher information. In turn, the Library could offer the industry partner an opportunity for a government-business partnership that could leverage support for their research and development projects, and above all, a sense of permanency for their work by archiving the data and placing the world of contemporary music in its whole historical context.<sup>12</sup>

To conclude, we offer some personal reflections, couched in terms of our own "ten commandments", as a way of handing on some personal knowledge and insight gained through the experience and journey of Music Australia:

1. Dream, think, plan, build but prototype and road test along the way.
2. Be realistic! Others are competing for your resources! And don't wait for perfection...you might just be too late.

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<sup>12</sup> Simon Crean. "Partnership between government and business helps Australian music". Media Release, 28 May 2007.

<http://www.nla.gov.au/pressrel/PartnershipbetweengovernmentandbusinesshelpsAustralianmusic2.html>

3. Project manage in stages, with clear goals, milestones, evaluation points and exit strategies all along the way.
4. Do not purpose-build: it is too costly, too small and unsustainable. Instead leverage off other processes and projects and automate as much as possible.
5. Re-purpose everything based on the principle of “one resource, many uses”. Apply the learning from other projects to your own.
6. Don't get stuck! If you do, try redefining the problem not the solution. Let the experts do that. Collaboration does not mean democracy!
7. Be alert to strategic opportunities. Catch these early, and align goals. Exit if necessary.
8. Work in teams and collaborate effectively. Choose partners who can build capacity. Work with those who are able to influence their own organisations, internally and externally.
9. Think ahead! Sustain the vision and imagine the future BUT take small steps along the way.
10. Maintain the rage, the passion, the commitment and work hard. Generate success and it takes on a life of its own!