

Archiving digital architectural records: national framework trial

PROJECT REPORT

June 2019

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***NATSPEC//
Construction
Information***

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1. Introduction

1.1 Project Aims and Objectives

1.1.1 The project

This project is named *Archiving digital architectural records: national framework trial*. It builds upon the foundations laid by projects in 2015-16 and 2017-18 in which members of the project team had leading roles. The first project, *Securing and enabling access to knowledge for the future: archiving digital architectural records* (ADAR) included a two-day public Symposium, *Born digital: a symposium exploring digital architectural and built environment records*, (18-19 April 2016). One of the recommendations of the symposium was that guidelines for archiving digital architectural records be developed for use by archivists and architects.

Mr Richard Choy, CEO of NATSPEC, attended and spoke at the 2016 symposium. NATSPEC is a national not-for-profit organisation, owned by Government and industry, whose objective is to improve the construction quality and productivity of the built environment through leadership of information. NATSPEC generously offered to provide funding to enable further research into current digital archiving practices (via an online questionnaire and literature review) and the preparation of a draft national framework for archiving digital architectural records. The second project concluded in June 2018.

A key recommendation of the second project report was to undertake practical testing of the framework through implementation of the guidelines in architectural practice and collecting institutions over a period of 3-6 months. Other recommendations included enhancement of the framework content through improved graphic presentation, and further development of practical recommendations to be disseminated to practitioners and professionals through a series of short interactive or video tutorials.

Following the recommendations of the second project report, in 2018-2019 NATSPEC offered further funding to trial the national framework in Australian architectural practices and collecting institutions. The aim of the trial was to test an approach (1) to introducing and disseminating the key messages and recommendations contained in the *Archiving digital architectural records: towards a national framework project report* and (2) to providing introductory training in the preservation of digital architectural records. The funding allowed the research team to employ a research assistant, Mr Chris Burns. The trial concluded in June 2019.

1.1.2 Overview

The emergence of digital technology has had a significant impact on the way in which buildings are designed and constructed. From being regarded initially as a tool to aid design, the computer is now commonly considered to be integral to the design process. The digital environment in which an architectural project is developed involves computer hardware and software in the creation of digital files.

The records of the process of designing a building cover a broad spectrum. They include models that explore its potential shape and form, sketches, plans, elevations, sections, renderings and other documents like photographs, emails, letters, faxes, specifications and contracts. Increasingly, these records are produced in digital environments and only exist as digital files.

The key challenges associated with archiving born digital architectural records include: (1) the rationale for collecting records produced in a digital environment; (2) which records to archive; (3) how to archive them; and (4) how to achieve digital continuity in rapidly evolving and changing electronic environments.

1.1.3 Project outputs

1.1.3.1 Project Report

1.1.3.2 National framework for archiving digital architectural records incorporating revisions from the trial

1.1.3.3 Presentation at icam Australasia meeting 2019

Christine Garnaut and Chris Burns will present a workshop, based on the project, at the icam Australasia meeting to be held in Adelaide in October 2019.

1.1.3.4 Peer-reviewed journal article

The research team will write a peer-refereed journal article targeted for publication in *Archives and Manuscripts*, the scholarly journal of the Australian Society of Archivists.

1.1.3.5 Articles for professional publications

The research team will prepare articles based on the project and its findings targeted for publication in the following professional forums:

- Archives Live (<http://archiveslive.ning.com/>), a professional social network facilitated by the Australian Society of Archivists (ASA)
- The Australian Institute of Architects (AIA) national e-newsletter (<https://wp.architecture.com.au/news-media/e-newsletters/>)

1.1.3.6 Conference presentation: Designing the Archive, Adelaide, 21-25 October 2019

Chris Burns and Christine Garnaut have had an abstract accepted to present work in progress on the national framework at *Designing the Archive*, a joint conference of the Australian Society of Archivists (ASA), Archives and Records Association of New Zealand Te Huinga Mahara (ARANZ), International Council on Archives (ICA) and the Pacific Regional Branch of the ICA (Parbica), to be held in Adelaide on 21-25 October 2019. Their presentation, titled *Archiving digital architectural records: a framework for archivists and architects in Australia* will introduce the national framework, outline its key contents, and conclude with guiding principles and steps for archivists and architectural practitioners.

1.2 Project team

Assoc Prof Christine Garnaut

Christine Garnaut is a planning and architectural historian and the inaugural Director of the Architecture Museum (formerly the Architecture Archive) at UniSA. The Museum collects records of South Australian-based architects and related professionals. It is Australia's only Architecture Museum and a member of the International Confederation of Architectural Museums (ICAM). Christine Garnaut is an ICAM Board member and Convenor of the regional network ICAM Australasia. E: Christine.Garnaut@unisa.edu.au

Dr Julie Collins

Julie Collins holds a B. Arch. and a PhD in architecture. She is Collections Manager and researcher at the Architecture Museum, School of Art Architecture and Design. She has extensive knowledge including of best practice in architectural archival records management. She provides advice to the architecture profession about how to manage their hardcopy records. E: Julie.Collins@unisa.edu.au

Mr Chris Burns

Chris Burns is an academic researcher based in the School of Art, Architecture and Design at the University of South Australia. He is the Research Assistant for the project *Archiving digital architectural records: national framework trial*. Previously, Chris was Research assistant for the projects *Securing and enabling access to knowledge for the future: archiving digital architectural records* and *Archiving digital architectural records: towards a national framework*, upon which this current project builds. He holds a B. Industrial Design and a M. Education (Design and Technology) from the University of South Australia. E: Chris.Burns@unisa.edu.au

1.3 Partners

NATSPEC is a national not-for-profit organisation, owned by Government and industry, whose objective is to improve the construction quality and productivity of the built environment through leadership of information. <https://www.natspec.com.au/>

icam Australasia is a regional network of the International Confederation of Architectural Museums (icam).

The **Architecture Museum**, School of Art, Architecture and Design, University of South Australia, is a nationally unique repository of architects' and allied professionals' records and a dynamic hub of research into South Australia's architectural and built environment history.

1.4 Methods

The framework trial was structured as a series of six modules. The modules comprised short videos or podcasts and practical exercises. They introduced the challenges of archiving digital architectural records; outlined a rationale for their long-term preservation, and guided participants through various aspects of digital preservation best practice.

Participants were architects and archivists working in practices and libraries, archives and museums across Australia. The participants represented small, medium and large architectural practices and archivists working in a variety of settings including architectural practices, national and state collecting institutions and university libraries.

The modules were released at intervals. Each module podcast was accompanied by a transcript. Module components were disseminated by email, through Dropbox and via YouTube.

Participants were contacted by email or telephone to provide feedback after each module had been open for about two weeks.

2. Framework trial

2.1 Module overview

Six audiovisual modules were designed to introduce key messages, concepts and skills drawn from the draft national framework report. The modules were organised in two streams to serve the needs of two audiences, namely practicing architects and professional archivists. The diagram below (fig. 1) provides an overview of the modules and the two content streams. Module documentation from the trial, including transcripts, may be found in the appendix to this report.

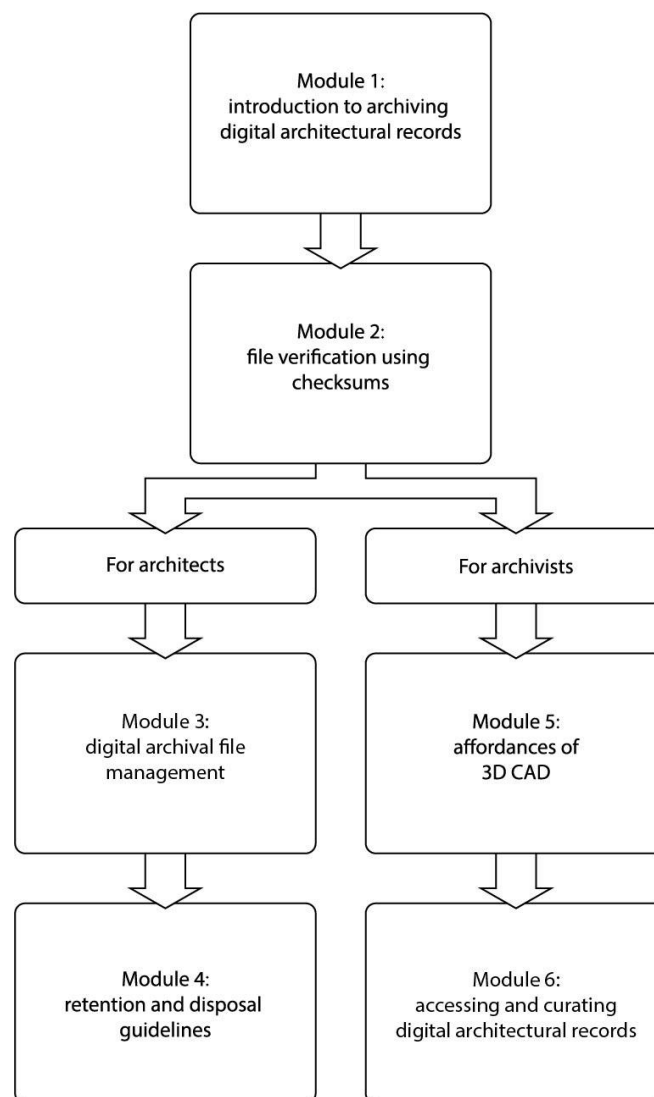


Fig. 1 – Module content stream overview

Module 1: Introduction to archiving digital architectural records is a short audio podcast for architects and archivists. It introduces the impact of digital technology on the architectural design process and the challenges of digital preservation and outlines a rationale for the long-term preservation of both paper-based and digital architectural records.

Module 2: File verification using checksums is an activity-based video tutorial for architects and archivists on generating and validating files against checksums. It addresses a significant finding of the *Archiving digital architectural records: towards a national framework* project survey, in which no surveyed participants in Australian collecting institutions reported using checksums in their archival workflow.

Module 3: Digital archival file management is a short audio podcast for architects. It introduces some fundamental principles of digital preservation, outlines a rationale for developing and documenting consistent digital file management policies, suggests file and folder naming and folder structure guidelines, and advises on the management of legacy digital archives, or in other words, archives created in the past.

Module 4: Retention and disposal guidelines is a short audio podcast for architects. It introduces some reasons for maintaining architectural archives, discusses retention and disposal schedules, and suggests which records should be archived. It outlines a rationale for donating architectural archives and concludes with a reflection on exit planning.

Module 5: Affordances of 3D CAD is a short video for archivists. It begins with a brief example of the kinds of cultural information that may be encoded in architectural records. It then introduces some of the special affordances (interactive possibilities) of three-dimensional computer aided design (3D CAD) models. It explains the ways in which 3D CAD models are fundamentally different from two-dimensional (2D) drawings and outlines some of the implications for archivists attempting to preserve 3D CAD data.

Module 6: Accessing and curating digital architectural records is a short audio podcast for archivists. It outlines the difference between digital preservation and digital access; discusses the challenges of maintaining access proprietary file formats and suggests some possible solutions; advises on preserving proprietary software, reformatting 3D CAD models and on transferring files from physical carrying media; and concludes with guidance on the arrangement of digital architectural records.

The modules are designed to be completed in this order:

For architects: 1, 2, 3 and 4 (5 and 6 optional)

For archivists: 1, 2, 5 and 6 (3 and 4 optional)

2.2 Semi-structured feedback questions

Participants were contacted by email to arrange a convenient time to obtain feedback via telephone. The following feedback questions were also emailed to participants in advance. The questions were asked of participants as part of a semi-structured interview process and led to further questions, depending on the responses of the participants.

The feedback questions associated with each module are listed below.

Module 1: Introduction to archiving digital architectural records

- Did you follow the written instructions or listen to the podcast, or both?
- Was there anything that you didn't understand?
- Do you have any suggestions to improve this first module?
- Do you have any questions about the remainder of the trial?

Module 2: File verification using checksums

- Did you follow the written instructions or watch the video, or both?
- How long did it take for you to complete the module?
- Were the instructions easy to follow? If not, please suggest how they may be improved.
- If you watched the video, how did you find the pacing?
- Did you encounter any technical terms that were not sufficiently explained?
- Did you encounter difficulties with any steps in the process?
- Was the link between the module content and the importance of file validation using checksums made sufficiently clear?
- Can you see an application for the skills learned in this module in your own professional practice?

Module 3: Digital archival file management

- How long did it take for you to complete the module?
- Did you listen to the podcast or read the transcript, or both?
- If you listened to the podcast, how did you find the pacing?
- Did you encounter any technical terms that were not sufficiently explained?

- Can you see applications for the content covered this module in your own professional practice?
- Do you have any suggestions to improve the module?

Module 4: Retention and disposal guidelines

- How long did it take for you to complete the module?
- Did you listen to the podcast or read the transcript, or both?
- If you listened to the podcast, how did you find the pacing?
- Did you encounter any technical terms that were not sufficiently explained?
- Can you see applications for the content covered this module in your own professional practice?
- Do you have any suggestions to improve the module?

Module 5: Affordances of 3D CAD

- How long did it take for you to complete the module?
- How did you find the pacing?
- Did you encounter any technical terms that were not sufficiently explained?
- Can you see applications for the content covered this module in your own professional practice?
- Do you have any suggestions to improve the module?

Module 6: Accessing and curating digital architectural records

- How long did it take for you to complete the module?
- Did you listen to the podcast or read the transcript, or both?
- If you listened to the podcast, how did you find the pacing?
- Did you encounter any technical terms that were not sufficiently explained?
- Can you see applications for the content covered this module in your own professional practice?
- Do you have any suggestions to improve the module?

3. Discussion

3.1 General feedback

Overall, feedback from the trial was very positive. Participants reported that the module recordings were very clear and well-paced with an appropriate tone, of a reasonable length to be completed in a single sitting, and that the content was pitched at an appropriate level of complexity for a specialized audience.

Those participants who viewed the draft framework document itself regarded it as detailed and comprehensive. An archivist from a state library suggested the draft framework would be a useful resource as they embark on collecting born digital architectural records. Suggestions from participants for additions to the framework content are mentioned in 3.2 below.

Participants who referred to the glossary considered it to be a valuable resource.

Participants listened to the podcasts, read the transcript or did both, according to personal preference.

Most participants agreed that the short clips of interviews with experienced architects discussing the challenges of digital archiving first-hand were a valuable inclusion. In a few cases where the modules utilised recorded interview audio of a lower technical quality, respondents indicated that the content was still understandable and 'too valuable to lose'.

A university archivist praised the initiative of the draft national framework and trial: 'People often feel they don't have the skills to take the first steps, however help is available.'

3.2 Module-specific feedback

Module 1: Introduction to archiving digital architectural records

One participant suggested that the introductory module would be appropriate for, and understandable to, all the employees within an architecture firm, including architects, drafters and administration staff.

Module 2: File validation using checksums

While some participants were not familiar with checksums and had never used them before, others were well acquainted with their use and one participant used TeraCopy itself as part of their day-to-day file management regime.

Participants who were already familiar with checksums considered Module 2 to be an appropriate introduction to the topic. Meanwhile some participants who had not been familiar with checksums before completing Module 2 expressed surprise at how easily they could be generated: 'It was an eye opener for me to learn that I could download a FREE program to do the validation and YES I am going to incorporate checksums into my archiving practice.'

A few participants reported minor delays installing TeraCopy due to internal information technology policies and protocols.

One participant suggested that digital preservation actions, such as generating and validating checksums, should not be attempted by individuals with limited information technology competency,

since they may inadvertently do more harm than good. The staggered development and release of modules over several months meant that this feedback was able to be incorporated into Module 3.

3.3 Suggested framework additions

Based on trial participants' feedback, suggestions for additions to the framework include:

- Definitions of digital preservation versus digitisation, two terms which are often confused by non-specialists, to be included in the glossary.
- Definitions of digital compression, outlining the difference between lossy (for example JPEG compression) and lossless compression, to be included in the glossary.
- Include a warning that digital preservation actions, such as generating and validating checksums, should not be attempted by individuals with limited information technology competency.

3.4 Suggested amendments to the course

Based on trial participants' feedback, suggestions for amendments to the course include:

3.4.1 All video modules

Some participants interpreted a lack of on-screen movement at the beginning of Module 5 as an indication that they could minimize the browser and listen to the narration while following the transcript on-screen, leading them to inadvertently miss animated portions of the video podcast.

This suggests that the video modules should acknowledge the conventions of video presentation by incorporating regular screen transitions throughout. This could be easily accomplished by including additional background slides containing key dot points from the spoken narration or relevant images.

3.4.2 Modules 2 and 3

Recorded narration of the *Digital preservation fundamentals* section of the national framework would be a valuable resource, given the vital importance of the content and its relevance to both architects and archivists. Ideally, this should be integrated into the course as an introduction to Module 2. Duplicated content in Module 3 should be removed.

3.4.3 Module 2

Since TeraCopy is Windows-based, an alternative to Module 2 should be provided for non-PC users, which may include adopting an alternative to TeraCopy which is system-agnostic.

3.5 Suggestions for future uses of module content

Based on trial participants' feedback, suggestions for future uses of the module content include:

3.5.1 *Continuing professional development training course*

An appropriate future platform for dissemination of the course content may be an online learning platform (for example Moodle or similar).

An architectural practitioner strongly suggested adapting the trial modules into a Continuing Professional Development (CPD) training course, accredited by the Australian Institute of Architects (AIA): 'It makes complete sense ... it would be fantastic as a training resource on the Chapter website.' Accrediting the course would allow it to count towards CPD points, which are a compulsory requirement of registration in certain states. Adapting the modules in this way would require the development of worksheets, or another assessable component. Worksheets, for example, may be comprised of reading comprehension questions accompanying the course content which serve as proof of engagement. Accrediting the course would substantially broaden the reach of the national framework among its intended audience of architectural practitioners.

Participants also suggested that there would be a considerable audience for the national framework from archival professionals: 'There's a huge appetite for learning in this space.'

The existing course content including recorded narration, animations, text slides and transcripts, could be adapted into an online course with minimal alteration. Necessary changes include amending the title of the course so that it does not refer to the trial project, and the elimination of instructions on accessing files, to reflect changes in the delivery of digital module components (for example, download from an online Moodle site rather than delivery via email and Dropbox).

Ideally, in an online learning environment, each podcast would be broken up into short 2 to 5-minute segments, punctuated by multiple choice assessment questions, with pre-recorded feedback tailored to each possible choice including reinforcement of the module content.

3.5.2 *Digital preservation guidance for a non-specialist audience*

The course could be adapted with new content recorded in a more casual tone, to provide basic, freely available digital preservation guidance for a non-specialist audience. However, it was also suggested that the course in its current form should not be made available for free, on the basis that practitioners would be more likely to take the content seriously if required to pay for access: 'People always take things more seriously once it costs money.'

3.5.3 *Additional practical modules*

Some participants expressed interest in further practical modules along similar lines to *Module 2: File validation using checksums*. Additional practical modules could be developed on various aspects of digital preservation including handling and transferring files from physical carrying media, disk imaging, emulation, recovery of deleted files, lossy and lossless file compression, and audiovisual digitisation standards and best practice.

4. Conclusions

4.1 Amendments to the national framework

4.1.1 Glossary

Add definitions for the following terms:

Compression	a means of reducing the size of a digital file; see also <i>lossy compression</i> and <i>lossless compression</i> .
Digital preservation	a set of policies, strategies and actions that ensure digital information remains accessible over time.
Digitisation	the process of converting analogue media into digital information. Compare with <i>digital preservation</i> .
Lossy compression	a kind of <i>compression</i> . When applying lossy compression, some data is discarded, files are permanently altered and may not be uncompressed. For example, <i>JPEG</i> compression is a lossy compression format for image files. Compare with <i>lossless compression</i> .
Lossless compression	a kind of <i>compression</i> . No information is discarded in lossless compression, and compressed files may be uncompressed, returning them to their original state. For example, <i>TIFF</i> is a lossless compression format for image files. Compare with <i>lossy compression</i> .

4.1.2 Guidelines for Australian Architectural Practice

Add to section 1: *Bit-level digital preservation*:

1.7 Individuals with limited information technology competency should not be responsible for carrying out digital preservation actions. They may inadvertently do more harm than good.

4.2 Directions for dissemination of the framework and further development of the module content

Several directions for dissemination of the revised national framework and further development of the module content are suggested:

4.2.1 Dissemination

In addition to the modes of dissemination included under 1.1.3. Project outputs

The Architecture Museum could facilitate workshops for architectural practitioners to introduce them to the national framework. Ideally, these workshops would be held in conjunction with the AIA and NATSPEC.

The Architecture Museum could facilitate workshops for archivists to introduce them to the national framework. Ideally, these workshops would be in conjunction with the ASA.

4.2.2 Module content development

- The module content developed for the national framework trial could be adapted into an online Continuing Professional Development (CPD) course through the creation of assessment and feedback components. Accrediting such a course through the Australian Institute of Architects could substantially broaden the reach of the national framework among its intended audience of architectural practitioners.
- The course could be adapted with new content recorded in a more casual tone, to provide basic, freely available digital preservation guidance for a non-specialist audience.
- Further modules could be developed on the following areas on digital preservation practice:
 - Handing and transferring files from physical carrying media
 - Disk imaging
 - Emulation
 - Recovery of deleted files
 - Lossy and lossless file compression
 - Audiovisual digitisation standards and best practice
- The revised framework content could be substantially enhanced through improved graphic presentation, potentially bringing the document into visual or brand conformity with other NATSPEC documents, including the NATSPEC National BIM Guide.

Appendix: Archiving digital architectural records: national framework trial

Module transcripts developed for the Framework Trial and associated documentation