

# **Digital transformation and the sustainability of organ and carillon culture**

**Grace Kar Man Chan**

**MB BS MMed (Ophthalmic Science)**

A thesis submitted to fulfil requirements for the degree of Doctor of Philosophy (Music)

Sydney Conservatorium of Music, The University of Sydney

2026

The research reported in this thesis was supported by the Research Training Program (RTP),

Department of Education, Australian Government, Canberra

# **CULTURAL CARE WARNING NOTICE**

## ***Cultural advice***

This item may contain culturally sensitive information.

All users are advised that this item may contain images, voices and/or names of people who have died.

## ***Indigenous Cultural and Intellectual Property***

This item may contain Indigenous Cultural and Intellectual Property. Please consult with the relevant communities if you wish to use any of the content in this item.

## ***Copyright***

This item is protected by copyright, and must be used in accordance with the provisions of the Copyright Act 1968 (Cth).

## **Statement of Originality**

This is to certify that to the best of my knowledge, the content of this thesis is my own work.

This thesis has not been submitted for any degree or other purposes.

Signature

Grace Chan

Name

## **Generative Artificial Intelligence Statement**

No content produced by generative AI tools has been used in the preparation of this thesis.

*For my parents*

## Preface

My artistic practice as an organist and carillonist involves performing on an early twentieth-century Taylor's carillon and a cluster of important nineteenth-century historical pipe organs located in Sydney, Australia. As part of my daily work as an organist and carillonist, I regularly prepare on digital virtual instruments for live performance on physical historical pipe organs and in tangible, material carillon towers. My audience can be listening in the place or precinct where I am performing. They can also be listening elsewhere via a digital livestream, or a recording disseminated on social media.

The first organ I played as a child in 1980s Australia had no pipes or bellows for wind production. Its tones were derived from analogue electronic oscillators and filters which were then enhanced by digital signal processing. This hybrid instrument was powered by electricity and incorporated frequency modulation synthesis as well as pre-recorded digital samples of real instruments to expand the acoustic palette. Sonically, this was all an effort to imitate the timbres and tones produced by an organ with pipes made musical by moving air. The physical interface was "real" enough; it had two manuals, a pedal board, swell pedals and colourful switches for each orchestral family of "stops" ergonomically set around the manuals. These physical switches were an updated electric interpretation of the hand pulled draw knobs in a traditional mechanical action pipe organ. Sound-wise, mechanical stops on a traditional pipe organ activated wind powered imitations of the human voice, a human choir and the instruments of a whole orchestra—divided by section. By now, it may seem like I am writing from a mirror prism within a childhood kaleidoscope, laden with vivid reflections, imitations, distortions—and I am. This joy in musical play and imitating orchestral effects, spurred a lifelong fascination in working seamlessly between real worlds and virtual digital

worlds in music and medicine. The carillon came later in life. The first carillon I played had no bells. It was notated: music from a French Noël suite. In effect, a conceptual carillon from the large organ composition genre. The first physical carillon I have memories of hearing is the Sydney University War Memorial Carillon while celebrating my graduation from a Bachelor of Medicine and Surgery in 2000. The same ceremonial instrument made music in the University Quadrangle as I graduated from a Master of Medicine in 2005. The first time I played an actual carillon was in 2018, in our national capital of Canberra, at the National Carillon where I studied from 2018 to 2022 with the National Capital Authority, Australian Government, Canberra.

Since 2021, I have had the immense privilege of performing on the War Memorial Carillon (and Great Hall pipe organ) at my *alma mater* for graduation ceremonies, weddings, faculty funerals, international student welcomes, information days and alumni festivals. To prepare for carillon recitals, I did so on a mechanical representation of a real carillon: a 1928 carillon practice clavier in the tower. This mechanical study keyboard has now been upcycled to a digital virtual practice instrument with digital bell samples (John Taylor & Co., Loughborough, UK, 1928 x Reinold Van Zijl, Harmelen, NL, 2025). Within my musical career, moving between digital virtual instruments to physical historical organs or carillons is crucial to my artistic process. As a performing scholar, I oscillate between physical pipes and bells to digital simulations of these instruments to enrich my daily work as an organist, carillonist and researcher. My artistic practice constantly cycles between real and virtual worlds as relentless innovation in both realms impact on organ and carillon culture. The circular path of this pendulum has sustained my artistic practice over the last decade. In this thesis, I share the exhilaration of this perpetual motion.

## Acknowledgements

I am extremely grateful to my lead supervisor Dr Daniel Yeadon who inspired me to do a PhD. I enrolled in a doctorate at the Sydney Conservatorium of Music after reading his PhD thesis at the same institution. Without his belief in me, I would not have completed this research journey. With patience, kindness and intelligence, he understood that things move at their own pace in the organ and carillon world. His support has been unwavering and much appreciated. I am equally grateful to my husband Dr Adrian Hunt who concurrently completed his PhD in Medicine at the University of Sydney—it has been inspiring to see him tackle his doctoral studies with passion and rigour. He set for himself the highest standards, and this has been an example to me.

I would like to thank my auxiliary supervisors who have given me unwavering support. Professor Neal Peres da Costa showed me that it is possible to be a performing scholar. Conservatorium Dean and Head of School, Professor Anna Reid has inspired me with her global work in music and sustainability. Professor Mark Gillies taught me that all research is a creative act. I am very grateful to my mentor in music and medicine, Dr Jill Forrest (McKerral) AM (1938–2023), MB BS MD, University Carillonist (1993-2010), Honorary Carillonist (1978-1993) for instilling in me an attitude of excellence and service as an organist, carillonist and doctor.

I would like to thank Dr Nathan Cox for his expert assistance in the formatting of this thesis. This help has been invaluable. I have also treasured his friendship. Mr Ludwig Sugiri provided much appreciated support as the Sydney Conservatorium academic librarian.

I am indebted to my organ teacher Dr Koen van Stade and his teacher Mr Jos van der Kooy, [Haarlem City Organist](#)<sup>1</sup> from 1990 to 2017, who introduced me to many historical organs in the Netherlands and allowed me to attend his rehearsals at the Grote of Sint-Bavokerk Haarlem, the [Westerkerk](#)<sup>2</sup> Amsterdam and the [Philharmonie](#)<sup>3</sup> Haarlem during my field trips to the Netherlands. I would like to thank my carillon teacher Dr Christiaan Winter, [City Carillonneur of Alkmaar](#)<sup>4</sup> and Village Carillonneur<sup>5</sup> of De Rijp who inspires me with his humble dedication to his communities and craft. I am very grateful for his generosity as a teacher and musician.

I would like to acknowledge the support of my workplace supervisor, Mr Titus Grenyer, Sydney University Organist & Carillonneur and City of Sydney Organist. Our conversations and correspondence have greatly enriched my research. Dr Anna Wong, Director of Canberra Museum and Gallery, cultural sector leader and respected carillonneur at the National Carillon, has also provided insightful conversation and instilled in me the importance of history.

I am grateful to the Sydney Conservatorium of Music for awarding me the Sarah and Muriel Jeavons Scholarship for Outstanding Female Organ Student and three cycles of Post Graduate Research Support Scheme funding for travel to Europe. It is thanks to this funding that I was able to participate in masterclasses at historical organs with Professors Leo van Doeselaar, Menno van Delft, Lorenzo Ghielmi, Oliver Latry and Franz Danksagmüller during the 2018

---

<sup>1</sup> Jos van der Kooy: Grote of Sint Bavokerk, NL Haarlem <https://www.youtube.com/watch?v=QJj9VAVNcYw>

<sup>2</sup> Jos van der Kooy: Westerkerk, Amsterdam, NL <https://www.youtube.com/watch?v=JKLJD04ua1A>

<sup>3</sup> Jos van der Kooy: Philharmonie, Haarlem, NL <https://www.youtube.com/watch?v=rVED6TeaJf8>

<sup>4</sup> Christiaan Winter: De Ontzetsuite (450 jaar Alkmaar Ontzet) <https://www.youtube.com/watch?v=Kq6Ow-Qo3nA>

<sup>5</sup> In Australia, the term carillonneur is used for a musician who performs on the carillon; in Europe the term used is *carillonneur*. The Carillon Society of Britain and Ireland uses the term carillonneur on its website. The United States of America (USA) uses both terms. Artists in the USA use carillonneur or carillonneur. The professional guild in the USA is called the Guild of Carillonneurs in North America (GCNA).

Haarlem Organ Festival and Academy, NL. I am grateful for the award of the Vice Chancellor's Global Mobility Scholarship which allowed me to spend time with Mr John Hargraves (father of Australian organ builder Mr Campbell Hargraves) at the South Island Organ Company in Timaru, New Zealand. The Sydney University Graduations Office team led by Ms Christine Fairchild have given enthusiastic support as have the Sydney University Student Life teams. Student Life Officer Mr Netani Ralulu has been very supportive. I would like to acknowledge Creative Australia for funding to participate in *Digital Transformation for the Creative Industries* at the University of Technology, Sydney, Australia.

I would like to express the deepest gratitude for my Sydney Indigenous Research Network (SIRN) colleagues Dr Janelle Evans, Professor Jakelin Troy and Associate Professor Rosanne Quinell. I would not have completed this PhD without their intellect, support and moments of generous laughter. My February 2025 "Australian Carillon Triangle" road trip with Dr Andrea McCrady, Dominion Carillonneur of the Peace Tower, Canada (2008–) was full of music, laughter and conversation. This trip crystallised many of the conclusions in this thesis.

Thankyou to the custodians of the organs and carillons I have the privilege to play: the University of Sydney, the City of Sydney, the National Capital Authority, Bathurst Regional Council, Palau de la Generalitat de Catalunya, Dr Shane Moran (1885 Fincham and Hobday organ, Swifts Darling Point), Reverend Roger Bray and Reverend Andrew Errington (1874 JW Walker and Son organ, St Stephen's Newtown) and Mrs Judith Brooke OAM (1874 William Davidson organ, Bathurst Uniting Church). Her nephew Dr Kelvin Hastie OAM, organ consultant to Sydney Town Hall and former Chair of the Organ Historical Society of Australia has been instrumental in helping maintain the superb condition of this important Australian made instrument.

The many organists, organ builders and carillonists/ carillonneurs who generously gave me their time during northern hemisphere field trips include Mr Michael Hedley (1951-2020) (Nicolaas Kerk, Amsterdam, NL), Mr Richard Egarr (Amsterdam, London and New York), Professor Menno van Delft (Amsterdam, NL), Mr Hayo Boerema (Laurenskerk, Rotterdam, NL), Mr Matthias Havingha (Amsterdam Conservatorium, NL), Mr Jan Spijker (Flentrop Orgels, Zaandam), Professor Pieter van Dijk (Amsterdam Conservatorium & Laurenskerk Alkmaar, NL and Hamburg, Germany), Professor Gerard Brooks (Royal Academy of Music, London), Mr Ronny Krippner (St Georges Church, Hanover Square, London), Professor Nathan Laube (Bavokerk Haarlem 2017 Artist in Residence and Eastman School of Music, Rochester, USA), Ms Katelyn Emerson (Cambridge, UK and USA), Mr Rien Donkersloot (Bavo Toren, Haarlem, NL) and Mr Bart Vervaat (Amsterdam and Alkmaar, NL).

Thanks to my very dear friends who have provided unconditional support: church organist Mrs Lynette Rae Whittingham (1939-2022), pianist and theatre organist Mrs Valda Lang (née Whittingham) (1930-2018), organist and surgeon Dr Jonas Roman (Varberg, Sweden), Dr Lyle Chan, Professor Peter Petocz, Dr Laura Mangelli, Professor Julia Kindt, Mrs Marijke van Stade (Oudorp, the Netherlands), Mr Joost van Stade (Schoorl, the Netherland) and Mr Thomas Grubb (Melbourne); carillonists Mr Edward Grantham (1944–2025) (Sydney), Dr Lucy Ng MB BS (Sydney), Ms Astrid Bowler (Canberra), Ms Julie Wright (Canberra) and Ms Denise Garland (Bathurst). Many thanks to the change-ringers in my life—Mr Chris Pickford (UK), Mr Murray-Luke Peard (Sydney) and Mr Andrew Reynolds (Perth)—I always enjoy the peal videos from around the world!

Love and thanks to my dear children Tia, Zara, Stirling and Bryn. You are my inspiration.

This thesis is dedicated to my parents Nancy and Daniel Chan.

## Abstract

This practice-led PhD thesis explores digital transformation and the sustainability of organ and carillon culture.<sup>6</sup> The organ and carillon are two of Western music's oldest and largest musical instruments. Heritage protections often conserve the tangible, material musical instrument while their sustainability as sources of intangible cultural heritage in a digitally transforming society remains fragile. This study presents a series of organ and carillon projects (2016–2025) drawn from the artistic practice of an organist and carillonist based in Australia. It examines sustainability via the artistic outputs that emerge when digital transformation intersects with organ and carillon culture. The diverse, real-world projects produce international transdisciplinary artistic outputs. These include live performances, compositions, oral presentations, recordings, articles, lectures, webpages, interviews, social and broadcast media, museum exhibitions and gallery installations. Chapter 1 introduces the foreground, context and objective of this artistic research thesis. The significance of the artist's tangible instruments being in Australia, remote from the European centres of organ and carillon culture is discussed. Chapter 2 reviews literature related to organ and carillon culture and performance, digital transformation, sustainability and artistic research. Chapter 3 outlines the methodology of artistic research and artist-led cultural mapping as a tool of cultural inquiry. Chapter 4 reports the results from eight organ and eight carillon artistic projects. Chapter 5 contains the discussion. The conclusion in Chapter 6 summarises the impact of digital transformation on organ and carillon culture to illuminate cultural sustainability strategies. Integrity in leading with artistic practice, an experimental “digital mindset,” active community participation and vigorous civic engagement appear to be crucial in ensuring the long-term relevance and appeal of the organ and carillon.

---

<sup>6</sup> The UNESCO definition of cultural sustainability will be used in this thesis (c.f. Chapter 2.3 Literature Review)

## Table of Contents

Statement of Originality.....	2
Preface.....	5
Acknowledgements.....	7
Abstract.....	11
Table of Contents.....	12
Figures.....	15
Tables.....	17
Introduction.....	18
1.1    Foreground.....	18
1.2    Context.....	23
1.3    Objective.....	33
1.4    Artistic Research Projects.....	33
1.5    Background.....	34
1.6    Thesis Structure.....	47
Organ Projects: Instrument and Site.....	50
Carillon Projects: Instrument and Site.....	52
2    Literature Review.....	54
2.1    Organ and Carillon Culture.....	54
2.2    Digital Transformation.....	87
2.3    Sustainability.....	97
2.4    Artistic Research.....	112
3    Methodology.....	123
4    Results.....	138

4.1	Organ Project 1: Commemorating the 175th Anniversary of the City of Sydney with organ music at the Sydney Town Hall Grand Organ (2017).....	138
4.2	Organ Project 2: New music for portative organ for the La Dame à la licorne tapestries (France, c. 1500) at the Art Gallery of New South Wales (2018).....	146
4.3	Organ Project 3: Performing Satie’s Vexations at the Extended Play festival of new music, City Recital Hall (2018) .....	153
4.4	Organ Project 4: Australian premiere of a large-scale organ work at the Sydney Town Hall Grand Organ for the 2020 Sydney Festival, Australia .....	161
4.5	Organ Project 5: Performing on the University of Sydney Great Hall pipe organ during livestreamed university graduation ceremonies (2021–present) .....	168
4.6	Organ Project 6: Digital publication of a lo-fi digital artwork and ‘live’ automated spoken word performance using voice generation for ADSR Zine 014 (2021) .....	176
4.7	Organ Project 7: “Organ Service Provider” (City Organist) shortlisting and audition at the Sydney Town Hall Grand Organ for the City of Sydney, Australia (2023) .....	183
4.8	Organ Project 8: Livestreamed celebration service to commemorate the 150th year anniversary of St Stephen’s Anglican Church, Newtown, Australia (2024).....	192
4.9	Carillon Project 1: Learning how to transfer repertoire from a carillon practice clavier to main carillon bells at the National Carillon, Canberra (2018–2022).....	199
4.10	Carillon Project 2: Premiere of an experimental Australian composition at an international music festival in the Palau de la Generalitat, Barcelona (2019).....	207
4.11	Carillon Project 3: Premiering Australian compositions on Australian War Memorial carillons in Sydney and Bathurst (2021).....	214
4.12	Carillon Project 4: Performing for University of Sydney graduations and events on a heritage instrument (2021–present).....	220
4.13	Carillon Project 5: An academic paper delivered from the National Carillon, Canberra for an inaugural online international carillon conference during the COVID-19 pandemic (2021) .....	226
4.14	Carillon Project 6: Remotely premiering an Australian carillon composition at university carillon precincts in the United States of America via a geolocation audio experience platform (2023).....	232

4.15	Carillon Project 7: Premiering an Australian carillon composition as a salon group listening experience at Peggy Glanville-Hicks House for ADSR Zine (2023) .....	238
4.16	Carillon Project 8: Performing the Ngarigu Snow Song on carillon with Professor Jakelin Troy (Ngarigu) at the Australian Linguistic Society Conference, University of Sydney, Australia (2023) .....	242
5	Discussion .....	248
6	Conclusion .....	282
7	Bibliography .....	288
8	Web Links .....	295
	Appendices.....	1
	Appendix 1 .....	2
	Appendix 2.....	9
	Appendix 3.....	14
	Appendix 4.....	15
	Appendix 5.....	17
	Appendix 6.....	21
	Appendix 7.....	24

## Figures

Figure 1.1 Virtual pipe organ in the Historical Performance Studio, Sydney Conservatorium .....	30
Figure 1.2 Touchscreen with virtual pipe organ stops .....	31
Figure 1.3 Virtual pipe organ (VPO) sample sets .....	32
Figure 1.4 Sydney Town Hall Organ.....	35
Figure 1.5 National Carillon, Canberra, Australia.....	36
Figure 1.6 William Hill & Son Grand Pipe Organ (1890), Sydney Town Hall .....	37
Figure 1.7 (Left) Ronald Sharp portative organ (1986–88), (Right) Sydney Town Hall William Hill & Son organ (1890) .....	38
Figure 1.8 Sydney University War Memorial Carillon .....	39
Figure 2.1 Heritage-listed historic mansion “Swifts,” Darling Point, Australia. ....	63
Figure 2.2 Pedal clavichord, Gothenberg. Photo: Esther YJ Kim .....	73
Figure 2.3 Clocktower stairs leading up to the University of Sydney War Memorial carillon clavier room. ....	76
Figure 2.4 University Organist & Carillonist Titus Grenyer and Dutch carillon practice instrument maker Mr Reinold van Zijl (Clavion, Harmelen, NL) viewing the city of Sydney from the 1928 University of Sydney War Memorial Carillon. Photo: Grace Chan (2025) .....	76
Figure 2.5 Digital virtual carillon practice clavier in the University of Sydney War Memorial Carillon clavier room and closeup of details (1928 Taylor’s mechanical practice clavier upgraded by Mr Reinold van Zijl of instrument company Clavion in Harmelen, The Netherlands). Photos: Grace Chan (2026) ....	77
Figure 2.6 Mechanical practice clavier, John Taylor & Co, Bell founders, Loughborough (1923) Photos: Grace Chan (2025) .....	78
Figure 2.7 Digitised carillon practice clavier. Photos: Christiaan Winter (2019) .....	79
Figure 2.8 Digitised carillon practice clavier. Photo: Christiaan Winter (2019) .....	79
Figure 2.9 Bathurst Clock-O-Matic Studium III. Photos: Grace Chan (2025).....	82
Figure 2.10 Bronzen piano. Photos: Facebook.....	84
Figure 2.11 National Carillon, Canberra practice claviers. Photos: Grace Chan (2020/2021).....	111
Figure 2.12 “Artistic Research,” adapted source: Assis, Paulo de .....	121
Figure 3.1 Artistic research methodology: overview .....	125
Figure 3.2 Digital transformation intersecting with organ and carillon culture to produce an artistic output .....	128
Figure 3.3 Cyclical and iterative nature of the artistic process .....	132
Figure 3.4 Examples of Venn diagram: Organ Project 4, Carillon Project 8 .....	134
Figure 4.1 William Hill & Son Grand Organ (1890), Sydney Town Hall. Photo: Damian Shaw (2017)....	138
Figure 4.2 Venn diagram for Organ Project 1 .....	145
Figure 4.3 Ronald Sharp portative organ (1986—1988) and La Dame à la licorne (1500). Portative organist Grace Chan performing with Mr Phillippe Platel, French Cultural Attaché, Embassy of France, Sydney, Australia. Photo: Benoît Deney (with permission) .....	146
Figure 4.4 Venn diagram for Organ Project 2 .....	152

Figure 4.5 (Left) Sydney Town Hall organ Photo: Grace Chan (2018) .....	153
Figure 4.6 (Right) Performing Vexations at City Recital Hall Extended Play 2018, Photo: Elaine Chia .	153
Figure 4.7 Grace Chan playing at home on a childhood Kawai electronic digital organ for her Poh Poh Wong Yin Fong (1917-1997) visiting Sydney from Boston, MA, USA. A Chopin transcription for electronic organ is on the music desk. Photo: Ng Wun Yee (1988) .....	158
Figure 4.8 Venn diagram for Organ Project 3 .....	160
Figure 4.9 William Hill & Son grand pipe organ (1890), Sydney Town Hall.....	161
Figure 4.10 Venn diagram for Organ Project 4 .....	167
Figure 4.11 Organist Grace Chan at the Beckerath pipe organ (1972) in University of Sydney Great Hall .....	168
Figure 4.12 Venn diagram for Organ Project 5 .....	175
Figure 4.13 Screenshot thumbnail compilation for ADSR Zine 014 .....	176
Figure 4.14 Venn diagram of Organ Project 6 .....	182
Figure 4.15 (Left) Giant screens lowered at the blind audition for the role of City Organist at the Sydney Town Hall Organ (22/03/23); (Right) View of façade pipes from the organ bench at the William Hill & Son (1890) Grand Pipe Organ (22/03/23).....	183
Figure 4.16 Venn diagram for Organ Project 7 .....	191
Figure 4.17 J.W. Walker & Son pipe organ (1874).....	192
Figure 4.18 Venn diagram for Organ Project 8 .....	197
Figure 4.19 The 3rd of February 2020, carillonist and organist Grace Chan at the raising of the new G bell commissioned by the National Capital Authority for the 50th Birthday of the National Carillon, Canberra, ACT, Australia. Photo: Anna Wong (2020).....	198
Figure 4.20 National Carillon (1970) on Lake Burley Griffin, Canberra. Photo: Grace Chan (2022).....	199
Figure 4.21 Venn diagram for carillon project 1 .....	206
Figure 4.22 (Left) Gothic courtyard with orange trees in the Palau de la Generalitat, Barcelona, (Right) Petit & Fritsen Carillon (1976) at Palau de la Generalitat, Barcelona. Photos: Grace Chan (2019).....	207
Figure 4.23 Venn diagram of Carillon Project 2 .....	213
Figure 4.24 (Left) Sydney University War Memorial Carillon (1928), (Right) Bathurst Carillon (1933). Photos: Grace Chan (2025) .....	214
Figure 4.25 Venn diagram for carillon project 3 .....	219
Figure 4.26 University of Sydney War Memorial Carillon precinct (1928). Photos: Grace Chan (2021-25) .....	220
Figure 4.27 Venn diagram for Carillon Project 4 .....	225
Figure 4.28 (Left) National Carillon, Canberra. Photo: Grace Chan (Right) GCNA Online Congress (2021) during COVID-19 pandemic (screenshot) .....	226
Figure 4.29 Venn diagram for Carillon Project 5 .....	231
Figure 4.30 <i>Crowning Perpendicular</i> (Vines, 2023) & “Echoes” .....	232
Figure 4.31 Venn diagram for Carillon Project 6 .....	237
Figure 4.32 Transcriptions: ADSR Zine @Peggy Glanville Hicks House .....	238
Figure 4.33 Venn diagram for Carillon Project 7 .....	241

Figure 4.34 Prof. Jakelin Troy singing and playing the Ngarigu Snow Song during a rehearsal at the mechanical carillon practice clavier in the Sydney University War Memorial Carillon .....	242
Figure 4.35 Venn diagram for Carillon Project 8 .....	247
Figure 5.1 Organist Grace Chan with registrants John Wilton and Elia Bosshard at the Sydney Town Hall 1890 William Hill & Son Grand Organ, Sydney, Australia (Organ Project 1). Photo: Damian Shaw (2017), with the kind permission of the City of Sydney Archives.....	272
Figure 5.2 Organist Grace Chan performing on the Ronald Sharp Powerhouse Museum portative organ at the Art Gallery of New South Wales in the presence of the c. 1500 La Dame à la licorne tapestry “Hearing.” (Organ Project 2) Photo: Benoît Deney (2018).....	278
Figure 6.1 Alkmaarse stadsbeiaardier (Alkmaar City Carillonneur) Dr Christiaan Winter (2009-) pointing to a pinned carillon drum at the Waagtoren, Alkmaar, NL. Photo: Grace Chan (2023) .....	282
Figure 6.2 The University of Sydney Great Hall during an examination period (when the University organ and carillon must be silent). Photo: Grace Chan (2025) .....	287

## Tables

Table 1.1 Organ vs. Carillon (Grace Chan, 2025).....	37
Table 2.1 Indices important to mapping of organ and carillon culture.....	60
Table 2.2 Mapping digital cultural engagement in Australia .....	92
Table 2.3 Introducing digital.....	94
Table 2.4 Creative technologies .....	94
Table 2.5 Audience engagement .....	95
Table 2.6 Digital transformation strategy.....	96
Table 2.7 Digital business models .....	96
Table 2.8 Digital ethics and leadership .....	96
Table 2.9 Adapted from UNESCO Qualities of Intangible Cultural Heritage .....	101
Table 2.10 Consensus traits of artistic research adapted from source: Music 2.0 (Assis, 2023) .....	118
Table 5.1 The impact of digital transformation on the sustainability of organ and carillon culture.....	270

# Introduction

## 1.1 Foreground

This introduction begins with a foreground—in the manner of one entering a building or precinct from a forecourt rather than the loading dock. Indeed, organs and carillons are often situated in buildings and precincts with magnificent façades and inviting approaches. The purpose is to intentionally anchor the organ and carillon into the here and now, before touching on the rich history of these ancient musical instruments.

As two of Western society’s oldest ceremonial voices, the organ and carillon offer a soundscape for significant occasions such as births, deaths and marriages—sparse, yet keystone moments in a human lifetime. This study is being conducted at a time when organs and carillons are diminishing in prominence within wider contemporary society, while digital transformation is expanding into every facet of human life. Digital transformation is unavoidable and accelerating towards what the Australian Financial Review calls the “coming AI [artificial intelligence] revolution.”<sup>7</sup> Futurists such as Matthew Ball define the metaverse, as a “massively scaled and interoperable network of real-time rendered 3D virtual worlds that can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications and payments.”<sup>8</sup> These scenarios are no longer presented as polarising utopias or dystopias in the media as the situation abides by

---

<sup>7</sup> James Chessell, "The coming AI revolution," Word from the Editor-in -Chief, *Australian Financial Review* (Australia), 6 June, 2025 2025.

<sup>8</sup> Matthew Ball, *The metaverse : and how it will revolutionize everything*, First edition. ed. (New York, NY: Liveright Publishing Corporation, a division of W.W. Norton and Company, 2022). p. 29.

more prosaic realities: digital transformation is here to stay and will eventually innovate many aspects of human society.

The cultures associated with the organ and carillon are fragile within contemporary society. This is despite import placed on preserving the musical instrument as a physical artifact or monument via policy imperatives which are dictated by material heritage concerns. In 2003, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) identified “intangible cultural heritage” as being as important as the World Heritage Listing of a physical structure or environment by adopting the Convention for the Safeguarding of the Intangible Cultural heritage. This came into effect in 2006 and highlights that the maintenance of the physical musical instrument is but one element in ensuring the sustainability of a musical culture. In practice, heritage protections are often in place for the tangible structure of an organ or carillon.<sup>9</sup> This leads to the preservation of the material musical instrument due to legislated requirement however the conserved instrument can still be at risk of being silent. The instrument can still be at risk of not having trained musicians to make music on it, not having an audience or not being conserved in a manner so that the instrument is musical when played.<sup>10</sup>

To combat this fragility and to support a broader cultural sustainability, UNESCO in 2014, selected to the “Register of Good Safeguarding Practices” the carillon culture of Belgium (the exact wording of this listing is: “Safeguarding the carillon culture: preservation, transmission,

---

<sup>9</sup> David Kinsela and Dr Greg Young, *A Guide to the Conservation and Maintenance of Pipe Organs*, (Sydney: Crown Copyright, 1983).

<sup>10</sup> Scott Allan Orr, "In situ acoustic analysis of two twentieth-century heritage carillons," *Heritage science* 9, no. 1 (2021), <https://doi.org/10.1186/s40494-021-00482-8>.

exchange and awareness-raising”).<sup>11</sup> In 2017, UNESCO inscribed “Organ craftsmanship and music” in Germany on the “Representative List of the Intangible Cultural Heritage of

Humanity.”<sup>12</sup> On 26 March 2025, the German UNESCO Commission confirmed that bell casting and bell music have been entered in the list of Intangible Cultural Heritage.<sup>13</sup>

In this thesis, the sustainability of organ and carillon culture (i.e. to keep it going for future generations) will be considered a desirable outcome. Furthermore, musical performance on the organ and carillon will be seen as an important aspect of the intangible cultural heritage of these two instruments.

Digital transformation is occurring in society and globally, governments and business have been preparing for this tsunami.<sup>14</sup> The arts and creative industries are part of this metamorphic societal change.<sup>15</sup> A crucial example of digital transformation within organ and carillon culture is the explosion of digital or “virtual” practice keyboards for organists and carillonists which are simulations of the difficult-to-access physical, “tangible” musical instrument. They are essentially a digitisation of the sound world of a particular organ or carillon. Digital recordings are made of each note, documenting the attack, decay, sustain and release within the native acoustic of the fixed musical instrument (organ or carillon). The collated sounds are called “sample sets.” These sample sets are made functional by a digital

---

<sup>11</sup> "Safeguarding the carillon culture: preservation, transmission, exchange and awareness-raising: Belgium," 2014, accessed January, 2025, <https://ich.unesco.org/en/BSP/safeguarding-the-carillon-culture-preservation-transmission-exchange-and-awareness-raising-01017> (Selected in 2014 on the Register of Good Safeguarding Practices).

<sup>12</sup> "Organ craftsmanship and music: Germany," UNESCO, 2017, accessed January, 2025, <https://ich.unesco.org/en/RL/organ-craftsmanship-and-music-01277>.

<sup>13</sup> *World Carillon Federation Newsletter*, (World Carillon Federation, 2025).

<sup>14</sup> "Digital Transformation," Policy Issue, Organisation for Economic Co-operation and Development, 2025, accessed February, 2025, <https://www.oecd.org/en/topics/policy-issues/digital-transformation.html>.

<sup>15</sup> CreativeAustralia, "Digital Culture Strategy 2021-2024," (2021), [https://creative.gov.au/wp-content/uploads/2021/07/aca\\_301326\\_digitalstrategyrepo-60e784d394ba9.pdf](https://creative.gov.au/wp-content/uploads/2021/07/aca_301326_digitalstrategyrepo-60e784d394ba9.pdf); CreativeAustralia, "Generative AI and Creative Work," <https://creative.gov.au/advocacy-and-research/creative-australia-principles-generative-artificial-intelligence-and-creative-work/>; CreativeAustralia, "In Real Life: Mapping digital cultural engagement in the first decades of the 21st century," (2021), <https://creative.gov.au/advocacy-and-research/in-real-life/>.

interface that integrates information (pitch, timings, musical notes) so that these sounds libraries can be “played.”<sup>16</sup> Therefore, a virtual pipe organ (VPO) or virtual carillon clavier (VCC)<sup>17</sup> refers to detailed sets of recordings (or samples) of physical musical instruments which can then be stored on a computer hard drive.<sup>18</sup> These are playable by a musician on MIDI keyboards through software that integrates sophisticated audio processing and MIDI control.<sup>19</sup> The sampled organ and carillon sounds are heard through speakers or head phones via a sound card. For organists and carillonists needing to practice and prepare for creative projects and service work, these digital “virtual instruments” have (1) increased accessibility, (2) reduced costs, (3) allowed engagement with historical sound worlds and (4) lessened the environmental burden (through reduced air travel to hear and learn from these important organs and carillons at their original location).

Digital transformation within organ and carillon culture can therefore affect the four interdependent elements that are recognised in sustainability discourse, namely the social, economic, cultural and environmental pillars of sustainability.<sup>20</sup> In the examples above, (1–4) are all positives with respect to the sustainability of organ and carillon culture. However, there are also concerns that digital transformation may lead to the degradation of organ and

---

<sup>16</sup> A MIDI (Musical Instrument Digital Interface) Controller is an example of this type of software (e.g. the commercial software Hauptwerk used in many virtual pipe organs).

<sup>17</sup> Virtual carillon clavier is used to refer to carillon bell recordings (samples) intended for use with a physical simulation to create a playable “virtual instrument” as opposed to “digital carillons.” Digital carillons are recorded or electronically generated bell sounds played from a computer with speakers installed in a traditional tower that are used in some USA churches.

<sup>18</sup> Hence the term “sample sets” which will be used throughout this thesis

<sup>19</sup> MIDI is the acronym for Musical Instrument Digital Interface and is a technical standard and communication protocol developed in the early 1980s that allows electronic musical instruments, computers and related devices to connect, communicate and synchronize with each other.

<sup>20</sup> Dawn Bennett, Anna Reid, and Peter Petocz, "Creative workers' views on cultural heritage and sustainability," *Journal of aesthetics & culture* 6, no. 1 (2014), <https://doi.org/10.3402/jac.v6.24476>; Anna Reid, *Educating Musicians for Sustainability*, 1 ed., ISME Series in Music Education, (United Kingdom: Routledge, 2021); Anna Reid, Peter Petocz, and Dawn Bennett, "Is creative work sustainable? Understanding identity, motivation, and worth," *Australian journal of career development* 25, no. 1 (2016), <https://doi.org/10.1177/1038416216637089>.

carillon culture. To continue with the example of VPOs, one concern is that virtual representations of historical instruments will lead to the replacement of the tangible instrument in concert performance, church installations for liturgical use and other music applications such as film, advertising or computer game music.<sup>21</sup> There are concerns that “digital carillons” (a computer and speaker installation) will replace towers with bells and batons claviers. The physical, tangible bells require the complex cultural ecosystems of a foundry to make the bells and a carillonist to make music—the digital former does not.<sup>22</sup> Sometimes, these “negative” digital transformations are carefully chosen and desirable outcomes for tower custodians (e.g. churches, local governments) even if they are not the preference of musicians concerned about the sustainability of a fragile and intangible musical culture.

To extend concerns about digital transformation in society beyond that of a digital virtual machine replacing an acoustic heritage instrument, there is also apprehension that artificial intelligence may better articulate with a non-human digital system and thus accelerate posthuman music making.<sup>23</sup> Artists like Peter Ablinger (1959–2025) have explored these dystopias in works such as *DEUS CANTANDO* (God, singing). In this work, produced for the Wien Modern Festival and the World Venice Forum in 2009, a computer-controlled piano “reads” a Declaration of the International Environmental Criminal Court.<sup>24</sup> Positive and negative impacts regarding the intersections of digital transformation with organ and carillon culture, as they relate to cultural sustainability, will be discussed in this thesis.

---

<sup>21</sup> "Vienna Symphonic Library," 2000, <https://www.vsl.co.at>.

<sup>22</sup> "Electronic Carillons," 1835, 2025, <https://www.verdin.com/electronic-carillon-bells/>; "Digital Carillons," 1975, 2025, <https://www.chimemaster.com/digital-carillons>.

<sup>23</sup> APRAAAMCOS2024, "AI and Music," <https://www.apraamcos.com.au/about/supporting-the-industry/research-papers/aiandmusic>.

<sup>24</sup> "Deus Cantando (God Singing)," 2009, [https://ablinger.mur.at/speaking\\_piano.html](https://ablinger.mur.at/speaking_piano.html); "Speaking Piano," 2009, <https://www.youtube.com/watch?v=muCPjK4nGY4>.

## 1.2 Context

Many of the organs and carillons used in the projects studied in this thesis, are ceremonial instruments with substantial links to tangible and intangible heritage important to Australian society. The physical performance sites are meaningful places of secular or sacred congregation for Australians and visitors from around the world. The projects feature a diversity of tangible and intangible assets: historical organs and carillons in Australia, Europe and the United States of America (USA), digital organ and carillon sample sets, portable digital instruments for domestic and professional markets, musical instruments that are recorded and digitally transmitted through geolocation. This variety will allow a rich discussion regarding the effect of digital transformation on the tangible and intangible cultural heritage that flows from these assets.

The performance locations are equally diverse. They include a church, universities (in Australia and the USA), a town hall, a city recital hall, a house of cultural significance, an art gallery and various digital spaces. The real-world projects capture urban, suburban and rural locations; the carillon projects extend beyond traditional recital spaces to involve entire precincts such as Lake Burley Griffin in Canberra, the Main Quadrangle at Sydney University, Kings Parade in Bathurst and the Gothic Palace courtyard in Barcelona, Spain. A geolocated carillon experience via satellites is reported. Historical pipe organs recorded in Europe and experienced via the Sydney Town Hall house sound system (which has twelve subwoofers and three suspended speaker stacks) features in Organ Project 4: *Bronze Lands*.

“Wellbeing, placemaking and carillon culture: connecting with our audiences” (Chan and Wong, 2022) explicitly links a musical culture, wellbeing and human connection to place. It

asserts that place and wellbeing in a precinct or landscape are important to a musical culture that has its instrument fixed to a specific site. This site can have pre-existing, present and future meaning for its listeners. It may have meaning for the performer and so impacts on the artist's music making. To illustrate how an audience may connect to a musical experience through an affiliation with an institutional precinct, it quotes a University of Sydney graduate and Australian carillonist currently employed at the National Carillon, Canberra:

I first heard the sounds of the carillon when I was a student at Sydney University. Going to classes you would hear the bells ring. And of course, when I graduated, it became intertwined with such an important milestone in my life. It's basically where I fell in love with the instrument.<sup>25</sup>

This verbal recollection is followed by the following commentary in the paper:

The graduation ceremony [at the University of Sydney] is both a joyous and daunting experience, as students celebrate their academic achievements but also face the end of their protected student life and community. The carillon and its music ushers them into the next stage of their lives. The Sydney University War Memorial Carillon is located in and heard from the physical heart of the University. Its ceremonial voice is accessible to all students and staff in the open quadrangle. The quadrangle is also open to the general public. Buildings and bells embrace the audience to create indelible, multisensory memories for the listener.<sup>26</sup>

The above vignette and commentary highlight the complex interplay between music, ceremony, identity, participation, cultural sustainability and "place." It describes the memory of an affirming in-person experience situated in a physical environment. "Placemaking" is an urban planning concept that aims to create meaningful human connections to a precinct. A

---

<sup>25</sup> Grace Chan and Anna Wong, "Wellbeing, placemaking and carillon culture: connecting with our audiences," *Beiaard- en Klokkencultuur in de Lage Landen* 1, no. 1 (2022), <https://doi.org/10.5117/BKL2021.1.001.CHAN>, <https://www.aup-online.com/content/journals/10.5117/BKL2021.1.001.CHAN#:~:text=A%20sense%20of%20place%20and,connectedness%2C%20social%20inclusion%20and%20participation>.

<sup>26</sup> Chan and Wong, "Wellbeing, placemaking and carillon culture: connecting with our audiences."

sense of place and belonging is considered crucial to the public health concept of human “wellbeing.”<sup>27</sup> Wellbeing is regarded as a central tenet of the Australian economy and embedded in our national budget.<sup>28</sup> That the subject subsequently proceeded to become a carillonist because of this transformative event is a precious form of cultural sustainability in action—the ultimate fruition in the context of sustaining a fragile intangible culture. Recruiting a carillonist through the act of performing is “keeping something going.”<sup>29</sup> This is an example of cultural sustainability through intangible cultural heritage and artistic practice. It can be seen in this example that it did not happen quickly. Memory and nostalgia played a role in the subject eventually becoming a carillonist: this is an indicator that timeframes to achieve cultural sustainability may be in the order of decades if not generational. The genesis of Carillon Project 6 was an exploration of ceremony (a coronation) as an event with embedded conduits for generational sustainability in the form of new artistic knowledge.

It is also valuable to think beyond digital transformation influencing the obvious, visible and audible, namely: infrastructure (the site and structures), machines (e.g. mechanical and digital systems for automating organ and carillon music performance) and musical instruments (the organ and carillon). The effects of digital transformation on these elements are in general, positive and viewed as “innovation” if heritage and conservation concerns are sensitively addressed. The above example shows that it is also important to evaluate if digital transformation has a negative effect on the unique human connections to “place” through participation—the graduation ceremony above was a live, in-person experience in a physical space. Can a livestreamed graduation ceremony generate as a powerful connection to place

---

<sup>27</sup> Chan and Wong, "Wellbeing, placemaking and carillon culture: connecting with our audiences."

<sup>28</sup> Ronald Mizen, "Chalmers' first budget will include a chapter on 'wellbeing'," *Australian Financial Review* (Australia), 7/7/2012 2017, <https://www.afr.com/policy/economy/chalmers-first-budget-will-include-a-chapter-on-wellbeing-20220707-p5azvt>.

<sup>29</sup> Reid, *Educating Musicians for Sustainability*. p. 1.

and sense of belonging as an in-person experience? Placemaking and fostering wellbeing is important for organ and carillon culture to flourish amidst the fanfaring of technological innovations. This thesis will consider if digital virtual spaces where organ and carillon music is experienced can also generate these human connections.

To provide context regarding how this thesis has been shaped, the researcher completed the PhD candidature within the Historical Performance division at Sydney Conservatorium of Music (SCM), The University of Sydney. The Historical Performance division is a centre for practice-led artistic research and informed performance.<sup>30</sup> Both higher degree research and undergraduate students are encouraged to explore amongst their peers the sensory and intellectual implications of experimenting with historical instruments and materials. An example is performing historical chamber repertoire in ensembles with gut strings on period string instruments. One purpose is to elicit the imaginative stimulus of sound-worlds that are unfamiliar to contemporary ears.<sup>31</sup> This is analogous to the creative stimulus possible when preparing organ repertoire on a VPO's panoply of immersive historical pipe organ sound worlds. Students in the Historical Performance division are encouraged to listen to historical recordings to glean performance practice insights.<sup>32</sup> Sample sets of historical organs and carillon can also be thought of as a form of historical recording (albeit one that is high fidelity and contemporaneously made of conserved historical instruments) and source material for performance-practice research and experimentation.<sup>33</sup>

---

<sup>30</sup> Anna Reid, Neal Peres Da Costa, and Jeanell Carrigan, *Creative research in music : informed practice, innovation and transcendence*, ISME specialist themes in music education, (New York: Routledge, 2021).; Neal Peres da Costa, *Off the Record: Performing Practices in Romantic Piano Playing*, 1 ed. (United Kingdom: Oxford University Press, 2012).

<sup>31</sup> Daniel Edward Yeadon, "The Sydney Conservatorium Early Music Ensemble: An activity-theoretical study of the impact of period instruments, historically-informed performance and a unique pedagogy on tertiary group-learning experiences" (Sydney Conservatorium of Music, 2016).

<sup>32</sup> Koenraad J. H. van Stade, "Discovering Ideals of Expressivity and Artistry in 19th-Century Vocal Performance: Re-enacting Schumann's *Dichterliebe*" (The University of Sydney, 2022).

<sup>33</sup> Peres da Costa, *Off the Record: Performing Practices in Romantic Piano Playing*.

SCM is a performance and research environment where musicians are actively asked to consider issues of sustainability. In the words of academic and composer Professor Liza Lim, they are asked to embrace “ecological thinking.” Musicians are “educat[ed] for sustainability” in keeping with broader University of Sydney policy.<sup>34</sup> In addition to the daily artistic practice of working as an organist and carillonneur, I (the artistic researcher) have a background in basic science and clinical research as a medical doctor at the Save Sight Institute, The University of Sydney. This has included involvement in laboratory-based basic science experiments, large multicentre randomised controlled trials,<sup>35</sup> the understanding of real-world evidence in therapeutics and experience in teaching ophthalmic sciences at master’s degree level within the University of Sydney. I have had extensive and ongoing experience working in surgical environments such as advanced laparoscopy and microsurgery where digital interfaces (digital laparoscopes, high magnification digital microscopes) and artificial intelligence (AI) driven augmented reality overlays are used to access complex surgical fields in real-time during microsurgery.<sup>36</sup> This artistic and scientific background has resulted in an innate interdisciplinary research mindset that has been incubated in a practice-led environment where continuing professional development is reflexive, reflective and iterative.

---

<sup>34</sup> Liza Lim, "Ecological time " *Liza Lim Composer*, 2025, <https://lizalimcomposer.com/category/ecological-time/>; "How Liza Lim is breaking down barriers in music composition," The University of Sydney, 2025, <https://www.sydney.edu.au/news-opinion/news/2025/03/17/how-liza-lim-is-breaking-down-barriers-in-music.html>.; "Sustainability at Sydney," University of Sydney, <https://www.sydney.edu.au/about-us/vision-and-values/sustainability.html>.; Reid, *Educating Musicians for Sustainability*.

<sup>35</sup> Mark C. Mbbs PhD Gillies et al., "Five-year Results of a Randomized Trial with Open-label Extension of Triamcinolone Acetonide for Refractory Diabetic Macular Edema," *Ophthalmology (Rochester, Minn.)* 116, no. 11 (2009), <https://doi.org/10.1016/j.ophtha.2009.04.049>.; Mark C. Mbbs PhD Gillies et al., "Intravitreal Triamcinolone," *Ophthalmology (Rochester, Minn.)* 116, no. 3 (2009), <https://doi.org/10.1016/j.ophtha.2008.09.044>.

<sup>36</sup> "Zeiss Callisto eye Computer assisted cataract surgery," Zeiss Medical Technology, 2025, <https://www.zeiss.com/meditec/en/products/surgical-microscopes/ophthalmic-microscopes/callisto-eye.html>.

The collective, digital open access scholarship of the Orpheus Institute, Ghent, Belgium and particularly the work of their research fellow, pianist, experimental performer, music philosopher, and artistic researcher Professor Dr. Paulo de Assis in the online space, has been important in the development of the artistic research thesis methodology.<sup>37</sup> The scholarship of Finnish performance artist, researcher and pedagogue Professor Dr. Annette Arlander has been particularly helpful in alerting me to tensions within artistic research—especially that between artistic integrity (which has creative parameters for success and an ability to acknowledge failure) and the important requirement in institutions to report “excellence” to validly access research funding.<sup>38</sup> This has been explored at the Sydney Conservatorium of Music, The University of Sydney by Dr. Joseph Toltz and Professor Emeritus Linda Barwick in their work on our institution’s non-traditional output (NTRO) guidelines for reporting to Excellence in Research for Australia (ERA).<sup>39</sup> ERA is Australia’s national research assessment body and administered by the Australian Research Council which distributes Federal Government funding for research. This awareness has been useful, as many of the artistic outputs reported in the artistic research projects are performed on instruments within academic institutions and government authorities.

To support the PhD project, I created a virtual pipe organ studio in the Historical Performance division as tangible and intangible resource material for this practice-led artistic research study (December 2015–present). This Kees Noorlander, Barnveld, NL three-manual

---

<sup>37</sup> "Orpheus Instituut," 2025, <https://orpheusinstituut.be>.; "Paulo de Assis: Artistic research in music," *Visioning the future: artistic research doctorate in Ireland*, University College Cork, 2020, <https://artisticdoctorateireland.com/events/music/>.

<sup>38</sup> "Annette Arlander Website," 2025, <https://annetearlander.com>.

<sup>39</sup> Linda Barwick and Joseph Toltz, *Quantifying the Ineffable? The University of Sydney's 2014 Guidelines for Non-Traditional Research Outputs* (Sydney Conservatorium of Music, 2017)., in *Perspectives on Artistic Research in Music*, edited by Robert Burke and Andrys Onsman, 67-77. Lanham, Maryland & Oxford: Lexington Books, 2017.

MIDI virtual pipe organ (VPO) uses Milan Digital Audio “Hauptwerk” MIDI controller software which was originally launched by mathematician Martin Dyde in 2002 (Crumhorn Labs Ltd, Birmingham, UK).<sup>40</sup> The VPO has a parallel straight pedal board and is nestled amongst violins, recorders, viola de gambas, natural horns, harpsichords, clavichords, harmoniums, chamber organs and historical pianos.

The VPO has over twenty-five sample sets of historical keyboards (large pipe organs from different countries, chamber organs, harpsichords, a harmonium, a clavichord and a theatre organ). It is connected to high fidelity active speakers with an option for professional studio monitor headphones. The VPO is connected to an ergonomic touchscreen interface that is suspended by a hydraulic arm—allowing the organist to effect efficient organ stop changes and program pistons. The existence of the VPO within the Historical Performance division studio has inspired collaborative experiments tangential but highly informative to this thesis. This includes experiments with eye tracking technology to allow hands free stop changes during improvisation.<sup>41</sup> The major schools of organ building are represented in the VPO hard drive through careful historical organ sample set selection. Thus, the gamut of the organ repertoire can be experimented upon and explored on a historically appropriate VPO in the Historical Performance division studio. There is also the artistic and creative freedom (and privacy if using headphones) to apply virtual representations of pipe organs from any era to repertoire from—any era. The VPO has performed with Historical Performance division

---

<sup>40</sup> Virtual pipe organ console by Kees Noorlander (2015), Noorlander Orgels, Pascalstraat 10, 3771RT Barneveld, The Netherlands, [info@noorlanderorgels.com](mailto:info@noorlanderorgels.com); Hauptwerk software by Martin Dyde (2002) and Milan Digital Audio, <https://milandigitalaudio.com/about/>; Sample sets by Professor Helmut Maier OrganArt Media <https://www.organartmedia.com/en/>; Jiri Zurek Sonus Paradisi <https://www.sonusparadisi.cz/en/project.html>; David Butcher Lavender Audio <https://www.lavenderaudio.co.uk>; Brett Milan Milan Digital Audio <https://milandigitalaudio.com/instruments/>.

<sup>41</sup> See Abstract in Appendix 1; Grace Chan and Neal Peres da Costa, "Two hand, two feet and both eyes: incorporating eye-tracking technologies into virtual pipe organ performance" (Conference on music and eyetracking, Max Planck Institute for Empirical Aesthetics, Frankfurt, Germany, August 17th-18th, 2017).

instrumentalists and singers during an honours recital at the Sydney Conservatorium of Music.<sup>42</sup> Access to the virtual instrument was offered to all Conservatorium staff, students and professional organists throughout the duration of the PhD candidature, in the spirit of open access to cultural resources for research, experimentation and learning.

**Figure 1.1 Virtual pipe organ in the Historical Performance Studio, Sydney Conservatorium**



**Turbosound IP2000 V2 active speakers kindly loaned by organist and harpsichordist Dr. Nathan Cox, Photo: Grace Chan (2024)**

---

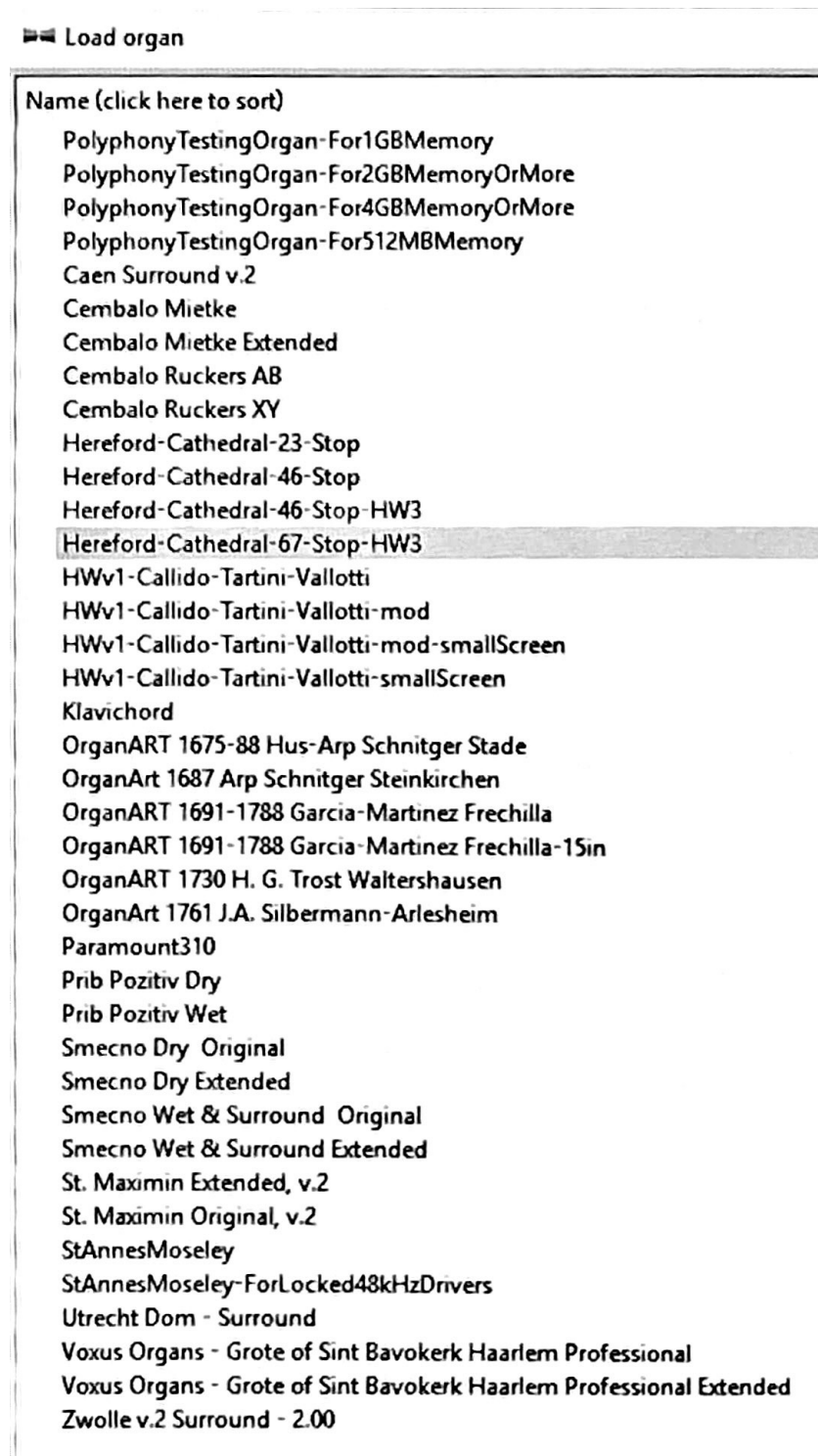
<sup>42</sup> Nathan Robert Cox, "Bach, JS, Gott soll allein mein Hertze haben BWV 169" (Honours Recital #2, Sydney Conservatorium of Music, 2018).

Figure 1.2 Touchscreen with virtual pipe organ stops



Image of the virtual console of the modified mean-tone 1675/88 Hus/Arp Schnitger organ in the Parish of St. Cosmae et Damiani, Stade, Germany, sample set creator: Professor Helmut Maier, Organ Art Media, Germany.

Figure 1.3 Virtual pipe organ (VPO) sample sets



Screenshot image, “Hauptwerk” (Milan Digital Audio) computer touchscreen interface of the virtual pipe organ (installed December 2015) listing some of the installed sample sets, Historical Performance division studio (Room 1043), Sydney Conservatorium of Music, The University of Sydney.

### 1.3 Objective

**To explore the impact of digital transformation on the sustainability of organ and carillon culture through an artistic research methodology.**

Heritage protections often conserve the tangible, material musical instrument while there is a gap in the knowledge concerning their sustainability as sources of intangible cultural heritage and artistic output in a digitally transforming society.<sup>43</sup>

### 1.4 Artistic Research Projects

The objective in section 1.3 will be examined through a series of real-world organ and carillon projects spanning a decade (2016–2025). “Real-world” refers to the projects being situated in my daily work life as an organist, carillonist and researcher. Each project thus constitutes a complex, nuanced, and importantly, actual workplace scenario. Artistic outputs from these practice-led projects are transdisciplinary and in the form of live performances, compositions, oral presentations, recordings, articles, lectures, webpages, interviews, social and broadcast media, museum exhibitions and gallery installations.<sup>44</sup> Projects selected for reporting from my artistic practice are those in which digital transformation significantly intersects with organ and carillon culture. In keeping with the artistic research methodology, the focus will be on the artistic process of the project that leads to an artistic output and the

---

<sup>43</sup> Simon Makuvaza, *Aspects of Management Planning for Cultural World Heritage Sites : Principles, Approaches and Practices*, 1st 2018. ed. (Cham: Springer International Publishing, 2018).; Reid, *Educating Musicians for Sustainability*.; AustralianGovernment, "2025 Digital Transformation Strategy," (2018).

<sup>44</sup> "Artistic research seminar 2 - artistic research in music," University College Cork, 2020, 2025, <https://www.youtube.com/watch?v=jGQDH-gYUDQ> (Visioning the future: artistic doctorates in Ireland Open Resource Youtube Playlist).

implications for cultural sustainability. The artistic process and ensuing output for each project will be reported and presented in a chronological series, by instrument (eight organ, eight carillon). This new knowledge, generated through the creation of diverse, real-world transdisciplinary artistic outputs using an artistic research methodology, will be analysed and any emerging strategies for cultural sustainability discussed.

## 1.5 Background

The organ and carillon are two of Western music's oldest and largest musical instruments. Carillon towers and large pipe organs that dominate an interior can be regarded as "musical monuments" because of their architectural scale.<sup>45</sup> They are often situated in a building (in the case of organs) or constitute a building (in the case of carillons) of historical and cultural significance. Pipe organs and carillon towers are unique musical instruments in that they are often public emblems of civic, institutional or community pride. Since their genesis, organs and carillons have revealed the pinnacle technologies of the age in which they were created.<sup>46</sup> They are often at the cusp of where art meets science. It is therefore not surprising that within the thesis projects they are vigorous participants in society's current digital transformation. This is despite the organ and carillon being niche entities from a bygone mechanical age.

Both musical instruments originated in Europe and have a rich cultural history situated in the northern hemisphere. The organ has a history of over 2000 years. A water powered pipe organ called a "hydraulis" was invented in 3rd century BC Greece by Ctesibius of

---

<sup>45</sup>" Monument," in *Oxford English Dictionary* (Oxford University Press).  
<https://www.oed.com/search/dictionary/?scope=Entries&q=monument>.

<sup>46</sup> Nicholas Thistlethwaite et al., *The Cambridge Companion to the Organ*, Cambridge companions to music, (Cambridge University Press, 1999).; Luc Rombouts, *Singing Bronze* (Leuven University Press, 2014).; Tiffany Kwan Ng, "The Heritage of the Future: Historical Keyboards, Technology, and Modernism" (eScholarship, University of California, 2015).

Alexandria.<sup>47</sup> This is thought to be the first keyboard and a precursor to the modern pipe organ which uses air, not water.<sup>48</sup> While individual bronze bells have a history dating back to 3000 BC, the carillon as a musical instrument originated in the sixteenth century in the “Low Countries” (present-day Belgium, the Netherlands and the French Netherlands).<sup>49</sup> The organ and carillon were early proponents of music for a mass audience; they had liturgical and civic roles that often aligned with public ceremony, memorialisation and commemoration.

**Figure 1.4 Sydney Town Hall Organ**



**Organist Grace Chan performing at Sydney Town Hall for the 175th Anniversary of the City of Sydney, Australia. Photo: Damian Shaw (2017), with the kind permission of the City of Sydney Archives.**

---

<sup>47</sup> Garard Green et al., *History of the organ, History of the organ. Vol. 1 : Latin origins* (Germany: ArtHaus Musik, 2012).

<sup>48</sup> "Encyclopedia Britannica," Merriam-Webster, 2012, 2025.

<sup>49</sup> Rombouts, *Singing Bronze*.

**Figure 1.5 National Carillon, Canberra, Australia**



**Queen Elizabeth II Island, Lake Burley Griffin, Canberra, Australia. Photo: Grace Chan (2018)**

Unlike a flute or violin, organs and carillons are not easily accessed, purchased or transported. A pipe organ is usually fixed to the wall of a building, with the façade belying the significant space taken up by pipework, pallets and bellows. A carillon tower is a musical instrument that is a whole building or integrated into an already significant structure (e.g. the University of Sydney War Memorial Carillon which is in the clocktower of the neo-gothic main quadrangle buildings).

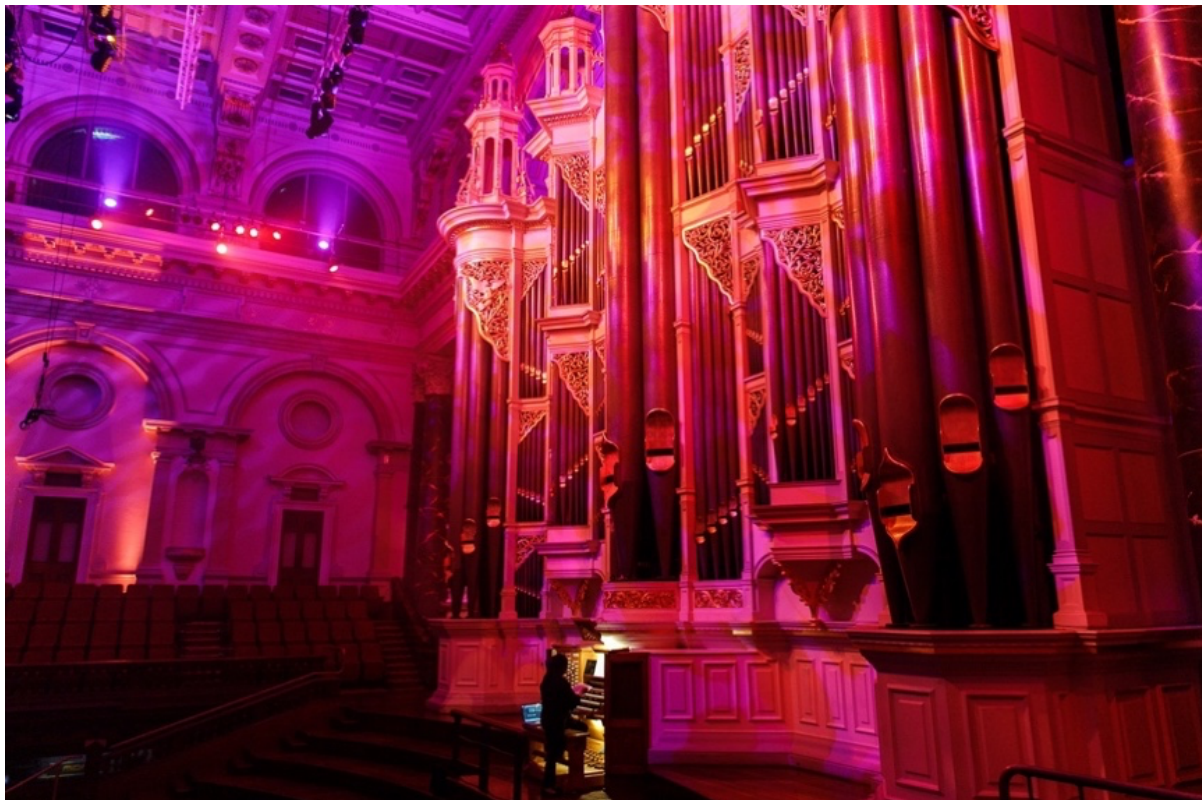
The parts of these instruments that generate sound are controlled via keyboards for the hands and feet (see Table 1.1). The musician must interact with an instrument that is of disproportionate size to the performer. This disproportion is a telling indicator of the organ

and carillon’s association with large audiences: the goal is for one artist to perform for a community of people on a mass scale. The space within which a pipe organ sits provides a characteristic acoustic and can almost be considered part of the instrument. Similarly, the precinct in which a carillon is located can be conceptualised as part of the instrument and musical experience. The dynamic sounds of a carillon play, reverberate and diminish to the landscape and open air.

**Table 1.1 Organ vs. Carillon (Grace Chan, 2025)**

	<b>Organ</b>	<b>Carillon</b>
<b>Type of instrument</b>	Wind	Percussion
<b>Sound generation</b>	Pipes	Bells
<b>Name of keyboard interface for hands</b>	Manuals (1 or more) with keys	Clavier with batons
<b>Name of keyboard interface for feet</b>	Pedal board	Lever pedals
<b>Dynamic response</b>	No	Yes

**Figure 1.6 William Hill & Son Grand Pipe Organ (1890), Sydney Town Hall**



*Bronze Lands* premiere (2020) Photo: Yaya Stempler (2020), with the kind permission of Sydney Festival.

**Figure 1.7 (Left) Ronald Sharp portative organ (1986–88), (Right) Sydney Town Hall William Hill & Son organ (1890)**



**(Left) Portative organist Grace Chan, Lady and the Unicorn Tapestries special event, Art Gallery of NSW. Photo: Benoît Deney (2018); (Right) Organist Grace Chan, registrants John Wilton, Elia Bosshard, 175th Anniversary for the City of Sydney, Australia. Photo: Damian Shaw (2017), with the kind permission of the City of Sydney Archives.**

A note can be sounded on an organ by the organist's fingers or feet depressing keys or pedals, so allowing air to traverse a specific pipe. The sound is continuous until this finger or foot is lifted from the key or pedal, initiating mechanisms that close the pipes and the air flow ceases. There is no dynamic response on an organ—striking keys with more force does not generate a louder sound. When reverberation is discussed by organists, it usually refers to the time notes take to decay to silence within the building containing the organ. The reverberation time is often honorifically detailed to the second by organists as it contributes to the sonic beauty of organs as musical instruments.

**Figure 1.8 Sydney University War Memorial Carillon**



**(Left) Carillonneur Grace Chan, Sydney University War Memorial Carillon. Photo: Majo Mathew (2024)**

**(Right) View of cityscape from carillon tower window during “Welcome Fest”: Sydney University lawns, Chau Chak Wing Museum, Fisher Library, Glebe and Sydney skyline. Photo: Grace Chan (2024)**

On a carillon, sound is created when the carillonist’s clenched hands or fingers strike a baton on a carillon clavier to activate a bell clapper. A carillonist’s feet can also sound a note by depressing a lever-like pedal. There is dynamic response on a carillon: it depends on the force with which the baton is struck—this is then transmitted to clapper, then bell.<sup>50</sup> After a clapper strikes the inside of a bell, the sound generated cannot be stopped. When reverberation is discussed by a carillonist, it usually refers to the time it takes for a note to decay to silence after clapper meets bell. Each organ and carillon is different in physical arrangement and sonic possibility.

---

<sup>50</sup> In many ways, the carillon is like a (very) “big piano.” In a piano hammers strike strings. In a carillon clappers strike bells.

Australia, where I am based as an organist and carillonist, is an island in the southern hemisphere that is at least 14,000 kilometres away from the traditional epicentres of organ and carillon culture.

Islands have fascinated biologists since the days of Charles Darwin and Alfred Russel Wallace and before, providing the inspiration for substantial theoretical development that has advanced our understanding of global biodiversity patterns and mechanisms that underpin them. As such, they are often termed ‘natural laboratories’, providing the ideal setting to study the interface between ecology, evolution and conservation... Interestingly, more than 25% of human languages, many of which are also threatened with extinction, are also to be found on islands.<sup>51</sup>

Language and music are two of the most powerful and complex communication systems between humans.<sup>52</sup> Drawing parallels between language and music is fraught with complexity—debates abound between linguists, neuroscientists, geographers and evolutionary biologists.<sup>53</sup> As a musician participating in artistic research, these are stimulating ideas and spur reflection on how artistic practice is communicated through musical instruments. Music is my mode of communication. The organ and carillon are akin to two languages that I speak using music.

In a 2024 paper published in *Nature Ecology & Evolution* by Bromham et. al. from the Australian National University, Canberra and reported in *Nature* as a research highlight,<sup>54</sup> the authors concluded that “islands are engines of language diversity” and “islands generate

---

<sup>51</sup> T. J. Matthews and K. Triantis, "Island biogeography," *Curr Biol* 31, no. 19 (Oct 11 2021), <https://doi.org/10.1016/j.cub.2021.07.033>.

<sup>52</sup> Aniruddh D. Patel, "Four questions about the relationship between music and language," *Oxford University Press*, 2012, <https://blog.oup.com/2012/10/relationship-between-music-and-language-neuroscience/>.

<sup>53</sup> John Sloboda, "Music as a Language," in *Exploring the Musical Mind: Cognition, emotion, ability, function* (Oxford University Press, 2004).; Elizabeth Hellmuth Margulis, "Music as language," in *The Psychology of Music: A Very Short Introduction* (Oxford University Press, 2018).

<sup>54</sup> Lindell Bromham, Keaghan J. Yaxley, and Marcel Cardillo, "Islands are engines of language diversity," *Nature ecology & evolution* 8, no. 10 (2024), <https://doi.org/10.1038/s41559-024-02488-4>.

language diversity by accelerating both language change and diversification.”<sup>55</sup> It is tantalising to consider if organs and carillons in Australia, as musical instruments far from their place of origin and subject to geographic isolation, are inevitably reimagined in form and function in this distant land with distinct cultural practices, traditions and histories. It is interesting to ponder if this antipodean “laboratory” and “engine of...diversity” can contribute to the sustainability of organ and carillon culture through accelerating innovation. Digital transformation is the focus of this thesis however, it is also pertinent to consider if amalgamating the act of making music (art) and the conducting of research (science) could, be an important driver of cultural sustainability through the generation of new knowledge that leads to innovation.<sup>56</sup>

Organ historian John Maidment<sup>57</sup> writes that after Australia was colonised by Britain in 1788 “a few small pipe organs were brought to Australia by British emigrants. It was not until the 1820s, however, that the first commissioned church organs arrived, built by the London firm of John Gray for churches in Sydney and Hobart.”<sup>58</sup> In *Bells in Australia*, John D. Keating writes:

Bells on ships were the first public timekeepers and the first calls to worship in Australia. And doubtless it was initially ships’ bells...that were first set up permanently for public functioning in the colony. They were in demand as time bells in army barracks and convict prisons, and as fire bells. The church bells with their more mellow tones, were to come later.<sup>59</sup>

---

<sup>55</sup> Bromham, Yaxley, and Cardillo, "Islands are engines of language diversity."

<sup>56</sup> That is, artistic research as a driver of cultural sustainability

<sup>57</sup> Maidment was the organ consultant for the installation of the Australian-made 1885 Fincham & Hobday pipe organ (ex-Gawler, SA) into the ballroom loft of Swifts mansion in Darling Point, Sydney, Australia mentioned in the Chapter 2 literature review as an example of “heritage culture”; "Swifts, Darling Point Rd, Darling Point," 2025, <https://ohta.org.au/organs/organs/DarlingPointSwifts.html>.

<sup>58</sup>"Organ Historical Society of Australia," 2025, <https://ohta.org.au/the-organ-in-australia/>.

<sup>59</sup> John D. Keating, *Bells in Australia* (Carlton, Vic: Melbourne University Press, 1979). p. 1.

In 2025, digital transformation within the creative industries<sup>60</sup> (and wider society) is accepted as a given and globally supported through various national and international policy directives as a priority.<sup>61</sup> Connectivity can be instantaneous, and we do not need to wait centuries to see, hear or understand cultures from another hemisphere. Digital transformation, digitization and digital connectivity has had tremendous impact in a country like Australia where we are far from the rest of the world and from each other within our spacious continent. The quotations above highlight a time where global connectivity was not instantaneous. It involved tall ships, seafaring and extended timeframes. Bells and organs were imported items that were functional tools of a colonising empire's transplanted societal institutions that kept time, order, safety and issued religious guidance. It was a time in Australia of exploration, survival, violence and pragmatism rather than ideals, aspirations or music as art (which came later in the colonies as civic milestones were achieved or, specifically for two of the Australian carillon towers, through involvement in the nation-maturing theatre of a world war).

The Oxford English Dictionary defines the word "antipodes" as describing "people who live on directly opposite sides of the globe." In particular, it refers to "those who live on the opposite side of the globe to the speaker or writer."<sup>62</sup>

---

<sup>60</sup> UTS, "Digital Transformation for the Creative Industries," *Digital Transformation for the Creative Industries* (2022).; AustralianGovernment, "2025 Digital Transformation Strategy."; OEDC, "Digital Transformation."

<sup>61</sup> AustralianGovernment, "2025 Digital Transformation Strategy."; UNESCO, "Artificial Intelligence and Digital Transformation Competencies for Civil Servants," (2022), <https://unesdoc.unesco.org/ark:/48223/pf0000383325>; Sabine Chrétien-Ichikawa and Karolina Pawlik, *Creative Industries and Digital Transformation in China*, 1st 2022. ed. (Singapore: Palgrave Macmillan, 2022); Martin Hilbert, "Digital technology and social change: the digital transformation of society from a historical perspective," *Dialogues in clinical neuroscience* 22, no. 2 (2020), <https://doi.org/10.31887/DCNS.2020.22.2/mhilbert>; Reimund Neugebauer, *Digital transformation*, 1st 2019. ed. (Berlin, Heidelberg: Springer Vieweg, 2019); OEDC, "Digital Transformation."

<sup>62</sup>"Antipodes," in *Oxford English Dictionary* (Oxford University Press). [https://www.oed.com/dictionary/antipodes\\_n?tl=true](https://www.oed.com/dictionary/antipodes_n?tl=true).

Oceania scholar Damon Salesa writes in an afterward for a 2012 collection of essays titled *The Atlantic World in the Antipodes: Effects and Transformations since the Eighteenth Century*:

... the Antipodes as both a place and a people, at once reassured Europeans that they lived on the right side of the world and unsettled them with a vision of a world upside-down and back-to-front. But always those in this wrong sided world, so distant and so different, were somehow imagined to be bound to those who stood ‘on top’ of them.<sup>63</sup>

When time came for civic pride to be celebrated or fallen soldiers to be memorialised in nineteenth and early twentieth-century Australia, this deeply embedded bind to those who “lived on the right” and superior side of the world prevailed. Civic institutions looked to Europe or Britain for emblems of prosperity and success. Post-World War I communities in mourning looked to monuments that recalled Europe. Australia was perceived in this period of history to be “foreign” by British settlers and convicts who were dispatched to the Antipodes, its natural world hostile with alien animals<sup>64</sup> and Aboriginal culture and traditions were not acknowledged, understood or respected.<sup>65</sup>

Australia has three large carillons and one of the world’s most iconic pipe organs—the Sydney Town Hall Grand Organ.<sup>66</sup> These musical monuments were conceived with this attitude that glorification of place and creation of community was to emphasise ties to a

---

<sup>63</sup> Kate Fullagar, *The Atlantic world in the Antipodes : effects and transformations since the eighteenth century*, EBL., (Newcastle: Cambridge Scholars, 2012). p. 283.

<sup>64</sup> Janelle Evans, "Painting the unfamiliar: why the first European paintings of Australian animals look so alien to our eyes," *The Conversation* ( 2023), [https://theconversation.com/painting-the-unfamiliar-why-the-first-european-paintings-of-australian-animals-look-so-alien-to-our-eyes-202719?utm\\_medium=article\\_native\\_share&utm\\_source=theconversation.com](https://theconversation.com/painting-the-unfamiliar-why-the-first-european-paintings-of-australian-animals-look-so-alien-to-our-eyes-202719?utm_medium=article_native_share&utm_source=theconversation.com).

<sup>65</sup> Eva Bischoff, "Settler Imperialism and Indigenous Peoples in Australia," in *The Palgrave Encyclopedia of Imperialism and Anti-Imperialism*, ed. Immanuel Ness and Zak Cope (Cham: Springer International Publishing, 2021). pp 2436-2443.

<sup>66</sup> "Sydney Town Hall," Organ Historical Society of Australia, 2005, accessed 7 Jan 2025, 2025, <https://www.ohta.org.au/confs/Sydney/SYDNEYTOWNHALL.html>.

colonial heritage that was linked to Britain and a superior European culture. To express pride, newfound confidence or the human need to memorialise, a city, university or rural township looked to the northern hemisphere for symbolism rather than within Australia.<sup>67</sup> In 1879 when the City of Sydney designed a new town hall, it followed the path of other civic spaces in the British Empire where it was “customary for civic halls to be provided with grand organs as imposing symbols of a city’s pride and its aspirations.”<sup>68</sup> A British and European symbol of prestige was chosen to reflect the City of Sydney’s growing assertiveness, prosperity and identity.

The National carillon in Canberra (1970) was a diplomatic gift from the British government on the 50th anniversary of its founding as Australia’s capital city in the Australian Capital Territory (ACT). The carillons in Sydney and Bathurst are both war memorials. The University of Sydney War Memorial carillon was inaugurated in 1928 and the first carillon in Australia. The carillon in Bathurst was inaugurated in 1933. In “The Cost of War,” historian Professor Stephen Garton highlights the revitalising consolation of memorials, in that “[m]emorials are not only a means of acknowledging the sacrifice of those who served, but also our way of making the war dead live again in the hearts of those who survive.”<sup>69</sup> He writes about a research visit made to war memorials in the United States of America (USA) (the italics are my emphasis):

The physical forms of these memorials [in North America] seemed very familiar—cenotaphs, grand columns, faux classical and art deco memorial buildings, neo-classical and religious statuary atop grand plinths. What was

---

<sup>67</sup> Patrick Nickleson’s paper explores similar issues in Canada. Patrick Nickleson, “The Message of the Carillon: Bells as Instruments of Colonialism in Twentieth-Century Canada,” *Intersections* (Toronto. 2006) 36, no. 2 (2016), <https://doi.org/10.7202/1051594ar>.

<sup>68</sup> “City of Sydney,” City of Sydney, 2025, <https://www.cityofsydney.nsw.gov.au/things-to-see-and-do/grand-organ-sydney-town-hall>.

<sup>69</sup> Stephen Garton, *The cost of war: war, return and the re-shaping of Australian culture* (Sydney: Sydney University Press, 2020). pp 9-10.

unfamiliar and disorientating was the rhetorical framing of all this memorialisation. This was not the poignant minimalism of “Lest We Forget” ...but something more grandiloquent...I came away from my sojourn in Indianapolis persuaded that form does not necessarily dictate content and, more importantly, that *Australia was different and had to be seen in its specificity...*<sup>70</sup>

These three Australian carillons and the Sydney Town Hall Grand pipe organ were specifically chosen as examples in this Introduction to highlight that in form (i.e. as musical monuments chosen to express an idea of civic pride, public memorialisation or commemoration), they would be metaphorically considered “cabinet curios” if not for their sonic beauty and monumental size as public musical instruments. These antipodean organs and carillons, compared to traditional European instruments, were oversized, louder, and pushed the boundaries of technological innovation and the logistics of delivery at the time they were commissioned. They are exaggerations in form that are saved from being caricatures through their aesthetic beauty, success in function as musical instruments and as suitability as monuments to the ideas that instigated their creation.

These examples do align with the definition of “curio” (shortened from “curiosity”) in that they are “something...considered novel, rare, or bizarre.”<sup>71</sup> This is not to diminish their status as fine musical instruments, frequently used in their current communities and respected as icons in international organ and carillon circles. At the time of construction, the three Australian carillons far exceeded many traditional European carillons in number and weight of bells (the National Carillon in Canberra currently has fifty-seven bronze bells, and the largest bell is six tonnes).<sup>72</sup> The novel features of these instruments were breathlessly

---

<sup>70</sup> Garton, *The cost of war: war, return and the re-shaping of Australian culture*. pp 9-10.

<sup>71</sup> "Merriam-Webster," (Encyclopedia Britannica). <https://www.merriam-webster.com/dictionary/curio>.

<sup>72</sup> "National Carillon," National Capital Authority, 2025, <https://www.nca.gov.au/points-interest/national-carillon#>.

reported in newspaper press clippings contemporaneous to the instrument openings.<sup>73</sup> The Sydney Town Hall pipe organ was recounted as having 127 stops, five manuals and a famous “never previously attempted” hidden 64-foot pedal pipe that must be turned upon itself to fit into the organ case.<sup>74</sup> However, a historical quotation cited on the City of Sydney webpage for the Sydney Town Hall Grand Organ, highlights that despite the extravagance and innovations of the organ, English organ heritage was still consciously (and desirably) respected:

A number of prominent organists were invited to test it, including the organist of Westminster Abbey, Dr Bridge, who considered it to be the ‘finest organ ever built by an English organ builder.’<sup>75</sup>

To recall the opening passage from the scientific journal *Nature*, within this Antipodean cultural ecosystem, away from the status quo and rigidly calibrated power structures of European organ and carillon culture, the “novel, rare or bizarre” had opportunity to exist. Here, a unique mode of conservation is observed where ties to the British Empire or Europe are revered and preserved but with such excess that ingenious, almost fantastical variations were actualised, capturing global imaginations (and still doing so as seen in this 2019 [video](#)<sup>76</sup> of visiting English organist Daniel Moulton, speaking direct to camera at the Sydney Town Hall organ console). These were uniquely antipodean inventions.

Distance from Britain created freedom to deviate from the status quo of the northern hemisphere. It drove “never previously attempted” innovations in instrument making (such as

---

<sup>73</sup> COS, "City of Sydney."; Robert Ampt and Tony Butler, *The Sydney Town Hall organ: William Hill and Son's magnum opus* (Woodford, N.S.W: Birralee Publishing, 1999).

<sup>74</sup> COS, "City of Sydney."

<sup>75</sup> COS, "City of Sydney."

<sup>76</sup> Daniel Moulton at the Sydney Town Hall Grand Pipe Organ FugueStateFilms, "https://www.youtube.com/watch?v=wwmcIesEkQ0," 2019.

the outrageous 64-foot pedal stop) and also creative practice (such as performing musically with that novel pedal stop).<sup>77</sup> These observations, together with Garton's insightful comment that "form" does not necessarily dictate the content around memorialisation and, more importantly, that "Australia was different and had to be seen in its specificity..." provide vital context to this practice-led thesis, centred around performing on an important cluster of organs and carillons in Australia.<sup>78</sup>

## 1.6 Thesis Structure

This thesis Introduction has outlined the significance of my physical, tangible musical instruments being situated in Australia, remote from the traditional European epicentres of organ and carillon culture. The introduction has also discussed the observation that within the context of ceremony and memorialisation, the tangible material form of the monument (i.e. organ or carillon) does not necessarily give an observer clues to the intangible ceremonial functions which may be culturally, historically or socially specific to a particular geography or place.<sup>79</sup>

Chapter 2 of this thesis reviews relevant literature related to organ and carillon culture, digital transformation, sustainability and artistic research. Section 2.1 will address the broader meanings of culture and discuss what may be included in organ and carillon culture. A section on how components of these musical cultures can be mapped i.e. cultural assets

---

<sup>77</sup> COS, "City of Sydney."

<sup>78</sup> I am referring to "form" of the musical monument i.e. organ or carillon. An Australian organ or carillon that looks like an instrument from Europe may or may not have the same musical or ceremonial role in Australia.

<sup>79</sup> Garton, *The cost of war: war, return and the re-shaping of Australian culture*. pp 9-10.

identified and analysed for a particular community or project serves as important background to delineating intersections of carillon/ organ culture with digital transformation.<sup>80</sup> Artist-led cultural mapping used as tool of inquiry in the development of strategies to attain cultural sustainability will be discussed. Current organ and carillon cultures in Australia that are observed within the digital space (i.e. within the “digital literature”) are summarised. This will cover church culture, civic culture, heritage culture, popular culture, digital organ and carillon culture, university campus culture, wellness culture and the culture surrounding music competitions (e.g. a composition competition). Reference will be made to organists’ and carillonists’ requirement of needing practice instruments as being an inherent part of organ and carillon culture. The use of practice instruments for performance will be discussed.

The literature review examining digital transformation (chapter 2.2) will briefly mention the philosophical and artistic research discourse concerning the terms “real”, “actual” and “virtual”. The definition of ‘virtuality’ relevant to this thesis will be explored. This chapter will then discuss a position statement from artistic researcher and music philosopher Paulo de Assis entitled “Music 2.0 and artistic research. Beyond a thousand years of Western art music.”<sup>81</sup> It will capture Australian and international policy documents, as well as insights from a Creative Australia initiative with the University of Technology, Sydney: an online course designed to upskill practicing creatives to incorporate digital transformation in their artistic practice.

---

<sup>80</sup> The term “mapping” here can but does not only refer to pictorial maps in the geographic sense.

<sup>81</sup> Paulo de Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music," *Forum* 30, no. 1/2 (2023), <https://doi.org/10.5117/FORUM2023.1/2.007.ASSI>.

The literature review regarding sustainability (chapter 2.3) will highlight cultural sustainability as a key “fourth pillar” of sustainability<sup>82</sup> and examine scholarship that considers cultural heritage and cultural sustainability as “two sides of the same coin.”<sup>83</sup> UNESCO’s work regarding tangible and intangible cultural heritage will be summarised, as will the drive to place culture at the heart of sustainability within its charter. Reference will be made to the archival sound sampling of heritage historical organs and carillons which have evolved to being functional digital virtual representations of the original instrument. Digital sound archiving as documentation of cultural history and the preservation of intangible sound heritage as a driver of the conservation of tangible, material musical monuments will be discussed as an important role reversal. Access to archived sound samples of virtual historical musical instruments as: (1) a form of historical recording and (2) a conduit to enriching performance will be discussed as drivers of cultural sustainability. The role of the virtual pipe organ and virtual carillon clavier in creating artistic outputs and generating new knowledge regarding performance practice on organ and carillons will be interrogated.

The section regarding artistic research (section 2.4) will explain the general term “practice-led” and how it relates to artistic research. The richness of capturing “real-world data” and “real-world evidence” through practice will be discussed with supporting examples. The key literature that positions artistic research as being practice-led, open ended inquiry, reflective, iterative, inter/transdisciplinary and embodied exploration will be summarised. This section of the literature review will then discuss scholarship that positions the combination of artistic practice (sensation) with academic research (sense) as a methodology and method for

---

<sup>82</sup> M. Sharon Jeannotte and Nancy Duxbury, "Advancing Knowledge through Grassroots Experiments: Connecting Culture and Sustainability," *The Journal of arts management, law, and society* 45, no. 2 (2015), <https://doi.org/10.1080/10632921.2015.1039739>.

<sup>83</sup> Reid, *Educating Musicians for Sustainability*. p. 24.

generating new knowledge.<sup>84</sup> The scholarship underpinning the methodological design of an artistic research project will be summarised to reveal the factual, analytical, speculative and artistic types of questions that emerge in the generation of the artistic outputs and new knowledge.<sup>85</sup> A justification of why this theoretical framework was chosen over others in the artistic research literature will be provided.

Chapter 3 discusses the methodology of this practice-led artistic research thesis. The methods of data collection and data analysis will be outlined. The strengths and weaknesses of this methodology will be discussed.

Chapter 4 contains reports data collected and data analyses from the eight organ and eight carillon projects in chronological order by instrument.

### Organ Projects: Instrument and Site

No.	Project	Instrument	Site
1	Commemorating the 175th anniversary of the City of Sydney with an experimental organ music composition at the Sydney Town Hall Grand Organ (2017)	1890 Hill & Son (1886-1889) 5 manuals 127 speaking stops Tubular-pneumatic/ Barker lever	Sydney Town Hall, Australia
2	New music commissions for portative organ in honour of the La Dame à la licorne tapestries (France c. 1500) AGNSW (2018)	Ronald Sharp (1986-1988) Portative organ Powerhouse Museum, Object no. 88/47 Single manual 20 note compass G-d1 Coupler switch	Art Gallery of New South Wales, Sydney, Australia

---

<sup>84</sup>"On Artistic Research: From the classical dualism to a unifying approach," (Video lecture), University College Cork, 2020, 2025, <https://www.youtube.com/watch?v=DYI2C8120Qs> (Visioning the future: artistic doctorates in Ireland Open Resource).

<sup>85</sup> Assis, "Artistic research seminar 2 - artistic research in music."

<b>3</b>	Performing Satie's Vexations at the Extended Play festival of new music (2018)	Casio SA-76 (2015) Digital keyboard 44 mini-size keys, 3.5 octaves 100 tones Synthesizer chip: custom (Pulse code modulation samples)	City Recital Hall, Sydney, Australia
<b>4</b>	Australian premiere of a large-scale organ work (50 min) at the Sydney Town Hall Grand Organ for an international festival	Hill & Son 1886–1889 5 manuals 127 speaking stops Tubular-pneumatic/ Barker lever	Sydney Town Hall, Australia
<b>5</b>	Performing on the University of Sydney Great Hall pipe organ during livestreamed university graduation ceremonies (2021—present)	Rudolf von Beckerath (1972) 3 manuals 54 speaking stops and 75 ranks Mechanical action Electric coupling and stop action	Great Hall, University of Sydney, Australia
<b>6</b>	Digital publication of a lo-fi digital artwork and automated spoken word performance using voice generation for ADSR Zine (2021)	<a href="http://voicegenerator.io">http://voicegenerator.io</a> Preset voices Artificial intelligence Browser text to speech technology	Digital space (Internet)
<b>7</b>	"Organ Service Provider" (City Organist) shortlisting and audition at the Sydney Town Hall Grand Organ for the City of Sydney, Australia (2023)	1890 Hill & Son (built 1886–1889) 5 manuals 127 speaking stops Tubular-pneumatic/ Barker lever	Sydney Town Hall, Australia
<b>8</b>	Livestreamed celebration service to commemorate the 150th year anniversary of St Stephen's Anglican Church, Newtown, Australia (2024)	J.W. Walker & Son (1874) Restoration 1989–1990 (David Rumsey) 2 manuals 18 stops Mechanical action Level ("hitch") swell pedal	St Stephen's Anglican Church, Newtown, Australia

## Carillon Projects: Instrument and Site

No.	Project	Instrument	Site
1	Learning how to transfer repertoire from a carillon practice clavier to main bells at the National Carillon, Canberra (2018–2022)	National Carillon (1970) John Taylor & Co. 57 bronze bells Bourdon F-sharp	Queen Elizabeth II Island, Canberra, Australia
2	Premiering an experimental Australian composition at an international music festival in the Palau de la Generalitat, Barcelona (2019)	Carilló del Palau (1977) Petit & Fritzen 49 bronze bells Bourdon: F in middle octave	Palau de la Generalitat, Barcelona, Catalunya, Spain
3	Premiering Australian compositions on Australian War Memorial carillons in Sydney and Bathurst (2021)	The University of Sydney War Memorial Carillon John Taylor & Co. 54 Bronze bells Bourdon G  Bathurst War Memorial Carillon John Taylor & Co.	Main Quadrangle, The University of Sydney, Australia  Kings Parade, Bathurst, Australia
4	Performing at university graduations and events on a heritage instrument (2021–present)	The University of Sydney War Memorial Carillon John Taylor & Co. foundry 54 Bronze bells	Main Quadrangle, The University of Sydney, Australia
5	An online academic presentation at an international carillon conference during the COVID-19 pandemic (2021)	National Carillon (1970) John Taylor & Co. foundry 57 bronze bells Bourdon F-sharp	Digital Space (Internet)
6	Remotely premiering an Australian carillon composition in United States university carillon precincts via a geolocated audio experience platform (2023)	3 Satellites  Baird Carillon John Taylor & Co. foundry 53 Bronze bells Bourdon D-sharp  Lurie Carillon Royal Eijsbouts foundry 60 Bronze bells Bourdon G	Digital Signal (GPS) trilateration  University of Michigan, USA  University of Michigan, USA

		The University of Sydney War Memorial Carillon John Taylor and Co. foundry 54 Bronze bells. Bourdon G	University of Sydney, Australia
7	Premiering an Australian carillon composition as a group listening experience at Peggy Glanville-Hicks House for ADSR Zine (2023)	The University of Sydney War Memorial Carillon John Taylor & Co. foundry 54 Bronze bells Bourdon G	Digital Space (recording)  Peggy Glanville Hicks House, Paddington, Australia
8	Performing the Ngarigu Snow Song on carillon with custodian Professor Jakelin Troy (voice and body percussion) at the Australian Linguistic Society Conference, Main Quadrangle, The University of Sydney, Australia (2023)	The University of Sydney War Memorial Carillon John Taylor & Co. foundry 54 Bronze bells Bourdon G	Main Quadrangle, The University of Sydney

The Discussion in chapter 5 features an interpretation of the data that emerges from the organ and carillon artistic projects and outputs. The discussion will highlight the main themes identified in the study regarding digital transformation and the sustainability of organ and carillon culture.

The Conclusion in chapter 6 will summarise the contribution of this artistic research thesis in identifying how digital transformation has created new performance practice and cultural sustainability strategies within organ and carillon culture. Any negative impacts of digital transformation on organ and carillon culture that have been identified in the study will be canvassed. Future directions for artistic research in this field will be discussed.

Digital still images and audiovisual material made during this study by the researcher through journaling, memoing and scratch notes, will be used extensively in this thesis to convey the sense of “place” that is crucial to understanding organ and carillon culture.

## 2 Literature Review

### 2.1 Organ and Carillon Culture

The cultures relating to the organ and carillon are defined by a contradiction: organs and carillons are at once ancient musical instruments and throughout their history, a magnet for the latest technologies of an era. These technologies have been hydraulic, mechanical, pneumatic, electric (analogue or digital) and adhere to technological timelines of human innovation.<sup>86</sup> This key paradox of organ and carillon culture is expressed as being “at once perpetually old and yet perpetually new” by Tiffany Kwan Ng in her 2015 doctoral dissertation which explores the reinventions of these instruments in a twentieth century United States of America (USA) and in the Netherlands.<sup>87</sup> Ng describes organs and carillons as having “simultaneous appeal as ingenious technological devices and as cultural symbols of the European Baroque,” outlining the history of their joint association within which historical place of origin intermingles with innovation and technology:<sup>88</sup>

They are indelibly associated with a European musical past, yet their size and complexity have led everyone from engineers and politicians to reinvent them to suit new electronic and social ideals. As a result, they [organs and carillons] have often been on the leading edge of music technology...innovations have been ongoing since the sixteenth century, when they first co-existed in the Netherlands.<sup>89</sup>

---

<sup>86</sup> Andrew King et al., *The Routledge Companion to Music, Technology, and Education*, 1 ed., Routledge Music Companions, (Oxford: Routledge, 2017).; Rombouts, *Singing Bronze*.; Thistlethwaite et al., *The Cambridge Companion to the Organ*.

<sup>87</sup> Ng, "The Heritage of the Future: Historical Keyboards, Technology, and Modernism."

<sup>88</sup> Academic and carillonneur Luc Rombouts has explored the idea of “The carillon as ingenious machine.” in an oral paper presentation at the 2023 World Carillon Federation Conference in Utrecht, The Netherlands.

<sup>89</sup> Ng, "The Heritage of the Future: Historical Keyboards, Technology, and Modernism."

The latest technology in the sixteenth century was not in the form of a personal handheld device but machines owned by churches (and later municipalities).<sup>90</sup> Ng continues:

From that time onward, carillons in the Netherlands called the faithful to church from towers, while organs lead the song once they filed inside. A church's organ, clock, and automatic carillon were the most advanced pieces of technology most people were likely to encounter...the organist-carillonneur became a standard church position in the Baroque period. For the seventeenth and early eighteenth centuries, the instruments were seen as complimentary...In the twentieth century, keyboards became the interface of choice for electronic music technologies developed for commercial production.<sup>91</sup>

The organ and carillon were seen as “complementary” for many centuries—in physical proximity and bound by ritual through their musical roles within liturgical ceremony.<sup>92</sup> This complementarity is seen in a contemporary secular circumstance at the University of Sydney, where students and families are welcomed and farewelled into the Great Hall during Graduation ceremonies by music from its carillon. Once in the Great Hall they hear pipe organ music during the graduation ceremony (a recital, processional and recessional). During the ceremony, family and friends are encouraged to take photos of their loved ones as they receive their graduation certificate from the presiding Pro-Chancellor. These photos are usually taken with their smart phones which they also use to download the paperless Sydney University Graduation booklet via a unique QR Code. The two other Australian carillons in Bathurst and Canberra are stand-alone structures within a civic precinct and have no ceremonial association with an organ.

---

<sup>90</sup> Hamish Hector, "ICYMI: the week's 7 biggest tech stories from Apple's beautiful Liquid Glass to the Xbox's surprise handheld launch," *Technradar* 2025, <https://www.techradar.com/tech/icymi-the-weeks-7-biggest-tech-stories-from-apples-beautiful-liquid-glass-to-the-xboxs-surprise-handheld-launch;> "Carillon Culture," <https://www.immaterieleerfgoed.nl/en/beiaardcultuur.>: “The carillon owners are often municipalities, but university boards, church councils and individuals can also own a carillon.”

<sup>91</sup> Ng, "The Heritage of the Future: Historical Keyboards, Technology, and Modernism."

<sup>92</sup> Ng, "The Heritage of the Future: Historical Keyboards, Technology, and Modernism."

Australia is far from the European centres of organ and carillon culture however geographically we are close to Asia and the Pacific Nations.<sup>93</sup> While it is accurate to assert that the church pipe organ and carillon tower originated in Europe, the artistic research projects in this thesis benefit from a global perspective of organ and bell culture. For example, there is a long history of mouth organs in Asia (the *sheng*<sup>94</sup> in China and the *saenghwang*<sup>95</sup> in Korea) and *harmoniums*<sup>96</sup> in India. There is a rich ceremonial bell culture in Asia. The Chinese *bianzhong*<sup>97</sup> dates back 2400 years and consists of a set of graduated bronze bells suspended in a frame made of wood.<sup>98</sup> Solitary ceremonial bells populate places of worship throughout Asia.<sup>99</sup>

It is useful to consider what “culture” broadly refers to in Australian and international contexts. A 1995 document produced by Young et al. at the Commonwealth Department of Communications and the Arts, is an early attempt at identifying the cultural assets of a community or “mapping culture” for use in community centred strategic urban planning.<sup>100</sup> The publication is titled *Mapping Culture: a guide for cultural and economic development in communities* so positioning “culture” as a community asset that can lead to the enrichment of the existing cultural life and the economic development of communities. The impetus for the publication of the guide was the enhancement of the quality of life of a community and finding a way for existing “culture” to be amplified.<sup>101</sup>

---

<sup>93</sup> See p. 40 of this thesis.

<sup>94</sup> Sheng soloist Wu Wei <https://www.youtube.com/watch?v=Xios4KtjG2A>

<sup>95</sup> Traditional Korean Instruments: Saenghwang <https://www.youtube.com/watch?v=aFoih6gjcBs>

<sup>96</sup> Kuljit Bhamra: What is a harmonium? <https://www.youtube.com/watch?v=R3iltQ5Fm2c>

<sup>97</sup> Bronze Bells: Bianzhong <https://www.youtube.com/watch?v=kJaMCKVOFJM>

<sup>98</sup> Rombouts, *Singing Bronze*.

<sup>99</sup> Grace Chan, "The Impact of Post-COVID Digital Transformation on Global Bell & Carillon Culture" (Performers(°) Present 2023: Flowing Resonances, Singapore, YST Conservatorium, 2023).

<sup>100</sup> I am indebted to Dr Greg Young (ex-NSW Department of Planning and Environment) who kindly provided me with his personal hard copy of this document.

<sup>101</sup> G. Young, Clark, I., Sutherland, J., "Mapping Culture: a guide for cultural and economic development in communities," (1995), [https://doi.org/ISBN\\_0644452331](https://doi.org/ISBN_0644452331).

## Mapping organ and carillon culture

Mapping culture involves “a community identifying and documenting local cultural resources.” Young et al. then offer their definition of tangible and intangible culture. After this identification research is undertaken, “cultural elements are recorded—the *tangibles* like galleries, craft industries, distinctive landmarks, local events and industries, as well as *intangibles* like memories, personal histories, attitudes and values.” The document emphasised that “the most fundamental goal of cultural mapping is to help communities recognise, celebrate and support cultural diversity for economic, social and regional development.”<sup>102</sup> This is an early attempt to assert that culture has the power to reap economic benefits and can “increase employment, boost tourism, restore historical sites or streetscapes or increase cultural experiences and products.” UNESCO’s definition of tangible and intangible culture as documented in the 2003 Convention for the Safeguarding of Intangible Cultural Heritage will be expanded upon in section 2.3 of this chapter within the literature review of sustainability literature.<sup>103</sup>

In this 1995 document, the authors position culture as begetting more culture without explicitly using the words “sustainability” or “cultural sustainability”. Quoting the then Commonwealth cultural policy, the “Mapping Culture” document asserted that:

Culture arises from the community...It encompasses our entire mode of life, our ethics, our institutions, our manners and our routines, not only interpreting our world but shaping it...To speak of Australian culture is to recognise our common heritage. It is to say that we share ideas, values, sentiments and traditions, and that we see in all the various manifestations of these what it means to be Australian. Culture, then concerns identity—the identity of the nation, communities and individuals. We seek to preserve our

---

<sup>102</sup> Young, "Mapping Culture: a guide for cultural and economic development in communities."

<sup>103</sup> "Intangible Cultural Heritage ", 2025, accessed January 2025, 2025, <https://ich.unesco.org/en/home>.

culture because it is fundamental to our understanding of who we are...Culture is that which gives us a sense of ourselves.<sup>104</sup>

Culture was deemed a “fourth pillar” of in sustainable development in 2004, within the United Cities and Local Governments’ Agenda 21 for Culture. It is only in 2013 that UNESCO clearly inserted culture into the sustainability discourse in the Hangzhou Declaration, “Placing Culture at the Heart of Sustainable Development.”<sup>105</sup> Sustainability and culture will also be discussed in section 2.3 of this chapter, within the literature review of sustainability literature.<sup>106</sup>

Mapping or identifying what constitutes “organ culture” may reveal cultural assets to be musical performances by organist, the musical instrument and the building in which it is housed, the musical repertoire, performance practices, the knowledge associated with organ building (whether they be pipe, digital or hybrid iterations), organ restoration, and the education and training of organists. Mapping “carillon culture” could reveal cultural assets to be the musical performances by carillonists, the tower, the precinct in which the tower sits, the repertoire (which may be specifically composed or arranged for the carillon), performance practices, the knowledge associated with campanology, carillon construction and maintenance, education of the public, the training of carillonists and community engagement through public performances, events and outreach. As musical instruments, the organ and carillon are vehicles for artistic expression through the mode of music—the musicians themselves can be regarded as cultural assets. Musical performance is an important aspect of organ and carillon culture and the way these instruments connect to their

---

<sup>104</sup> Young, "Mapping Culture: a guide for cultural and economic development in communities."

<sup>105</sup> Graeme Evans et al., "Cultural Mapping and Planning for Sustainable Communities," (Routledge, 2015).

<sup>106</sup> Nancy Duxbury and M. Sharon Jeannotte, "The Role of Cultural Resources in Community Sustainability: Linking Concepts to Practice and Planning," *International journal of sustainability policy and practice* 8, no. 4 (2013), <https://doi.org/10.18848/2325-1166/CGP/v08i04/55409>.

communities. This scholarship and discussion is useful when considering how to parse elements of transdisciplinary artistic projects involving the organ and carillon as they involve institutions, a precinct, buildings and a large machine (the instrument). To delineate these elements is the first step in identifying intersections with digital transformation.

The 2013 “A Contemporary Guide to Cultural Mapping: An ASEAN-Australian Perspective” expands on these ideas in a Southeast Asia-Australia regional context and conceptually articulates with international work done by UNESCO in the tangible/ intangible heritage and cultural sustainability space.<sup>107</sup> Heritage is defined as:

...things we want to keep manifested in places, objects, and traditions that people value and have meaning. It is not just physical, tangible aspects of things that are significant people’s value systems, but vitally important are intangible values people associate with places, objects and practices as part of their lived experiences.<sup>108</sup>

The document then goes on to highlight that heritage has evolved to being “no longer a matter of focusing on buildings, archaeological remains, literature...[and the] rich and famous in history.”<sup>109</sup> The “value of the everyday” is underlined as is the idea that the “ordinary is just as vital as the famous.” Three key indices are identified as important when trying to create an inventory of cultural assets. These indices are summarised in the following table developed from ideas in the ASEAN document that emphasises culture is everywhere, even in the seemingly “ordinary,” “everyday” and local. The last column is an application and interpretation of these definitions to the context of organ and carillon culture specifically developed for this thesis.

---

<sup>107</sup> Ian Cook and Ken Taylor, "A Contemporary Guide to Cultural Mapping: An ASEAN-Australia Perspective," (2013), <https://asean.org/wp-content/uploads/2021/09/Contemporary-Guide-to-Cultural-Mapping-Rev-X.pdf>.

<sup>108</sup> Cook and Taylor, "A Contemporary Guide to Cultural Mapping: An ASEAN-Australia Perspective." p 15.

<sup>109</sup> Cook and Taylor, "A Contemporary Guide to Cultural Mapping: An ASEAN-Australia Perspective." p 15.

**Table 2.1 Indices important to mapping of organ and carillon culture<sup>110</sup>**

Concept	Definition	Interpretation
Culture	What it means in the sense of the way we live and do things.	<b>In the context of organ and carillon culture this can refer to the circumstance in which listeners encounter these instruments and their music e.g. rituals and ceremonies for births, marriage, mourning, convocation, memorialisation or celebration.</b>
Identity	Of people as communities, groups and individuals and the depth of meaning that a feeling of identity has for human wellbeing.	<b>In the context of organ and carillon culture this can refer to the communities around the instrument's locations, the listeners that come to a precinct for a purpose, people from specific local government areas.</b>
Distinctiveness	Particularly at local levels that people feel through association with their places, activities, traditions and knowledge systems.	<b>In the context of organ and carillon culture, this can refer to understanding that if the musical instrument is located a particular precinct, listening to First Nations histories where an organ or carillon may sit is important.</b>

The extrapolation of these indices to organ and carillon culture emphasises the connections that the organ and carillon have to the urban planning concept of placemaking and the public health concept of wellbeing.<sup>111</sup> They also suggest that organ and carillon culture can be invested in the life experiences, occasions, rituals and ceremonies of people within society (and not only imposed by institutions such as government or a monarchy and their local

---

<sup>110</sup> Cook and Taylor, "A Contemporary Guide to Cultural Mapping: An ASEAN-Australia Perspective." pp 15-16.

<sup>111</sup> Chan and Wong, "Wellbeing, placemaking and carillon culture: connecting with our audiences."

proxies). Carillon Project 6 has its genesis in an academic lecture that explores the issues surrounding hierarchical power and grassroots agency.

In the context of this artistic research study, the “mapping” or identification of organ and carillon cultural assets that lead to the intersection of digital transformation and organ/carillon culture, will be stimulated by an artistic process of “problematization” that leads to an artistic output. This practice-led approach will identify the elements of organ and carillon culture that have been impacted by digital transformation and examine the artistic output of each organ or carillon project for novel cultural sustainability strategies. Cultural mapping as a tool of cultural inquiry to assist in this examination will be discussed in section 2.4 of this literature review and in the chapter 3 Methodology. Specific reference will be made to cultural mapping by artists as a method of enriching a practice-led research approach.

### **Australian organ and carillon subcultures observed in the “digital literature”**

The following section will discuss some subcultures within organ and carillon culture that were observed during my daily organist/ carillonist work life within the online space (a review of the “digital literature”). This is to give a contemporaneous survey of the milieu in which this study is situated. This will cover church culture, civic culture, heritage culture, popular culture, digital organ and carillon culture, university campus culture, wellness culture and the culture surrounding music competitions.

In contemporary Australian society, organs still play a significant role in Christian worship through supporting liturgy. In this context (its original context), organ culture can be seen as being a living part of “church culture” even with the popularity and high level of

musicianship in contemporary bands supporting current Christian worship.<sup>112</sup> Livestreaming is now routine for many church services—a COVID initiative that has continued since 2020. Funerals in Australia are routinely livestreamed. If an organ with organist is present, organ music is often incorporated into the digital broadcast through a dedicated camera. In Australia, organs have a non-liturgical, civic presence in town halls and concert halls and so, participate in the mainstream musical culture through these conduits of civic culture. Events in these secular settings are usually captured on the social media accounts of the audience and the institutions that hold the events.

An example of an organ that actively participates in diverse cultural events at which many of the listeners are hearing a pipe organ for the first time, is the Australian made Fincham and Hobday organ (1885) located in the ballroom of the historic mansion Swifts, Darling Point.<sup>113</sup> The organ at Swifts performs for weddings, fundraisers, film shoots, couture fashion events, jewellery launches and school visits. This pipe organ and others in historic houses, could be deemed part of the “heritage culture” promulgated by the house museum movement.<sup>114</sup> The historical Fincham and Hobday organ has been part of Sydney Living Museum (now Museums of History, NSW) events. The organ has also featured in high-profile, digital broadcast and social media intensive events attended by the current and previous Prime

---

<sup>112</sup> E.g. Emu Music "Emu Music," [https://emumusic.com/?srsltid=AfmBOoqT\\_RQaeH0ONxAkHvekrIc9EATqequO4BzKitygctE8j6uPmtZ-](https://emumusic.com/?srsltid=AfmBOoqT_RQaeH0ONxAkHvekrIc9EATqequO4BzKitygctE8j6uPmtZ-). An example of contemporary music co-existing with organ and bell culture are the music ministry and Christian musical events at St Stephens Anglican Church Newtown where I am organist. The church has a Walker and Son (1874) organ restored under organist consultant David Rumsey and also a rare set of Whitechapel hemispherical chimes that are now operated from a MIDI keyboard.; "St Stephen's Newtown, Walker and Son pipe organ (1874)," <https://www.sydneyorgan.com/StStN.html>.; "Whitechapel hemispherical chimes. Newtown: Australia. St Stephen's Anglican Church," <http://www.towerbells.org/data/AUNWTNSS.HTM>.

<sup>113</sup> The researcher Dr Grace Chan is organist at the heritage listed historic mansion Swifts, Darling Point, Sydney, Australia. Swifts is owned by Dr Shane and Mrs Penny Moran.

<sup>114</sup> Anna Wong, "Keeping house for different masters : history, heritage and house museums in Australia" (2007).

Ministers of Australia and the current New South Wales Premier.<sup>115</sup> Here attendees greatly amplify the reach of the organ through video posts on social media accounts and the professional videography of events.

**Figure 2.1 Heritage-listed historic mansion “Swifts,” Darling Point, Australia.**

**Photos: Grace Chan, Shane Moran**



**(Left) Ballroom entrance, (Centre) Organist Grace Chan, Fincham and Hobday pipe organ (Gawler, SA, 1885; storage Williamstown, SA, 1976–2015; installed Darling Point, NSW, 2016), (Right) Couture fashion event and dinner in Swifts ballroom.**

The three carillons in Australia perform most frequently for secular public events so could be situated in “popular culture” (especially that of memorialisation).<sup>116</sup> The digital presence of the three Australian carillons mirror the manner with which they inhabit this popular culture space; they appear frequently on mainstream digital broadcast media as a human-interest item.<sup>117</sup> None of the Australian carillons are located at churches so do not feature in church

---

<sup>115</sup> "Songs of Home at Swifts," Sydney Living Museums/ Museums of History, NSW, 2019, <https://www.australianmusiccentre.com.au/event/songs-of-home-at-swifts.>; Paulina Vidal, "Prime Minister Anthony Albanese attends Kyle Sandilands' wedding, despite criticism," 2023 (Australia) 2023, <https://www.abc.net.au/news/2023-04-29/anthony-albanese-chris-minns-avoid-media-kyle-sandilands-wedding/102282432.>; "An Evening with the Honorable Malcolm Turnbull," Wolper Jewish Hospital, 2019, <https://wolper.com.au/an-evening-with-the-hon-malcolm-turnbull/>.

<sup>116</sup> The carillon is a rare instrument in Australia. Australia has 3 carillons, New Zealand 1. There are around 650 carillons globally with 120 in the Netherlands, 94 in Belgium and 180 in the United States. "Tower Bells," World Carillon Federation, <http://towerbells.org>. "The carillon in Dutch culture," Access Netherlands, 2023, 2025, <https://access-nl.org/features/the-carillon-in-dutch-culture/>.

<sup>117</sup> <https://m.soundcloud.com/bathurstbroadcasters/hump-day-march-24-2021-bathurst-war-memorial-carillon> 27:45 Grace Chan interviewed by Chris Morgan 2BS Radio Bathurst

services or funeral livestreams. This contrasts with the situation discussed in Ng's opening quotation which described the co-existence of organs and carillons within church precincts in the Low Countries (dating back to sixteenth century Europe).<sup>118</sup> The carillons in Bathurst and Canberra are free standing towers in civic precincts. The carillon in Sydney is part of the university sandstone quadrangle and its precinct is part of the University of Sydney grounds. Unless wider history is consulted, there is no obvious link between organ and carillon culture in Australia. Musicians who play both instruments in are a rarity in Australia.

There is a burgeoning global organ and carillon culture in the online and social media space: a "digital culture". A notable organ example of digital presence is Ms Anna Lapwood MBE who is the first official organist at Royal Albert Hall, London, UK, former Director of Music at Pembroke College, Cambridge (2016-2025) and an international touring artist. Lapwood currently has [1.5 million Instagram followers](#).<sup>119</sup> A notable carillon example of digital presence is Professor Joey Brink (Adjunct Professor of Carillon at the University of Denver and 2014 Mechelen 7th International Queen Fabiola carillon competition laureate) who has 6.51 K followers on his [YouTube channel](#).<sup>120</sup> The growth of these digital cultures related to the organ and carillon can be seen as a form of cultural sustainability through the population of burgeoning digital realms.<sup>121</sup>

Australia has a rich, developing organ and carillon culture within the online space. It has been discussed in this thesis (p. 40), that Australia is far from the traditional European centres of

---

<sup>118</sup> Ng, "The Heritage of the Future: Historical Keyboards, Technology, and Modernism."

<sup>119</sup> Anna Lapwood Instagram <https://www.instagram.com/annalapwoodorgan/?hl=en> YouTube <https://www.youtube.com/c/annalapwoodorgan> Webpage <https://annalapwood.co.uk>

<sup>120</sup> Joey Brink YouTube <https://www.youtube.com/@joeybrinkbells>

<sup>121</sup> It is from these digital realms that artificial intelligence modules will draw content. The implications of this is an interesting area of future research.

organ and carillon culture. However, digital organ and carillon content that is created in Australia and created to be online is untethered when it enters cyberspace and is no longer restricted to a southern hemisphere island. This obliterates the idea of an “antipodes.”<sup>122</sup>

Australia’s largest YouTube organ and carillon channel is called “Pep Organ”. It was started by Titus and Kim Grenyer in 2020.<sup>123</sup> Mr Titus Grenyer is the current City of Sydney Organist at the iconic Hill & Son Grand pipe organ (1890) in Sydney Town Hall.<sup>124</sup> He often features edited videos of his full house performances at Sydney Town Hall on the Pep Organ YouTube channel.<sup>125</sup> These serve as a digital archive of his creative outputs at the Sydney Town Hall organ and a way of connecting with his online community in Australia and around the world. Grenyer is also the current University of Sydney Organist and Carillonist. He is the custodian and manager of the Rudolf von Beckerath (1972) pipe organ in the University of Sydney Great Hall and the John Taylor and Company (1928) University of Sydney War Memorial Carillon.<sup>126</sup> Grenyer posts regular livestreams of his carillon recitals from the War Memorial Carillon onto his YouTube Channel with University encouragement, in keeping with institution’s strategy of trying to extend into the [social media space](#)<sup>127</sup> of their target student demographic. Grenyer’s livestreams often feature his own carillon compositions<sup>128</sup>

---

<sup>122</sup> See pp 40-41 of this thesis.

<sup>123</sup> PepOrgan, YouTube, 2020, [https://www.youtube.com/channel/UC5QU4J8-8a\\_UN4mKDyg\\_LNQ](https://www.youtube.com/channel/UC5QU4J8-8a_UN4mKDyg_LNQ).

<sup>124</sup> "CULTURAL AND CREATIVE LIFE\_Titus Grenyer ignites the future of the Sydney Town Hall organ\_Meet the 25-year-old organist keeping historic traditions alive with a modern outlook," 2023, <https://news.cityofsydney.nsw.gov.au/articles/titus-grenyer-ignites-the-future-of-the-Sydney-Town-Hall-organ>.

<sup>125</sup> Production of the Sydney Town Hall raw content is supported by the City of Sydney in house audiovisual team. Editing of the audio and vision at Sydney Town Hall on the Pep Organ YouTube channel is by Grenyer.

<sup>126</sup> "News\_Meet the new University Organist and Carillonist\_3 July 2024," 2024, <https://www.sydney.edu.au/news-opinion/news/2024/07/03/meet-the-new-university-organist-and-carillonist.html>.

<sup>127</sup> Titus Grenyer University Carillonist Sydney University Instagram account reel <https://www.instagram.com/reel/DIvAoUdhC5J/>

<sup>128</sup> e.g. the Grenyer compositions White Cross (for Anzac Day 2025), The Jacaranda (for the 175th Anniversary of the University of Sydney, 2025), The Flame Tree (for the 175th Anniversary of the University of Sydney, 2025). White Crosses (Grenyer, 2025) <https://www.youtube.com/watch?v=a7WS7wy1pm8> The Jacaranda Grenyer, 2025) [https://www.youtube.com/watch?v=q\\_kuPYV5uC8](https://www.youtube.com/watch?v=q_kuPYV5uC8) The Jacaranda (GCNA Google drive)

this is encouraged by the University of Sydney to support the creation of a carillon musical culture that meaningful to the University of Sydney community and specific to Australia. Popular student study vacation (“Stuvac”) wellbeing events at the Sydney University Great Hall, such as the two-hour, 4 June 2025, “#studywithme” improvised soft organ music sessions, are also documented on the channel. Grenyer collaborated with yoga teacher and Sydney Dance Company instructor Paul Cordeiro in a June Wellness Session (5 June 2025) at the Great Hall. Live organ music supported mindful breathing between asanas.<sup>129</sup> These two events resulted in a widely announced “Employee of the Fortnight” award for the University Organist and Carillonist—the social impact of musicianship explicitly being recognised by a workplace. This is reflecting the importance that workplaces (and society in general) are giving to wellbeing and the creation of human connection to a community. The style of music and presentation in these two examples reveals the primacy, flexibility and popularity of organ music as an ambient soundscape for contemporary listeners (as opposed to formal recital scenarios which currently attract far fewer numbers at our University).<sup>130</sup>

For the 175th Anniversary of the University of Sydney, Titus Grenyer led the carillonist team in a major musical project that covered the music of each decade from 1850 (the year the Sydney of University was founded) up to 2025.<sup>131</sup> The dual purpose of this “Decades” project

---

[https://drive.google.com/file/d/1Hhqqv5y156I\\_mBPKZrdb4mvqzXI8aSqK/view?pli=1](https://drive.google.com/file/d/1Hhqqv5y156I_mBPKZrdb4mvqzXI8aSqK/view?pli=1) The Flame Tree (GCNA Google Drive <https://drive.google.com/file/d/1GNIYtSujCC71QjxPpaWlzVV-eYqwdCvT/view>

<sup>129</sup> "June Wellness Session: Yoga with live organ music in the Great Hall," 2025, <https://whatson.sydney.edu.au/event/8a47b6aa-c01e-498a-8c4b-1edc620b1525/June%20Wellness%20Session:%20Yoga%20with%20live%20organ%20music%20in%20the%20Great%20Hall>.

<sup>130</sup> Another example is the durational (6 hour) Study in the Great Hall organ music event in 2025. Study in the Great Hall Titus Grenyer/ Grace Chan <https://whatson.sydney.edu.au/event/01acaf35-5b28-40c8-aa21-cea9f0371b4d/STUVAC:%20Study%20in%20the%20Great%20Hall,%20v2.0>

<sup>131</sup> The researcher Dr Grace Chan is a professional staff member in University of Sydney carillonist and organist team that is supervised by University Organist and Carillonist Mr Titus Grenyer within the Organ & Carillon Unit (Events and Marketing, External Engagement Portfolio, The University of Sydney); Final recital 175th Anniversary Carillon Recital by University Organist and Carillonist Titus Grenyer [https://www.youtube.com/watch?v=q\\_kuPYV5uC8](https://www.youtube.com/watch?v=q_kuPYV5uC8)

was to (1) re-create the historical-popular sound world of each decade for the University staff and students with music from each ten-year period and (2) provide a framework for the Sydney University carillonist team to learn new music and engage with their instrument in a communal musical endeavour. The project therefore attempted to support the wellbeing of students, staff and carillonists during the 175th anniversary year, through building a sense of connection to place within the University precinct. This example of “campus culture” and “wellness culture” shows that impact can be amplified by digital transformation through social media outreach, livestreaming and an open access digital archive.

Regarding #studywithme, Grenyer writes:

#organist #organmusic #studywithme

On 3 June 2025, I presented an experimental new form of organ performance at the University of Sydney Great Hall. For 2 hours straight, I improvised softly on the Beckerath organ, as students came in and out of the space to study and enjoy the music. We hired bean bags for comfort and set chairs around the sides of the hall. The feedback from students was overwhelmingly positive. Organ recitals don't need to be conventional—I truly believe this is the future of performance. I hope to do this again some time, as I really enjoy it.<sup>132</sup>

The previous examples have shown that digital organ and carillon culture is amplified by digital broadcast media, digital news media and other social media channels with content created by the audience and event organisers.<sup>133</sup> In “Pep Organ,” Grenyer uses YouTube as a

---

<sup>132</sup> "#studywithme," YouTube, 2025, <https://www.youtube.com/watch?v=0EN8uAUwYbA>.

<sup>133</sup> USU, "when your uni opens the Great Hall for study (University of Sydney Union)," Instagram, 2025; sydney\_uni (#USYD #Carillon #USYD175years), "You might've heard the carillon playing in the Clocktower at the Quad ? Hear from Titus, our talented Carillonist who has been playing for our many graduation ceremonies and special events. This week, we celebrate the carillon's 97th birthday on 25 April.," Instagram, 2025.; "The University of Sydney Carillon - Channel 9 News Story," Channel 9 News, 2025, <https://www.youtube.com/watch?app=desktop&v=rKtnxuPAYP4>; Mike Dalton, "The unusual Anzac Day tribute ringing out from an Australian university," (9 News website) 2025, <https://www.9news.com.au/national/anzac-day-the-unusual-anzac-day-tribute-ringing-out-from-an-australian-university/326b9d1d-b805-4a62-8c46-b6737c329d33>.

platform for his artistic organ and carillon outputs. It is a living archive, social media platform, performance space, research platform, a news channel and a place for conversations—often in real time or at most contemporaneous within twenty-four hours to audience comment posting.

Digital carillon culture though less prevalent (due to the rarity of carillons compared to organs) is as vibrant as online organ culture and not limited to social/digital news media or useful digitised information pages about carillon towers.

The following Australian example follows participation in an important northern hemisphere carillon composition competition. Digital networking and deliberate digital infrastructure built by a guild (here the GCNA, USA) are seen to foster the relationships that prior to digital transformation, were geographically very localised. Music competitions and examination processes flourish in the digital realm for all instruments and are also important components of the intangible heritage of carillon culture.<sup>134</sup> In this example, a contest entry that was inspired by travel from Australia to Portugal, composed in Australia and disseminated via digital online modes of engagement, becomes untethered from temporal and geographical restrictions in the digital space. The outcome was an international accolade by peers, culminating in a “first prize” world premiere and other awards. The hybridity and adaptability of human creativity traversing real and digital worlds is observed. The rapid transfer of information and communication is also notable. Future research work examining the positive and negative impacts of this aspect of digital transformation (rapid information transfer and the collapse of time in the artistic process) would be useful.

---

<sup>134</sup> An example of examinations is the Guild of Carillonneurs in North America (GCNA) Associate Carillonneur Exam (ACE) which involves digital submission of scores and recordings for remote assessment. <https://www.gcna.org/exam-associate>

Australian carillon composer Daniel Guo (b. 1996) won the First Prize in the 2025 Guild of Carillonneurs in North America (GCNA) “Franco Composition Contest” with a substantial tripartite work titled “Three scenes from Alentejo” (2025). This composition was based on a trip to Portugal (from Australia) in 2020.<sup>135</sup> Guo composes regularly for the carillon, is a [virtuoso carillonist and pianist](#) (with an affinity for contemporary piano works) and a professional collaborative pianist.<sup>136</sup> Guo started learning carillon in Berkeley, CA, USA while on exchange and is a long standing carillonist at the University of Sydney War Memorial carillon playing for graduations and other events. He also teaches mathematics for university prerequisites. The Franco Composition Contest was announced online via the GCNA website and emailed subscription newsletter. Submission to the contest was digital as was the announcement of the winners.<sup>137</sup> The world premiere was livestreamed on the 12th of June 2025 at the 82nd Annual GCNA Congress at the University of Kansas. This major work (just under 20 minutes) was premiered by Dr Jeremy Chesman who is University Carillonneur and Professor of Music at Missouri State University, USA.<sup>138</sup> The work is available for purchase in a digital PDF format from the GCNA online sheet music store.<sup>139</sup>

Lest this seems like an advertisement for the (excellent) GCNA sheet music store, there is purpose in the retelling of this anecdote. I was able to view the Kansas livestream recording

---

<sup>135</sup> Personal communication: Daniel Guo (June 2025).

<sup>136</sup> "Daniel Guo," 2025, <http://accompanistsguildofnsw.org.au/product/daniel-guo/>; "Music and science hit the right note. Piano virtuoso Daniel Guo is one of an elite group of students merging their science and musical talents in a unique dual degree.," 2013, <https://www.unsw.edu.au/newsroom/news/2013/01/music-and-science-hit-the-right-note>.

<sup>137</sup> "Franco Composition Contest," 2025, <https://www.gcna.org/music/contests/composition>.

<sup>138</sup> "82nd Annual GCNA Congress — 12 June 2025 A.M.Livestream of 2025 GCNA Franco Competition Winners: Three scenes from Alentejo by Daniel Guo (AUS); Performed by Jeremy Chesman (USA)," 2025, <https://www.youtube.com/watch?app=desktop&v=IsvHSJuGgCQ>.

<sup>139</sup> "PDF Three scenes from Alentejo; First Prize, 2025 GCNA Franco Composition Contest," Guild of Carillonneurs in North America, 2025, <https://www.gcna.org/music-store#!/PDF-Three-Scenes-from-Alentejo/p/756044815>.

in Sydney, Australia on the day after the world premiere and also able to congratulate the composer by text, purchase the PDF and read through the score within the space of an hour. Here, the creative output resulted from the composer travelling in-person to Alentejo, however the business surrounding the competition, world premiere and the world-wide distribution of the notated output was entirely in the digital space. This anecdote is a powerful example of digital transformation impacting on the invigoration of local and global carillon culture—one where artistic integrity is not compromised and human connection to colleagues is enhanced through rapid digital communication. Of note is the in-person journey to Alentejo as the imaginative nidus for the composition of music amidst the digital transformations which amplified that experience to an artistic output. This was a hybrid experience.

### **The evolution of practice instruments for organists and carillonists**

As musical instruments, organs and carillons require their musicians to use a practice instrument for teaching, learning and rehearsal—it is a core feature of organ and carillon culture.<sup>140</sup> This is due to organs and carillons often being inaccessible to students, teachers and performers due to their location in busy public places. There is often not enough time available on the actual (or “real”) instrument to learn the volume of repertoire to the performance level required for a professional public performance. Organs that are located in churches and town halls must share the space with a multitude of community users. The limitation is not only that the musician is unable to access the organ console or the carillon clavier, but that the sounds made through practicing on these large instruments are intrusive to other stakeholders if the space/acoustic is shared. For obvious reasons, students must prepare on a practice instrument as practice is in many ways performance on the organ and

---

<sup>140</sup> Other loud instruments also have a practice instrument culture e.g. bagpipe practice chanters and drumming pads.

carillon. The intention of an organist or carillonist may be to “practice”, however to listeners within the acoustic reach of the instruments, practice equates to a “performance” and they perceive a created soundscape. It is therefore relevant to discuss the evolution of practice instruments for organists and carillonists (up to and including the digital era) as a crucial aspect of organ and carillon culture.

Organists and carillonists face many obstacles when it comes to practicing their instruments. It has been a challenge throughout the history of the instruments and remains so in the current digital age. Depending on the technology of the era, organists practiced on clavichords, pedal clavichords, pedal harpsichords, pedal pianos, pedal reed organs, small pipe organs, electronic organs or digital organs. Currently, digital electronic organs and VPOs are common practice instruments for amateur and professional organists. VCCs are a popular option for carillonists/ carillonneurs at formal carillon schools and at home.<sup>141</sup>

Organist Susi Jeans presented a paper on November 9, 1950, at a Royal Academy of Music conference which was titled “Pedal Clavichord & other Practice Instruments of Organists.”<sup>142</sup> The “other instruments” included pedal clavictheriums, pedal harpsichords and claviorganums with pull down pedals. At the end of the lecture, she played the first movement from Johann Sebastian Bach’s (1685–1750) Trio Sonata in E flat major, BWV 525 on a pedal harpsichord as a demonstration.

---

<sup>141</sup> VPO: virtual pipe organ, VCC: virtual carillon clavier

<sup>142</sup> Lady Susi Jeans, Austrian born organist and musicologist; student of Franz Schmidt, Charles-Marie Widor, Karl Straube; wife of physicist Sir James Jeans Gary Oldham, "Obituary: Susi Jeans," *Independent* (UK) 1993, <https://www.independent.co.uk/news/people/obituary-susi-jeans-1478498.html>.

In this 1950 paper, Jeans speculates:

Of all musicians, organists have always had the greatest difficulty in getting regular practice on their instruments. Electric organ blowers were first used by about 1900 and up to this time big church organs were usually blown by human power.<sup>143</sup>

She also suggests that historically:

Organists had not much opportunity to play the organ except during services; they were always badly paid, could not afford to hire calcants [men who powered the organ bellows], and, moreover, the Church did not encourage practice on what was probably a costly instrument intended only for use in the worship of God.<sup>144</sup>

Doctoral researcher Joel Speerstra in his book “Bach and the pedal clavichord” investigates the pedal clavichord to illuminate the organ culture of Johann Sebastian Bach’s time.

Speerstra writes:

The practical nature of the pedal clavichord is obvious: the convenience of having a practice instrument at home at a time when churches were colder and darker than they are today and where the organist needed a trained (and normally paid) bellows pumper in order to practice.<sup>145</sup>

---

<sup>143</sup> Susi Jeans, "The Pedal Clavichord and Other Practice Instruments of Organists," *Proceedings of the Royal Musical Association* 77, no. 1 (1950), <https://doi.org/10.1093/jrma/77.1.1>.

<sup>144</sup> Jeans, "The Pedal Clavichord and Other Practice Instruments of Organists."

<sup>145</sup> Joel Speerstra, *Bach and the Pedal Clavichord: An Organist's Guide*, vol. 26, Eastman studies in music, (Rochester, NY: University of Rochester Press, 2004).

Figure 2.2 Pedal clavichord, Gothenberg. Photo: Esther YJ Kim



He proceeds to make a very perceptive comment that relates to modern carillon practice claviers and that is also relevant to the modern VPO when used for practice. He firstly describes how an organist at a north-German-style pipe organ hears the music they play:

The North European organist often has the worst seat in the church to properly hear the organ. The soundscapes of the North European organ are often designed to be heard best well away from the keyboard, and so the divisions of the organ—the *Hauptwerk*, the *Brustwerk*, the *Oberwerk*, the pedal towers, the *Rückpositiv*—are placed above and behind and on top of the player, creating illusions of their relative strength and balance that are very different from those perceived by the listener in the church.<sup>146</sup>

Speerstra then discusses the situation at the pedal clavichord:

The pedal clavichord creates exactly the opposite performance situation. The best seat from which to hear the clavichord is the player's [seat]. This must have afforded the player a clear and intimate perspective of the music while preparing for the performance at the organ, not unlike the modern practice

---

<sup>146</sup>Speerstra, *Bach and the Pedal Clavichord: An Organist's Guide*, 26.

keyboards that are made for the convenience and education of carillonneurs.<sup>147</sup>

In terms of teaching, learning and practice, the clarity and intimacy of a practice keyboard may be an asset for a musician. Currently, the most common form of practice organ is powered by electricity and harnesses digital technology. These digital instruments can have proprietary generated digital sounds, sampled sound played from MIDI interface (as in a VPO) or a combination of both. They can have additional effects and customisation which emulate the original historical instrument or go beyond simulation to bespoke modification of the sound-world. The virtual carillon clavier (VCC) is the carillon equivalent.

To briefly reiterate, these organs with sampled sounds are referred to as “virtual pipe organs” (VPOs)<sup>148</sup> as they derive their sound world from detailed recordings of significant historical organs. They offer a simulation or virtual representation of a historical organ’s specific sound world through the high-fidelity documenting (digital sampling) of individual pipe sounds and the native acoustic. This type of instrument creates the sensation for the organist of hearing themselves as they would sound on a recording, thereby affording the player “a clear...perspective of the music” to recall Speerstra’s quote. This is because the sound samples of each note are usually recorded where the congregation or audience may sit and can include the acoustic of the space. When commercially purchased, the sample sets are often accompanied by a visual suggestion of the console layout via touch screen graphics or a physical console reconstruction at owner’s discretion and need. This all demonstrates that the special requirement of organists and carillonists needing a practice instrument is not

---

<sup>147</sup>Speerstra, *Bach and the Pedal Clavichord: An Organist's Guide*, 26.

<sup>148</sup> They are also commonly known as “Hauptwerk organs” referencing Martin Dyde’s groundbreaking software (launched 2002) which is now distributed and developed by Brett Milan at Milan Digital Audio. Dyde still has input on technical matters as required (personal communication).

necessarily a disadvantage. Digital VPOs will be discussed further at the end of section 2.3 in the context of being an important intersection of digital transformation and cultural sustainability.

Carillonists can practice on mechanical claviers in which the batons activate hammers that strike tone bars—these sound like a vibraphone and so, sound very different to a carillon’s bronze bells. This type of practice instrument is a physical replica of the main bell clavier and usually located in or near the tower. This style of instrument was often made at the same time as the main bell clavier and maintained or upgraded as needed. The mechanical, acoustic style of practice clavier for carillonists remained the status quo until quite recently. The University of Sydney War Memorial Carillon had a mechanical practice clavier in the same room as the main bell clavier (Figure 2.3). In 2025, the mechanical practice instrument was shipped to Mr Reinold Van Zijl in the Netherlands for upcycling. Using as much of the original materials as possible, it was upgraded to a digital MIDI practice clavier using digital sampled bell sounds. These sounds are a generic bell sample set the workshop uses for all their practice claviers and not a specific sample set recorded from the University of Sydney War Memorial carillons bells.<sup>149</sup> These videos supplied by Mr Reinold Van Zijl to University of Sydney War Memorial Carillonist Mr Titus Grenyer, show (1) [the instrument modifications](#)<sup>150</sup> and (2) an [improvised demonstration](#)<sup>151</sup> (on the tune “Waltzing Matilda” by virtuoso carillonist Mr Boudewijn Zwart (Amsterdam)).

---

<sup>149</sup> Reinold van Zijl Dorpsstraat 267 34 81 EJ Harmelen. The Netherlands. Reinold Van Zijl has supplied carillon practice claviers to all the major carillon schools e.g. Mechelen, Belgium and Amersfoort, The Netherlands (personal communication).

<sup>150</sup> MIDI modifications to the Sydney University War Memorial Carillon practice clavier <https://youtube.com/shorts/gQeXKTA0mZU?feature=share>

<sup>151</sup> Improvised demonstration by Boudewijn Zwart, NL on newly upgraded carillon practice clavier from Sydney University by Reinold van Zijl, NL <https://youtube.com/shorts/vjBqDIUGSFI?feature=share>

**Figure 2.3 Clocktower stairs leading up to the University of Sydney War Memorial carillon clavier room.**



**(Left) Stair leading up to the Clavier Room; (Right) Original mechanical carillon practice clavier (pre-cycle) along wall (bottom left-hand side of image in the carillon clavier room).**

**Figure 2.4 University Organist & Carillonist Titus Grenyer and Dutch carillon practice instrument maker Mr Reinold van Zijl (Clavion, Harmelen, NL) viewing the city of Sydney from the 1928 University of Sydney War Memorial Carillon. Photo: Grace Chan (2025)**



**Figure 2.5 Digital virtual carillon practice clavier in the University of Sydney War Memorial Carillon clavier room and closeup of details (1928 Taylor's mechanical practice clavier upgraded by Mr Reinold van Zijl of instrument company Clavion in Harmelen, The Netherlands). Photos: Grace Chan (2026)**



The following images show further examples of a mechanical and digital virtual carillon practice claviers. Figure 2.6 is an example of a 1923 mechanical carillon practice clavier which originated from Phillips Academy, Andover, MA in the United States of America. The tower at Philips Academy, Andover is now automated with MIDI keyboard capability.<sup>152</sup>

**Figure 2.6 Mechanical practice clavier, John Taylor & Co, Bell founders, Loughborough (1923) Photos: Grace Chan (2025)**



**This mechanical instrument is located in the researcher's music studio alongside a mix of real and virtual instruments: two Noorlander 3 manual VPO's for 1 or organ repertoire, a double-manual French harpsichord after Jean-Claude Goujon and a 1897 Estey harmonium.**

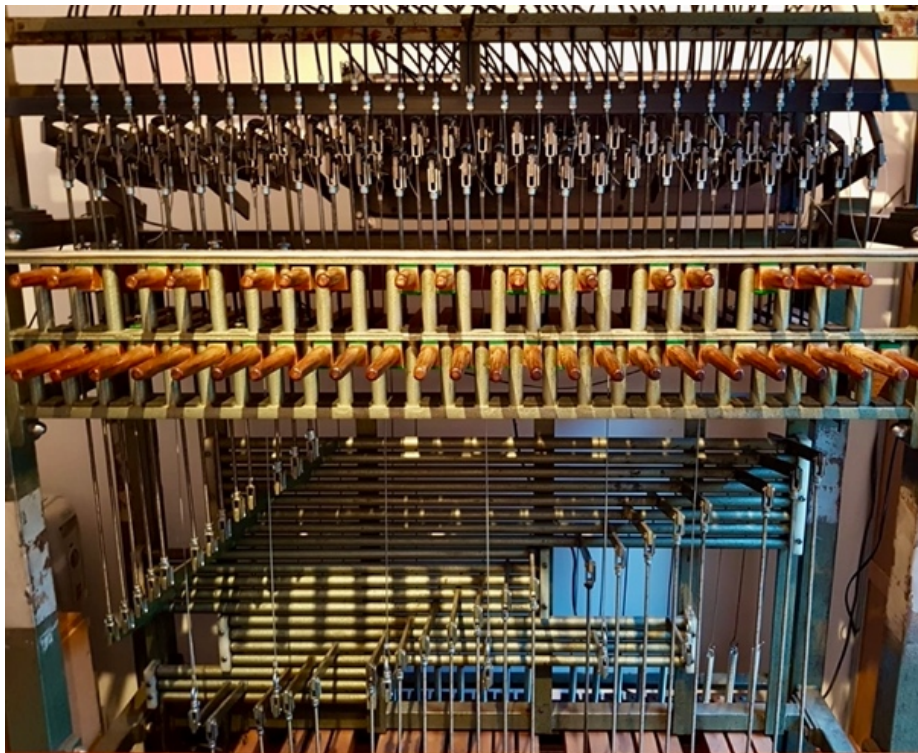
---

<sup>152</sup>"Chiming Away: Discovering The History of The Memorial Bell Tower," The Phillipian, Phillips Academy, 2016, 2025, <https://phillipian.net/2016/09/30/chiming-away-discovering-history-memorial-bell-tower/>.

Figures 2.7 Digitised carillon practice clavier. Photos: Christiaan Winter (2019)



Figure 2.8 Digitised carillon practice clavier. Photo: Christiaan Winter (2019)<sup>153</sup>



---

<sup>153</sup> Images are supplied by Dr Christiaan Winter who is the city carillonneur of Alkmaar (2009-present), a multifaceted virtuoso musician, he is village carillonneur of De Rijp, lecturer at the HKU/ Netherlands Carillon School, president of the Carillon Centre of the Netherlands and the Royal Dutch Carillon Society, editor of the Yearbook of Carillon and Bell Culture of the Low Countries (Amsterdam University Press) and Director of Music at the Nicolaas Kerk, Amsterdam. He was a programmer for NCRV radio and church musician of Oude Kerk, Amsterdam. <https://www.hku.nl/en/study-at-hku/utrechts-conservatorium/the-netherlands-carillon-school>; <https://notenmaker.nl>

Carillonists have taken old mechanical tower claviers and converted them into digital virtual instruments. The images in figures 2.7 and 2.8 are an example of this and shows a redundant Dutch tower clavier which ingeniously repurposes and upcycles an inverted MIDI keyboard as an interface between the mechanical action and a computer with a bell sound sample set.<sup>154</sup> This style of practice instrument is considered a “digital virtual” simulation of the main bells in a carillon tower.

The following [video](#)<sup>155</sup> opens with North American carillonist Annie Gao performing the Sinfonia from *Wir danken dir, Gott* BWV 29 by Johann Sebastian Bach on an acoustic practice instrument for carillonists which uses tone bars. It is made in the same atelier that upgraded the University of Sydney mechanical practice clavier. Master Dutch instrument maker Reinold van Zijl<sup>156</sup> describes his client’s requirements:

In May 2024, Annie [Gao], accompanied by Boudewijn [Zwart],<sup>157</sup> visited my workshop with the question about the possibilities of building a [practice clavier] for her with the following requirements: a stick keyboard with acoustic sound for study and concerts; divisible body and suitable for a passenger car; mechanically quiet and clear sound; limited financial budget.<sup>158</sup>

---

<sup>154</sup> Images show the home carillon practice clavier of Dr Christiaan Winter (C.W.). Modifications to the mechanical instrument to render it a digital practice clavier were made by C.W.

<sup>155</sup> Video of Annie Gao performing on an acoustic carillon practice clavier by Reinold van Zijl, NL <https://www.youtube.com/live/u7YeCCczJ9g?t=7357s>

<sup>156</sup> Reinold van Zijl Dorpsstraat 267 34 81 EJ Harmelen. The Netherlands.

<sup>157</sup> Boudewijn Zwart is a Dutch carillonneur who plays at 3 towers in Amsterdam, Gouda, Dordrecht, Schoonhoven, Bergambacht, IJsselstein, Ede, Wageningen, Apeldoorn, 2 towers in Barnveld, Nijkerk, Zeewolde and Den Helder. Personal communication (June 2025) Bart Vervaat, stadsbeiaardier Heerhugowaard.

<sup>158</sup> "Facebook post to carillonneur group re: new chamber practice clavier," Facebook, 2025, <https://www.facebook.com/groups/110196189127982>.

The following [video](#)<sup>159</sup> shows North American carillonneur Ms Frances Newell's digital virtual practice clavier which was also made by Reinold van Zijl and again demonstrated by Boudewijn Zwart.<sup>160</sup> Newell writes:

It is European standard, pedals C to G1, no low C-sharp. I bought a [digital] bell sampler with it, which makes it sound like a carillon.<sup>161</sup>

This digital virtual style of instrument (baton keyboard and pedal board with MIDI interface and sampled bells) also comes in kits. The current University of Chicago carillonneur and 2019 Mechelen 8th International Queen Fabiola carillon competition laureate, Mr Alex Johnson, built such an instrument as a physics and math major at the University of Rochester in the United States of America. This is detailed in an article titled "If you build it, they will learn":

The new practice carillon has a standard MIDI output and can connect to any MIDI keyboard to produce any prerecorded sounds. An added benefit of the technology is that players can now hear actual pre-recorded audio samples of the University's own carillon while practicing on the keyboard.<sup>162</sup>

There is a [video](#)<sup>163</sup> produced by the University of Rochester which shows the construction process undertaken by Johnson and his fellow students in 2017.

The Bathurst War Memorial Carillon has a Clock-O-Matic "Studium" III practice clavier which arrived with the recent tower upgrade (2021). Clock-O-Matic is a Belgian company

---

<sup>159</sup> Video of Dutch carillonneur Boudewijn Zwart demonstrating a Reinold van Zijl digital virtual carillon practice instrument for USA carillonneur France Newell <https://www.youtube.com/watch?v=eCezGq8fleg>

<sup>160</sup> Reinold van Zijl and Boudewijn Zwart were in the same student cohort at the Dutch Carillon School (teacher: Bernard Winsemius) (personal communication).

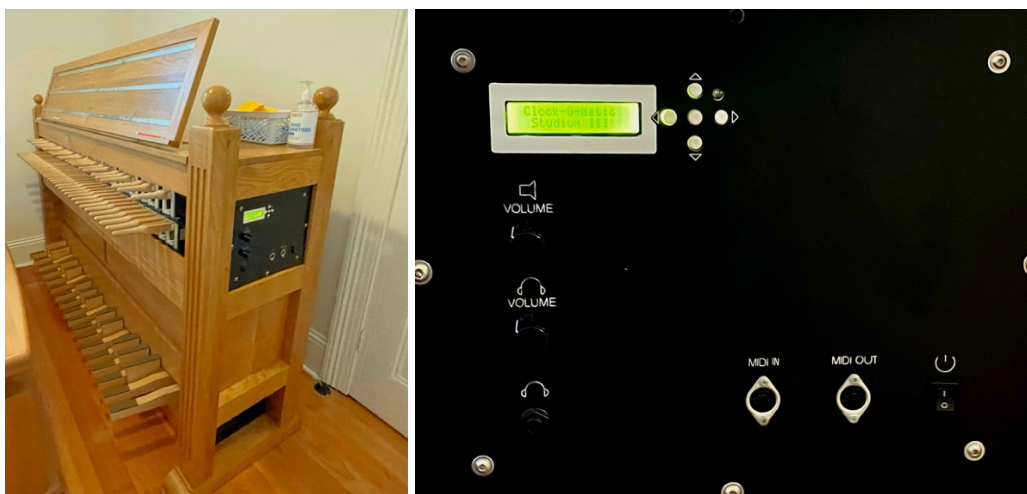
<sup>161</sup> Personal communication: Frances Newell, 2018.; video demo: <https://www.youtube.com/watch?v=eCezGq8fleg>

<sup>162</sup> "If you build it, they will learn," 2017, 2025, <https://www.rochester.edu/newscenter/build-it-and-they-will-learn-carillon-242652/>.

<sup>163</sup> "A Crash Course in Carillon Construction," Youtube, 2017, accessed January, 2025, <https://www.youtube.com/watch?v=6YmQFm6fQE4>.

that has global expertise in bell installations, clockwork systems, carillons and monumental clocks. This instrument is a third-generation version of their study keyboard offering.<sup>164</sup> The practice clavier is located a short walk from the carillon tower in a cottage administered by the regional Mitchell Conservatorium, Bathurst. Carillon tower access for practice and performance is under Bathurst Regional Council guidelines (the Bathurst Regional Council is responsible for the Bathurst War Memorial Carillon and its precinct).

**Figure 2.9 Bathurst Clock-O-Matic Studium III. Photos: Grace Chan (2025)**



### **Performing on “practice instruments”**

Returning to the video of carillonneur Annie Gao performing on her acoustic carillon practice clavier in a church service, it is interesting to consider the conceptual interplay between the ideas of “practice” and “performance” touched on earlier in section 2.1. It shows an instrument commissioned for the dual purpose of practice and performance being used (with admirable virtuosity) as a collaborative acoustic “chamber instrument”. A Facebook post accompanying the video is titled “Carillon+ in North America”.<sup>165</sup> “Carillon Plus” refers to

---

<sup>164</sup> "Clock-O-Matic company webpage," 2026, <https://www.clock-o-matic.com/en/>.

<sup>165</sup> Annie Gao, "Carillon+ in North America," Facebook, 2025, <https://www.facebook.com/groups/110196189127982>.

performances where carillons are combined with other performances or activities to draw attention to the carillon and its cultural significance.<sup>166</sup>

The instrument maker's reply to the social media post exhorts the commissioning carilloneer to continue to use the clavier as a chamber instrument in lieu of a celeste in orchestral performances, so encouraging the dismantling of boundaries between practice and performance.<sup>167</sup> It is also encouraging the usually solo tower carilloneer to engage with other artists in a culture of collaboration. It is interesting to ponder if there is stigma attached to performing on a digital virtual instrument with an orchestra. Practicality has often outweighed stigma in the use of digital or digital virtual organs in churches and concert halls, for example after fires at St John Divine, New York (2001 and 2019);<sup>168</sup> after water damage at the Sydney Opera House,<sup>169</sup> during a restoration at Utrecht Dom,<sup>170</sup> NL; during a restoration at Westerkerk, NL<sup>171</sup> and for convenience in the pit of the Australian Opera Orchestra.<sup>172</sup> Cost can also be a factor in the pragmatic use of a digital virtual instrument in lieu of tuning (or restoring) a large in situ pipe organ.

---

<sup>166</sup> "The Carillon: Living Heritage is Music to Everyone's Ears," The Low Countries, Flanders Investment and Trade, 2019, <https://www.the-low-countries.com/article/the-carillon-living-heritage-is-music-to-everyones-ears/#:~:text=Carillon%20Plus&text=In%202000%2C%20this%20culminated%20in,the%20general%20Low%20Countries'%20mood.>

<sup>167</sup> Van Zijl, "Facebook post to carillonneur group re: new chamber practice clavier." <https://www.facebook.com/share/p/1K9xPNirZ4/>

<sup>168</sup> <https://www.youtube.com/watch?v=FQ-I7eWxaps>; <https://www.youtube.com/watch?v=AgOyLYfMaxo>

<sup>169</sup> "In the final minutes of the Mahler, Young led the orchestra, soloists, choir and organ to a glorious, life-affirming conclusion. But people in the audience and watching the TV simulcast may have noticed that the organist, David Drury, was not sitting high up in the organ loft, but was at a digital organ with the rest of the orchestra on the stage. The electronic sound – while not lacking in grandeur – was piped through a bank of speakers." <https://www.theaustralian.com.au/arts/sydney-opera-house-organ-damaged-by-rain-event/news-story/19f2ede9a6172f9f4087ecd9bcf35b84#:~:text=An%20accident%20above%20the%20stage,lot%20of%20water%20coming%20down.>

<sup>170</sup> Personal communication Jan Hage, Utrecht Dom Organist at *Fountains* St Bavo recital, Haarlem (July, 2018)

<sup>171</sup> Email Kees Noorlander (2018)

<sup>172</sup> Personal communication Mr Anthony Hunt, Australian Opera (2015)

“Carillon plus” on a mobile chamber carillon (an instrument with bronze bells, not an instrument with tone bars or a digital virtual instrument) is a feature of the Queen Fabiola Competition in Mechelen, Belgium. One such mobile carillon is the Bronzen Piano, co-created by respected virtuoso carillonneurs Anna Maria Reverté (Barcelona) and Koen Van Assche (Belgium).<sup>173</sup>

**Figure 2.10 Bronzen piano. Photos: Facebook<sup>174</sup>**



The specifications of the instrument (from the Bronzen piano website):

The Bronzen Piano is a mobile carillon...[with] the shape of a grand piano and can be easily transported and set up indoors. Features of the Bronze Piano: 50 bells, cast by bell foundry Royal Eijsbouts (Asten, NL), 2013; bass bell C2; C2– D2– chromatic to D6; European keyboard standard; modular set-up in 6 parts...the bells contain 3% lead in the bronze so that they do not ring out as long as regular bells, and are therefore extremely suitable for playing together with other instruments.<sup>175</sup>

---

<sup>173</sup> "Bronzen Piano," 2013, 2025,

[https://www.bronzenpiano.com/?fbclid=IwY2xjawKpYdxleHRuA2FlbQIxmABicmlkETE5NHRDWF15dlFkV TkzV25yAR7c4uqjMoPFGjW1pwCKyeGmW0TykqWyOJd\\_UMYlbI5\\_YO-QBuYx4DnwcayI3g\\_aem\\_0Sq63BasZMMb-vcSfJiuVg](https://www.bronzenpiano.com/?fbclid=IwY2xjawKpYdxleHRuA2FlbQIxmABicmlkETE5NHRDWF15dlFkV TkzV25yAR7c4uqjMoPFGjW1pwCKyeGmW0TykqWyOJd_UMYlbI5_YO-QBuYx4DnwcayI3g_aem_0Sq63BasZMMb-vcSfJiuVg).

<sup>174</sup> Koen Van Assche and Anna-Maria Reverte, Facebook,

<https://www.facebook.com/photo.php?fbid=411115931085261&id=100065605714730&set=a.387529393443915>.

<sup>175</sup> "Bronzen Piano Webpage," 2025, <https://bronzenpiano.com>.

Koen Van Assche, Bronzen piano co-creator, carillonneur and carillon teacher at the Royal Carillon School “Jef Denyn” Mechelen writes on social media (2025):

...the reason in 2013 to have the Bronzen Piano built, [is] to let the public know all the possibilities of a carillon in combination with other instruments and with different music styles. The intention is always to bring the instrument to the public in original settings so that they hopefully may also want to discover the tower carillon afterwards. In this example it concerns contemporary music, perfectly performed by this trio with carillon... bass clarinet...and percussion...as a chamber music exam for Master in Music students.<sup>176</sup>

There is a modern day, analogous impetus to use the clavichord (a practice instrument for organists) as a performance instrument, pedagogical aid and in competitions. Dr Esther Yae Ji Kim is a professional clavichordist who performs in Sydney Conservatorium of Music public recitals and in Europe. Kim is also a clavichord instructor at the Sydney Conservatorium of Music where many organ students take her one semester course to gain insight into organ technique and performance practice.<sup>177</sup> The following is a [video](#)<sup>178</sup> of Dr Esther Yae Ji Kim (Sydney/ Germany) and Professor Menno van Delft (Amsterdam) performing the Johann Wilhelm Hässler (1747–1822) Sonata C major on clavichord. The duet is being performed at the 5th Nordic Historical Keyboard Festival in Kuopio, Finland 10 June 2016. In this [video](#),<sup>179</sup> Kim performs Timur Ismagilov's Fantasia for Clavichord in the final recital of the International Clavichord Composition Competition 2018 at the VII Nordic Historical Keyboard Festival in Kuopio, Finland. The performance is on an unfretted five-octave Specken-Svensson clavichord by Hans Erik Svensson. As further support for this

---

<sup>176</sup> Koen Van Assche, Facebook, 2025, <https://www.facebook.com/search/top/?q=bronzepiano%20>.

<sup>177</sup> Yae Ji Kim, "The clavichord during the classical era: a gentle voice but a giant among keyboards" (Sydney Conservatorium of Music, 2014).

<sup>178</sup> Dr Esther Yae Ji Kim and Professor Menno van Delft performing the Johann Wilhelm Hässler (1747–1822) Sonata C major on clavichord <https://www.youtube.com/watch?v=vbGD5fkf7n4>

<sup>179</sup> Dr Esther Yae Ji Kim performs Timur Ismagilov's Fantasia for Clavichord <https://www.youtube.com/watch?v=J48qRSbpFpI>

contemporary analogy of a traditional practice instrument becoming a performance instrument, Professor Menno Van Delft frequently performs well attended recitals in his Amsterdam teaching studio using his collection of clavichords and virginals.<sup>180</sup>

The prominent (but not unique)<sup>181</sup> feature of requiring practice instruments within organ and carillon culture, has therefore yielded a rich subculture of performing on practice instruments as can be demonstrated in this review of the digital literature and current musical landscape. It is a rapidly transforming arena hence many of the citations being emails, websites and social media from leaders in the organ and carillon field. In reviewing the digital literature, it is important to have an awareness that perceptions may be mediated by social media algorithms and direct interpersonal communications with musicians or guilds to ascertain current performance practices are still vital.

The evolution of practice instruments for organists and carillonists (and the rapid communication of this change) appears to be following society's technologically driven movement towards digitisation, digital transformation and virtual representations of tangible musical instruments for various purposes. The practice instruments themselves have evolved socially and culturally alongside digital, technological transformations to become performance instruments, chamber music collaborators, teaching tools and ways to promote organ and carillon culture to the public.

---

<sup>180</sup> The researcher has attended this recital series during multiple field trips to the Netherlands.

<sup>181</sup> Many musicians who perform on loud instruments also have a culture of using practice instruments e.g. drummers and drumming pads, bagpipers and chanters (the footnote examples given earlier in this chapter). The monumental nature of the organ/ carillon does make them much bigger and louder than other instruments and hard to take home – hence the prominence of practice instruments or simulations within organ and carillon culture. To use the example of drummers or pipers, these musicians could theoretically become highly skilled without a practice instrument. It is very difficult to master to a good standard, recital repertoire on the carillon and organ without some form of simulation during a learning phase due to issues of access to an instrument.

## 2.2 Digital Transformation

### Digital transformation and virtuality

Digital transformation and virtuality are interconnected concepts that permeate every aspect of society. The definition of virtuality most relevant to this thesis is one that it refers to the quality or state of being simulated or computer generated. It is creating immersive, interactive and simulated environments that can be experienced by human beings remotely. This definition emanates from the informatics literature.<sup>182</sup>

Various philosophical discussions about virtuality have their specific, systematically argued definitions of the words “virtual,” “actual” and “real” French philosopher Gilles Deleuze has had a significant influence on this discourse. Deleuze writes in *The Actual and the Virtual*:

Philosophy is the theory of multiplicities. Every multiplicity implies actual elements and virtual elements. There is no purely actual object. Every actuality surrounds itself with a fog of virtual images.<sup>183</sup>

From the Oxford University Press *A Dictionary of Critical Theory*:

For Deleuze, both the actual and the virtual are fully real—the former has concrete existence, while the latter does not, but it is no less real for that fact. The importance of this distinction can readily be seen by giving thought to the state of being of an idea: it may only exist in our heads, or on paper, but its effects are fully real and may also be fully actual too.<sup>184</sup>

---

<sup>182</sup> Mark Grimshaw, *The Oxford handbook of virtuality*, Handbook of virtuality, (New York: Oxford University Press, 2013).

<sup>183</sup> Gilles Deleuze and Charles T. Wolfe, "THE ACTUAL AND THE VIRTUAL," *Any* (New York, N.Y.), no. 19/20 (1997).

<sup>184</sup> Ian Buchanan, "A dictionary of critical theory," (Oxford: Oxford University Press, 2010). Online version.

There is a resurgence in interest in the philosophical work of Deleuze in this age of digital transformation, virtuality, the metaverse and artificial intelligence.<sup>185</sup> To quote further from *A*

*Dictionary of Critical Theory*:

Initially treated as an esoteric distinction of interest only to specialists in the field of ontology, since the advent of computer games, and more especially the Internet, this distinction has become very important because it allows that what is seen or experienced on screen is still real, even if it isn't actual.<sup>186</sup>

There are philosophers who argue that the informatics definitions of the virtual, actual and real do not completely align with the ideas of Deleuze.<sup>187</sup> In the *Logic of Experimentation* music philosopher Paulo De Assis draws on the philosophies of Deleuze (and Rheinberger) regarding experimentation. In an Orpheus Institute (Ghent, Belgium) volume titled *Virtual Works—Actual Things: Essays in Music Ontology* artistic researchers pen essays that give “specific attention...to the relationship between the virtual multiplicities that enable the construction of an image of the musical work and the actual, concrete materials that make such a construction possible.”

Further exposition of these philosophical discourses and their controversies is beyond the scope of this thesis. The researcher is aware of this rich body of literature, and it will certainly be an area of future investigation.<sup>188</sup>

---

<sup>185</sup> Deleuze and Wolfe, "THE ACTUAL AND THE VIRTUAL."; Keith Ansell Pearson, "The Reality of the Virtual: Bergson and Deleuze," *MLN* 120, no. 5 (2005), <https://doi.org/10.1353/mln.2006.0020>; Marc Rölli et al., "Virtual ontologies: Heidegger, Deleuze and the concept of the event (ereignis, événement) 1," (Routledge, 2022).

<sup>186</sup> Buchanan, "A dictionary of critical theory." Online version.

<sup>187</sup> Małgorzata Czarnocka and Mariusz Mazurek, "Deleuze's Conception of Virtuality Versus Virtual Computer Objects," *Foundations of science* 29, no. 4 (2024), <https://doi.org/10.1007/s10699-023-09921-0>.

<sup>188</sup> Deleuze and Wolfe, "THE ACTUAL AND THE VIRTUAL."; Grimshaw, *The Oxford handbook of virtuality*; Pearson, "The Reality of the Virtual: Bergson and Deleuze."; Rölli et al., "Virtual ontologies: Heidegger, Deleuze and the concept of the event (ereignis, événement) 1."; Lydia Goehr et al., *Virtual Works – Actual Things: Essays in Music Ontology*, Orpheus Institute Series, (Leuven: Leuven University Press, 2018).

## Digital transformation in music

Music 2.0 (2023) is a “conceptual manifesto” by artistic researcher, pianist and music philosopher Paulo de Assis and published by Amsterdam University Press in their open access FORUM+ series. He presents it as a position paper on various societal “transformations” (including digital technological transformation), the state of Western Art music, the need for an experimental approach that moves beyond interpretation, and the crucial role of artistic research in music pedagogy and research. Assis poses the key question “how to rethink music in the digital age?” and sounds the alert about “an epochal transformation of society”.<sup>189</sup> Assis writes:

Humanity is going through a major epochal transformation. The digitisation of knowledge, communication, and social interactions is triggering a reconfiguring in society only comparable to the transformations brought about by the invention of language...the invention of the wheel, of writing, of the steam engine or of electricity...Currently, and already for the thirty or so years we are living such a process of disruption, which has been accelerated by the emergence of artificial intelligence tools and technologies for everyday tasks and workflows.<sup>190</sup>

In a graphic titled “Music 1.0” within the position paper (created and copyrighted by Assis), he overlays technological developments with movements within Western art music. At the beginning of his timeline, sound is emphasised in the music experience and notation is underrepresented. At the end of the timeline, where our digitally transforming society currently sits, sound is often “excluded” and over notated or over coded to the point where Assis asserts that there is a “need for reintegration of sound in the whole range of sonic experiences.” This point of view is particularly relevant to organ and carillon culture in Australia where (non-notated) music improvisation is not prominent in the secular

---

<sup>189</sup>Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music." p. 56

<sup>190</sup>Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music." p. 55

performance culture or conservatorium organ teaching. Adjacent to the conservatorium organ curriculum, the Historical Performance division, Sydney Conservatorium of Music, The University of Sydney has held two international conferences (Correct, but not beautiful performance I and II) to explore these concepts of moving away from uncritical and uncreative adherence to a musical score (or Urtext).<sup>191</sup>

### **Digital transformation in society**

The Organisation for Economic Co-operation and Development (OECD) has the following view on digital transformation in society:

Digital transformation—the impact of digital technologies and data and their use on existing and new activities— is accelerating worldwide, affecting all sectors. It offers immense opportunities for our economies and societies yet poses important risks that must be addressed to reap its benefits. Countries and stakeholders must work together in an evidence-based, whole-of-governance approach to advance a trusted, sustainable and inclusive digital future for all.<sup>192</sup>

Additionally:

The OECD helps policy makers shape digital transformation for a trusted, sustainable and inclusive digital future. Through evidence-based policy analysis and as a global standard setter, the OECD supports countries in navigating the profound effects of digital transformation in areas such as connectivity, privacy, data flows, artificial intelligence and emerging technologies, safety, security, and policy design at the intersection of digital and other policy domains.<sup>193</sup>

---

<sup>191</sup> Correct, but not beautiful performance I and II <https://share.google/DCS3qsuVl619NUVpo> and <https://share.google/OcPAy5aOuZE5UVwqP>

<sup>192</sup> OEDC, "Digital Transformation."

<sup>193</sup> "Digital," Organisation for Economic Co-operation and Development, 2025, <https://www.oecd.org/en/topics/digital.html>.

Hence, the process of digital transformation is accepted as accelerating and already embedded into society at a global level. The OECD expresses the desire for this technological cataclysm to be married with sustainability and with optimism refers to an “inclusive digital future.” Digital technologies have an impact on cultural heritage. Digital transformation and music have been important in discussions within the Australian arts policy sector. The Australian Government agency Creative Australia,<sup>194</sup> uses the term “digital” as follows:

Digital includes both online and other technologies that extend or impact on creation, presentation and distribution of creative content...we think of digital as an enabler, practice, mindset, platform, industry.

Digital Culture Strategy (2021–24), Creative Australia

### **Mapping digital cultural engagement**

The Creative Australia Digital Culture Strategy was based on joint work by the then Australia Council for the Arts and the National Arts Council of Singapore. The resulting report *In Real Life: Mapping digital cultural engagement in the first decades of the 21st century* highlights important associations between the arts and its audience “in an environment increasingly influenced by digital technology.”<sup>195</sup> The document makes mention of the effect of the COVID-19 pandemic on digital transformation and aligns with observations made by the researcher during this study. These observations were presented in a paper presented at the Yong Siew Toh Conservatory of Music (YST) in Singapore titled “The Impact of Post-COVID Digital Transformation on Global Bell & Carillon Culture” (2023).<sup>196</sup>

---

<sup>195</sup> CreativeAustralia, "In Real Life: Mapping digital cultural engagement in the first decades of the 21st century."

<sup>196</sup> "The Impact of Post-COVID Digital Transformation on Global Bell & Carillon Culture," Performers() Present 2023: Flowing Resonances, 2023, <https://www.ystmusic.nus.edu.sg/research-performers-present-2023-day-1/>.

The key findings of the *In Real Life* report are applicable to both organ and carillon culture and adapted in Table 2.2.

**Table 2.2 Mapping digital cultural engagement in Australia** <sup>197</sup>

**Key findings from “In Real Life: Mapping digital cultural engagement in the first decades of the 21st century**

- We live in a hybrid world
- More people are creatively participating, and it is difficult to distinguish between “artist” and “audience”
- Audience expectations are changing...expect to be able to insert themselves into the story...
- For many people, the live experience is no longer just about “in person” attendance. It can mean experiencing art simultaneously with others and watching events unfold in real time.
- Digital is unevenly distributed and does not mean increased participation automatically for everybody.
- Audience expectations now also include significant access to arts and culture for minimal cost.
- We should be wary of merely replacing traditional gatekeepers with new, digital ones.
- Many of the digital trends highlighted by the COVID-19 adaptation were already occurring and have simply been accelerated by the pandemic.

**Source: In Real Life: Mapping digital cultural engagement in the first decades of the 21st century**

As the phenomenon of digital transformation permeates through our society, the processing, transfer and storage of information digitally, is foundational to the smooth running of our daily lives whilst also propelling social change. Paulo de Assis describes society as moving from “information scarcity to hyper-abundance of information.”<sup>198</sup> The term digital transformation describes the integration of digital technology into all facets of society—including the creative arts and industries. The Australian federal government agency,

---

<sup>197</sup> Hokyung Chung and Jongoh Lee, "Community Cultural Resources as Sustainable Development Enablers: A Case Study on Bukjeong Village in Korea compared with Naoshima Island in Japan," *Sustainability* 11, no. 5 (2019), <https://doi.org/10.3390/su11051401>.

<sup>198</sup> Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music." p. 56

Creative Australia, has been monitoring and researching these developments to understand how they will affect the arts and music in Australia. Music industry organisations such as APRA AMCOS and Creative Australia have commissioned reports into artificial intelligence (AI) and music.<sup>199</sup>

In 2022, Creative Australia (formerly known as the Australia Council for the Arts), developed a short course for creative artists in conjunction with University of Technology, Sydney (UTS). I received funding from Creative Australia to attend this online course *Digital transformation for the Creative Industries* from April 2022 to June 2022. The course included self-directed multimedia modules with lectures, video demonstrations and slideshows. It incorporated tutorial groups with live online discussions involving fellow practicing artists. University of Technology, Sydney, Australia faculty lecturers and tutors were present at these sessions to support participants and stimulate new ideas.<sup>200</sup>

This joint initiative was deliberately orientated towards giving digital literacy and skills to practicing artists with real world projects that may benefit from approaches harnessing “digital transformation”. Key learnings from the “Digital Transformation for the Creative Industries” online course were summarised at the end of the course delivery. The learning unit and these summary points from the course material informed the organ and carillon projects selected as case studies in this thesis.

---

<sup>199</sup> APRAAMCOS2024, "AI and Music."

<sup>200</sup> <https://open.uts.edu.au/insights/success-stories/how-creative-industries-can-upskill-for-digital-transformation/>

**Adapted from Digital Transformation for the Creative Industries Skillset “Passports” (UTS/ Creative Australia) Source: The University of Technology, Sydney, Australia**

**Table 2.3 Introducing digital**

<b>Introducing Digital</b>
<ul style="list-style-type: none"> <li>a. Digital is an enabler, platform, practice, industry and mindset.</li> <li>b. The digital and analogue worlds are intermeshed and inform one another.</li> <li>c. Strong digital experiences and programs consider the privacy, safety and wellbeing of audience, artists and communities.</li> <li>d. Fostering a digital mindset is about being adaptive to new possibilities.</li> </ul>

The online group introduction to the course, tried to elevate the digital to being more than the technology, whether that be hardware or software. Course lecturers and tutors reinforced the conceptual aspects of digital transformation and encouraged an open mindset. This appealed to me as a creative artist. The emphasis on hybridity also resonated—the view that the digital and analogue are on a continuum that is traversed in both directions by iterative artistic practice. Issues of safety, ethics and wellbeing were raised early to give emphasis to the importance of digital governance. Good governance was positively couched as being core to a great digital experience for artist and audience. Our facilitators asked us to internalise and transform digital tools and infrastructure with our artistic practice. Rather than feeling fearful (or luddite-like), artists were encouraged to consider digital as a gateway to new possibilities for creative practice.

**Table 2.4 Creative technologies**

<b>Creative Technologies</b>
<ul style="list-style-type: none"> <li>a. Emerging technologies offer new ways both to create and experience art.</li> <li>b. Technology needs to be a meaningful part of the creative process or experience to be most effective.</li> <li>c. Explore new technologies through small experiments where it is safe to fail.</li> <li>d. Engage technology specialists to collaborate on artistic projects.</li> </ul>

Creative technologies were described as offering value and richness in experience for both artist and audience. Many of our tutors were practicing artists. They spoke of how when digital approaches were a meaningful part of their of artistic practice, digital transformation occurred in an authentic and revelatory manner. The facilitators advocated exploring digital tools on smaller projects where failure is safe. The emphasis was on learning and gaining proficiency incrementally. There was an awareness within my own artistic mindset that my humanity as a musician and artist could provide a buffer to the sense of rapid change ushered in with digital transformation. The course provided resources and contacts that we could access to find experts to assist with any creative projects.

**Table 2.5 Audience engagement**

<b>Audience Engagement</b>
a. Digital audiences expect more direct interaction than traditional audiences, blurring the line between performer and participant.
b. Use the unique affordance of digital platforms to engage more effectively with ... [the] audience.
c. Build healthy digital communities through inclusion, safety, presence and moderation.
d. Consider the entire user journey of your audiences' engagement with your art.

The course facilitators discussed the importance of maintaining boundaries with digital audiences. In the digital performance space, the boundaries between performer and audience can be blurred. This can be an advantage or disadvantage depending on the creative project. The audience in digital projects was discussed and referred to as a community. The importance of inclusion, presence, and mental wellbeing/ safety through moderation was emphasised. Safety included artist safety (e.g. moderation of content generation) and audience safety (e.g. being mindful of who can access content in online platforms). Digital engagement with artistic outputs was conceptualised as being on a continuum. Participants were encouraged to consider how an audience may engage with a digital artistic output.

**Table 2.6 Digital transformation strategy**

<b>Digital Transformation Strategy</b>
a. A digital transformation strategy identifies where you are digitally now, where you want to go, what you want to achieve, and how you will get there.
b. A digital readiness audit assesses how mature your current digital practice is to identify areas for improvement.
c. In a good digital strategy, your mission, vision, goals, objectives and activities should all be aligned.
d. A digital transformation strategy will need to be reviewed and adapted over time.

**Table 2.7 Digital business models**

<b>Digital Business Models</b>
a. A business model identifies the way you create and deliver value for audiences.
b. A business model starts with your value proposition: Who is your audience, what do they value, and what will they pay for it.
c. Digital has opened new opportunities for business, distribution and monetisation models
d. Digital partnerships with other artists and organisations, channels and platforms can build revenue, reach and engagement, but need to be carefully established for collaborative success.

**Table 2.8 Digital ethics and leadership**

<b>Digital ethics and leadership</b>
a. Digital leadership isn't as much about technology, about bringing a digital mindset to leadership.
b. Digital leadership recognises that digital is pervasive, not separate.
c. Reach across disciplines and seek digital partnerships with experts and other artists and organisations to build digital literacy, skills, networks, capacities and culture.
d. Ethical issues to consider in digital include copyright and intellectual property, Indigenous cultural safety and protocols, data ethics and environmental impact.

Artists were encouraged to adopt a digital transformation strategy, apply business principles to their artistic practice for financial sustainability and to always consider ethics. Artists were encouraged to be leaders.

This all resonated with me in my artistic practice as an organist and carillonist in Australia. The distance from traditional epicentres of organ and carillon culture in the northern hemisphere, lead me to gravitate to artistic partnerships initiated online, forged in person (through travel) and enriched subsequently with a hybrid of real/ virtual engagement. This part of the course also highlighted a weakness in my artistic practice. I was too Eurocentric in my digital explorations. This process of upskilling inspired me to interrogate bell and organ cultures in my Asia Pacific region (e.g. travel to YST Conservatory, Singapore) and also collaborate with custodians of First Nations knowledges (e.g. Carillon Project 8).

### **2.3 Sustainability**

In the context of this study, the sustainability of organ and carillon culture (i.e. to keep the cultures alive for future generations) is considered a desirable outcome.<sup>201</sup> The contribution of organ and carillon culture to society is discussed in chapter 1. Sustainability has often been discussed in the literature as being a constellation of interdependent supporting factors. It was mentioned in section 2.1 that culture was deemed a “fourth pillar” of sustainable development in 2004, within the United Cities and Local Governments’ Agenda 21 for Culture. In the same section it was also discussed that in 2013 UNESCO clearly inserted culture into to the sustainability discourse in the Hangzhou Declaration, “Placing Culture at the Heart of Sustainable Development”.<sup>202</sup> After scholarship from Duxbury and Jeanotte (2013), general sustainability discourse referring to the “pillars” of sustainability (the environmental, social

---

<sup>201</sup> Instances where it is not desirable to sustain a musical culture or aspects of a musical culture include situations that may be harmful to artists or society. An extreme example are castrati in 16th-18th century singing culture (male singers castrated before puberty to preserve voice range). Other examples are the use of endangered or unethical material in instrument building such as the use of ivory, tortoise shell and rare woods.

<sup>202</sup> Evans et al., "Cultural Mapping and Planning for Sustainable Communities."

and economic aspects) more frequently expanded to include a fourth pillar, namely culture. For sustainability to be achievable within this framework, the four interconnected and interdependent aspects need to be supported. Here, cultural sustainability is “focus[ing] on ideas of cultural capital, culture as creative expression, and culture as a way of life and a vehicle for sustainable values” to quote Reid and Petocz’s interpretation of Duxbury and Jeanotte (2013).<sup>203</sup>

In 2015, the United Nations for the first time, referred to culture in its Sustainable Development Goals (SDG). In an announcement from 2017 (and updated in 2023), UNESCO states that “placing culture at the heart of development policies is the only way to ensure a human-centred, inclusive and equitable development”.<sup>204</sup> The announcement is authored by an architect, planner and culture specialist at the Division for Creativity in the Culture Sector at UNESCO and part of the integration of culture in the implementation of the UN 2030 Agenda. This positions culture as central to urban planning as well as development which is relevant when thinking about the role of “place” in organ and carillon culture.

Regarding cultural heritage, it explicitly links cultural heritage to sustainability and SDGs:

Cultural heritage—both tangible and intangible—and creativity are resources that need to be protected and carefully managed. They can serve both as drivers for achieving the SDGs as well as enablers, when culture-forward solutions can ensure the success of interventions to achieve the SDGs.<sup>205</sup>

This builds on the cultural mapping work of Young et al. cited in section 2.1.

---

<sup>203</sup> Reid, *Educating Musicians for Sustainability*. p.15

<sup>204</sup> "Culture is key in achieving a more sustainable world," 2025, accessed January, 2025, <https://www.unesco.org/en/articles/culture-key-achieving-more-sustainable-world>.

<sup>205</sup> Jyoti Hosagrahar, "Culture: at the heart of sustainable development goals," 2023, <https://courier.unesco.org/en/articles/culture-heart-sustainable-development-goals>.

## Tangible and Intangible Heritage

The organ and carillon are unique in that each musical instrument is a repository of tangible and intangible cultural heritage. UNESCO World Heritage Listing considers the tangible elements of heritage. To be considered for the World Heritage List, sites must be of “outstanding universal value” and meet at least one out of ten selection criteria listed in the Operational Guidelines for the Implementation of the World Heritage Convention.<sup>206</sup> Orr (2021) in the journal *Heritage Science*, states that the “56 belfries of Belgium and France have been collectively inscribed as a World Heritage Site since 1999 (expanded in 2005).”<sup>207</sup> The UNESCO intangible culture listings of organ building, and carillon culture were briefly discussed in Chapter 1. In 2014 UNESCO selected to the “Register of Good Safeguarding Practices” the carillon culture of Belgium.<sup>208</sup> In 2017 UNESCO selected “Organ craftsmanship and music” in Germany to be on the “Representative List of the Intangible Cultural Heritage of Humanity”.<sup>209</sup> Additionally, German UNESCO Commission confirmed on 26 March 2025 that bell casting and bell music have been entered in the list of Intangible Cultural Heritage.<sup>210</sup>

The UNESCO website on intangible cultural heritage states that “cultural heritage does not end at monuments and collections of objects. It also includes traditions or living expressions inherited from our ancestors and passed on to our descendants.” It includes “performing arts, social practices, rituals, festive events.” UNESCO echoes ASEAN’s cultural mapping document which highlighted local distinctiveness: “while fragile, intangible cultural heritage

---

<sup>206</sup> "The Operational Guidelines for the Implementation of the World Heritage Convention," <https://whc.unesco.org/en/guidelines/>.

<sup>207</sup> Orr, "In situ acoustic analysis of two twentieth-century heritage carillons."

<sup>208</sup> UNESCO, "Safeguarding the carillon culture: preservation, transmission, exchange and awareness-raising: Belgium."

<sup>209</sup> UNESCO, "Organ craftsmanship and music: Germany."

<sup>210</sup> *World Carillon Federation Newsletter*.

is an important factor in maintaining cultural diversity in the face of growing globalization.”<sup>211</sup>

UNESCO’s position is that “the importance of intangible cultural heritage is not the cultural manifestation itself but rather the wealth of knowledge and skills that is transmitted through it from one generation to the next,” thus emphasising that human continuity is important as a form of intergenerational cultural sustainability. The focus on transmission allows room for innovation and evolution from generation to generation. Intangible cultural heritage is not stasis or mummification. Genuine community based human connection is critical and intangible cultural heritage must not be locked away in a museum for connoisseurs or tourists, silent and inanimate—ready to be objectified.

The statement suggests that the “social and economic value of this transmission of knowledge is relevant for minority groups and for mainstream social groups within a State and is as important for developing States as for developed ones” —in other words, the benefit is universal and for everyone: for humanity.<sup>212</sup> The following table is adapted from information on the UNESCO intangible cultural heritage website and is relevant to organ and carillon culture in Australia. In the context of the artistic projects in this thesis, the “explainer” makes space for traditions inherited from the northern hemisphere to be allowed to explore evolving contemporary iterations in the southern hemisphere.

---

<sup>211</sup> UNESCO, "Intangible Cultural Heritage ".

<sup>212</sup> UNESCO, "Intangible Cultural Heritage "; UNESCO, "Organ craftsmanship and music: Germany."; UNESCO, "Safeguarding the carillon culture: preservation, transmission, exchange and awareness-raising: Belgium."

**Table 2.9 Adapted from UNESCO Qualities of Intangible Cultural Heritage<sup>213</sup>**

Source: UNESCO Intangible Cultural Heritage website, <https://ich.unesco.org/en/home>

Intangible cultural heritage is...	Explanation
<b>Traditional, contemporary and living at the same time</b>	Intangible cultural heritage does not only represent inherited traditions from the past but also contemporary rural and urban practices in which diverse cultural groups participate
<b>Inclusive</b>	<p>We may share expressions of intangible cultural heritage that are like those practiced by others. Whether they are ... from a city on the opposite side of the world or have been adapted by peoples who have migrated and settled in a different region, they all are intangible cultural heritage: they have been passed from one generation to another, have evolved in response to their environments and they contribute to giving us a sense of identity and continuity, providing a link from our past, through the present, and into our future.</p> <p>Intangible cultural heritage does not give rise to questions of whether certain practices are specific to a culture. It contributes to social cohesion, encouraging a sense of identity and responsibility which helps individuals to feel part of one or different communities and to feel part of society.</p>
<b>Representative</b>	Intangible cultural heritage is not merely valued as a cultural good, on a comparative basis, for its exclusivity or its exceptional value. It thrives on its basis in communities and depends on those whose knowledge of traditions, skills and customs are passed on to the rest of the community, from generation to generation, or to other communities.
<b>Community-based</b>	Intangible cultural heritage can only be heritage when it is recognized as such by the communities, groups or individuals that create, maintain and transmit it – without their recognition, nobody else can decide for them that a given expression or practice is their heritage.

---

<sup>213</sup> UNESCO, "Intangible Cultural Heritage".

## **The tangible and intangible cultural heritage of musical instruments**

Howard (2022) raises some thought-provoking questions in his paper “Musical instruments as tangible cultural heritage and as/for intangible cultural heritage.”<sup>214</sup> He uses British piano heritage and the traditional musical instruments of north and south Korea as cross-cultural case studies however his points are relevant to tangible/ intangible organ and carillon culture. In the paper, he concedes that “musical instruments are central components of both the tangible and intangible heritage”; however he concludes that there is “no single answer to questions about the role of musical instruments when (and if) instruments are recognised as both tangible and intangible heritage.” The organ and carillon are unique in that they are simultaneously tangible and intangible reservoirs of cultural heritage because they are musical monuments *and* musical instruments. Howard (2022) articulates a bind:

...discourse about music as intangible cultural heritage frequently overlooks the importance of instruments in conserving traditions inherited from the past and making live performance possible in the present, while curating instruments as tangible heritage often neglects their function for making music...<sup>215</sup>

Howard (2022) then asks two rhetorical questions concerning instrument building and the debate regarding museum conservation versus the use of musical instruments:

First, should instrument-crafting skills inherited from the past be sustained today, and, where industrial or mechanized manufacturing processes and the development of instruments is encouraged, what are the implications for sustaining music traditions? Second, given that instruments as crafted objects deteriorate over time, should instruments inherited from the past be

---

<sup>214</sup> Keith Howard, "Musical instruments as tangible cultural heritage and as/for intangible cultural heritage," *International journal of cultural property* 29, no. 1 (2022), <https://doi.org/10.1017/S0940739121000436>.

<sup>215</sup> Howard, "Musical instruments as tangible cultural heritage and as/for intangible cultural heritage."

displayed as objects, be restored to playing condition, or be updated and developed for contemporary use?<sup>216</sup>

All the organs and carillon featured in this thesis would benefit from regular contemplation of these questions. These considerations should loom large at each organ/carillon maintenance visit or tuning.

Organ Project 2 in this thesis involves an art gallery performance and art gallery installation of a museum instrument (portative organ) that was commissioned as a museum piece (as an exemplar of a respected organ builder's oeuvre), kept in storage and mostly silent in its lifetime. This contemporary Australian made iteration of an ancient organ style (1986—1988 portative organ by Ronald Sharp) was used to launch a major cultural exchange between Australia and France. The loan to the Art Gallery of NSW from the then Museum of Applied Arts and Material Science (MAAS) (now again known as the Powerhouse Museum), involved museum protocols of object handling and limited practice time to conserve the instrument.

### **Cultural heritage and cultural sustainability**

The cyclical interplay between cultural heritage and cultural sustainability is highlighted in a 2014 paper by Petocz et al.:

Cultural sustainability is based on cultural heritage, as the future is based on the past, but in turn influences the (re-) assessment of cultural heritage, as the past is re-interpreted in terms of the future.<sup>217</sup>

---

<sup>216</sup> Howard, "Musical instruments as tangible cultural heritage and as/for intangible cultural heritage."

<sup>217</sup> Bennett, Reid, and Petocz, "Creative workers' views on cultural heritage and sustainability." p. 7

The authors (Reid and Petocz, 2021) expand on these ideas in a paper where they posit a linking of “cultural heritage and sustainability” based on their evolving body of work in this area (the italics are my emphasis):

We introduce the notion of ‘cultural heritage and sustainability’ (Petocz et al., 2014) as an approach to the cultural aspects of sustainability (as opposed to environmental, economic or social aspects). In the *context of music, we view cultural heritage and cultural sustainability as two sides of the same coin, the former looking backwards, referring to the preservation of non-tangible aspects of past society, the latter looking forwards, referring to the continuation of these non-tangible aspects into future society.*<sup>218</sup>

This idea weds the past to the future, with the foundation of tradition a counterbalancing ballast for future forward innovation. Interestingly, this same tension is present in the idea of digital transformation now being a foundation of modern life and it also being its greatest change agent. The rapid pace of change has rendered basic digitisation almost in our societal past—like two-dimensional pixel papyrus versus the origami of virtual worlds.<sup>219</sup>

### **Digital archives of sound heritage: virtual representations as cultural sustainability**

In his 2012 monograph *Off the Record: Performing Practices in Piano Playing*, Neal Peres Da Costa considers historical sound recordings to be a “window into the past.” His book examines late nineteenth-century sound recordings of pianists as “direct evidence of the individual musicians’ performance styles.” These precious archives were often inaccessible due to redundant formats, poor sound quality and “for many decades it was almost exclusively museum curators who valued the capacity of the recording process.” Importantly, Peres Da Costa writes, “although early recordings tell us much about a particular era, it is

---

<sup>218</sup> Reid, *Educating Musicians for Sustainability*.

<sup>219</sup> Virtual worlds being a digital *transformation* not just a digitization of what was analogue.

also well worth considering *the extent to which they capture an ongoing tradition.*<sup>220</sup> That is, heritage cannot be discerned from disconnected items from an archive. “Tradition” needs to be researched as on continuum of culture and referenced in the context of contemporary society.<sup>221</sup> Likewise, sonic information needs to be referenced to past soundscape and ways of hearing. Sound studies scholarship cautions modern listeners, arguing that we cannot have the same perceptual experience of historical sounds that historical listeners experienced. This is due to our inhabiting a different sound world that has acquainted our ears to different sensitivities. Contemporary listeners need to undertake additional work to perceive historical sonic experiences.<sup>222</sup> This is of relevance when listening to historical organs and carillons, recordings or reproducing rolls of instruments and also digital virtual sample sets. Artistic researchers should avoid being lulled into thinking that because a sound may be accurately captured or simulated that our ears hear the same way as the “historical ear.”

Historical organs and carillons do provide a unique insight into the sound worlds of the past. Listening to historical organs and carillons in a live setting is akin to being given a window into past sound worlds. This is because of the stability of the materials in a carillon bell (the sheer mass of bronze material) and the basic mechanisms not having changed significantly over time.<sup>223</sup> Organs are often located in churches where stability of the liturgy has ensured conservation and preservation of the musical supports. Civic instruments have often legislated heritage requirements that must be adhered to, so that the heritage of historical instruments are protected hence their sound worlds may indeed be a tinted window into past eras. For significant smaller instruments such the Fincham & Hobday (1885) organ in Swifts

---

<sup>220</sup> The italics are my emphasis.

<sup>221</sup> c.f. large body of scholarship concerning contemporary ways of listening to old recordings and the “historical ear”

<sup>222</sup> Peres da Costa, *Off the Record: Performing Practices in Romantic Piano Playing*.

<sup>223</sup> Christiaan Winter, "Traditie/ Tradition," *Klok & Klepel* 129 (2025).

Ballroom, Darling Point and the Walker & Son (1874) instrument at St. Stephen's Anglican Church, Newtown (featured in Organ Project 8)<sup>224</sup> specialist advisory bodies such as the Organ Historical Society of Australia (OHTA), have a philosophy to recommend authenticity in restoration, to respect the original intentions of the maker i.e. conservation and preservation.<sup>225</sup>

The recordings referred to by Peres Da Costa in *Off the Record* capture a fully formed musical performance. The digital recording of historical organs and carillons to create a digital virtual sample set involves the detailed, high fidelity digital recording of each note i.e. the building blocks of a performance. The performer can gain creative and performance practice insights through performing with these historical sound worlds—reconstructing a score and making music with sounds from the past, literally note by note. This granular reconstruction of a historical soundscape (note by note) may in fact, be more relevant in a thesis study examining cultural sustainability than an intact recorded performance for consumption (i.e. as opposed to components creatively transformed by a musician performing musical notes from a score on a VPO with a historical organ sample set). A living musician reconstituting a historic sound world (on a VPO) for and in their own time, is bringing the past into the present through performing music. This act made possible by digital transformation intersecting with organ and carillon culture can itself be seen as a form of artistic research (this will be discussed in section 2.4).

---

<sup>224</sup> The researcher is organist at heritage listed St. Stephen's Anglican Church, Newtown, Australia (2013-present)

<sup>225</sup> , Organ Historical Society of Australia, 2025, accessed January 2025, 2025, <https://ohta.org.au> (OHTA webpage).

In 2003, a “Virtual Pipe Organ Project” was commenced by Dr. Jiri Zurek.<sup>226</sup> Zurek’s website is based in the Czech Republic and sells sample sets of historical organs as an archival and commercial enterprise.<sup>227</sup> From the website:

The Sonus Paradisi project’s purpose is to record, document, and archive the sounds of important and historically significant pipe organs from Europe, North America, and elsewhere.

The project has these goals: (1) To archive and conserve the sounds of the organs (2) To offer playable models of the organ via specialized computer software and MIDI (Musical Instrument Digital Interface) technology (3) To increase awareness and popularize these organs in order to help preserve and maintain them for future generations. (4) To assist in research on organ sound, restoration, recording techniques, and similar topics.<sup>228</sup>

The website discusses digital transformation and the company’s outlook regarding the digitization of historical organs:

Since the advent of digital technology decades ago, digitization of various artifacts has benefitted countless people. The organ models created as part of the Sonus Paradisi project are yet another way in which digital models can increase the awareness, popularity, and respect for the underlying artifacts - in this case, beautiful organs from around the world.<sup>229</sup>

The organ is considered an “artifact,” and the organ sample sets are called “organ models” i.e. a representation or a simulation of a “real” organ. The purpose of the archival and commercial enterprise is to promote awareness and respect for historical organs. Zurek also takes pains to acknowledge that the “organ models...simplify reality.”<sup>230</sup>

---

<sup>226</sup> "Dr Jiri Zurek Biography," 2025, [https://www.bachlund.org/Prelude\\_and\\_Fugue\\_in\\_D\\_major.htm](https://www.bachlund.org/Prelude_and_Fugue_in_D_major.htm).; “Jiri Zurek (b. 1974) ...is currently a researcher at the Institute for Classical Studies of the Academy of Sciences of the Czech republic”

<sup>227</sup> Sonus Paradisi and Organ Art Media are companies that produce high quality digital virtual organ sample set libraries. There are many other companies. These libraries are rendered function on a physical MIDI keyboard through a MIDI controller (software). Examples of this software include “Hauptwerk” (Milan Digital Audio, creator Martin Dyde (2002)) and GrandOrgue <https://sourceforge.net/projects/ourorgan/> (open-source software).

<sup>228</sup> "Sonus Paradisi," 2003, <https://www.sonusparadisi.cz>.

<sup>229</sup> Zurek, "Sonus Paradisi."

<sup>230</sup> Zurek, "Sonus Paradisi."

Another sample set creator, Organ Art Media (OAM) established in 2002 by Professor Helmut Maier<sup>231</sup> has a similar website that offers sample sets of historical organs for purchase:

Preservation for future generations. The original idea of the project was the sound documentation of all audible facets of systematically selected historic monuments using the best technical methods. These sound documents give the opportunity to restore or reconstruct instruments to a former state of their sound, for example after severe or irreparable damages caused by fire, vandalism, etc. Therefore, today many church communities with important instruments as well as renowned organ restorers support [this] project. A part of the revenue is always dedicated to the preservation of the organs.<sup>232</sup>

OrganArt Media appeals to the idea of accessibility and the gleaning of musicological insights for a “historically informed performance” alongside a goal of “preservation” of the intangible sound world as cultural resource.

The website continues with:

Significant organ culture—playable for every organist. In the past, usually only a few travelling concert organists had the chance to play European organ literature on the type of instrument it was composed for. The OrganArt Library now enables both organists and organ enthusiasts to experience the sounds of unique instruments built by Schnitger, Silbermann, Walcker, Cavaillé-Coll and numerous others while staying at home and using only a PC system and a MIDI organ console (e. g. existing digital organ). Many musicians will receive a new awareness and understanding of each organ music period while enriching their own interpretation and registration practice.<sup>233</sup>

---

<sup>231</sup> "Organ Art Media," 2002, <https://www.organartmedia.com/en/>. "Prof. em. Helmut Maier has taught Information Technology and Multimedia at the Reutlingen University (Germany) for more than 20 years. Long years of experience in organ and musical acoustics. Organ studies with Hermann Unger/Darmstadt, Hermann Harrassowitz/Nürnberg, Eva Hölderlin-Liedecke/Stuttgart. Established Organ Art Media in 2002."

<sup>232</sup> Maier, "Organ Art Media."

<sup>233</sup> Maier, "Organ Art Media."

This owner of a sample set company is also at pains to highlight his emphatically expressed ethical approach, that the virtual representations of historical instruments “will not compete with traditional pipe organs nor replace them.”<sup>234</sup>

Heritage carillons have also been recorded and archived for open access download online (University of Michigan) and recorded for use in their own digital virtual practice clavier (National Carillon, Canberra). Bell samples are available as part of virtual sound libraries used for commercial music production, for example, the “Vienna Symphonic Library.”<sup>235</sup>

A grant from the University of Michigan Bicentennial (2017) funded a recording of individual audio samples of the sixty-bell Ann & Robert H. Lurie Carillon at the University of Michigan, Ann Arbor. This was an institution supported, student lead, interdisciplinary collaborative project involving students, the University Carillon and Organ Department and the Department of Performing Arts Technology at the University of Michigan. The bell sample set from the Lurie carillon, features bells cast by Royal Eijsbouts, Asten, the Netherlands and is downloadable for free under CC BY 4.0 license at the webpage <https://gobluebells.com/2016/09/21/lurie-carillon-samples/>.<sup>236</sup> This webpage states that the sample set is “recorded and edited in October 2016 by Isaac Levine with the assistance of Ashton Baker, Rowena Ng, Rachael Park, and Anjana Rajagopal and the support of Tiffany Ng (UM Organ Department) and John Granzow (UM Department of Performing Arts Technology)...This recording project was made possible by a grant from the University of Michigan Bicentennial.”

---

<sup>234</sup> Maier, "Organ Art Media."

<sup>235</sup> "Vienna Symphonic Library - Bells," <https://www.vsl.co.at/search?keyword=bells>].

<sup>236</sup> Go Blue Bells, University of Michigan <https://gobluebells.com/2016/09/21/lurie-carillon-samples/>

The open access recording encourages creative use of the bell sounds beyond the carillon tower and precinct from which they are derived. Users can “share—copy and redistribute the material in any medium or format...adapt—remix, transform, and build upon the material for any purpose, even commercially.”<sup>237</sup> This is an instance of cultural heritage being digitally transformed to encourage cultural sustainability through online open access.

The National Carillon in Canberra, ACT, Australia, upgraded its carillon practice clavier in 2020/21 to one with digital bell sounds derived from recordings of the bells in the tower. A social media post from 2021:

John Taylor & Co., 27 May 2021, #ThrowbackThursday...to our project for The National Carillon, Canberra, which was completed at the end of last year. The refurbished Carillon now features an incredible 57 bells, including a 5-tonne bass G bell. The project also featured a Taylor seasoned oak clavier ... together with a new programmable touch-sensitive electronic practice clavier.<sup>238</sup>

The recorded sound was from a limited number of National Carillon tower bells and though the digital recordings were manipulated to achieve the complete range of pitches needed to pair each baton with a note, they still represent a digital document of the bells sited in the tower.<sup>239</sup>

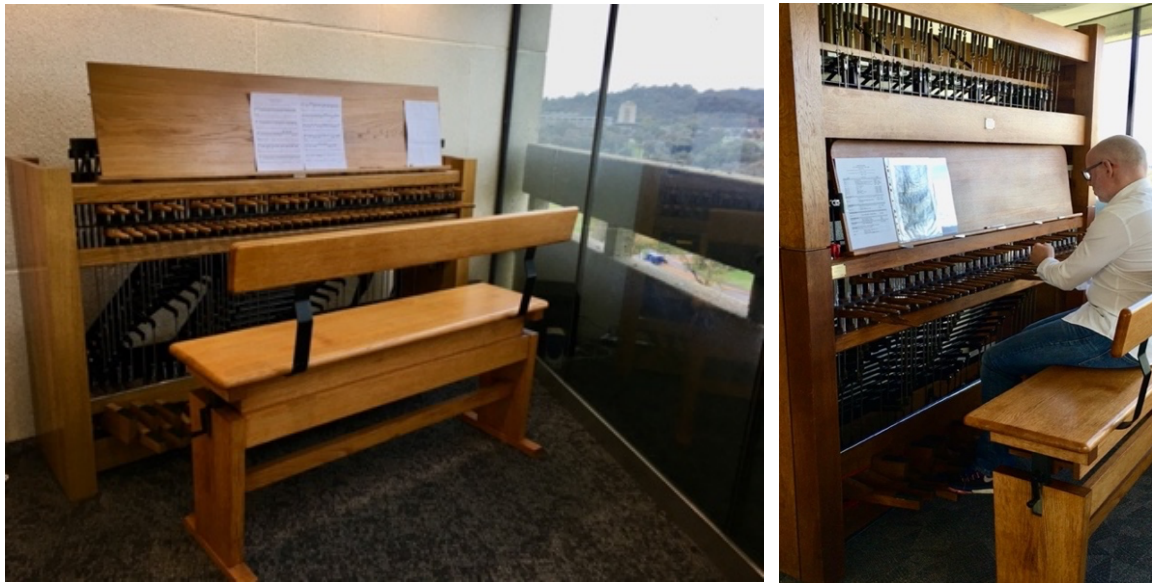
---

<sup>237</sup> "Download Lurie Carillon samples," University of Michigan, 2016, <https://gobluebells.com/2016/09/21/lurie-carillon-samples/>.

<sup>238</sup> "National Carillon Practice Clavier (2020)," 2021, <https://www.facebook.com/JohnTaylorBells/posts/throwbackthursday-to-our-project-for-the-national-carillon-canberra-which-was-co/3556433717789408/>.

<sup>239</sup> Personal communication

**Figure 2.11 National Carillon, Canberra practice claviers. Photos: Grace Chan (2020/2021)**



**(Left) Taylor's electronic practice clavier (Right) Koen Van Stade at the original mechanical Taylor's practice clavier (1970) now located at the ANU School of Music, Canberra.**

Digital transformation facilitating organ and carillon training, and performance as demonstrated in these online sources, is a form of cultural sustainability. Digital recordings of historical sounds (individual notes) are amalgamated by an organist or carillonist (note by note) to practice their art and gain insight into performance practice traditions. The digital sampling of heritage organ and carillons in these examples shows cultural heritage meeting cultural sustainability within virtual sonic worlds to perpetuate the art and the craft associated with these instruments. This creates the possibility of future innovation in organ and carillon culture through performance.

## 2.4 Artistic Research

### Practice-led inquiry

In a 2023 edition of artistic research journal *Music and Practice*, Professor Clive Brown (Prof. emeritus at the University of Leeds and a guest professor at the Universität für Musik und darstellende Kunst, Wien), was interviewed in a “Q & A” titled “Artistic research! Where are we today?” He introduces the term “practice-led” in the context of artistic research:

Practice-led ... might be better ... than Artistic Research...Practice, in the widest sense, however, is not unique to the arts. Research in the sciences will often involve practical experiments, both as tools and demonstrative outcomes, just as an investigator in the fine or performing arts might utilize practice as a necessary component of the research process and an essential element of its communicable results.<sup>240</sup>

A “laboratory” is used as an analogy here, however practice-led research can accrue data and make new knowledge that is be situated in the “real world.” The real world can be the laboratory. Bromham et al. (2024) (cited in chapter 1 of this thesis), consider an island to be a “living laboratory” i.e. a dynamic natural ecosystem not constructed by scientific design—but one in which scientific research and experimentation can be conducted. The style of laboratory experimentation that Brown seems to allude to in his analogy is a construct, a closed system whereby ideal conditions are created by a researcher (artistic or scientific) to answer a question. Randomised controlled drug trials for example are also an artificial construct. They may involve real patients, real drugs and real clinical scenarios; however, the research design creates a scenario that is very much artificial and literally “controlled”

---

<sup>240</sup> "Artistic research! Where are we today?," *Music and Practice*, 2023, <https://www.musicandpractice.org/enquete-vol-10-brown/>.

(controlled intentionally, for a specific purpose—e.g. to determine drug safety and efficacy).

To generate more meaningful data so as to treat patients with greater nuance, “real world data” has come to be an important part of practice-led medical research.<sup>241</sup> These transdisciplinary learnings from the field of medicine can inform real world practice-led artistic research.

### **Real-world data**

Real world research is growing in importance as an inductive adjunct to qualitative and quantitative inductive approaches such as multicentre randomised controlled trials. The integration of a “real-world” approach is seen, for example, by the US Federal Drug Administration (FDA) as a way of bringing greater nuance to decision making:

FDA has a long history of using what we currently call real-world data (RWD) and real-world evidence (RWE) to monitor and evaluate the post market safety of approved drugs...Advances in the availability and analysis of RWD have increased the potential for generating robust RWE to support FDA regulatory decisions.<sup>242</sup>

The FDA uses RWD and RWE to evaluate “post market safety” of approved drugs, that is, they are studying what happens when the medication is out in the real world being prescribed by doctors and used to treat disease in patients.

---

<sup>241</sup> Janika Shah et al., "Characterization of Poor Visual Outcomes of Diabetic Macular Edema: The Fight Retinal Blindness! Project," *Ophthalmology retina* 6, no. 7 (2022), <https://doi.org/10.1016/j.oret.2022.03.007>; Nancy Wang et al., "One-year real-world outcomes of bevacizumab for the treatment of macular oedema secondary to retinal vein occlusion," *Clinical & experimental ophthalmology* 50, no. 9 (2022), <https://doi.org/10.1111/ceo.14139>; Rachel E. Sherman et al., "Real-World Evidence — What Is It and What Can It Tell Us?," *The New England journal of medicine* 375, no. 23 (2016), <https://doi.org/10.1056/NEJMs1609216>; Adrian R. Hunt et al., "Twelve-month outcomes of ranibizumab versus aflibercept for macular oedema in branch retinal vein occlusion: data from the FRB! registry," *British journal of ophthalmology* 106, no. 8 (2022), <https://doi.org/10.1136/bjophthalmol-2020-318491>.

<sup>242</sup> "Real-World Evidence," 2024, accessed January, 2025, <https://www.fda.gov/science-research/science-and-research-special-topics/real-world-evidence>.

The FDA defines real-world data and real-world evidence as follows:

**Real-world data are data** relating to patient health status and/or the delivery of health care routinely collected from a variety of sources. Examples of RWD include data derived from electronic health records, medical claims data, data from product or disease registries, and data gathered from other sources (such as digital health technologies) that can inform on health status.

**Real-world evidence** is the clinical evidence about the usage and potential benefits or risks of a medical product derived from analysis of RWD.<sup>243</sup>

This definition of real-world data is applied to a specific scenario, namely the approval of drug or medical devices for prescribed consumer use. However, it reinforces that real-world data is a valid and powerful form of research evidence. This mirrors the advocacy for rich and diverse sources for data promulgated in artistic research literature.

To extrapolate to more general areas, Gray (2004) writes that the “real world” can mean “businesses, companies, hospitals, schools, colleges or other organisations.” The real world can be:

...communities where people live, including residential areas, parks, shops, local amenities or areas where young people congregate. It could also mean networks such as community groups, educationalists, professional associations, management associations or trade unions.<sup>244</sup>

Of direct relevance to this thesis is Gray’s commentary regarding “virtual communities”:

Increasingly, it could also include virtual communities where people communicate with each other through the Internet. In other words, the real

---

<sup>243</sup> FDA, "Real-World Evidence."

<sup>244</sup> David E. Gray, *Doing research in the real world* (London: Sage Publications, 2004), p 3.

world comprises any setting where human beings come together for communication, relationships or discourse.<sup>245</sup>

Here, Gray explicitly includes in the real world “virtual communities where people communicate with each other through the internet.” The real world is any scenario where “human beings come together for communication, relationships or discourse” and so captures the style of real-world artistic projects featured in the thesis. Real-world project selection, data collection and data analysis as applied to this artistic research thesis will be discussed in Chapter 3 (Methodology).

### **“The power of artistic research”**

The following is a brief overview of artistic research approaches and a justification of why one particular theory/ framework was chosen over others. The performing scholars working in the field of artistic research intentionally resist a strict definition. Advocacy is for a flexible approach that allows the artist-researcher to develop their own methodology which is based on (1) the questions being explored and (2) their own artistic and creative process. A survey of the artistic research literature reveals some common themes.<sup>246</sup> Artistic research is practice-led (through artistic process and creative decision making). It is inquiry-based and open ended—a hypothesis does not need to be generated to be proved or disproved; in fact, more questions may be raised as more questions are asked by the artistic researcher. Artistic research is reflexive, the researcher requiring an awareness of their own biases. It is also reflective, requiring an objective assessment of the research process by the researcher. Thus,

---

<sup>245</sup> Gray, *Doing research in the real world*. p 3.

<sup>246</sup> Paulo de Assis and Lucia D'Errico, *Artistic research : charting a field in expansion* (London, UK: Rowman & Littlefield International Ltd, 2019); Robert Burke, Andrys Onsman, and Ebscohost, *Perspectives on artistic research in music* (Lanham: Lexington Books, 2017).; Arlander, "Annette Arlander Website."; Annette Arlander et al., *Performance as research : knowledge, methods, impact*, First edition. ed. (New York: Routledge, 2018).

the researcher must look from the inside out and outside in to meet at a point of new knowledge. Artistic research is iterative and cyclical; it is interdisciplinary and ideally should be transdisciplinary as other disciplines are imbibed in the creative process. Embodied exploration is important and captures the sensations of performance which can then be analysed intellectually to generate new knowledge.<sup>247</sup>

Penny (2014) reminds researchers that artistic research is often undertaken in universities and part of structured programs like PhDs. She asserts that it is important for elements of creative practice to be submitted at these higher degree levels to illuminate the creative process and gives as examples: “performances, combinations of multimedia outputs...text-based documentation.” This evidence must also be included with “evaluation and articulation of the relationships of these materials in the formation of theory or new knowledge.”<sup>248</sup>

Finnish academic Annette Arlander also has extensive experience in artistic research at doctoral level and discusses the tensions between artistic and scientific research in this online lecture presented at University College Cork in 2020.<sup>249</sup> Toltz and Barwick (2017) also grapple with these issues in the context of “non-traditional research outputs” as valid expressions of research in the Australian context.<sup>250</sup>

---

<sup>247</sup> Brown, "Artistic research! Where are we today?."; Reid, Peres Da Costa, and Carrigan, *Creative research in music : informed practice, innovation and transcendence*; Paulo de Assis, *Logic of Experimentation: Reshaping Music Performance in and through Artistic Research*, Orpheus Institute Series, (Leuven: Leuven University Press, 2018); Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music."; Assis, "Paulo de Assis: Artistic research in music."

<sup>248</sup> Jean Penny, "Reflections on Practice-led Research Methods and their Application in Music Performance Research," *Malaysian Music Journal* 3, 2 (2014).

<sup>249</sup> "Visioning the future: artistic research doctorates in Ireland," University College Cork, Ireland, 2020, <https://www.youtube.com/watch?v=vwjsRSchOhg>.

<sup>250</sup> Barwick and Toltz, *Quantifying the Ineffable? The University of Sydney's 2014 Guidelines for Non-Traditional Research Outputs*.

In *Music 2.0 and artistic research. Beyond a thousand years of Western art music*, Dr. Paulo Assis argues for the “power of artistic research”—particularly in this age of digital transformation where “given the massive accumulation of historic materials, sources, instruments, traditions of practice, and recordings, Western art music is currently confronted with hyper-documentation and hyper-archives.” Assis writes:

Under global historical conditions that decentre the Western model, and in the face of the increasing digitization of performances, compositions, and music archives, novel concepts and innovative practices grounded in artistic practice and research are highly required...the centrality of the transdisciplinary perspective offered by artistic research cannot be overstated, and even more so given its constitution as a new mode of knowledge production.<sup>251</sup>

He asserts that this avalanche of material almost necessitates an artistic research approach to music and performance as “music is always apprehended from multiple and heterogenous perspectives.”<sup>252</sup> Assis identifies some “consensus traits” that characterise artistic research, but resists providing a rigid definition. These traits are summarised in table 2.10.

---

<sup>251</sup> Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music." p.59

<sup>252</sup> Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music."

**Table 2.10 Consensus traits of artistic research adapted from source: Music 2.0 (Assis, 2023)<sup>253</sup>**

<b>Consensus traits of artistic research</b>
Practice-based
Involves the creation of art
Diversity of methods
Diversity of mediums
Focus on artistic process
Art resulting from artistic process is a form of knowledge
Object of research is not entirely constituted before the research starts
Object of research gains constituency as the research progresses (emerges)
Generates facts
Produces new knowledge
Sheds new light onto existing practices, processes and entities
Experimentation over interpretation
Transdisciplinary

Assis argues that artistic research goes beyond the accumulation of knowledge to activate transformation. It is about “transforming objects of sensorial experience into aesthetic-epistemic objects for thought and problematization.”<sup>254</sup> “Problematizing” here is considering an issue as a problem in a positive sense and asking questions. Doing so serves to dismantle accepted comprehensions of an issue so that new ideas or innovation can occur. Assis writes in Music 2.0:

---

<sup>253</sup> Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music."

<sup>254</sup> Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music."

The notion of problematisation I have in mind here derives from Michel Foucault's 'problematization', a term that refers to a positive conception of problems and that Foucault used as a method of questioning the assumptions and norms that shape our thinking...it is [the] transformation of aesthetic objects into objects for thought...that can have the power to radically change musical practices<sup>255</sup>

Problematization is discussed in a lecture Assis presented online for an open access research project called *Visioning the future: artistic doctorates in Ireland* (2020). He uses the phrase "field of problematicity" in the [video lecture](#) (6:16) and defines it as:

...a ground where problems, doubts, questions, ideas, hypotheses, analytical and creative solutions become thinkable; this is a space that enables the formation of a discourse with the aesthetic and epistemic components...it is within such a space that questions are constructed and formulated [for artistic research projects]<sup>256</sup>

In the online lecture, Assis then systematically elaborates on four types of questions artistic researchers should formulate for their practice-led research. Three types of questions are useful as "conventional modes of research" and capture realms such as "music historiography, music analogies, music theory, music philosophy or the sociology of music." They are questions that can be asked by and addressed by a non-artist. These questions are according to Assis' framework: **(1) factual questions, (2) analytical question, and (3) speculative questions.**<sup>257</sup> The fourth type of question posed in Assis' framework can only be addressed by a practitioner or artist. These questions could be categorised as **(4) artistic research questions.**<sup>258</sup> This artistic research framework is used in the reporting and analysis of the organ and carillon projects in the Results section of this thesis.

---

<sup>255</sup> Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music."

<sup>256</sup> Assis, "Artistic research seminar 2 - artistic research in music."

<https://www.youtube.com/watch?v=jGQDH-gYUDQ>

<sup>257</sup> Assis, "On Artistic Research: From the classical dualism to a unifying approach."

<https://www.youtube.com/watch?v=DYI2C8120Qs>

<sup>258</sup> Assis, "Artistic research seminar 2 - artistic research in music."

In another online video lecture in the same series, titled *From the classical dualism to a unifying approach*, Assis refers to the “classical dualism” between artist and researcher.

To paraphrase an exposition of this concept discussed in the lecture, the artist is the subjective producer of new relations, the researcher objectively articulates knowledge. To quote Assis, “one deals with sensation [the artist] the other with sense [the researcher].” He then states “in my view of artistic research, artistic research precisely merges sense and sensation, it merges artistic practice and academic research. Furthermore, “artistic research appears as a generator of experimental machines articulating sense and sensation through experimentation.”<sup>259</sup> Two graphics from the open access online lecture illustrate these points well. Figure 2.12 is an adapted tabulation of the ideas from the slide graphics created by Assis. The first column lists the qualities/action of artistic practice (sensation related). On the right it lists the corresponding quality or action of academic research (sense related).

---

<sup>259</sup> Assis, "On Artistic Research: From the classical dualism to a unifying approach."

Figure 2.12 “Artistic Research,” adapted source: Assis, Paulo de<sup>260</sup>

Artistic practice: sensation	Academic research: sense
Making a space	Measuring that space (after it has been created)
Imagination	Analysis
Experience	Meaning
The event	The fact
Vital movement	Stabilised form
The nervous system	The brain
The subject	The object

These ideas are adapted from a slide Dr Paulo de Assis presented in a lecture series called *Visioning the future: artistic doctorates in Ireland* Open Resource Published by: University College Cork

<https://www.youtube.com/watch?v=DYI2C8120Qs>

In the monograph *The Logic of Experimentation*, Paulo de Assis asks artists to go “beyond representation” and consider “performance as problematisation.” To do this is to experiment rather than interpret within a performance. The result is that beyond being “an executant or an interpreter, the performer becomes an operator, activating unexpected assemblages of forces and materials.” Chapter 3 will discuss the artistic methodology of this thesis, which positions the artistic project a “experimental machine[s]” within which digital transformation and organ/carillon culture are components; this machine is assessed for the presence of “sustainability.” Assis clarifies that he is not referring to experimental music but an experimental approach.<sup>261</sup>

---

<sup>260</sup> Assis, "On Artistic Research: From the classical dualism to a unifying approach."

<sup>261</sup> Assis, *Logic of Experimentation: Reshaping Music Performance in and through Artistic Research*. p 19.

## Selecting an artistic research theory and approach

There are many divergent approaches within artistic research theory and methodology. The theoretical detail of Dr Paulo De Assis' approach is included because it allowed me to gain an in-depth understanding of how he devised his four key questions for artistic researchers (as discussed in his online lecture for artistic research doctoral candidates in Ireland).<sup>262</sup> These four key questions (see footnote below) form the basis of my methodological approach, reporting of results and qualitative analysis. They allowed me to develop a simple, visual way (Venn diagram) to organise the complex, multimodal information that was collected contemporaneously during each artistic project. Organising information (that spanned actual and virtual worlds) in this manner, helped me qualitatively discern intersections between digital transformation and organ/ carillon culture within real world artistic projects (the main objective of this thesis).

---

<sup>262</sup>Dr Paulo de Assis: Four key questions for artistic researchers (1) factual questions, (2) analytical question, (3) speculative questions (4) artistic research questions Assis, "Artistic research seminar 2 - artistic research in music." <https://www.youtube.com/watch?v=jGQDH-gYUDQ>

### 3 Methodology

#### Introduction

This chapter outlines the qualitative research design and methods used to explore the impact of digital transformation on the sustainability of organ and carillon culture (Objective 1.3).

This is done through applying an artistic research methodology to 16 organ and carillon real-world projects (2016 to 2025). “Real-world” refers to the projects being situated in my daily work life as an organist, carillonist and artistic researcher. Projects were purposively selected to capture artistic processes and outputs (new knowledge) that result from the intersection of digital transformation and aspects of organ/carillon culture.

Data was collected within each artistic project through observations documented in a secure cloud-based multimedia diary that collated reflective journalling, digital memos, digital audiovisual scratch notes, annotated screenshots and searchable images of geolocated archival material important to each of the projects. This data was analysed through composing text based artistic statements and critical reflections that followed an artistic research framework (Assis, 2020).<sup>263</sup> Themes and patterns were identified through generating reflective text descriptions, categorising these descriptions and applying artist-led cultural mapping approaches to digital/non-digital cultural assets identified. For each project, a Venn diagram was generated that maps the digital and non-digital cultural assets associated with each project. This is to enhance visualisation the of intersections between areas of interest. These areas of interest align with the objective in section 1.3, namely: (1) digital transformation, (2) organ culture and carillon culture and (3) sustainability (that of organ and

---

<sup>263</sup> Assis, "Artistic research seminar 2 - artistic research in music."

carillon culture). The Discussion in Chapter 6 interprets this data to understand the impact of digital transformation on the sustainability of organ and carillon culture and develop cultural sustainability recommendations/strategies.

### **Research design**

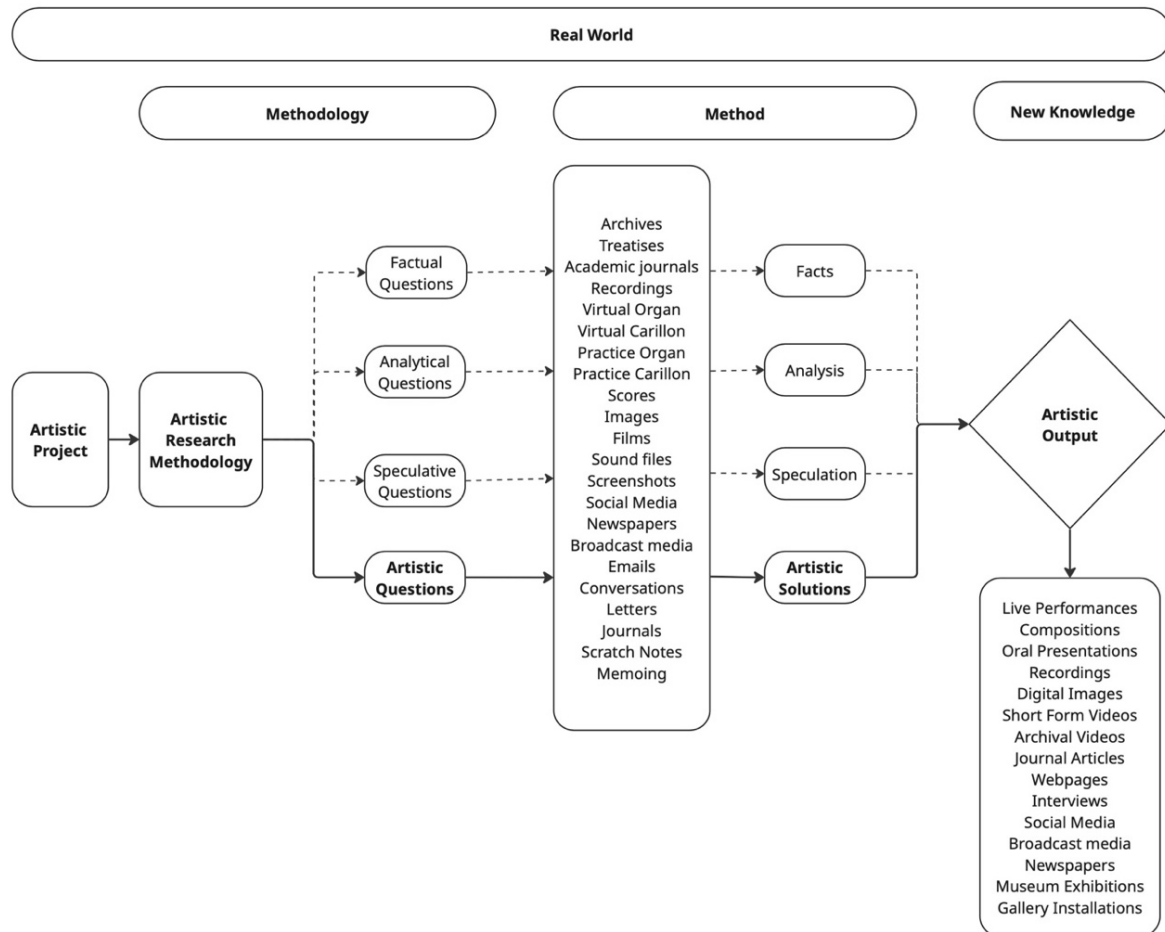
This is a qualitative study that uses an artistic research methodology. Artistic research methodology is practice-led and involves the creation of art (an “artistic output”). The **artistic output** is considered a generator of knowledge and also a form of **new knowledge**. A diversity of methods and mediums can be used to create this art; however, the focus of artistic research is the artistic process—the creative processes that lead to the making of the artistic output. In “art-based research” the focus is the artistic output and along with a written thesis, an “art-based” doctoral researcher may provide a detailed portfolio of artistic outputs for assessment. In contrast, the focus of this artistic research thesis is on the artistic process. In this thesis, the *artistic process* will be analysed to explore how digital transformation impacts on organ/carillon culture being supported and sustained for future generations.

In the creation of the artistic output, experimental transdisciplinary artistic processes generate four categories of information (1) facts, (2) analyses, (3) speculation and (3) artistic solutions. All four categories are important to an artist; the fourth category is specific to the artist.

Reflexivity is important in artistic research so there is a balance between objectivity/subjectivity within the research design; the researcher needs to be aware of their biases. Having the projects situated in the real-world tempers this to some extent, as the work-based projects featured in this study usually have a “brief” or project requirements that exert themselves as an external check to subjectivity. This tension (like that identified by

Arlander between funding body requirement and the need to make a space for artistic failure) often can be harnessed in the artistic process to produce innovative work.<sup>264</sup> Artistic research methodology can “shed new light onto existing practice, processes and entities.”<sup>265</sup>

**Figure 3.1 Artistic research methodology: overview**



The flowchart in figure 3.1 depicts the study as being situated in the real world from project initiation to the artistic output. For each of the 8 organ and 8 carillon artistic projects, an artistic research methodology is used to delineate the artistic process and the information generated in creating art, into 4 prongs: the factual, analytical, speculative, artistic. Various

<sup>264</sup> Arlander, "Visioning the future: artistic research doctorates in Ireland."

<sup>265</sup> Assis, "Artistic research seminar 2 - artistic research in music."

cultural assets and tools contribute to these four prongs of the artistic process, such as archives, treatises, journals, recordings, VPOs, VCCs etc (see figure 3.1).<sup>266</sup> These reservoirs of knowledge and practice coalesce in the artist to create an artistic output which is a form of new knowledge.<sup>267</sup>

### **Sampling strategy**

Artistic research methodology is applied to eight organ and eight carillon real-world projects that occurred between 2016 and 2025. “Real-world” refers to the projects being situated in my daily work life and so occur in a detailed, nuanced and actual workplace context. The projects in this study occurred as part of my occupation as an organist, carillonist and artistic researcher. Projects were purposively selected to capture artistic processes and artistic outputs that result from the intersection of digital transformation and aspects of organ/carillon culture. An equal number of organ and carillon projects were selected for reporting and analysis to give the study balance. The extended timeframe (2016—2025) allowed for a diverse range of artistic outputs, instruments and locations to be captured in this study. It reflected the pace at which organ and carillon projects occur given they are usually subject to many bureaucratic conditions due to their custodianship by institutions, governments or heritage bodies. This research period also included down time caused by the global COVID-19 pandemic.

Purposive sampling is used in qualitative research and is an “iterative process of selecting research [units] rather than starting with a predetermined sampling frame.” The selection

---

<sup>266</sup> Some of these tangible and intangible cultural assets were once new artistic knowledge, hence the similarity to some of the artistic output forms in the text box to the bottom right-hand side.

<sup>267</sup> The PhD thesis itself could also be considered new knowledge and incorporated into future research schematics.

process involves “identifying themes, concepts, and indicators through observation and reflection.” It is not “intended to offer a representative sample but rather to hone in on particular phenomena and/or processes.”<sup>268</sup> In this study, the eight organ and eight carillon projects were chosen if within the artistic research framework, aspects of digital transformation intersected with aspects of organ/carillon culture to generate new knowledge in the form of an artistic output. This iterative process of selecting units aligns well with artistic research methodology. The largest circle of the Venn diagram in figure 3.2 can be considered the boundary of the “experimental machine” articulated in section 2.4 of this thesis by the Assis quotations.<sup>269</sup>

The 16 Venn diagrams are used as a method of organising and analysing complex qualitative information for a qualitative discussion and analysis.<sup>270</sup> This information was obtained through contemporaneous data collection as outlined in the following section of this chapter. Further quantitative statistical analysis of data was beyond the scope of this qualitative thesis.

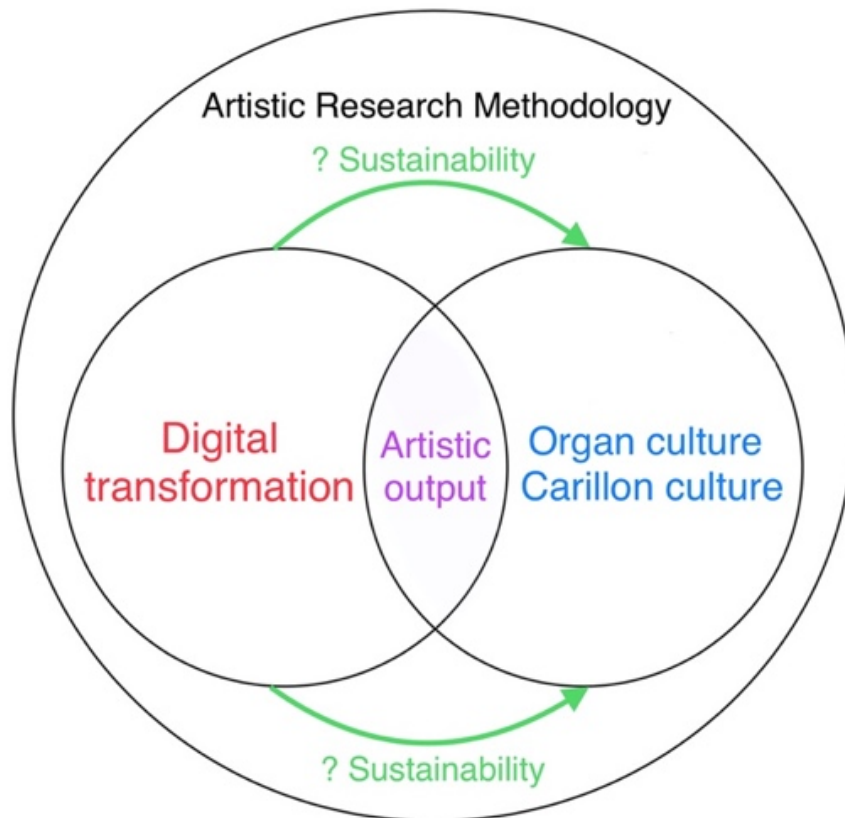
---

<sup>268</sup> Rebecca S. Robinson and Alex C. Michalos, "Purposive Sampling," (Dordrecht: Springer Netherlands, 2014). Online version ([link.springer.com](http://link.springer.com) via The University of Sydney Library)

<sup>269</sup> Assis, *Logic of Experimentation: Reshaping Music Performance in and through Artistic Research*. pp 79-80.

<sup>270</sup> i.e. Venn diagrams are not for further statistical analysis which is beyond the scope of this qualitative artistic research project.

**Figure 3.2 Digital transformation intersecting with organ and carillon culture to produce an artistic output**



## **Methods**

### **Data Collection**

Data was collected through observation and reflection within the creative processes of my artistic practice. Observations and reflections were generated through contemporaneous notes during each project and provided rich data. Observations and reflections was archived contemporaneously in a secure cloud-based multimedia diary that collated reflective

journalling, digital memos, digital scratch notes, annotated screenshots and searchable images of geolocated archival material important to each of the projects.

Reflective journalling was useful in the artistic research process as creative responses to a project, instrument or score could be documented in real time. As the artistic researcher, I could recognise assumptions and biases through re-reading my own entries and be aware of this at the next workshopping session or rehearsal. It was a safe space to document challenges and what I perceived to be failures during workshopping or rehearsals so that at the next cycle of the artistic process, improvements could be made. Reflective journaling supported my reflexivity as an artistic researcher and by extension research quality.<sup>271</sup>

Digital memoing allowed me to rapidly capture emerging ideas and thoughts. They were more formal than scratch notes and less structured than reflective journalling. I could also rapidly text or email my thoughts to interdisciplinary collaborators who were often not on site. This greatly enhanced the integration of multiple disciplines, transcended disciplinary boundaries and fostered fruitful collaborative outcomes across various fields. Tracking decision-making and artistic choices via memoing helped facilitate the artistic process and outputs to move from being interdisciplinary to being transdisciplinary. Traditional disciplinary boundaries were transcended to create new knowledge in the form of an artistic output.

Digital scratch notes were very useful during the artistic process as a tool of data collection. Initial thoughts and ideas were captured (sometimes only one word or image) and the casual,

---

<sup>271</sup> Sharan B. Merriam and Elizabeth J. Tisdell, *Qualitative research : a guide to design and implementation*, Fourth edition. ed., The Jossey-Bass higher and adult education series, (San Francisco, CA: Jossey-Bass, a Wiley brand, 2016).

unstructured format stimulated creativity. Both my digital memoing and digital scratch note taking were multimedia in nature: often short videos were paired with text and also still images and screenshots. I used cloud-based storage and handheld devices.

Annotated screenshots became extremely useful in the artistic research process. They allowed rapid documentation of instruments, venues and archival material. For all the above data collection methods, the use of searchable images of geolocated archival material was a powerful tool for collecting and organising data.<sup>272</sup>

### **Integrity of Data**

The multimedia diary was accessible on all my handheld and laptop devices and secured with password and biometric protection. Methods to ensure data integrity included regular backup and duplication of important material, triangulation with multiple data sources to verify accuracy and an awareness of my own biases as an artist and researcher. Detailed records were kept for all the projects during the artistic research process. The records were in diverse forms: text, images, videos, sound recordings etc. to ensure richness of data collection.

### **Data Analysis**

Data (from notes made contemporaneously during the artistic project) were analysed through composing point form, text based observational and critical reflections for a carillon or organ project. These were then categorised in an artistic research framework (Assis, 2020).<sup>273</sup>

During qualitative analysis of the data, I was mindful that it was derived from the iterative and cyclical artistic process portion of a project and data may be separated by time and

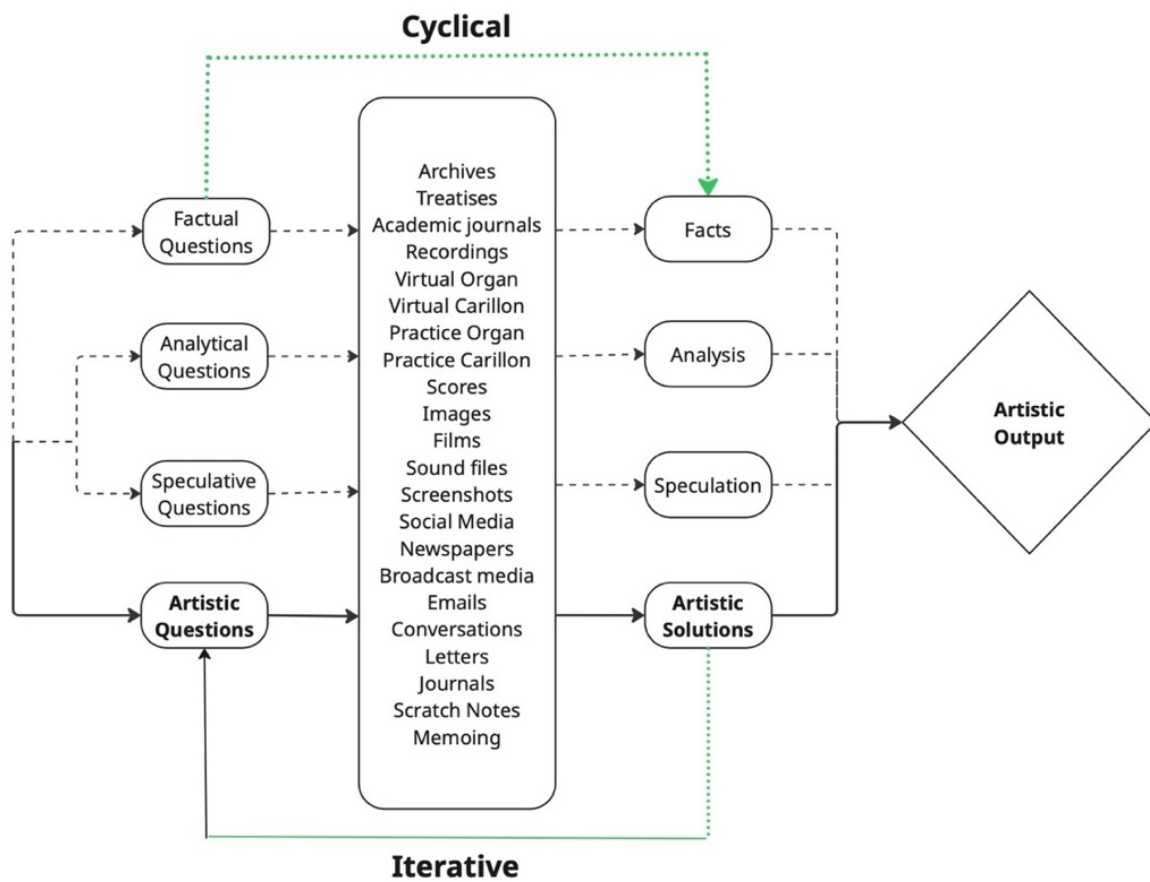
---

<sup>272</sup>Lyn Richards, *Handling qualitative data: a practical guide*, Fourth edition ed., Core textbook, (London: SAGE Publications, 2021).; Aarti B. Arora et al., "Scratch Notes," (Hoboken, NJ, USA: John Wiley & Sons, Inc, 2017).

<sup>273</sup> Assis, "Artistic research seminar 2 - artistic research in music."

location. Figure 3.3 illustrates the cyclical nature of the artistic process as described in this artistic research methodology. This portion of the flow chart captures the workshopping and rehearsal stages of an artistic project where cultural assets and tools that contribute to the artistic output may only emerge in later iterative cycles—it was important to be aware of this so that all data was analysed. Themes and patterns were identified through generating the categorised text descriptions and adopting artist-led cultural mapping approaches which will be described below. Artist-led cultural mapping approaches are discussed because they hone and further refine the general cultural mapping theory discussed in the literature review to better inform the prose based, narrative qualitative analysis in the Discussion.

Figure 3.3 Cyclical and iterative nature of the artistic process



Drawing on the artistic research framework developed by Assis (2020) and discussed in section 2.4.<sup>274</sup>, artistic outputs for each project were analysed through using the following artistic research questions:

**(1) Factual questions**

e.g. which organ or carillon is being used for the performance?

What are the specifications of this instrument?

---

<sup>274</sup> Assis, "Artistic research seminar 2 - artistic research in music."

Where is the site?

Who is the composer?

## **(2) Analytical questions**

e. g. What influenced the composer in the creation of a work?

How do I enact the composer's score on the instrument designated for performance?

How do I perform the work if there is no score?

## **(3) Speculative questions**

e. g. What is the emotion conveyed in that phrase of a musical work?

How will the audience react to the way I perform this work?

What will be the reverberation time in the venue be at the performance next week? How do I adjust to this variability during the private rehearsal and public performance?

## **(4) Artistic questions**

e. g. which organ stops create the sense of enormity required?

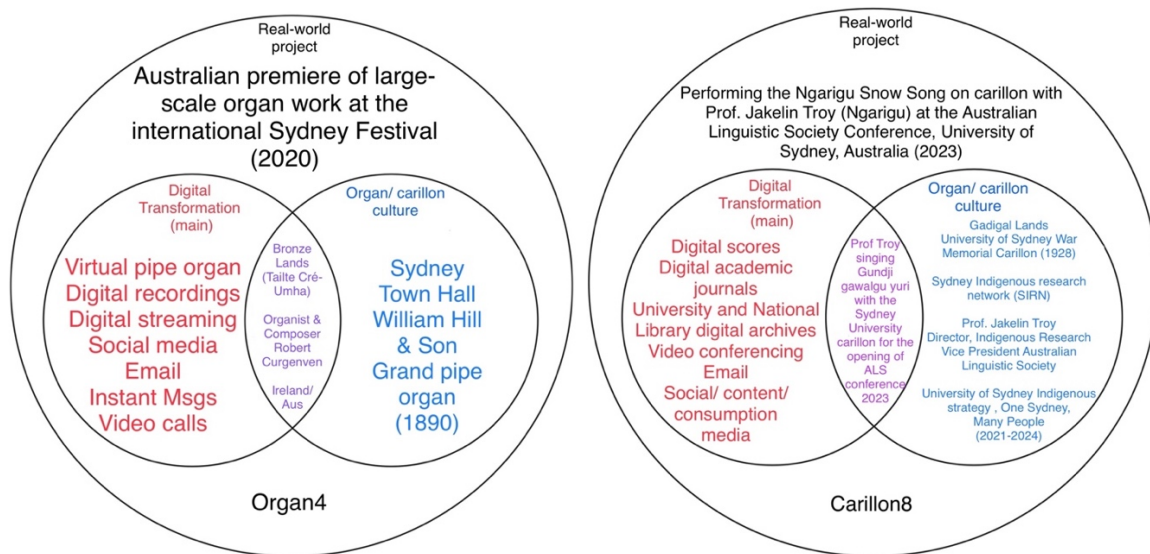
How do I learn to embody the sensation of creating my own wind supply for an instrument that is only allowed limited access by the artist during the rehearsal phase of a project?

How do I position myself and my instrument during performance so that I form a meaningful tableau with the visual artwork that inspired a composition?

From these questions the (1) facts, (2) analyses, (3) speculation and (4) artistic solutions used to make the artistic output are identified. As part of an iterative, cyclical approach, these 4 questions can be repeated as part of the artistic process. They are the four categories used for the text-based analyses in the results. For each project, this text based qualitative data is

summarised in a Venn diagram that maps the aspects of digital transformation that intersected with organ and carillon culture during the project. This assists in identifying themes and patterns so the data can be interpreted across the projects with regards to how they impact on the sustainability of organ and carillon culture.

**Figure 3.4 Examples of Venn diagram: Organ Project 4, Carillon Project 8**



For each project, a Venn diagram summarising the digital and non-digital cultural assets associated with each project was generated to visualise intersections between areas of interest. These areas of interest align with Objective 1.3 and are (1) digital transformation, (2) organ culture and carillon culture and (3) sustainability (that of organ and carillon culture).

Digital and non-digital cultural assets and tools can be mapped to produce an inventory that is useful in understanding the impact of digital transformation on the sustainability of organ and carillon culture. As an organist, carillonist and artistic researcher, my identifying these digital and non-digital assets within my own artistic practice, can be considered a form of artist-led cultural mapping. Digital assets or tools are of course intangible but in the case of VPOs or VCCs they are intangible representations (digital virtual sample sets) of a tangible cultural

item (a physical organ or carillon). Within the artistic space these complex ideas find a natural home. Duxbury, Garrett-Petts and Longley in *An introduction to the art of cultural mapping* state that “artistic approaches to cultural mapping foreground material strategies for moving ideas between the abstract and the concrete and [are good at] finding the means to articulate the intangible.”<sup>275</sup>

The authors also write:

Artistic interventions into the field of mapping may bring unprecedented connections between the material and the abstract, the actual and the virtual, the tangible and the intangible, the objective and the felt.

Additionally:

...artists’ contributions allow space for the imaginary, wherein the spaces between reality and possibility are made porous and interlayered. Imagination carries potentials for unseating convention, perspective, actuality, reproducibility, and common sense.<sup>276</sup>

Cultural mapping was discussed in section 2.1 and very much suited an urban planning imperative (in the external world). Artist-led cultural mapping is an evolution of cultural mapping as a form of inquiry, into spaces that are made “for imagination” (within internal spaces). The book *Artistic Approaches to Cultural Mapping: Activating Imaginaries and Means of Knowing* asserts that artist-led mapping of cultural resources:

...emphasizes the importance of creative process that engages with the “felt sense” of community experiences...contemporary artistic approaches can challenge conventional asset mapping by animating and honouring the local, giving voice and definition to the vernacular, or recognizing the notion of

---

<sup>275</sup> Nancy Duxbury et al., *Artistic Approaches to Cultural Mapping: Activating Imaginaries and Means of Knowing*, 1st ed., Routledge Research in Culture, Space and Identity, (Oxford: Routledge, 2019).

<sup>276</sup> Nancy Duxbury et al., "An introduction to the art of cultural mapping: Activating imaginaries and means of knowing," (United Kingdom: Routledge, 2019). p 6.

place as inhabited by story and history. It explores the processes of seeing and listening and the importance of the aesthetic as a key component of community self-expression and self-representation.<sup>277</sup>

### **Ethics and permissions**

Ethics approval was not required for this study. The images featured in this thesis were mainly taken by me in public areas or with approval at artistic project venues. If photos were not taken by me, permission was sought and granted by the photographer or institution that owned the image. Images in this thesis are mainly of instruments and their sites. If identifiable persons other than me are in the images, permission has been sought and granted for inclusion in this thesis. Permission was granted for the use of the Sydney University May 2024 graduation viewing statistics by the Organ and Carillon Unit and Graduations Office. The livestreams of University Graduation ceremonies are online and openly accessible for a period of time then archived by the third-party streaming service and the Graduations Office. For audiovisual material that has not been already published as permanent online open access or since archived in dark storage, I have chosen to only feature brief unlisted video excerpts to demonstrate very specific points. This is to protect privacy and also adhere to fair use requirements.

### **Limitations of the study**

Unlike probability sampling, purposive sampling or selection is not intended to give a representative sample. Artistic practice is inherently subjective. Scientific research is designed to be objective. Artistic research in combining artistic practice and scientific research principles relies on the reflexivity of the researcher. There may be limited generalisability to other contexts outside the organ and carillon communities.

---

<sup>277</sup> Duxbury et al., .

### **Shortcomings of this methodology**

A shortcoming of this methodology is that the reporting of data can be repetitive. There may be variability in the amount and type of data generated as they are real world projects (as previously defined). Some projects were more complex and detailed than others – this is unpredictable given the real-world nature. The large sample size of artistic cases (8 organ, 8 carillon) over a long period of time (10 years) is a counterbalance to these shortcomings. It is beyond the scope of this project to incorporate audience feedback or engagement data though this would be of interest in future projects. Ethics permissions would have to be sought in advance for the collection of audience engagement data.

### **Alternative methodologies**

A retrospective case study methodology was considered however this does not focus on the artistic process or regard it as a generator of new knowledge. Retrospective case study methodology also does not acknowledge, as artistic research does, that the object of a research study may not be entirely constituted before the research starts. In artistic research the object of research is given space to emerge in greater detail as the research iteratively progresses.<sup>278</sup>

---

<sup>278</sup> Assis, "Music 2.0 and artistic research. Beyond a thousand years of Western art music."

## 4 Results

The results of the 16 practice-led artistic research organ and carillon projects (2016—2025) are presented chronologically by instrument (eight organ, eight carillon). Artistic processes were iterative and cyclical within and between each project i.e. implicitly, Assis' four artistic research questions were considered cyclically until an artistic output was achieved. The Organ and Carillon Project results are in brief note form and written based on data that was collected at the time of the Projects (i.e. contemporaneously; see Chapter 3 Methodology).

### 4.1 Organ Project 1: Commemorating the 175th Anniversary of the City of Sydney with organ music at the Sydney Town Hall Grand Organ (2017)

Figure 4.1 William Hill & Son Grand Organ (1890), Sydney Town Hall. Photo: Damian Shaw (2017)



Imitations for pipe organ (Buckett, 2017) World premiere of a new pipe organ commission for the 175th Anniversary of the City of Sydney, Australia.

## Imitations for Pipe Organ by Austin Buckett

5th November 2017

<https://www.youtube.com/watch?v=JwWY5Xq42-Y> (20:08)

see Appendix 1 for Imitation score introduction and example pages

see Appendix 2 for Bavo Edition of Imitations for Pipe Organ

### Summary of artistic project

My main artistic output from Organ Project 1 was performing *Imitations for Pipe Organ* (Buckett, 2017) on the Sydney Town Hall Grand organ. It was an experimental solo organ work exploring of the origin of sound and its decay. The artistic outputs for this collaborative project spanned live performance, composition (as an organist workshopping with the composer over a 6 month period), oral presentations, interviews (within a [documentary](#)),<sup>279</sup> [recordings](#),<sup>280</sup> [social/broadcast media](#)<sup>281</sup> and a [museum exhibition](#)<sup>282</sup>. A transcription of Buckett's original score was made for submission to the Haarlem Organ Festival for a Young Composer's Masterclass performance (a composer from China was ultimately selected for the public performance).

In terms of notation, *Imitations* can be regarded as a minimalist work. However, in terms of soundscape and tonal complexity, the work is utterly maximalist in ambition. The composition attempts to input and then extract the last breath of air from each organ pipe that

---

<sup>279</sup> Documentary, *Imitations for pipe organ* (2017): The sound of Sydney Town Hall organ  
<https://www.youtube.com/watch?v=fitKU0FfDYI>

<sup>280</sup> *Imitations for pipe organ* live video recorded at the 2017 premier by the City of Sydney and uploaded to YouTube by composer Austin Buckett (aka Austin Benjamin aka Utility).  
<https://www.youtube.com/watch?v=JwWY5Xq42-Y>

<sup>281</sup> Social media video made by the City of Sydney for wide distribution across tradition and new media channels to promote the 175th Anniversary world premiere. [https://www.facebook.com/cityofsydney/videos/a-new-soundscape-for-town-halls-grand-organ/10155212458998892/?locale=de\\_DE](https://www.facebook.com/cityofsydney/videos/a-new-soundscape-for-town-halls-grand-organ/10155212458998892/?locale=de_DE)

<sup>282</sup> State Library of New South Wales, *The Dictionary of Sydney for the City of Sydney Exhibition* "Our City: 175 years in 175 objects" curated by the City Historian Dr Lisa Murray.  
[https://dictionaryofsydney.org/blog/our\\_city\\_175\\_years\\_in\\_175\\_objects](https://dictionaryofsydney.org/blog/our_city_175_years_in_175_objects)

is allowed to sound. This experimental organ work was commissioned for the 175th Anniversary of the City of Sydney by the City Historian Lisa Murray. A competition required entrants to submit a proposal for a ten-minute solo organ work. A \$10 000 first prize was to be awarded to the winner. The panel included the City Historian (Dr Lisa Murray), a professor of composition from Sydney Conservatorium of Music (Professor Matthew Hindson), a cathedral organist and representatives from the general community. Twenty-eight-year-old composer Austin Buckett was selected by the committee and given a six-month timeframe to create a notated work for the Sydney Townhall William Hill & Son (1890) Grand Organ.

*Imitations for Pipe Organ* was Buckett's first solo pipe organ work. I was asked by the composer and the City Historian to workshop and perform the world premiere of *Imitations for Pipe Organ* on the 5th of November 2017. The world premiere was considered part of the Museum exhibition *175 years in 175 Objects* curated by Dr Lisa Murray. The museum exhibition was opened by Mayor Clover Moore on the 1st of November 2017 at the Sydney Town Hall. The museum exhibition featured historical organ programs, historical tickets and other tangible ephemera related to the Sydney Town Hall Grand organ. The commissioning of the new work was part of the exhibition. Buckett's composition (score and video recording) and a series of still images were to be archived digitally as part of the City of Sydney collection related to the 1890 William Hill & Son Grand organ. The City Historian also requested one of the organ weights used for the premiere performance as a physical artifact from the project to archive for the City collection.

## **Artistic Process**

### **Facts**

- Date of premiere: 5th of November 2017.
- The specification of the of Sydney Town Hall 127 stop William Hill & Son organ was available from online sources (City of Sydney webpage).
- The history of the City of Sydney and the organ was available from the City website and digitised archives. Additional information from the National Library of Australia Trove archive of historical newspapers was available.
- I undertook a process of collaborative listening to organ repertoire with the composer on YouTube and Bandcamp.
- The composer and I met with leading organists in Sydney to help the composer understand organ culture in Australia.

### **Analysis**

- Access to the physical, tangible instrument in Sydney Town Hall Centennial Hall allowed me to workshop and rehearse with the composer over a 6-month period. We were able to analyse the physical challenges that a 5 manual, 127 stop instrument presented.
- Attending the instrument in person, the composer understood my suggestion that we should collaborate with two registrants for the performance. The two registrants were professional musicians however, non-organists (a flautist/ visual artist and a drummer). During the

workshopping process this led to transdisciplinary solutions to enacting the composer's score, such as colour coding and the unconventional labelling of organ hardware.

- Over the six-month period for workshopping, digital memos, scratch notes, emails and text messages with attached sound files, served as a useful way to exchange ideas. Ideas were honed through this cyclical and iterative exchange of digital recorded sound files which varied from a few second to 10's of minutes. We would often refer to these files at the physical organ console; the digital and real/ actual sounds of the Sydney Town Hall were given equal importance in this stage of workshopping.

- Cloud storage was important in sharing larger file like score drafts. We used this period to analyse and understand the facts we had discovered about this specific organ and organ repertoire, history and culture in general.

- I spent many hours playing at the console of the organ while the composer listened from various places in the hall. Often, he instructed me to combine various chords and clusters with registrations he had devised at previous workshopping sessions; sometimes instruction came to me at the organ console via real-time text messages from the composer listening at the back of Centennial Hall. Buckett documented these developing registrations as a sound journal in a detailed handwritten notebook.

### **Speculation**

- Often ideas would coalesce in the composer's mind, or an artistic solution would emerge in mine away from the organ console. Creativity was often at logger heads with the schedule of the busy and important venue that is Centennial Hall.

- In these situations, the composer and I used a virtual representation of a late nineteenth century English pipe organ. Buckett attended the Historical Performance studio (Room 1043) at Sydney Conservatorium, and we would continue our work at the VPO. We explored the twenty-five plus sample sets of historical instruments (mainly significant pipe organs from the German, French, Spanish and English organ building schools). The sample set we ended up drawing on the most was the 67 stop Hereford Cathedral (United Kingdom) Father Willis pipe organ (1892) sample set (Lavender Digital Audio; Hauptwerk Midi controller; Noorlander organ console).

- There is no sample set available of the Sydney Town Hall organ. However, using the digital virtual representation of a late nineteenth-century English pipe organ allowed us to speculate about how the emerging composition may sound in Centennial Hall.

- We also tested these ideas at the mechanical action Walker & Son (1874) pipe organ at St Stephen's Newtown. This work at three different organs provided useful triangulation of our creative ideas and instilled a robustness to Buckett's composition and developing registration choices.

### **Artistic solutions**

- In looking for a cohesive artistic solution we embarked on an extended process of collaborative listening to organ repertoire. Buckett identified key composers, and organ works that influenced his composition: Johann Sebastian Bach (*Passacaglia and Fugue in C minor*, BWV 582), Dieterich Buxtehude (1637-1707) (*Passacaglia in D minor*, BuxWV 161), Phillip Glass (*Mad Rush*) and Frank Martin (*Passacaille pour orgue*). Generally, he was inspired by the body of work (organ and non-organ works) from composers Max Reger,

György Ligeti, Terry Riley and John Cage. Buckett was influenced by the idea of imitative presets as used in contemporary music production (and evolved from pipe organ culture). He had also been immersed in Peter Ablinger's ideas of repetition while studying in Berlin. All this material was accessed in the digital space from social media, content media and streaming services.

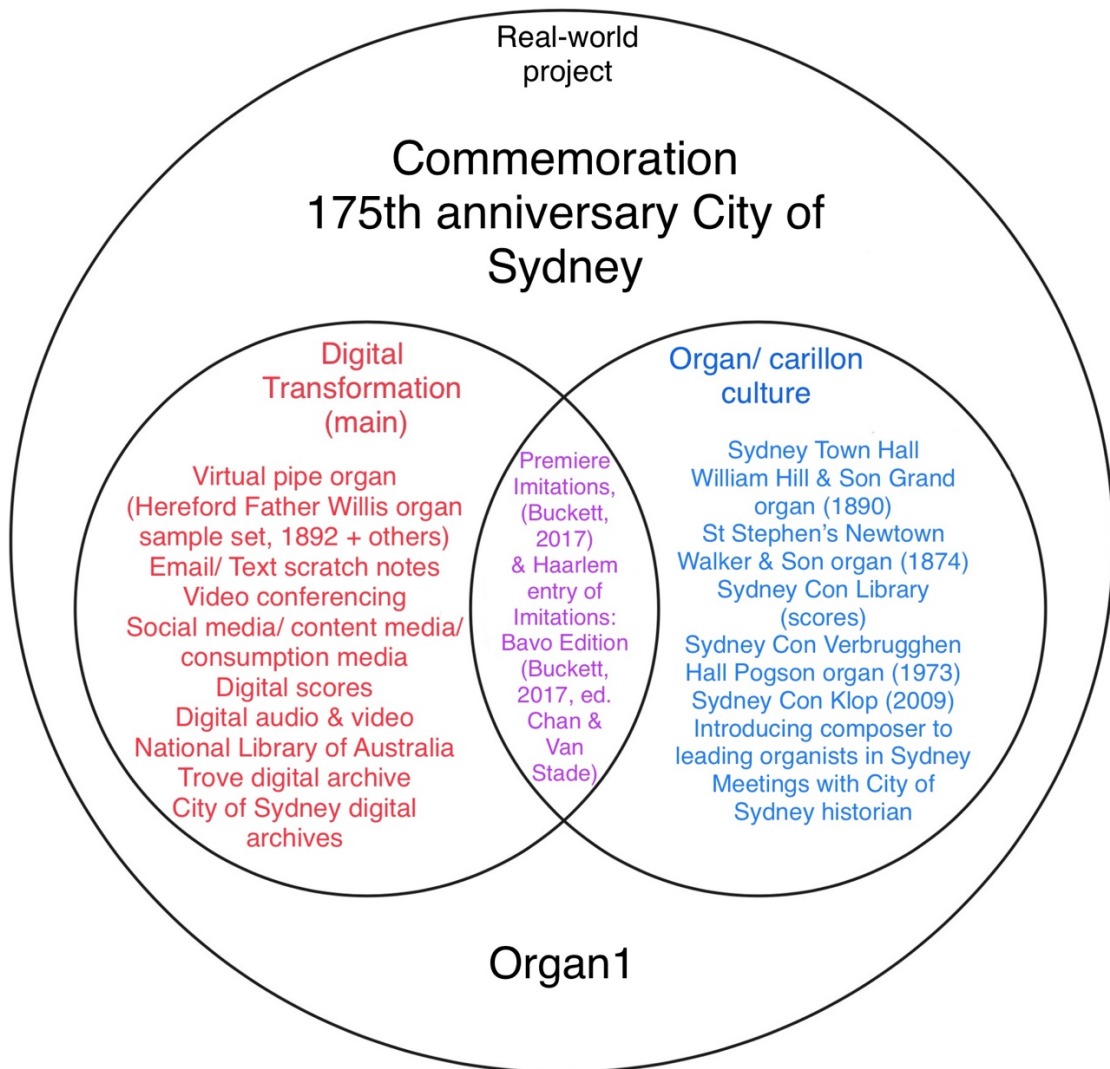
- Austin Buckett decided to draw on the functional aspects of intangible organ culture. He wanted to elevate the work of organ builders and craftsman—in musical devices such as the activation of the blower of an organ or using weights to hold notes like an organ tuner. Buckett's father was a carpenter—a craftsman. The composer grounded his composition in similar utility—he used large bolts and nuts from his father's wood workshop as organ weights.

- For the 175th Anniversary commission, Buckett wanted to showcase the beauty and tonal range of the William Hill & Son (1890) organ in a way that was new to audiences. He composed detailed, complex tonal combinations derived from our extensive workshopping sessions at the physical instrument. Buckett devised a colour coding system to facilitate rapid stop changes between extended chords. My task as organist was to create the notated chords with the weights as two skilled registrants rapidly changed the stops between “modules” of the composition. It was also my task as the organist to turn the organ blower on and off — with specific instructions (see Appendix 1). Preparation for this stage of the project needed to be conducted at the physical, mechanical action instrument.

- At my home studio, I assembled a “practice console” with 5 keyboards and life size images of the stops. This was crucial in helping me to practice the changing of key weights so that it

became automatic and precise (with safety to the heritage keyboard a key consideration). This helped the fluency of changing between “modules” of the work and was important in achieving a sense of cohesion while performing Buckett’s organ work

Figure 4.2 Venn diagram for Organ Project 1



## 4.2 Organ Project 2: New music for portative organ for the La Dame à la licorne tapestries (France, c. 1500) at the Art Gallery of New South Wales (2018)

Figure 4.3 Ronald Sharp portative organ (1986—1988) and La Dame à la licorne (1500). Portative organist Grace Chan performing with Mr Phillippe Platel, French Cultural Attaché, Embassy of France, Sydney, Australia. Photo: Benoît Deney (with permission)



Audience phone video of Wandteppiche by Lyle Chan (2017)

13th of February 2018 (50 sec)

[https://youtu.be/PCAuZMRY6Z8?si=J0q6bUR3\\_bR20NEw](https://youtu.be/PCAuZMRY6Z8?si=J0q6bUR3_bR20NEw)

Social media video post by journalist at La Dame à la Licorne (the Lady and the Unicorn) media launch

9th of February 2018 (14 sec)

<https://youtu.be/9Pa-UII8bOQ?si=fZGV8dIx4Dxf7Kdo>

## **Summary of artistic project**

My main artistic output from Organ Project 2 was performing the premiere performances of two new Australian works for portative organ as a tribute to the La Dame à la licorne tapestries (France). My artistic outputs for the whole project spanned live performances (one as a gallery installation) and social/broadcast media content.

The La Dame à la licorne (Lady and the Unicorn) tapestries are a French national treasure and usually never leave France. The six large scale tapestries represent the 5 senses—touch, taste, hearing, smell, sight—and were woven around the sixteenth century. The Embassy of France in Sydney, through its cultural attaché Mr Phillippe Platel, was able to coordinate a rare loan from the Musée de Cluny, Paris as a diplomatic gesture of goodwill to Australia. Mr Jason Catlett was the curator of a music program that was to accompany the exhibition of the tapestries at the Art Gallery of New South Wales. Mr Catlett commissioned a series of new works from Australian composers for a concert series in the Art Gallery of New South Wales as a tribute to the loan. I was asked to perform the premiere of new works by two respected Australian composers, Lyle Chan and Moya Henderson, in the presence of all six tapestries. The performance was to be on a portative organ, set up as a gallery installation in front of the tapestry “Hearing.” The portative organ designated for the performance had its own meaningful provenance. The organ was made by Australian Ronald Sharp (1929—2021) who was the organ builder for the iconic Opera House organ. The instrument was a loan from the Museum of Applied Arts and Science (MAAS, now the Powerhouse Museum) to the Art Gallery of New South Wales as part of a program of radical accessibility for archived (and silent) musical instruments in its collection. The project contained powerful creative synergies: celebration and thanks for an international diplomatic gesture, ancient treasures

displayed to the Australian public for the first time and a silent tapestry of a pipe organ infused with sound from an awakened museum relic.

## **Artistic Process**

### **Facts**

- The portative organ to be played for the premiere had never been used for a performance. In the lead up to the 1988 Australian bicentennial year celebrations, a portative organ was commissioned from Australian organ builder Mr Ronald Sharp as an example of his work and immediately placed into museum storage.

- Information about the organ was available from the museum website—I was able to see the instrument (as high resolution archival images) and read about the specifications of the instrument before physically playing it.

- To understand the broader aspects of the project, I was able to access the history of the tapestries online at the Musée de Cluny website. The tapestry with the visual depiction of “hearing” (an auditory sense) did not feature a portative organ but a positive organ being played by a woman. Another younger woman (possibly a servant) was activating the bellows.

- The organ I was to premiere the new works on (a portative organ) required the organist to play the keys and also operate the bellows. It was very helpful to be able to obtain all this information online ahead of meeting the composers Lyle Chan and Moya Henderson, the curator Jason Catlett and Art Gallery of New South Wales curator Jackie Dunn.

- I was able to access the websites of the composers for information about their artistic vision and hear some of their existing compositions on streaming services and YouTube. The Art Gallery of New South Wales by this stage had launched a detailed website and I was able to acquaint myself with the performance space and the other events in the arts program designed for the exhibition.<sup>283</sup>

- Through the University of Sydney Library website I was able to access online resources related to Renaissance music (1400—1600) and read about organ tunings of this period (Pythagorean, meantone and quarter comma meantone temperaments). I was able to access organs with these tunings on my virtual pipe organ (VPO) and experience these sound worlds in preparation for the project.

### **Speculation**

- One major area of speculation was what tuning the portative organ should be for the performances. Some of the composers had requested a meantone temperament and I had workshopped some early drafts of music with them on my virtual pipe organ (VPO) at the Conservatorium. I enjoyed experimenting with Pythagorean temperament on the VPO. However the organ tuners decided the metal mouths of the pipe were too fragile (and unusually rigid) to safely manipulate them beyond an equal temperament.

- I was able to finally able to play the Ronald Sharp portative organ on the 24 January 2018 in the foyer of the Art Gallery of New South Wales in front of the team of composers, curators

---

<sup>283</sup> ArtGalleryofNSW, "The Lady and the Unicorn," <https://www.artgallery.nsw.gov.au/artboards/theladyandtheunicorn/>.

and French embassy staff. It was wonderful to finally play the physical instrument after only “meeting” the portative organ in the digital realm.

- The portative organ keys were much smaller than I had expected. This combined with the limited time I had to prepare for the premiere led to the purchase of a Casio SA-76 (2015) digital keyboard with 44 mini-size keys, 3.5 octaves, 100 tones. This digital keyboard made for the mass market used a custom synthesizer chip and pulse code modulation samples to generate sound. The size of the keys was identical to those of the portative organ and I could easily practice with it turned at an angle.

- I discovered through playing the physical instrument at an Art Gallery of NSW composer session, that I needed to position the keyboard at an angle so I could operate the bellows with control.

### **Artistic solutions**

- The greatest challenge for me in this project was adjusting to performing while activating the bellows. Access to the Ronald Sharp portative organ was limited due to its protected status as a museum object. I was allowed a restricted number of hours at the Art Gallery of New South Wales to rehearse the new works for the premiere.

- The digital keyboard helped me adjust to playing on smaller keys with the keyboard at an angle, however I still needed to embody the sense of controlling the wind supply of my instrument while playing. A digital keyboard was not the solution.

- I was able to source another portative organ in Sydney, donated by retired early music specialist Professor Winsome Evans to the Santa Sabina school in Strathfield. Having time on this acoustic instrument made me realise the inadequacy of the digital keyboard for this purpose.

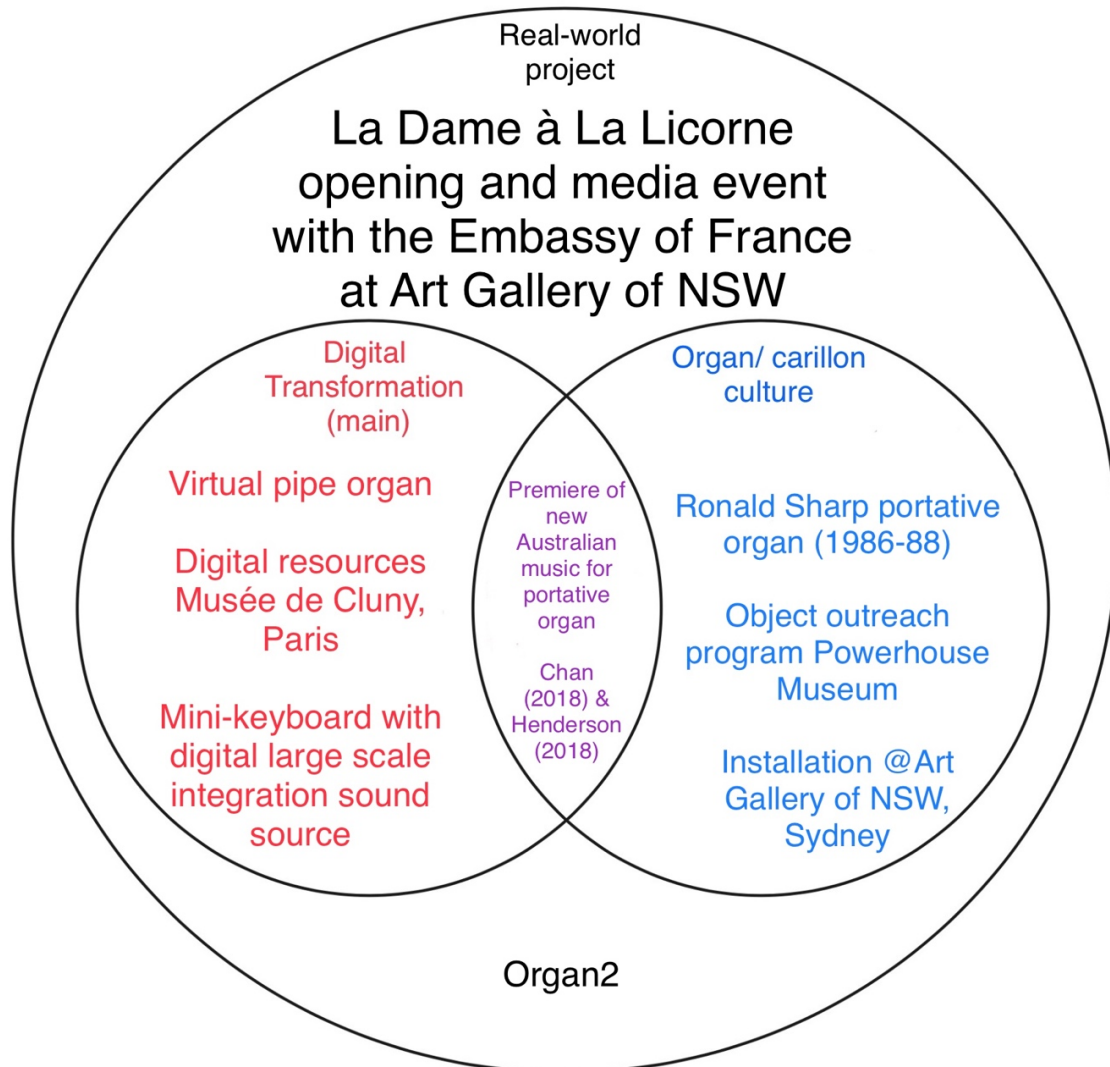
- I also practiced the pieces on a Mustel Art Harmonium at the Conservatorium and Estey reed organ in my home studio. These three instruments (the practice portative, harmonium and reed organ) helped me understand how to develop nuance and musicality when operating the portative organ bellows in performance.

- This project alerted me to the limitation of digital instruments to simulate keyboards where wind control by the artist is paramount to creating an expressive performance. The digital keyboard was only good for limited purposes— e.g. helping me adjust to the difference in keyboard size. In this instance, I was fortunate to have access to the Winsome Evans portative organ for practice. I did not expect this little organ to teach me so much about being expressive as a musician. After this project, I deleted the open-source harmonium sample set from my VPO. The portative organ taught me about the importance of wind control for performance on it and the harmonium.<sup>284</sup>

---

<sup>284</sup> Hauptwerk MIDI controller software does offer bellows and windchest adjustment for bigger organs.

Figure 4.4 Venn diagram for Organ Project 2



### 4.3 Organ Project 3: Performing Satie’s Vexations at the Extended Play festival of new music, City Recital Hall (2018)



Figure 4.5 (Left) Sydney Town Hall organ Photo: Grace Chan (2018)

Figure 4.6 (Right) Performing Vexations at City Recital Hall Extended Play 2018, Photo: Elaine Chia

See Appendix 3 for the score of Vexations by Eric Satie, re-pitched by Lyle Chan<sup>285</sup>

---

<sup>285</sup> Personal communication from the curator and composer Dr Lyle Chan 28/12/2025 explaining the “re-pitching” of Vexations for the Extended Play Festival: “More than any other work of Satie’s, mystery surrounds *Vexations*. We don’t know if he even intended the work to be performed or published. We don’t know the meaning of the famous inscrutable sentence on the score: “To play this motif 840 times in succession, it would be advisable to prepare oneself beforehand, in the deepest silence, by serious immobilities”. If it’s an instruction to perform the “motif” 840 times, then what is the “motif”? Our modern performing tradition interprets “motif” to mean the entire work, but it could also refer to the “Theme”, the monophonic line labelled as such by Satie.

For the audience-participation performance of *Vexations* in the 2018 Extended Play festival, I embraced the ambiguities in the score — Satie never specified the instrument, so we allowed any, including an exercise bike that triggered a recording. Satie never specified the number of performers for the work, nor whether one repetition needed to finish before another began, so we allowed simultaneous performances. Some people played live, and some via video link. I regard my re-spelled score of *Vexations* as a performing edition. Extended Play invited participation by amateurs, for whom the performing edition removed a bar to entry; many professionals continued to use the original. I see this as no different to modern performing editions of 14th century music, for instance, where the original neume and mensural notations are replaced by today’s five-line staves with bar lines and time signatures. Specialist performers have no trouble reading an original Guillaume Dufay, but the majority of performers use a performing edition.

## Summary of artistic project

The main artistic output from Organ Project 3 was performing 100 iterations of Satie's *Vexations* at the City Recital Hall Extended Play Festival of New Music (2018) on a portable digital keyboard. The performance was the last set of repetitions in an eleven-hour marathon. It was performed in a communal area of City Recital Hall.

Extended Play was a twelve-hour micro festival of new music. Co-curator and co-artistic director Lyle Chan described the event as a new music "musical marathon."<sup>286</sup> It took place on the 25 August 2018 in City Recital Hall, Sydney, Australia. I received a text message from Chan asking if I could participate in a communal iteration of Satie's *Vexations*. The short piece is one page in length (see Appendix 3). The original instructions from the composer Satie are: "In order to play the motif 840 times in succession, it would be advisable to prepare oneself beforehand, and in the deepest silence, by serious immobilities." Chan's instructions to me were "please just show up when you can." I decided to give Satie and Chan's instructions equal weight, arriving at City Recital Hall in the evening after a busy day.

The performance at City Recital Hall was collectively 11 hours in duration and the communal effort achieved 984 repetitions of *Vexations*. The ABC news site reported on the event:

Though the original score is written on a piano staff, Satie did not specify the instrumentation. The recent performance at the Extended Play Festival invited the community to take turns playing the piece transposed for their own instruments. An exercise bike hooked up to a recording allowed non-

---

<sup>286</sup>Angus McPherson, "Extended Play: a new music perfect storm," *Limelight*, 2/8/2018, 2018, <https://limelight-arts.com.au/features/extended-play-a-new-music-perfect-storm/>.

musicians to join in. Punters at the festival heard *Vexations* on everything from keyboards to erhu.

[Composer Elena Kats-Chernin](#)<sup>287</sup> did an early shift at City Recital Hall. There was a wide range of professional and amateur performers throughout the day. I was told by co-curator Lyle Chan that I performed the last 100/984 iterations in the 11-hour communal performance.

## **Artistic Process**

### **Facts**

- I was able to download co-curator Dr Lyle Chan's "re-pitching" of Satie's score as a digital PDF instantaneously from the Festival webpage (see Appendix 3).

- I looked online to try and understand the history and culture surround Satie's *Vexations* and was able to find a large number of performances on social media.

- The instrument was not specified by Satie or Chan. Based on this (non) instruction I decided to bring my own instrument. I performed on the digital Casio SA-76 (2015) digital keyboard with 44 mini-size keys, 3.5 octaves and 100 tones that I had purchased for a portative organ project with Chan at the Art Gallery of New South Wales in February 2018. The keyboard was not entirely successful for that purpose. For that project I eventually sourced an acoustic practice portative organ (see Organ Project 2). I felt this latest project with Chan was a good

---

<sup>287</sup> "Vexations: The world's longest-running musical meme?," Australian Broadcasting Corporation, 2018, <https://www.abc.net.au/listen/classic/features/satie-vexations/10156186>.

way to recycle or even upcycle this instrument from an unsuccessful digital practice keyboard to a successful public community performance at City Recital Hall.

- The work of professional toy pianist [Margaret Leng Tan](#)<sup>288</sup> influenced this decision. I was familiar with her work from YouTube and Instagram.

- I referred to a dictionary of pipe organ stops to give context to the digital iterations in the digital mini-keyboard.

### **Analysis**

- Reading and watching material online, I realised that *Vexations* was a work designed to be beyond interpretation. To me, the repetition seemed to be a mantra or the musical version of raking pebbles in a circular pattern.

- I decided that I would find tonal and timbral interest in the work through using the portable digital keyboard's 100 preset sounds to play at least 100 repetitions of Satie's *Vexations*.

---

<sup>288</sup> Margaret Leng Tan describes how she was the first the woman to graduate from Julliard and how she started on the toy piano. <https://www.youtube.com/watch?v=6ITMcwP3b7A>

- Satie's indication on the score is to play "very slow." I was able to find many examples online. Iterations of the work online varied in length. The longest solo performance was [24 hours](#).<sup>289</sup> A "shorter" solo performance was under [10 hours](#).<sup>290</sup>

## **Speculation**

- I speculated on how the audience may respond to my performance, or if they would even regard it as a performance in the traditional sense.

- I also speculated on whether the listeners would think of the digital keyboard as a "real" instrument. Do I need to perform it on a "real" and "important" instrument to make a piece of music feel worthwhile to me as an artist or the audience? How do I challenge my own preconceptions and expectations of musical instruments so that I could deliver an invested performance for the Extended Play audiences?

- I speculated on the role of memory and emotion in drawing on concepts of play in my artistic process. The name of the festival (Extended Play) gave me a road sign to do this... I tried to remember what it was like playing an electronic organ at home as a child. I mainly remember not being restricted by any genre of music on the organ and enjoyed the endless combinations of sounds and preset rhythms (e.g. rhumba, bossa nova, march, waltz... etc)

---

<sup>289</sup> 24 hr performance of Satie Vexations <https://www.youtube.com/watch?v=jZNknHHgm0M>

<sup>290</sup> A performance of Satie Vexations that was just under 10 hours  
<https://www.youtube.com/watch?v=gImDzmNuEDA>

**Figure 4.7** Grace Chan playing at home on a childhood Kawai electronic digital organ for her Poh Poh Wong Yin Fong (1917-1997) visiting Sydney from Boston, MA, USA. A Chopin transcription for electronic organ is on the music desk. Photo: Ng Wun Yee (1988)



### **Artistic solutions**

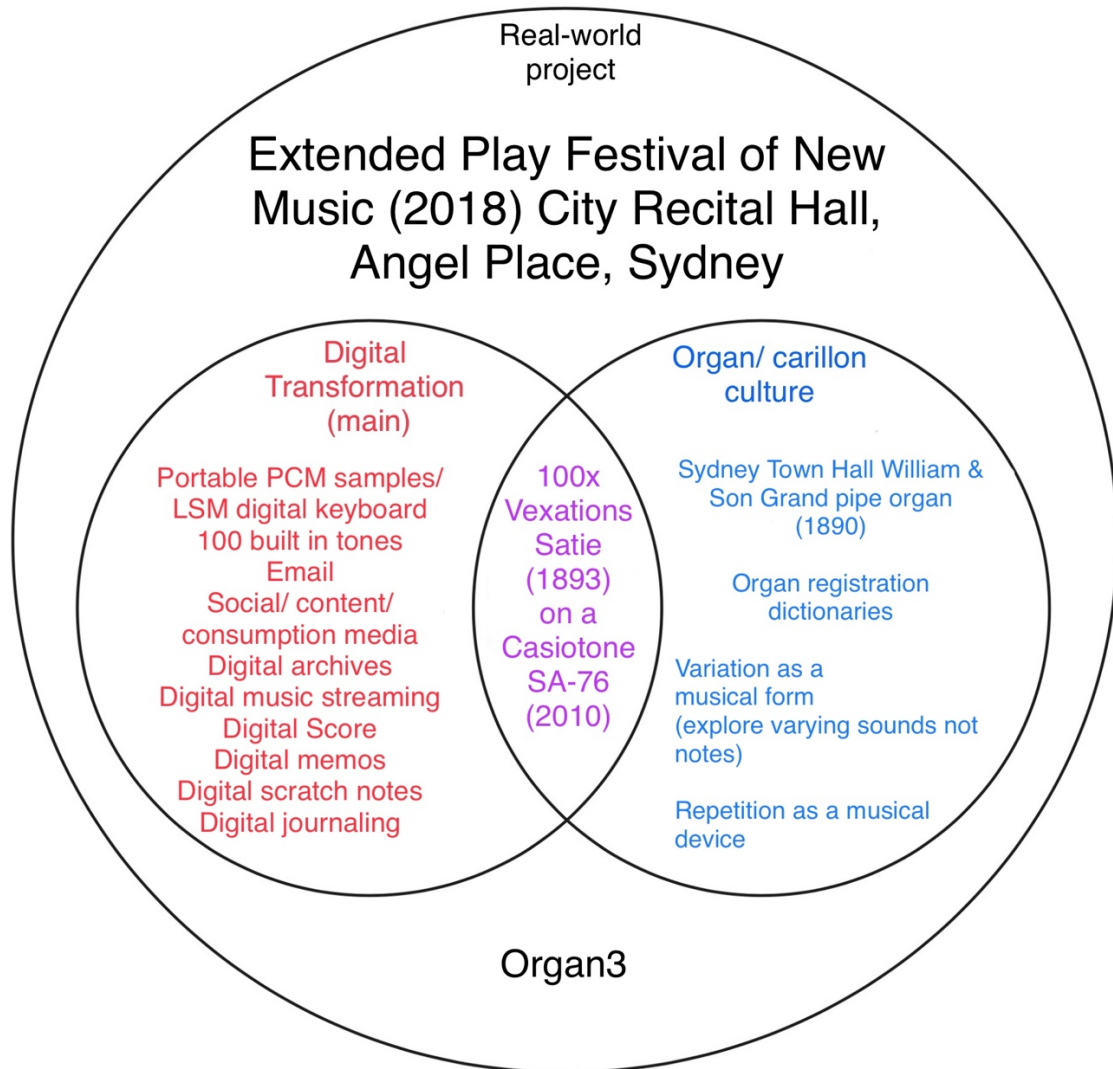
- To address my own speculations, preconceptions of artistic worth and understand what it would be like to perform 100 repetitions of *Vexations*, I decided to perform 127 on the Sydney Town Hall organ as practice. I was amused by the idea that I would be practicing for a recital featuring a tiny domestic digital keyboard on one of the biggest (and most important) mechanical pipe organs in the world. It made me think of Margaret Leng Tan and her channelling of joyful play in musical performance. Creating a situation of bemusement and absurdity helped me understand how to approach this performance of *Vexations* for Extended Play.

- The rehearsal session went very well. I used all 127 stops on the Sydney Town Hall organ, individually to play repetitions of Satie's *Vexations*. I used all 5 manuals, the pedals and different combination of manuals coupling. The changes in tonal colours between iterations were satisfying to me as a performer and listener. I learned more about the Sydney Town Hall instrument through playing Satie's work in this way. It reacquainted me with the sounds of the 1890 Hill & Son organ through this intense listening and rehearsal process. It made me consider future iterations of the 1893 *Vexations* with richly registered repetitions on the Sydney Town Hall organ. The rehearsal instrument (1890) was also historically appropriate for the piece of music (1893) (!).

- The task of manually selecting stops and changing keyboards imposed its own tempo to the work, as did the acoustic of Centennial Hall. I was sometimes interrupted by staff in the busy venue (who needed moments of silence). I enjoyed that the Hill & Son organ and its venue engaged with musical work and the Town Hall's workers in their own way— the rhythms of a busy public space.

- My rehearsal session at the Sydney Town Hall pipe organ also made me realise that I needed to approach the performance at City Hall as following a set of instructions (from the composer and from the co-curator). I added my own instruction to play the iterations using each of the 100 tones on the digital mini keyboard: this mass market "toy" could fulfil the same instructions as the prestigious instrument 5 minutes' walk from the City Recital Hall. I derived artistic satisfaction and gained new knowledge performing Satie's *Vexations* on both instruments.

Figure 4.8 Venn diagram for Organ Project 3



#### 4.4 Organ Project 4: Australian premiere of a large-scale organ work at the Sydney Town Hall Grand Organ for the 2020 Sydney Festival, Australia

Figure 4.9 William Hill & Son grand pipe organ (1890), Sydney Town Hall



*Bronze Lands* (Curgenven, 2019) for Sydney Festival 2020, Sydney Town Hall William Hill & Son grand organ

Full length recording of *Bronze Lands* by Robert Curgenven (2019)

<https://robertcurgenven.bandcamp.com/track/31-bronze-lands-tailte-cr-umha-live-at-sydney-festival-2020-part-i-vi>

See Appendix 4 (Sample of the registrations I developed for the 50 min work during rehearsal in Sydney)

#### Summary of artistic project

My main artistic output from Organ Project 4 was the development (over a 6 month period) and public performance of complex registrations changes for the Australian premiere of a 50 min work for pipe organ and sound system called [\*Bronze Lands\* by composer/ organist](#)

[Robert Curgenven \(Australia/ Ireland\)](#).<sup>291</sup> My artistic outputs for the whole project spanned live performance with the composer/organist Curgenven and a live recording funded by the City of Sydney (used to make a digital album that was released by Curgenven on his label Recorded Fields).

*Bronze Lands* (or *Tailte Cré-Umha*) by Robert Curgenven is a fifty-minute work that is a sonic cartography of ancient trade routes and highlights human relationships between continents. The composer/ organist also created bespoke lighting changes that accompanied the monumental, immersive work. Curgenven writes:

The basis for the piece's score and structure draws on Ireland's relations with Cornwall and Mediterranean Europe. 5000 years ago, coming into the Bronze Age, Ireland's copper and Cornwall's tin traversed the continent to make bronze. Tailte Cré-Umha derives the shape and movement of the score from the shape and movements of that route. ...Tailte Cré-Umha uses this navigation of the landscape itself as the score as those people and materials travel land, sea, sky and Europe at a time of change.<sup>292</sup>

I was asked by the composer/organist and Sydney Festival producers to participate as a performer/organist registrant at the Australian premiere on the 21 January 2020. The instrument chosen for the premiere was the William Hill & Son Grand organ (1890). The piece had been premiered at the [Cork Midsummer Festival in 2019](#).<sup>293</sup>

---

<sup>291</sup> Sydney Festival 2020 Webpage promotion for *Bronze Lands* by Robert Curgenven.  
<https://2020.sydneyfestival.org.au/events/bronze-lands>

<sup>292</sup> "Bronze Lands (Tailte Cré-Umha) - Live at Sydney Festival 2020 [Part I - VI]," Band Camp, 2020,  
<https://robertcurgenven.bandcamp.com/track/31-bronze-lands-tailte-cr-umha-live-at-sydney-festival-2020-part-i-vi>.

<sup>293</sup> <https://www.recordedfields.net/records/rfe04/>

Curgenven performed as an organist at the organ manuals. For the performance at the Sydney Town Hall, this solo work for pipe organ and sound system required a professional organist to function as a registrant to enact extremely complex stop changes (essentially performing as an organist on the organ stops to change the timbre and tonality of long chords interspersed with rapidly repeated textures). Unlike the organ Curgenven performed on in Cork, the Sydney Town Hall organ has no registration aids beyond fixed pistons (which required an organ builder to alter). Additionally, these detailed, frequent and precise changes needed to be tailored to Curgenven's digital recording of mechanical action organs in Ireland (at different tunings) to produce the interference (or "beating") that is the interest of the work. Incorporated into the recorded track is a manipulated version of a 78rpm acetate of an eighty-year-old Beethoven recording. This was an important marker in the narrative structure of the work and a symbol turning point in the music.

The work was performed to a sold-out audience at the international 2020 Sydney Festival. The audience either sat in the galleries or lay on mats in front of the organ, at the level of 12 subwoofers beneath the stage and under two large, suspended speaker stacks. For these listeners the experience was aural and very physical.

## **Artistic Process**

### **Facts**

- The 1890 Sydney Town Hall William Hill & Son Grand organ was to be used for the performance (information about the organ was found from the City of Sydney website and also iteratively derived from my own archived observations, reflections, annotated screen shots, memos and scratch notes from Organ Project 1 in 2017).

- The fifty-minute work for organ and sound system did not have a notated score. The composer played his part from memory and a list of timings.

- I had access to a live recording made at the world premiere at the Cork Midsummer Festival, Ireland (2019). Curgenvén's [webpages](#)<sup>294</sup> acted as an archive of his body of work. I was able to stream his catalogue of music and understand his compositional style.

- The composer was based in Ireland and toured frequently within the European Union. We met in person (by chance) during one of my regular practice sessions at the Sydney Town Hall. Most of our communications during the six-month preparation for the Australian premiere of *Bronze Lands* were in the digital space.

### **Analysis**

- Through analysis of the digital resources available to me, I worked out how I could perform a 50 min piece that did not have a score. I asked the composer for his timings of major shifts in the narrative of the work. I listened to the streamed live recordings of the Cork world premiere with these timings to memorise and also embody the changing landscape of the work.

- Much of the work consisted of large chords held by hand by the composer/ organist. Detailed registration changes created the interference between Curgenvén's recorded track

---

<sup>294</sup> Robert Curgenvén Organist and Composer webpages <https://www.recordedfields.net/>

and the Cork Cathedral pipe organ performance. The composer was able to develop and program these registrations at Cork Cathedral as it had some registration aides, however there was no computer system to do this at the Sydney Town Hall pipe organ. All registrations for *Bronze Lands* needed to be done by hand in real time.

- I accessed online maps of the ancient trade routes that inspired the work to see if they could assist me as a de facto graphic score.

### **Speculation**

- The temperature and humidity (affecting the tuning of the organ) in Centennial Hall affected the registrations choices for the performance. These environmental variables would not be known until close to the performance date, if not only on the day.

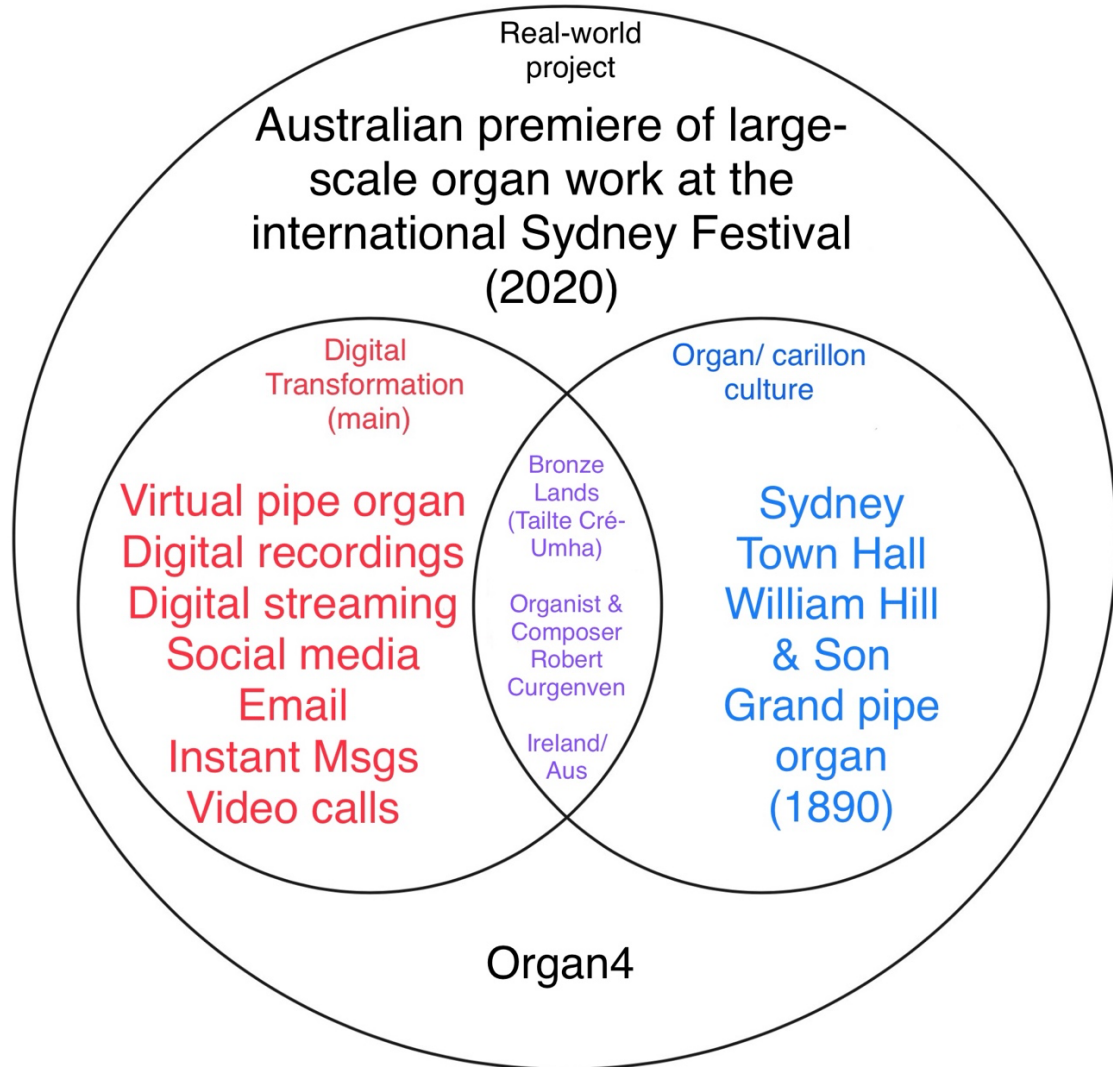
- The composer was due to arrive from Europe 48 hrs before the performance. 6 months of preparation had been conducted remotely in the digital space. This included me, over the 6 months recording on my smart phone all 127 stops in various combinations that I thought would work for Curgenvén's composition. I would record these audio jottings and message them to the composer who would response in real time to my questions at the console.

- I made extensive use of the English romantic organ sample set on my virtual pipe organ to understand various stop combinations that the composer and I hypothesised may work.

## **Artistic solutions**

- We were allocated 12 hours of access to the organ in the two days before performance.
- The Sydney Festival producers compiled an interdisciplinary team of events staff, sound engineers, lighting technician and artistic directors/ producers who assisted with the execution of the event. One of the artistic directors wanted to incorporate a “wellness” aspect to the audience experience and suggested yoga mats at subwoofer level for an immersive, embodied listener experience.
- Our remote preparation allowed us to rapidly fall into “work-mode.” I was able to develop the 50 minutes of registration changes within 4 hrs after hearing Curgenven perform his composition at the Sydney Town Hall organ for the first time. We used the remaining 8 hours to rehearse the work.
- Using Curgenven’s Cork timings as a scaffold, I created a twenty-page registration list.
- Curgenven’s lighting cues also assisted me with the final “performance” of the stop changes. I made detailed annotations to my registration list of the lighting changes. Doing so made the final performance almost a cinematic experience for me that was an immersive, embodied experience that went beyond notation.

Figure 4.10 Venn diagram for Organ Project 4



#### 4.5 Organ Project 5: Performing on the University of Sydney Great Hall pipe organ during livestreamed university graduation ceremonies (2021–present)

Figure 4.11 Organist Grace Chan at the Beckerath pipe organ (1972) in University of Sydney Great Hall



##### Summary of artistic project

My main artistic outputs from Organ Project 5 are the performance of ceremonial, recital, ambient and incidental music for livestreamed university graduation ceremonies. My artistic outputs spanned live organ performance and recordings (in the form of live stream libraries and archives). The outputs were also documented in social media (University and audience generated).

The University of Sydney has over 80 graduations a year which are livestreamed and all feature live organ music. A musician team led by the University of Sydney organist and carillonneur (Titus Grenyer) performs for these events. The graduation ceremonies were only livestreamed to a nearby hall (MacLaurin Hall) before the COVID-19 pandemic. During

COVID, livestreams became global and was the main way many students shared the special occasion with family and friends who could not be onsite (and who were elsewhere in Australia or scattered around the world). In the peak of COVID there were no in person meetings allowed in Australia, this was followed by reduced numbers in communal venues (e.g. the Great Hall) due to social distancing. Livestreams proved so popular that they continued and became routine after the COVID-19 pandemic ended.

During and post-COVID, livestreaming was prioritised by the Graduations Office. Integration with the graduation ceremony was enhanced with more audiovisual staff, more cameras and the use of specialised livestreaming service providers. In concert with this digital (and environmentally sustainable) transformation, graduation programs became digital and accessible through a QR code that is featured within the pre-ceremony livestream.

Throughout the ceremony, the livestream is projected onto a screen so that students and remote families/ friends can experience the same images. The organist is unable to see the screen while performing at the organ console (the organist is facing away from the screen towards the organ music desk).

Performing music on the organ for graduation ceremonies is a collaborative, transdisciplinary endeavour. The organists are working with each other as musical colleagues and also with the Graduations Office team, student ambassadors, camera operators and sound engineers. Our common goal is to produce the best possible event for the students and their families on their special day. Working with such a diverse team has resulted in new ways of using and performing music on the pipe organ during the ceremonies.

The graduation ceremonies continue to be streamed around Australia and the world. During the graduation season 29 June 2024 to 2 June 2024 the graduation ceremony livestreams garnered 18353 unique views with 78% of viewers using their mobile phone to watch the ceremony (see Appendix 5).

## Artistic Process

### Facts

- For a university graduation ceremony in the Great Hall I am required to perform a [processional](#)<sup>295</sup> and [recessional](#).<sup>296</sup>
- I am required to perform organ recital music before the ceremony. I also perform ambient and incidental music as the situation requires during the ceremony.
- A microphone is situated between the positive part of the organ and the organist, near a remotely operated camera that can take closeups of the organ and organist.
- Within the ceremony livestream, the organ is allocated one shot that zooms into the [organ stops](#),<sup>297</sup> pans to the [organist](#)<sup>298</sup> then pans out to reveal the [magnificent façade](#)<sup>299</sup> of the 1972 Rudolf Von Beckerath pipe organ behind the students and families that are seated in the Hall.

---

<sup>295</sup> Gaudeamus Igitur being performed for a University of Sydney graduation ceremony (1:01 min)  
<https://www.youtube.com/watch?v=uDCaq7yBINQ>

<sup>296</sup> Recessional for graduation ceremony in the University of Sydney Great Hall (0:22 sec)  
[https://www.youtube.com/watch?v=mvzPz\\_-AZic](https://www.youtube.com/watch?v=mvzPz_-AZic)

<sup>297</sup> Excerpt graduation ceremony feature organ stops (0:11 sec)  
<https://www.youtube.com/watch?v=jOsriZ7wDAI>

<sup>298</sup> Camera shot panning out from organist (0:17 sec) <https://www.youtube.com/watch?v=0jLadp6b9-c>

<sup>299</sup> Camera shot panning out from organ loft (0:28 sec) [youtube.com/watch?v=a4ra8xjiFfw&feature=youtu.be](https://www.youtube.com/watch?v=a4ra8xjiFfw&feature=youtu.be)

-The camera shot then pans to wall portraits of previous and current University Chancellors and Vice Chancellors. Architectural features of the Hall are shown (e.g. stained-glass windows and gargoyles) then the cameras zoom into the audience to create a sense of celebration and [liveliness](#).<sup>300</sup> The organist is unable to see what is being broadcast to the in house and livestream audience. Thus, the videography team improvise candid shots that they feel pair well with the organ music that is performed within the graduation ceremony pipe organ recital. The Graduations team provide valuable feedback as to what organ music and repertoire was most enjoyed by the students, their families, academics and themselves.

### **Analysis**

- The livestreams try to capture the ambience of the Sydney University Great Hall during graduation ceremonies.
- The sound in the livestream videos is akin to a field recording. This captures the atmosphere of celebration within the Great Hall. The organ music is an important part of the livestream however equally important are the live sounds of students and their families.
- The livestream soundtrack reminded me of the beginning of Paul McCreesh's [A New Venetian Coronation](#)<sup>301</sup> 1595 where bells, crowd, fireworks and sackbuts combine to convey a festival atmosphere. The graduations team told me that at overseas University of Sydney graduation ceremonies in Shanghai and Singapore, they used recordings made by the University Organist (Titus Grenyer) during livestreams that included organ music with

---

<sup>300</sup> Spontaneous, light-hearted moment during Graduation Ceremony. The videographer improvises candid shots of the audience according to the music the organist plays. The organist cannot see the broadcast. (0:08 sec) <https://www.youtube.com/watch?v=G5-KnS3oJy8>

<sup>301</sup> YouTube upload of A New Venetian Coronation 1595 (Paul McCreesh, Director) <https://www.youtube.com/watch?v=G5-KnS3oJy8>.

background audience noise. This made me reflect on the sterility of recital situations whereby convention the audience is silent. This reflection made me realise that background music is enriched as a soundscape through the inclusion of the sounds of human engagement. I was also reminded of the “canned laughter” used in many television sitcoms to create a sense of atmosphere, engagement and further laughter.

- Seeing the architectural features in the livestreams led me to read more about the history of graduation ceremonies at Sydney University and at other universities around the world online. This scenario was an iterative and cyclic process of learning from the artistic process of generating live pipe organ music at the graduation ceremonies.

### **Speculation**

- During livestreams, the shots for the organ and organist are pre-planned each season by the audiovisual team however, the organist doesn't know when they start the sequence.

- I often speculate on how best to communicate with the audiovisual team during a performance—while I am performing and potentially being livestreamed around the world.

- The size of the academic procession always varies. I often speculate on the best way to “fill” extra time in the processions and recessions.

### **Artistic solutions**

- I realised the livestreams are not only for the families but also an invaluable resource for my iterative/ cyclical artistic process and practice. They constituted a rapidly uploaded (and complete) digital archive of my performances and those of my colleagues. This positive

pedagogical purpose allowed me to think of livestreaming (and archived livestream recordings) as a source of new knowledge that can continually enhance my artistic practice as an organist. I considered doing this on the carillon.

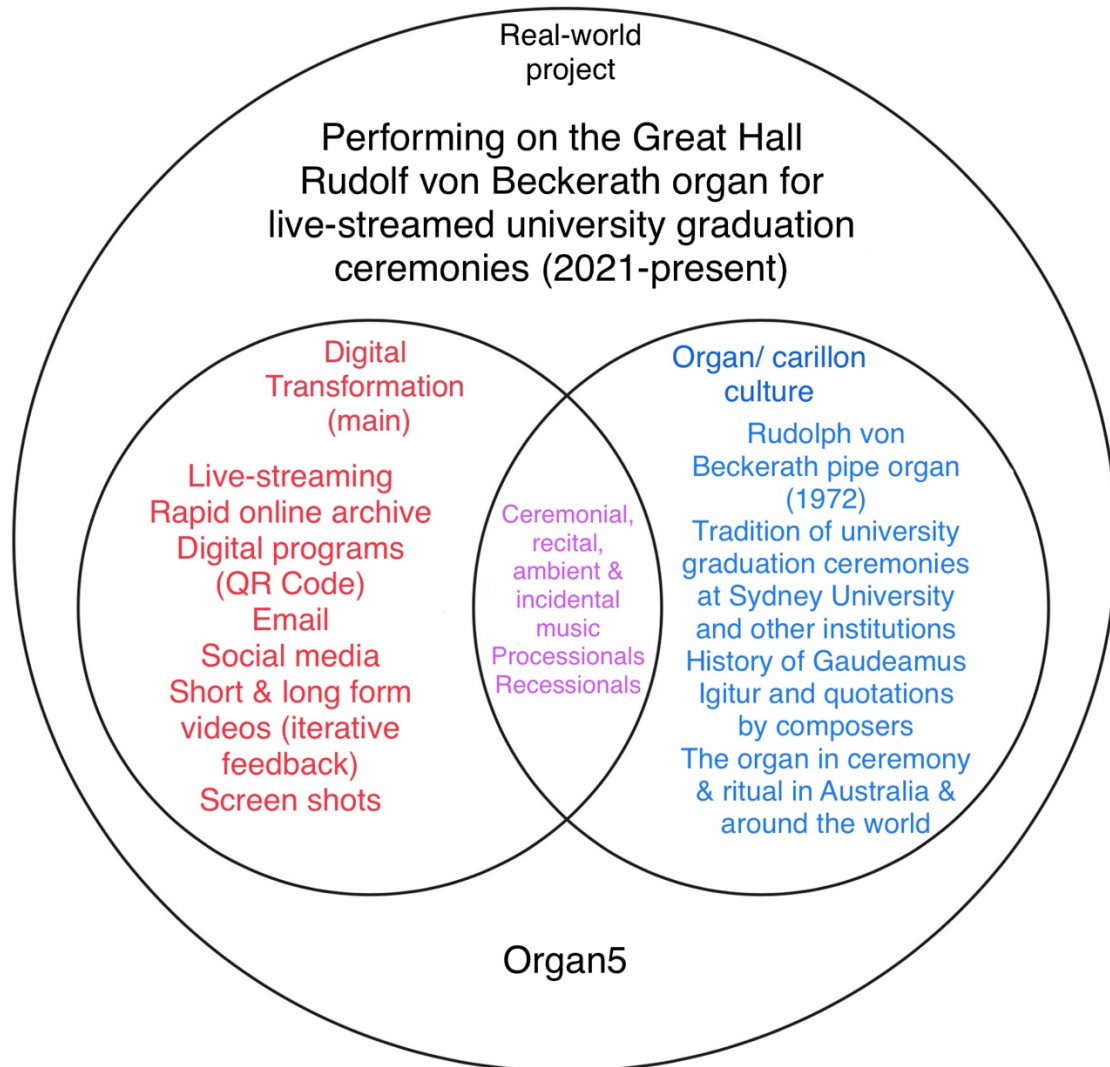
- Watching past livestreams led me to ask the University Organist to make an arrangement of *Gaudeamus Igitur* for use in the graduation ceremonies. I had enjoyed his improvisations of this traditional student hymn in a past season of livestreams.

- I expressed my desire to also have some well composed “filler” music to accompany this arrangement that suited the processional and the ambience of the graduation ceremony. It needed to be flexible in duration. Having a composed sequence would also allow the livestream team to sequence their shots better, eliminating the need to verbally communicate—coordination would be through knowing the music. The University organist composed some suitable music inspired by a Parry hymn he linked to me as a YouTube video on email.

- Re-watching the livestream videos allowed me to understand timings and shot sequences so that I could prepare music that fit in with the audiovisual and Graduation team’s vision for the ceremony livestreams. Future artistic solutions could include a monitor for the organist so that they can see the vision broadcast to the global livestream and in house audience. This may invoke and inspire an impetus to improvise to moving images as they appear during the live event.

- I started to use a small round mirror on the organ console (that reflected the audience and stage) during the recital portion of the graduation ceremony. Previously, I had only used it for the processional and recessional to time the music with the academic procession. It made me feel a greater sense of engagement with the audience (rather than just looking at the score on my music desk). This led to a greater sense of freedom during performances.

Figure 4.12 Venn diagram for Organ Project 5



#### 4.6 Organ Project 6: Digital publication of a lo-fi digital artwork and ‘live’ automated spoken word performance using voice generation for ADSR Zine 014 (2021)

See Appendix 6 for the three-page, full-sized artwork

Figure 4.13 Screenshot thumbnail compilation for ADSR Zine 014



#### Summary of artistic project

My main artistic output from Organ Project 6 is the creation of an interactive piece of lo-fi multimedia visual art based on my artistic practice as an organist (and carillonist). My artistic outputs from this project span an automated “spoken word” performance, a webpage, a

publication in an award winning experimental publication ([ADSR Zine, 2019-2023](#)),<sup>302</sup> social media and a gallery installation: *Special Collection @Sydney International*, an experimental art space in Sydenham (23/7/22—30/7/22).

ADSR Zine (2019—2023) was an award-winning experimental artist-led digital publication co-founded by Elia Bosshard, James Hazel and Sonia Hollowell. Their editors described the publication as:

...an online, quarterly publication that features diverse work from contributors who are, or who work with contemporary practising artists in Australia. Functioning from an 'art begets art' premise, we value the process of reflection, translation, interpretation, critical response and active engagement with Australian art and performance.<sup>303</sup>

I was commissioned to contribute the opening work in [ISSUE 014](#).<sup>304</sup> I was asked by co-editor Elia Bosshard to describe my artistic practice as an organist. I decided to create a lo-fi multimedia visual artwork based on the memos and scratch notes compiled within my artistic practice as an organist, carillonist and researcher. ISSUE 014 was supported by the City of Sydney and would exist as a webpage from which a free PDF<sup>305</sup> could be downloaded. I wanted to test the interactive and performative possibilities of this static digital format (PDF i.e. portable document format) by incorporating an automated “spoken word” performance

---

<sup>302</sup> Instagram page for ADSR Zine

<https://www.instagram.com/p/CgdtQhcryO8/?igsh=MXR4aHNxdW9saDJvcA%3D%3D> As with the nature of Zines, the Zine has now closed. The Instagram page still exists as an archive.

<sup>303</sup> "ADSR Zine (2019-2023)," <https://jameshazel.net/05-1>.

<sup>304</sup> ADZR Zine 014 <https://www.instagram.com/p/CSNIDDUBW4d/?igsh=YjJ1MGUydnJwcTJ4>

<sup>305</sup> The webpage for download is no longer functional; a PDF of the artwork is in the appendix of this thesis.

generated from a free online “voice generator” <https://voicegenerator.io>. The work referenced all my methods of data collection and the forms of data storage I enjoyed and also researched. The work explored concepts of automation, pixelation, encoding, indexing (e.g. thumbnails within my smart phone photo storage) and presets in organ and carillon culture. Visually, the text component intentionally resembled the perforations in a pianola roll: a physical, mechanical, conceptual ancestor of MIDI.

## **Artistic Process**

### **Facts**

- The format I was asked to use for the work was PDF. This format is valued for its ability to maintain the integrity of its content and prevent manipulation.
- I was able to produce the work in colour.
- I was asked to survey my artistic practice as an organist. I decided to include my practice as a carillonist/ carillonneur and artistic researcher.
- My multimedia archive of digital images, digital video, reflective journals, memos, scratch noted and annotated screenshots were accessible from my mobile phone (cloud storage).

## **Analysis**

- To make this work, I wanted to honour the low technology format of the Zine.
  
- I wanted to make sure that if the reader wanted to “read” the work they would have to interact with the work.
  
- I researched the history of microforms and microfiche online as I wanted the present as much visual and vocal information with as few pages as possible.
  
- I read about the history of “rice writing” online, where artists write words on a grain of rice.

## **Speculation**

- I was concerned that readers would not interact with the work
  
- I wondered if using hyperlinks would break my own rule of being *very* low tech and lo-fi
  
- I considered engaging with [lo-fi audio](#)<sup>306</sup> works for the piece however decided a generated speaking voice was the most suitable. I re-visited the work of Peter Ablinger.

---

<sup>306</sup> lo-fi audio work example <https://www.youtube.com/channel/UCSJ4gkVC6NrvII8umztf0Ow>

## **Artistic solutions**

- the work was created on my phone with sequential screen shots of thumbnail archives. No editing software or preset templates were used. Final assembly and conversion to PDF was in Microsoft word however all editing was done on a mobile phone and my cloud-based multimedia archive. This multimedia archive is an ongoing documentation my artistic practice.

- The work was titled “grace plays real & virtual, pipe & bells”

- the instructions for the reader were “copy TEXT ROLL below, paste into ANY VOICE GENERATOR, view THUMBNAILS L-> R.

- I gave an example of a free online voice generator: <https://voicegenerator.io>

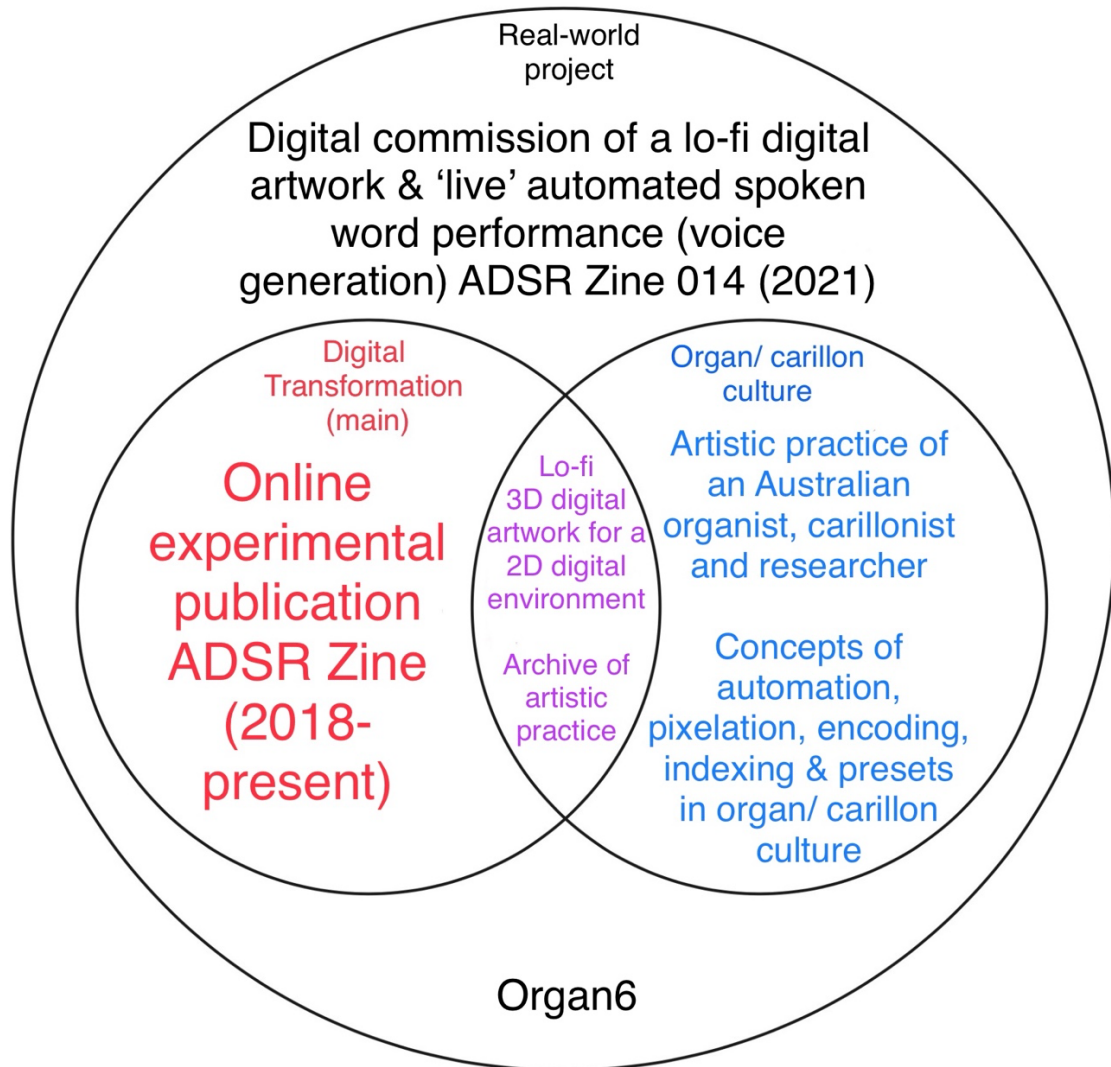
- I intentionally did not use hyperlinks in the PDF artwork (so that the reader would have to manually copy and “physically” paste various elements of the work for greater embodied engagement that went beyond finger touch.

- I intentionally made the font small so that while it was readable for the voice generator, it was not easily readable with the human eye. I had to edit the text myself through zooming and magnifying. I created the text in 12 point and then reduced the font size to miniaturise my words.

- The slab of text consists of simple sequential descriptions of the thumbnails that survey my artistic practice. The voice generator “reads along” with the images recalling childhood episodes of reading a paper book with a cassette tape (that often featured a triangle sound to turn a physical page). The small font also enhanced the optical illusion of “perforations” within the slab of text to suggest a pianola or organ roll.

- I intentionally inserted some spelling errors in the slab of text that when read by the voice generator are undetectable to the listener (or the voice generator). The artist is the only one who knows...

Figure 4.14 Venn diagram of Organ Project 6



**4.7 Organ Project 7: “Organ Service Provider” (City Organist) shortlisting and audition at the Sydney Town Hall Grand Organ for the City of Sydney, Australia (2023)**



**Figure 4.15 (Left) Giant screens lowered at the blind audition for the role of City Organist at the Sydney Town Hall Organ (22/03/23); (Right) View of façade pipes from the organ bench at the William Hill & Son (1890) Grand Pipe Organ (22/03/23).**

**Summary of artistic project**

My main artistic outputs from Organ Project 7 are the performance of organ works I selected and prepared for the City of Sydney City Organist audition at Sydney Town Hall on the William Hill & Son (1890) Grand pipe organ. The audition occurred at 11am on the 22 March 2023. There were five candidates shortlisted from an international pool of applicants. I was first the female candidate to have been shortlisted and auditioned for this role at the Sydney Town Hall organ, the City of Sydney, Australia. Historical advertisements had only asked for “gentlemen” to apply for the role of City Organist.<sup>307</sup> The successful candidate from the

---

<sup>307</sup> Ampt and Butler, *The Sydney Town Hall organ: William Hill and Son's magnum opus*. p. 36.

auditions was Mr Titus Grenyer who is the current City of Sydney organist, University of Sydney Organist and Carillonist and Director of Music at Our Lady of Dolours Catholic Parish, Chatswood, Australia.

Creating an audition program for the “Organ Service Provider” role at the City of Sydney (i.e. City Organist at the Sydney Town Hall 1890 William Hill & Son grand pipe organ) was extremely enjoyable. The process amalgamated all my interests within organ culture: performing music, history and culture, wellbeing and placemaking. It allowed me to think about how a musician may represent a City and the possibilities for creativity and innovation, as well as service and accessibility in repertoire choice. I had given a talk about [Re-imagining Programming on the Australian Carillons](#)<sup>308</sup> at Sydney Conservatorium of Music. I now had the opportunity to do the same for the iconic Sydney Town Hall organ.

## **Artistic Process**

### **Facts**

- The audition was to take place on the William Hill & Son (1890) organ at Sydney Town Hall. I had already undertaken past projects on the instrument so was able to iteratively delve into my archived material regarding stop lists, recorded stop archives and the other specifications of the instrument.

---

<sup>308</sup> Lecture presentation: Re-imagining musical programming on the Australian carillons (2023), Sydney Conservatorium of Music, The University of Sydney YouTube archive  
<https://www.youtube.com/watch?v=MhCEbUYLiBk>

- I accessed City of Sydney policy documents and strategic plans to understand the vision the City had for its citizens. These were all available online.

- I read about the history of City Organists in Sydney and at other Town Halls around the world (e.g. Birmingham Town Hall where Thomas Trotter is City Organist). I looked at the programs that Mr Trotter had performed at Sydney Town Hall (in my research archives) and at Birmingham Town Hall. I read organist Edwin Lemare's autobiography and also listened to recordings of the organ rolls he made for the German company Welte. This helped me understand the style of repertoire Lemare played at various town halls around the world. Many of Lemare's orchestral transcriptions were available online via IMSLP and Sydney University digital portals (e.g. Alexander Street).

- I drew on my audiovisual archives and online videos of my Australian-Dutch organ teacher's teacher Mr Jos Van Der Kooy, Haarlem City Organist, NL from 1990 to 2017. His teacher Mr Piet Kee was City Organist of Haarlem, NL from 1956 to 1989. I examined their previous concert programs and recordings.

- I discovered a historical advertisement from 1890 that asked for “Gentlemen” to apply:

TO ORGANISTS,

Town Hall, Sydney, New South Wales, 15th September 1890.

APPLICATIONS will be received at this Office until Saturday 20th November, 1890, from Gentlemen competent to fill the position of Organist to the City of Sydney. The successful applicant will be required to give two Public Recitals of at least an hour and a half each, each week, and on other occasions when specially desired by the Mayor. Salary €500 per annum. The appointment will be for a period of three years.

HENRY J. DANIELS, Town Clerk of Sydney.<sup>309</sup>

## Analysis

- My aim in analysing the programs of other city organists was not to copy their repertoire. I tried to discover what they played and also why—I wanted to understand their artistic process and vision.

- The City of Sydney had as its vision: “Sustainable Sydney 2030—2050.” The aim was to create a sustainable, liveable, and thriving global city. The City of Sydney emphasised sustainability, liveability, inclusivity, connectedness and a thriving culture. Accessibility and community cohesion was also important to the City.<sup>310</sup>

- I tried to read about past women organists who had auditioned or expressed interest in the role of City Organist. Reading the historical advertisement (see above) that only asked for “Gentlemen” to apply I felt it important to include both a historical and a living contemporary

---

<sup>309</sup> Ampt and Butler, *The Sydney Town Hall organ: William Hill and Son's magnum opus*. p 36.

<sup>310</sup> "Sustainable Sydney 2030-2050 Continuing the Vision," 2023, <https://www.cityofsydney.nsw.gov.au/sustainable-sydney-2030-2050>.

female composers in my program. I chose to play the works of French composer Nadia Boulanger (1887-1979) and Moya Henderson (1941-).

- The City of Sydney archives had a thirty-two-page digitised file titled “Recommendation for appointment of Miss Lillian Frost at City Organist, 1926—1934 her list referees for the position.”<sup>311</sup> The Australian Dictionary of Biography had an online entry for Ms Frost.<sup>312</sup> This was a very interesting and informative read, learning about the challenges Ms Frost faced in her musical career.

### **Speculation**

- I speculated on how to balance Australian content in my program while still showcasing iconic works from the organ repertoire—especially that of Johann Sebastian Bach (my favourite composer).

- I was wondered if I would have enough time during the practice session to register all my pieces. Shortlisted candidates were allocated one hour at the organ in Centennial Hall a week before the official audition.

- I prepared for the audition on my virtual representation of an English romantic instrument at Sydney Conservatorium and in my home studio. My VPO is physically a three manual

---

<sup>311</sup> "Recommendation for appointment of Miss Lillian Frost at City Organist, 1926-1934," City of Sydney Archives, Between 12th May 1926 and 3rd January 1934, <https://archives.cityofsydney.nsw.gov.au/nodes/view/744557?keywords=lillian+frost&type=all&highlights=eyJwIjoiznJvc3QiLCIyIjoibGlsbGhbiJ9>.

<sup>312</sup> "Lillian Frost," <https://adb.anu.edu.au/biography/frost-lillian-mary-12930>.

instrument. The “Hauptwerk” sample set I used was the Hereford Cathedral Father Willis Organ which has 4 manuals (I had to double up on one of the VPO’s physical manuals).<sup>313</sup> I speculated on whether I would be able to institute my plan for registrations over 5 manuals whilst preparing on a three manual instrument which simulated half the sonic resources (67 stops of the Hereford organ vs 127 stops over five manuals).

### **Artistic solutions**

The following were my artistic solutions. I performed excerpts from the following works for my audition (with program notes for the Committee, who gave me positive feedback about my written application and diverse programme selections):

I have chosen the following organ compositions with broad audience engagement as a priority. They are all works that I genuinely enjoy performing and perform regularly as they are so appealing to audiences (from post-recital feedback). My selection is satisfying to organ music devotees and people who have never heard an organ previously: people who may be visiting Centennial Hall for the first time

#### **1. Leon Boellmann (1862—1897) Choral - Introduction (from Suite Gothique Op. 25)**

This French romantic Suite is often played in recital (Choral- Menuet Gothique-Prière à Notre-Dame-Toccata) as it is accessible, and each movement can showcase different tonal qualities of an orchestral style instrument. I am performing the Choral which is just magnificent. This short introductory movement allows the STH Grand organ to “roar” and “purr”, displaying its full emotional range in a few minutes.

---

<sup>313</sup> Hereford Cathedral Father Willis Pipe Organ sample set made by Lavender Audio and used with Milan Digital Audio Hauptwerk software (Martin Dyde, 2002) on a Kee Noorlander 3 manual MIDI virtual pipe organ, Dali Mentor surround speakers, subwoofer and a RME Babyface Pro soundcard.

## **2. J.S. Bach (1685—1750) Prelude and Fugue in A Min (BWV 543)**

“Eternity” is synonymous with Sydney: whether the script is chalked on a pavement or emblazoned by fireworks on the Harbour Bridge. This virtuosic piece by Bach feels like the musical expression of that word: “eternity”. Every note is important in conveying Bach’s ideas and not just there to show off foot work and finger dexterity (which the piece certainly does!). Organ music aficionados would call this “real organ music” ...however it is exhilarating listening for everyone. Performing this piece, I feel the adrenaline of scaling a sheer cliff, arriving at the top in the final chord to find JS Bach already enjoying the endless vista.

## **3. Nadia Boulanger (1887—1979) Petite Canon pour Orgue ou Harmonium**

This beautiful early twentieth-century (c.1912) piece by French female organist and conductor Nadia Boulanger is delightfully for organ or harmonium. A harmonium is a small domestic organ powered by the player via foot pump. It is an intimate instrument as the organist has direct control of the wind going through the pipes and this piece *is* intimate. I chose this piece because it beautifully conjures this intimacy in Centennial Hall on one of the largest instruments in the world. It is a palate cleanser after the intellect of the fugue and I will perform it with trembling harmonic flutes, a sparkling 1-foot piccolo, echo manual unda maris and uncoupled pedals.

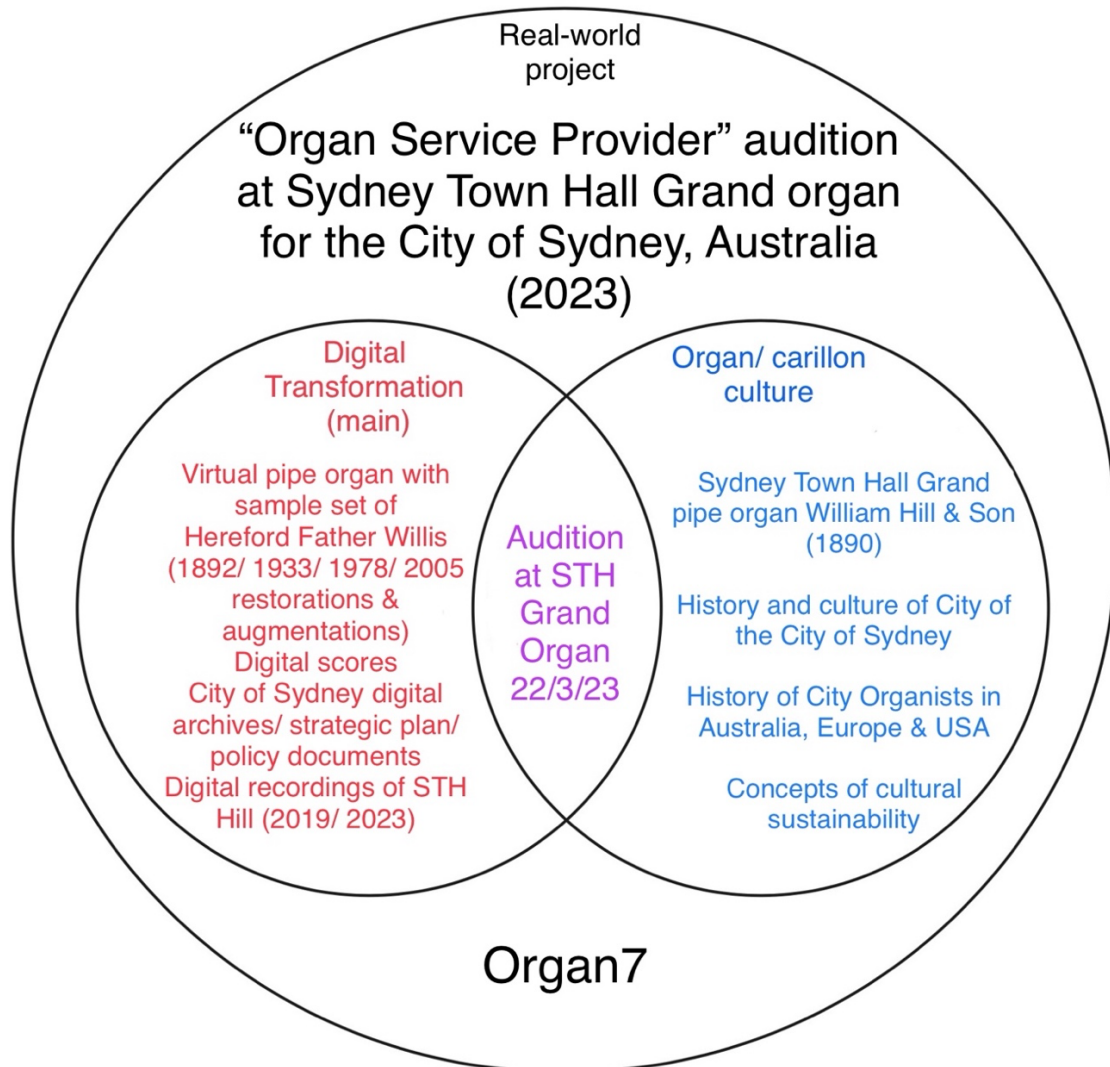
## **4. Moya Henderson (b. 1941) Gynea Lilies (2017/8) (for Prof Yvonne Cossart).**

Henderson is an Australian composer who was commissioned by the Sydney University Medical Faculty to honour ground-breaking infectious diseases researcher and clinician Professor Yvonne Cossart. The piece evokes the strong statuesque stalk of this Australian native plant. There are also gentle, lyrical passages which provide contrast and delicacy to its anthem-like quality. I often perform this piece at Sydney University graduation ceremonies in the Great Hall to celebrate the students’ special day.

## **5. Carson Cooman (b. 1982) Gratitude (2021)**

The composer describes this piece as “warm, affirmative music.” Cooman is Composer-in-Residence at Harvard University, and this piece was composed in memory of his grandmother. The long, held chords have much in common with the Boellmann Choral however the piece is from a twenty-first century sound-world. I have chosen this piece to demonstrate the different stops on the STH Grand Organ and will build up different tonal colours and densities as the piece ebbs and flows. There is a rapid central section that showcases the STH Grand organ’s solo stops. I am performing this piece to express my Gratitude to the City of Sydney and this magnificent instrument.

Figure 4.16 Venn diagram for Organ Project 7



#### 4.8 Organ Project 8: Livestreamed celebration service to commemorate the 150th year anniversary of St Stephen's Anglican Church, Newtown, Australia (2024)

Figure 4.17 J.W. Walker & Son pipe organ (1874)



JW Walker & Son pipe organ and 150th Anniversary service with the Her Excellency the Honourable Margaret Beazley, 39th Governor of NSW at St Stephen's Anglican Church, Newtown. Photo: Grace Chan (2024)

#### Summary of artistic project

My main artistic outputs from Organ Project 8 are the performances of pre- and post- service music and the beautiful, traditional, well-loved hymn Holy, Holy, Holy.<sup>314</sup> The congregation at St Stephen's are strong and enthusiastic singers. St Stephen's Anglican Church Newtown is a heritage listed church in Sydney, Australia. It was founded in 1844 and the current building design by architect Edmund Blackett. This building was constructed between 1871 to 1874. Edmund Blackett also designed the Sydney University Main Quadrangle and Great Hall (1845)

---

<sup>314</sup> hymnary.org [https://hymnary.org/text/holy\\_holy\\_holy\\_lord\\_god\\_almighty\\_early](https://hymnary.org/text/holy_holy_holy_lord_god_almighty_early)

## **Artistic Process**

### **Facts**

- The hymn to be played was Holy, Holy, Holy (Reginald Heber, 1826).
- I was instructed to perform half an hour of organ music before and after the service.
- The senior Minister for the service was Reverend Dr Andrew Errington.
- The service was attended by the Governor of New South Wales Her Excellency The Honourable Margaret Beazley.
- The service was to be livestreamed.
- I would be performing on the St Stephen's historical 1874 J. W. Walker and Son organ, restored by organ consultant David Rumsey (1989). From the Sydney Organ Society webpage listing, the specification of this instrument is:

**J.W. Walker & Son, 1874 (2/18 mechanical)<sup>315</sup>**

**Great**

Open Diapason	
Horn Diapason	8
Stopped Diapason	8
Dulciana	8
Principal	8
Harmonic Flute	4
Fifteenth	4
Mixture	2
	III

**Swell**

Double Diapason	
Open Diapason	16
Stopped Diapason	8
Principal	8
Fifteenth	4
Mixture	2
Cornopean	II
Oboe	8
	8

**Pedal**

Open Diapason	
Bourdon	16
	16

**Couplers**

Swell to Great	
Swell to Pedal	
Great to Pedal	

Compass 56/30  
Mechanical action  
Lever swell pedal  
3 composition pedals to Great  
2 composition pedals to Swell

---

<sup>315</sup> Sydney Organ Society webpage listing of the 1874 J. W. Walker and Son, UK pipe organ at St Stephen's Anglican Church Newtown, Australia. <https://www.sydneyorgan.com/StStN.html>

## **Analysis**

- This was an important event for the parish and the congregation—part of a major celebration that spanned the 2024 anniversary year.
  
- The Governor of NSW, current and past Ministers of St Stephen’s church, senior Anglican clergy, and importantly a large congregation of past and present parishioners, were in attendance.
  
- The music before and after the service needed to be celebratory and also reflect the importance of the occasion.
  
- I prepared my hymn verses at the physical organ and on my VPO using an English romantic organ sample set (Hereford Cathedral “Father Willis” Organ, 67 stops over 4 manuals, created by Lavender Audio, UK).

## **Speculation**

- I wondered if using the historical chimes would contribute to the ambience of the day. The chimes could be controlled from my mobile phone or via wireless keyboard at the organ console (via MIDI).
  
- What music should I perform before and after the service and will it be featured in the livestream?

### **Artistic solutions**

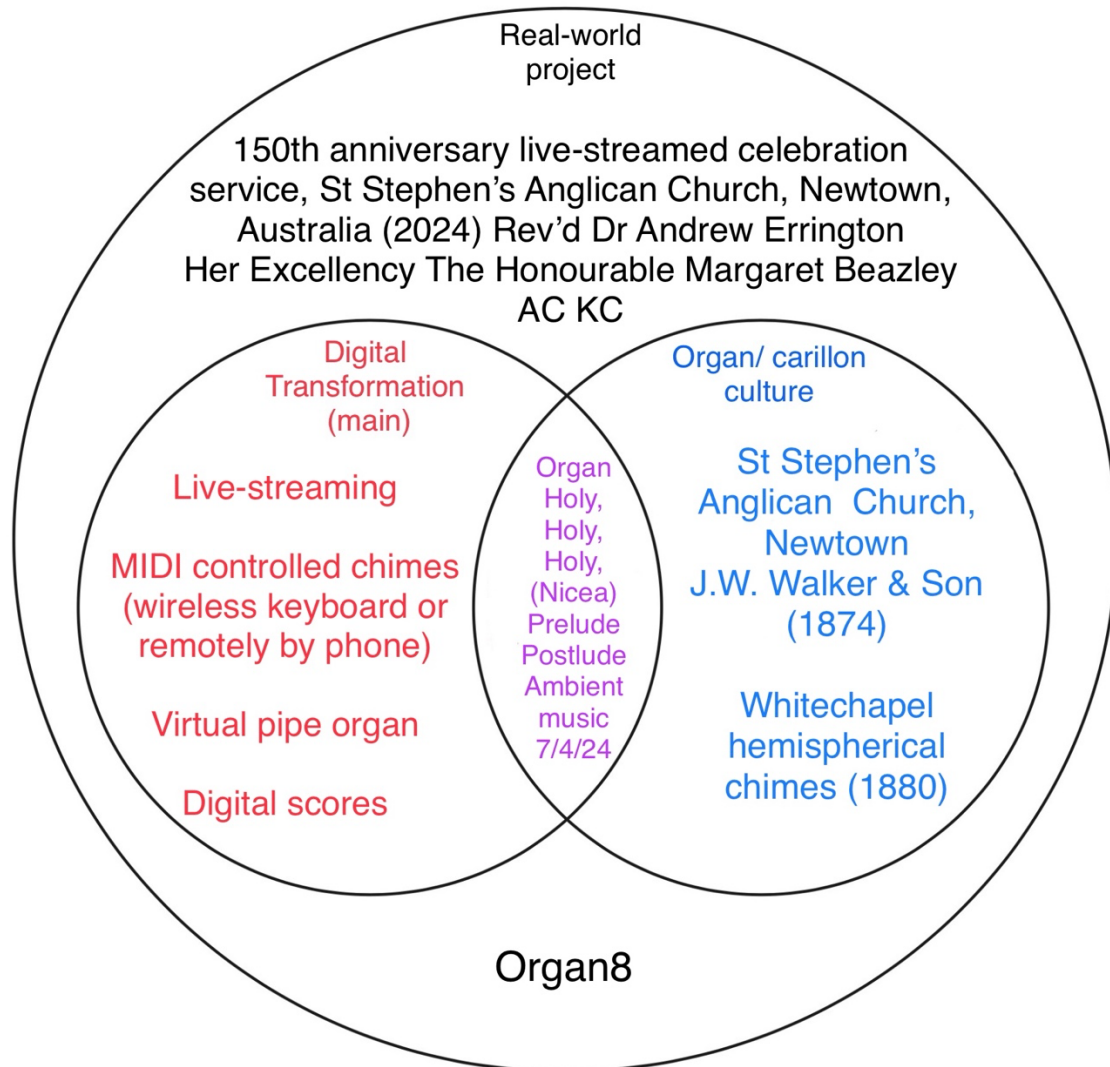
- I performed all verses of Holy, Holy, Holy in a traditional manner while accompanying the congregation on the J. W. Walker and Son (1874) organ. The registrations had been prepared on my VPO as access to the church was limited in the lead up to the celebrations.

- I downloaded some contemporary music as digital scores to play before and after the service. Pieces included Gratitude by Carson Cooman (hard copy) and celebratory selections from Andrew Newcombe's Mantras (digital download; a sequence of 96 works composed for solo organ, edited and typeset by St Patrick's Melbourne Cathedral organist Thomas Grubb).

- I played Holy, Holy, Holy on the Whitechapel hemispherical chimes from my mobile phone before commencing my pre-service music.

- Following my post-service music, I took the MIDI keyboard to a vestibule in the bell tower and improvised some "peals". I also played some of the motifs from Andrew Newcombe's Mantras to bring some unity to the organ and bell music presentation.

Figure 4.18 Venn diagram for Organ Project 8





**Figure 4.19** The 3rd of February 2020, carillonneur and organist Grace Chan at the raising of the new G bell commissioned by the National Capital Authority for the 50th Birthday of the National Carillon, Canberra, ACT, Australia. Photo: Anna Wong (2020)

#### 4.9 Carillon Project 1: Learning how to transfer repertoire from a carillon practice clavier to main carillon bells at the National Carillon, Canberra (2018–2022).

Figure 4.20 National Carillon (1970) on Lake Burley Griffin, Canberra. Photo: Grace Chan (2022)



#### Summary of artistic project

The specific goal of Carillon Project 1 was to understand how to translate the learning of a piece of music on a carillon practice clavier to the main bells of a carillon tower. Soon after starting to play carillon, I realised that playing on a carillon practice clavier is very different to playing on the main carillon bells. A relevant analogy is the pipe organ and historical organ practice instrument, the clavichord. Thus, Carillon Project 1 is a series of reflections on

how I tried to decipher playing musically on a carillon practice keyboard and then translating my learnings to the main bells in Canberra.<sup>316</sup>

My Australian-Dutch organ teacher Mr Koen Van Stade inspired me to start learning carillon. During organ lessons, he would tell me stories about his close childhood friend who fulfilled a dream of becoming an organist and carillonneur in the Netherlands. I finally met this carillonneur (Mr Bart Vervaat) on a field trip to Alkmaar, north Netherlands. On my return to Australia, Mr Vervaat with great enthusiasm, would periodically send videos and photos of different towers from around the Netherlands and Europe. It was delightful and my interest was piqued. The social media contact with a European colleague somehow made Australia feel close to the of organ and carillon culture of the Low Countries and studying such a niche instrument achievable. I did not feel like I was isolated in the antipodes, on the other side of the world (even though geographically I was certainly distant from Europe).

I contacted my mentor Dr Jill Forrest (a medical doctor, church organist and Emeritus University Carillonneur) who suggested that I study at the National Carillon in Canberra to broaden my experience. The National Capital Authority accepted me as a carillon student from 2018-2022.

---

<sup>316</sup> Learnings then applied to the main carillon bells at the Sydney and Bathurst carillons.

## **Artistic Process**

### **Facts**

- In general, carillon practice instruments are a lot lighter in touch than main carillon bells.

The real instrument has graduated weighting across the clavier batons according to the size of the bells across the clavier. The batons to the left on the clavier are heavier (connected to bells with more bronze mass to achieve a lower pitch). The batons to the right on the clavier are lighter and easier to depress (connected to smaller bells that are higher in pitch).

- The National Carillon in Canberra had a mechanical carillon clavier for practice which was made by John Taylor and Co, Loughborough, UK in 1970.

- In January 2020, a digital virtual carillon clavier was delivered to the National Carillon. It had a MIDI baton keyboard with dynamic response. Sounds were sampled from a selection of the National Carillon bells and digitally re-pitched to cover the entire compass of the baton keyboard.

- I had access to a mechanical carillon practice keyboard (Taylor's, 1923) in my home studio. This instrument was gifted to me by Senior Carillonist Astrid Bowler. The instrument had been bequeathed to her by Canberra carillonist Suzanne Magassy (1940-2008). GCNA colleagues lead by carillonneur Sally Slade Warner gifted a redundant Philips Academy, Andover, MA, USA instrument to Ms Magassy. Suzanne Magassy was the first non-American to sit and pass the GCNA Carillonneur examinations. She frequently toured the USA as a concertizing carillonist and her arrangements are still performed in the USA.

- I had access to main bells in Canberra and Sydney.

- I would drive down to Canberra (2.5-3hr one way) for carillon lessons and extended practice sessions. The practice sessions were divided as half the time on the practice clavier and half on main bells.

### **Analysis**

- I immersed myself in online carillon culture: social media, video sharing platforms, (content generating and content consumption platforms). I participated in online conferences in the USA and EU (centres of carillon culture in the northern hemisphere) to feel part of the academic community of performing musicians.

- I accessed online streaming services to listen to carillon recordings. There were a surprising number of carillon recordings available for streaming (e.g. Boudewijn Zwart, Frank Steijns, Edward M. Nassor). I was able to track down the carillon CD's and LPs of artists such as Jef Denyn (in shellac), Piet van den Broek, Jo Haazen, Ghislain Pouseele, Eugeen Uten, Eddy Marien, Geert D'hollander and Peter Langberg. Remarkably, many of these recordings had been uploaded from vinyl or CD to YouTube by enthusiasts.

- I accessed digital archives and online sheet music stores to understand the repertoire—particularly arrangements for the carillon from organ works.

- I spent time learning repertoire on the various practice instruments I had access to; at the end of every session I always tried to translate this music to main bells and reflect on the similarities and differences. This intentional act of reflecting and journalling the difference between the practice clavier and main bells helped me physically adjust to the different touch. This was a hybrid (real and virtual) scenario of iterative and cyclical artistic process/ learning.

- I was able to access carillon methods online (e.g. one by Koen Van Assche—Mechelen, Antwerp) and paper copies in the National Carillon Library administered by Canberra’s longest serving carillonist Ms Astrid Bowler. Ms Bowler provided me with copies of methods by Leen ‘t Hart and Willem Cremin. Ms Ellen Dickenson from Trinity College, Hartford, CT was able to post me her method for beginners (*A New Carillon Book*). Professor Laura Ellis in Florida was able to post me a purchased paper copy of the GCNA method by John Gouwens. Gouwens also offered to work through the book with me via video conferencing. We were able to do this effectively at my home practice clavier during the Australian lockdown periods of the COVID-19 pandemic (2020—2021).

### **Speculation**

- I wondered, if immersing myself within the online realm represented the actual circumstances in the United States and Europe? Most of the online content was from the northern hemisphere because of the greater number of towers. I decided I needed to balance time online with travel to Europe.

- In Canberra, the situation was such that we had frequent access to main bells. I reflected on what it may be like in towers where access is highly restricted and the practice claviers is the main source of learning.

### **Artistic solutions**

- I realised translating music from the practice console (mechanical or digital virtual) was about embodiment: physically grasping the sensations of transferring between the simulated and actual instrument.

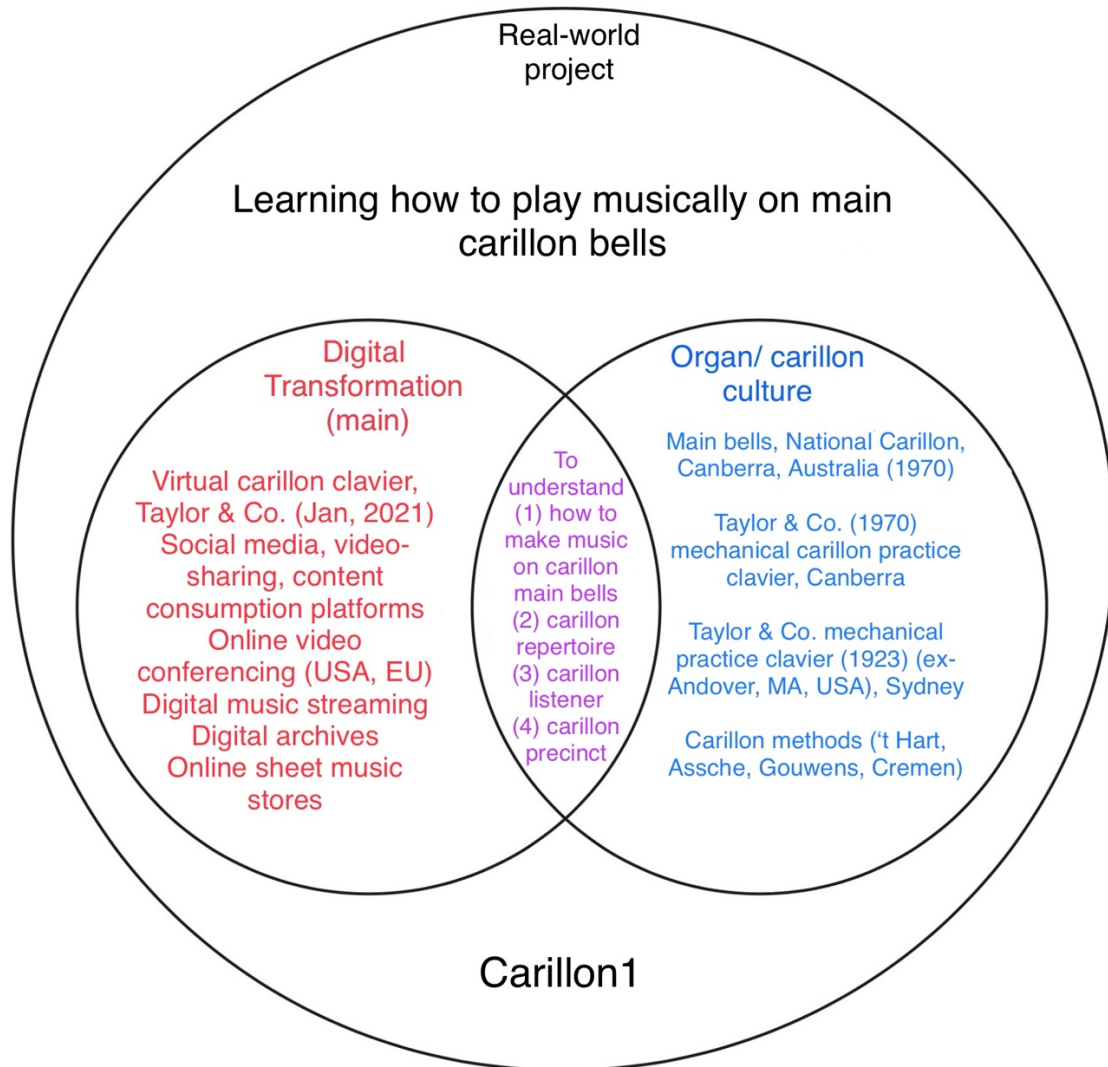
- The process was iterative. I constantly cycled between the practice console and main bells. I had the luxury in Sydney and Canberra of being able to play main bells frequently. I realised that if I did not use the practice consoles regularly, I would not be able to translate the embodied process of making music seamlessly if for some reason I couldn't use the main bells (e. g. during exam periods at Sydney University).

- I developed a routine of diligently using mechanical and digital carillon practice claviers and main bells for each piece of music I learned.

- In the process of understanding this need for embodiment for translating musicality between instruments, I also learned about carillon repertoire, the perspectives of carillon listeners and carillon precincts from my digital foray into northern-hemisphere carillon culture.

- I tried to use the round trip 6 hours of transit time driving between Sydney and Canberra to reflect on my learning process. I would record myself on the practice instrument and also on the main bells. I was able to listen to this audio in the car drive and start to slowly understand how I had to modify my touch between real and virtual instruments to achieve a musical performance.

Figure 4.21 Venn diagram for carillon project 1



#### 4.10 Carillon Project 2: Premiere of an experimental Australian composition at an international music festival in the Palau de la Generalitat, Barcelona (2019)

Figure 4.22 (Left) Gothic courtyard with orange trees in the Palau de la Generalitat, Barcelona, (Right) Petit & Fritsen Carillon (1976) at Palau de la Generalitat, Barcelona. Photos: Grace Chan (2019)



World premiere of *Bells in Barcelona* (Cole, 2018) at the Palau de la Generalitat.

[Video link](https://youtu.be/MhCEbUYLiBk?si=Uz8dskp-HBdOx-bA&t=1838) to an excerpt of the livestreamed world premiere in Barcelona  
<https://youtu.be/MhCEbUYLiBk?si=Uz8dskp-HBdOx-bA&t=1838>

#### Summary of artistic project

My main artistic output from Carillon Project 2 is the world premiere performance of *The Bells of Barcelona* (2018) by Australian composer Dr Amanda Cole. My artistic outputs from this project spanned a live performance, livestreaming, an archived livestreaming recording, workshopping of a composition with a composer, generating social media content and an interview in a documentary made by Canberra filmmaker Bremer Sharp.<sup>317</sup>

---

<sup>317</sup> This 15 minute documentary by Bremer Sharp was premiered as an installation at the Australian National University School of Art and Design, Canberra, Australia (2019/20)

*The Bells of Barcelona* was commissioned by the National Capital Authority to commemorate the [50th Birthday of the National Carillon](#).<sup>318</sup> The COVID-19 pandemic intervened and the Australian premiere of Cole's experimental carillon work could not proceed in 2020 as planned. The world premiere of the piece occurred during the summertime International Carillon Festival in the Gothic Palace in Barcelona (July 2019). The duet was performed with carillonist Lyn Fuller from the National Carillon. The Festival was curated by carillonneur Ms Anna-Maria Reverté.

## **Artistic Process**

### **Facts**

- *The Bells in Barcelona* is a carillon duet—for two carillonists playing on the same carillon. I was able to rehearse the sine tone and carillon duet at the National Carillon before travelling to Barcelona via Amsterdam, Haarlem, Mechelen and Alkmaar/De Rijp, the Netherlands.
  
- The work features the use of a sine tone electronic track which is designed to interfere with the reverberations of the bells.
  
- Amanda Cole is a composer of experimental instrumental and electronic art music who studied electroacoustic music with Professor Dennis Smalley at City University, London after

---

<sup>318</sup> Promotion from the National Capital Authority for the 50th anniversary of the National Carillon <https://www.youtube.com/watch?v=c98s40TzHXY>

a PhD in composition at Sydney Conservatorium. Her compositions feature microtonal structures, overtones, interference beats with fusions of electronic and acoustic timbres.<sup>319</sup>

- The work was composed in Sydney. It was workshopped on the National Carillon in Canberra through email, phone recordings, digital scores and phone calls with the Sydney-based composer. Digital modes of communication made the interstate collaboration work smoothly.

- The carillon of the Palau de la Generalitat, Barcelona is made by Pettit & Fritsen (1976).

### **Analysis**

- The work required accurate timing to achieve the effect of interference as desired by the composer. I contacted the composer to discuss this and as a result of these discussions she provided a click track for the performance.

- The performance of the work at a carillon in Barcelona required understanding the specifications of that instrument. The Petit & Fritsen instrument is also much lighter than the carillon in Canberra where the piece was workshop and prepared.

---

<sup>319</sup> Amanda Cole biography and video <https://www.amandacolemusic.com/video>

- Specifications of the instrument were online and the carillonneur Ms Anna Maria Reverté was accessible and responsive on email communication before my arrival in Barcelona. I was also able to access the specifications of the Palau de la Generalitat carillon tower from the Tower Bells website administered by World Carillon Federation Committee member Mr Carl Zimmerman (USA). From this website:

**\*Technical data:**

Traditional carillon of 49 bells

Pitch of heaviest bell is F in the middle octave

Keyboard range: C D / C G

Transposition is up 5 semitone(s), i.e., from C to F

The whole instrument was installed in 1977 with bells made by Petit & Fritsen

Automatic play at 1200 & 1800 daily.<sup>320</sup>

**Speculation**

- Enroute to the Carillon Festival in Barcelona, I attended the Queen Fabiola Carillon Competition in Mechelen with a cohort of Australian carillonists. We were there to support a young Australian carillonneur, Peter Bray who was competing in the finals. It was the first time I had attended a carillon competition. I reflected on the impact competitions have on carillon culture.

---

<sup>320</sup> Tower Bells Website with global carillon specification listings  
<http://www.towerbells.org/data/ESBRCLPG.HTM>

- One key reflection was that repertoire performed at the competition was very different to the repertoire that is requested and frequently performed at the University of Sydney and the National Carillon. I wondered if any of this repertoire would diffuse to the local towers where I play and if our audiences would enjoy the style of music. I enjoyed hearing this music (it was new and interesting to me) which was performed with great musicality and skill. I reflected on how much the culture of competitions and repertoire influences what is taught to carillon students around the world.

- I attended the installation of new bells into the carillon tower at De Rijp, NL (village carillonneur Dr Christiaan Winter). I reflected on the impact of a “new” carillon tower in a community and how that may assist in sustaining carillon culture. A key reflection was that the whole community attended the installation. They were all invested in the creation of the new carillon as locals who wanted a rejuvenated focal point for the village. There was a previous tower that had been destroyed by fire a few centuries ago. A new tower also meant a new position for a carillonneur. Broadcast media were present to interview villagers and the new carillonneur. The new tower generated a great deal of publicity. There was local pride in the village having a new instrument become part of the network of historical carillons in the Netherlands. This helped me think about how my experimental work and being an Australian carillonneur may be received by the audiences at the premiere in Barcelona.

- I was concerned the work would be “too experimental” for an audience listening in a historical site (the Gothic Palace in Barcelona). The Palau is also the seat of parliament in Catalunya. I wanted to make sure the carillonneur at the Palau heard the full work and approved of the piece for her carillon precinct.

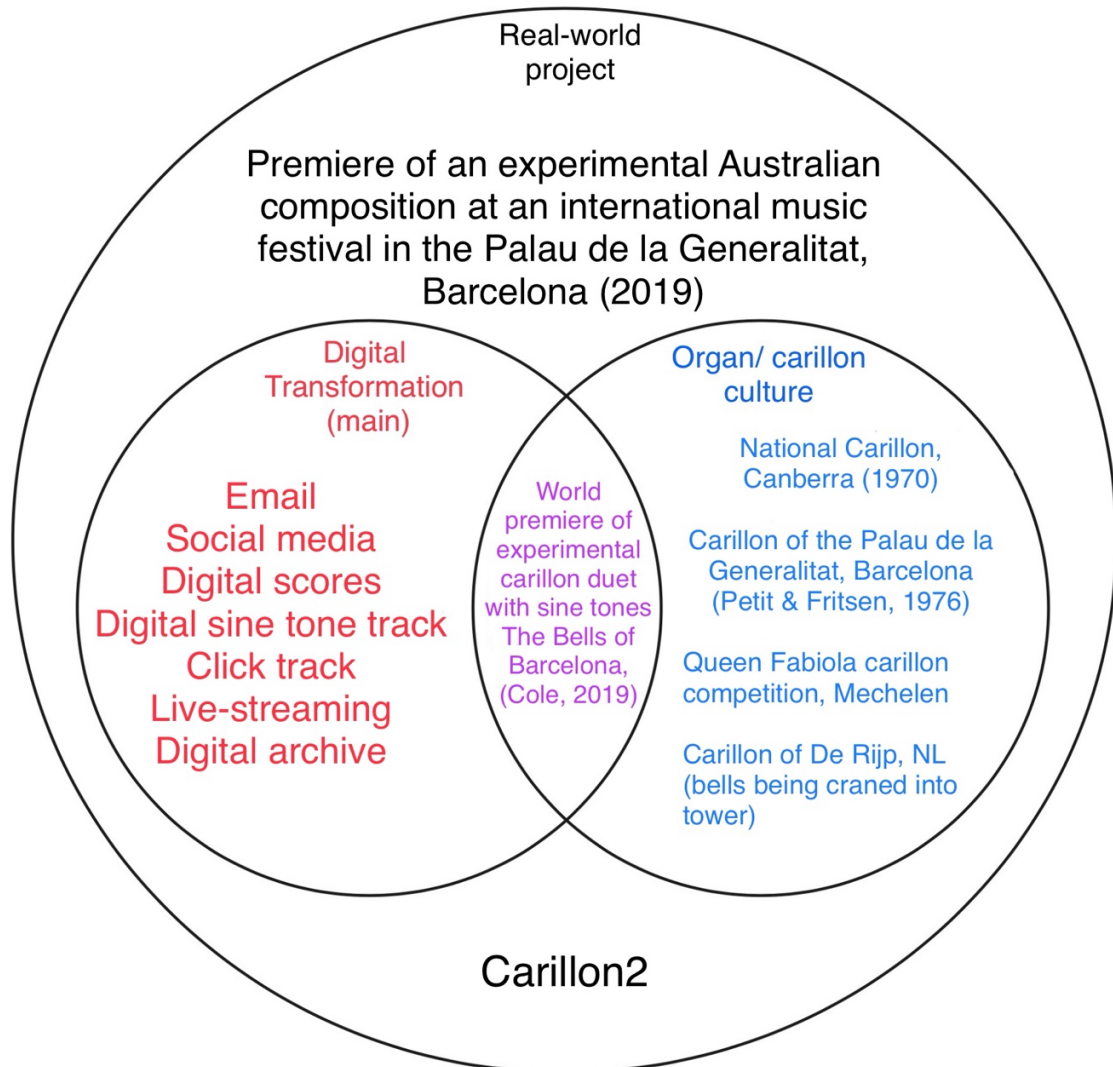
## **Artistic solutions**

- I requested that the composer create a click track so that timings in the duet were accurate. I played this click track on my smart phone and I listened to the track with headphones during the performance.

- I felt very welcomed by the carillonneur and the community at the Gothic Palace. The carillonneur at the Gothic Palace Ms Anna Maria Reverté enjoyed the piece and felt it was appropriate for the recital. She listened to the work during rehearsals and gave feedback. The piece worked well with the inhouse sound system playing the sine tones in the gothic palace courtyard. I voiced my concerns that the piece may be too experimental for the audience. In a preconcert talk, Ms Reverté communicated to the audience the nature of the work and prepared them for the experience of hearing electroacoustic, minimalist music. She described Cole's carillon composition as a meditative piece that was "different" but that the listener only needed to relax and "absorb" the bell and electronic sounds.

- The world premiere was livestreamed to the audience. This recording also served as a digital archive so that the performance could be shared with the composer in Australia and used for subsequent analysis and academic discourse. From this project, I learned the importance of in person communication with the custodian of a carillon tower. Electronic communication was useful in the early stages of the relationship however being able to discuss artistic concerns in person was extremely important. In turn, the carillonneur at the Palau generously prepared our audience for a piece that may have been confronting for listeners not expecting an experimental electroacoustic work for carillon and sine tones. The performing in Barcelona was a very positive experience.

Figure 4.23 Venn diagram of Carillon Project 2



#### 4.11 Carillon Project 3: Premiering Australian compositions on Australian War Memorial carillons in Sydney and Bathurst (2021)

Figure 4.24 (Left) Sydney University War Memorial Carillon (1928), (Right) Bathurst Carillon (1933).  
Photos: Grace Chan (2025)



#### Summary of artistic project

My main artistic outputs in Organ Project 3 are the performances of two Australian works at the Sydney War Memorial Carillon and the Bathurst War Memorial Carillon. My artistic outputs spanned live performance, livestreaming and generating social media content. Both works have a connection to war and memorialisation. The work *Elegy* (1915) was written by Frederick Septimus Kelly (a young Australian composer) for a friend who died in the First World War. Kelly did not survive the war, dying himself in 1916.<sup>321</sup> *GyMEA Lilies* (2017) by Moya Henderson (2017)<sup>322</sup> was commissioned by the Faculty of Medicine at the University

---

<sup>321</sup> "Elegy by F.S. Kelly at the commissioning of Bathurst War Memorial Carillon," 2021, [https://www.australianmusiccentre.com.au/event/bathurst-war-memorial-carillon-bells.](https://www.australianmusiccentre.com.au/event/bathurst-war-memorial-carillon-bells.;); "Elegy for string orchestra : in memoriam Rupert Brooke," <https://www.australianmusiccentre.com.au/workversion/kelly-frederick-septimus-elegy-for-string-orchestra/14586.>

<sup>322</sup> Video of Carillonist Grace Chan performing *GyMEA Lilies* (Moya Henderson) at the Bathurst War memorial carillon during Bathurst Festival of Bells 8/5/21 (0:37 sec) <https://www.youtube.com/watch?v=M2IZ11D0Frw>

of Sydney to honour infectious diseases Professor Yvonne Cossart (1934–2014). Professor Cossart also taught a course called Medicine and War within the Medical Humanities subject at the University of Sydney. Both pieces were arranged on the main bells at the National Carillon, Canberra. The pieces were performed at the Bathurst War Memorial Carillon for the carillon’s “first concert” and at the Bathurst Festival of Bells in 2021). Both pieces of music have also been performed at the University of Sydney during appropriate events and occasions.<sup>323</sup>

## **Artistic Process**

### **Facts**

- The Frederick Septimus Kelly piece was to be performed on the 20 March 2021 for the first formal concert of the newly completed Bathurst War Memorial carillon. This piece was originally written for a string orchestra.
- Moya Henderson’s piece, *Gynea Lilies* was to be performed on the 8th of May 2021 at the Bathurst Festival of the Bells during the “Classical Vibes” session. This piece was originally commissioned by the Faculty of Medicine at the University of Sydney to honour the memory an esteemed academic and doctor.
- Both *Elegy* and *Gynea Lilies* have a connection to war and memorialisation. In music and in meaning they were both suitable for the war memorial carillon in Bathurst and for the occasion of an inaugural concert.

---

<sup>323</sup> "Gynea Lilies by Moya Henderson at Bathurst Festival of the Bells," 2021, <https://www.australianmusiccentre.com.au/event/festival-of-bells-classical-vibes>.

- The histories of the carillons related to being a war memorial were available online. There is also a network of Peace Carillons. I read about these instruments to understand their meaning and purpose for their communities.

- The Australian War Memorial website had digital archives related to war and music: the Australian War Memorial Sheet Music collection.<sup>324</sup>

- Digital scores of the works were available from the composer (Henderson) and online from IMSLP (Kelly).<sup>325</sup>

## **Analysis**

- Both pieces are by Australian composers, one male and one female.

- One piece is composed in 1915 and one in 2017. I felt this was a good balance between tradition and innovation. The Kelly work is contemporary to the First World War, the Henderson was closer in time to my audience.

- Both works were suitable to be arranged for carillon as they had attractive melodies that suited the minor overtones of the carillon bells. I arranged both pieces to suit the compass of

---

<sup>324</sup> Australian War Memorial Sheet Music Collection <https://www.awm.gov.au/collection/C2094733>

<sup>325</sup> *Elegy* for String Orchestra (Kelly, FS)  
[https://imslp.org/wiki/Elegy\\_for\\_String\\_Orchestra\\_\(Kelly%2C\\_Frederick\\_Septimus\)](https://imslp.org/wiki/Elegy_for_String_Orchestra_(Kelly%2C_Frederick_Septimus))

the Bathurst War Memorial carillon which was available from online sources. In arranging the works I tried maintaining the clarity of the melody by thinning out harmonies in the bass.

- Both works were written for people who had passed away, so had infused within the music, the gestures and emotions of memorialisation.

### **Speculation**

- Would my arrangements work at the Bathurst carillon? Would the pieces work at all three carillons?

- Would I have time to prepare in Bathurst on main bell before the concerts? Access to the practice clavier in Bathurst was not possible.

- Would the events be livestreamed? This uncertainty was coupled with that of not knowing about rehearsal times.

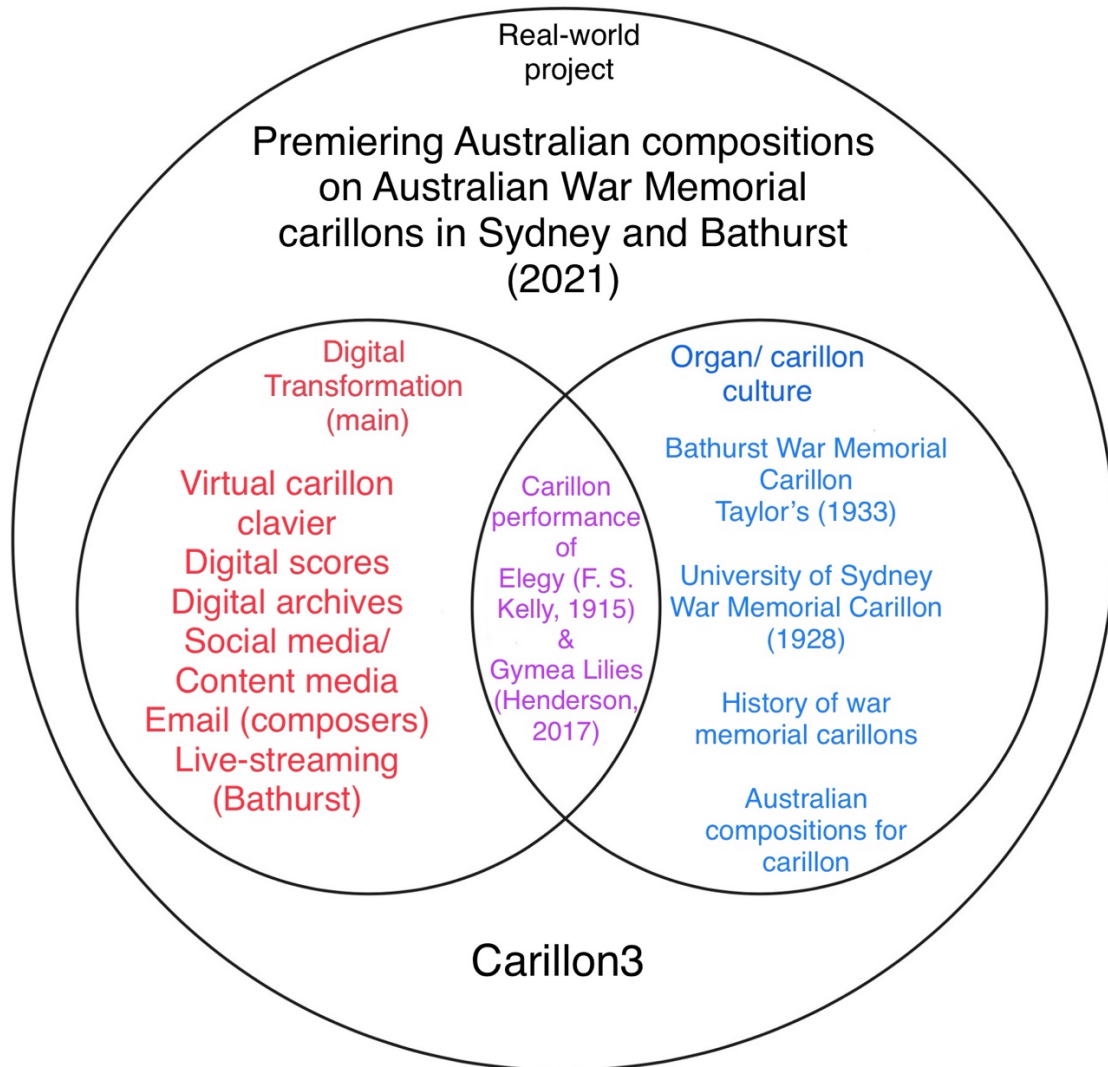
- How will travelling to Bathurst to perform affect my performances? I was concerned about fatigue. I was also worried that it may be unsafe for any of us musicians to travel due to major flooding in the Bathurst region in March 2021.

### **Artistic solutions**

- I intentionally prepared the arranged pieces on a variety of carillons and practice claviers in Canberra and Sydney as I was unsure of access to Bathurst main bells for rehearsal prior to the performances. This allowed me to learn the pieces and make sure they were robust for the performances and potential livestreaming to a large audience.

- Performing the works at war memorial carillons helped me to understand their emotional content as works dedicated to a specific person who had passed away. Performing these sincere musical tributes to different audiences at the three carillon towers in Australia created a sense of artistic unity. It was after this project that I began to artistically and geographically conceive of the three instruments as a connected “carillon triangle.”

Figure 4.25 Venn diagram for carillon project 3



#### 4.12 Carillon Project 4: Performing for University of Sydney graduations and events on a heritage instrument (2021–present)

Figure 4.26 University of Sydney War Memorial Carillon precinct (1928). Photos: Grace Chan (2021-25)



Scenes from the University of Sydney War Memorial carillon.  
(with permissions).

(Left top) Main Quadrangle.

(Right top) Main Quadrangle from carillon tower roof.

(Left lower) Mr [Edward McNeal Grantham](#) (1944–2025)<sup>326</sup>

(Right lower) University lawns.

---

<sup>326</sup> Video of Edward M. Grantham teaching Grace Chan how to improvise a chromatic scale passage on the University of Sydney War Memorial carillon. (0:43 sec) <https://www.youtube.com/watch?v=RmwAc-IOgD4> (with permission E.M.G.)

## **Summary of artistic project**

My main artistic outputs from Carillon Project 4 are my performances on the Sydney University War Memorial carillon for university graduations and events, community festivals, faculty funerals and public weddings in the Great Hall (the guests listen to the carillon music from the lawns and Main Quadrangle). My artistic outputs span live performance, social media (generated by listeners in the Main Quadrangle and University lawns), and online lecture-recitals at academic conferences. I am employed by the University as a member of a professional team of organists/ carillonists working under the leadership of the Sydney University Organist and Carillonist Mr Titus Grenyer.

## **Artistic Process**

### **Facts**

- The Sydney University War Memorial carillon has 54 bells (this information is on the University website).<sup>327</sup> The bells were made in the year 1928 in Loughborough, UK by John Taylor and Co. Bellfounders.

- The history of the carillon is available on the University website. The University archives have digitised significant amounts of material related to the carillon.<sup>328</sup> The Sydney University website *Beyond 1914* is a searchable biographical database related to the students

---

<sup>327</sup> University of Sydney Places of Interest <https://www.sydney.edu.au/engage/visit/places-of-interest.html#carillon>

<sup>328</sup> University of Sydney Archives: carillon <https://archives-search.sydney.edu.au/nodes/view/22198>

and staff who died in World War I.<sup>329</sup> The website is based on the University of Sydney book of Remembrance and research by the University Historian.

- The Honour Rolls under the carillon clocktower are part of the memorial.

### **Analysis**

- Preparation for University graduations and events was conducted on the mechanical Taylor's practice clavier (1928) and the Main Bells.<sup>330</sup>

- Programming for the University events entails an awareness of University campus culture, University strategic plans and policies and carillon culture globally. Campus culture can be absorbed through being on Main Campus daily and participating in university life. It can also be accessed through the University and University Union social media accounts.

- Understanding that the carillon is an Australian war memorial and the ceremonial voice of the University underpins all the performance aspects of this carillon.

---

<sup>329</sup> "Beyond 1914," University of Sydney, accessed 7 Jan 2025, 2025, <https://heuristic-usydney.cloud.edu.au/heuristic/?db=ExpertNation&ll=Beyond1914>.

<sup>330</sup> The digital virtual upgrade of the practice clavier occurred in 2025.

## **Speculation**

- I often speculated on what students and staff may want to hear on the bells.
  
- Is anyone listening and does it matter if no-one is listening? Am I forcing anyone to listen?  
Are people enjoying my musical choices?
  
- How do I keep in touch with developments in the carillon world in the northern hemisphere?
  
- How do I respect heritage, maintain traditions while also innovating as a musician and carillonist?

## **Artistic solutions**

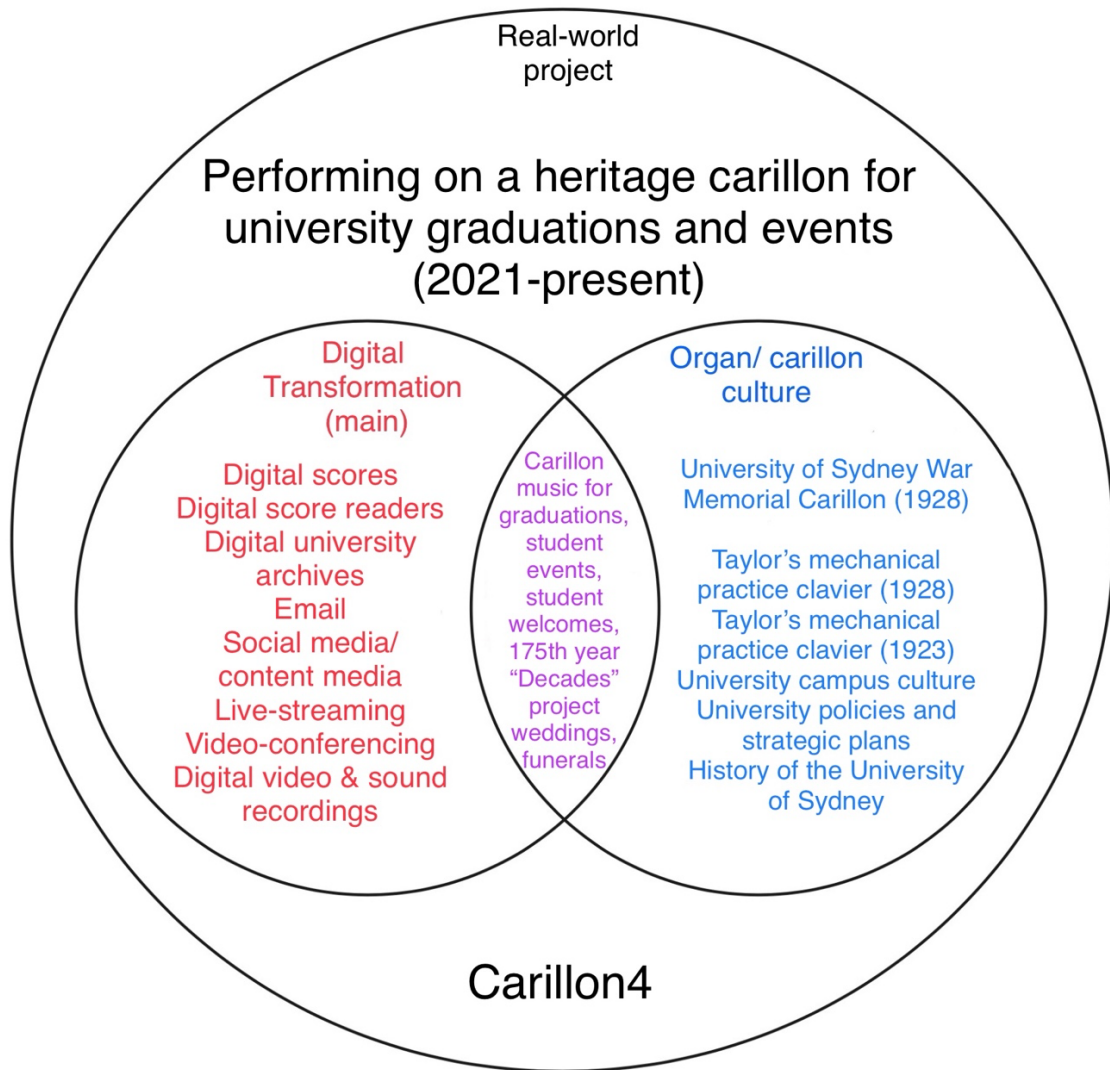
- I immersed myself in global carillon culture in the digital realm. This was through websites, social media, content media (e.g. YouTube) and also through regular videoconferencing with other carillonists/ carillonneurs in the tower. I took a collaborative approach to solving artistic problems through a local and global network of colleagues This has enriched my carillon performances for university graduations and events.
  
- This was counterbalanced with spending time with the longest serving carillonist in the tower, Mr Edward Grantham (“Ted”) (1944–2025) who conveyed the oral history of the tower to me. Regular weekly meetings where I could listen to him perform, ask questions

about performance practice and the history of the tower and also play for him, were indelible. These meetings were invaluable to my artistic development. Ted would give me feedback about my playing, repertoire choices and demonstrated alternative interpretations which he encouraged me to video for future reference in my learning. He also emphasised that an attitude of service at the War Memorial will yield creative artist solutions that a broad audience can enjoy. Ted encouraged a mindset of lifelong learning as an artistic solution.

- It has been artistically satisfying to engage with initiatives in my workplace such as a “Decades” project created by the University Carillonneur to celebrate the 175th Anniversary of the University of Sydney. The carillonneur team collectively performed decades of music from the time of founding of the University in 1850 up to 2025. This project led to the team enthusiastically downloading scores, texting, emailing and sharing our new ideas for our allocated recitals.

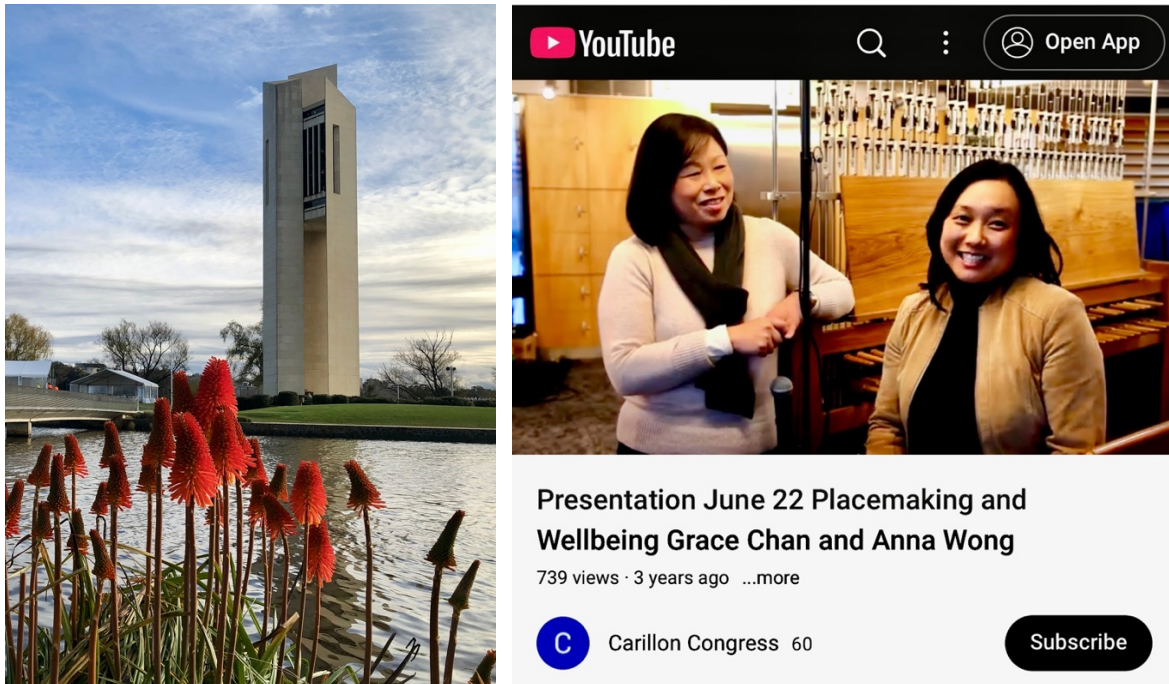
- It has been artistically rewarding working in a team under the leadership of a University carillonneur/ organist who is also a prolific composer for carillon and organ (as well as choir and orchestra). I am able to see him workshop and perform his own compositions and also obtain feedback regarding my performances of his compositions. It is artistically satisfying regularly learning newly composed Australian music that is written for the University community’s events and anniversaries.

Figure 4.27 Venn diagram for Carillon Project 4



**4.13 Carillon Project 5: An academic paper delivered from the National Carillon, Canberra for an inaugural online international carillon conference during the COVID-19 pandemic (2021)**

**Figure 4.28 (Left) National Carillon, Canberra. Photo: Grace Chan (Right) GCNA Online Congress (2021) during COVID-19 pandemic (screenshot)**



**Video of Bell culture, placemaking and wellbeing, presented by Dr Grace Chan and Dr Anna Wong at the joint online 2021 World Carillon Federation (WCF)/ Guild of Carillonneurs in North America (GCNA) Congress**

<https://www.youtube.com/watch?v=rddjMtL0wHw>

## Summary of artistic project

My main artistic output from Carillon Project 5 is an academic presentation in the form of a film. At the end of the film presentation there was a live videoconference question and answer session between the USA (WCF/GCNA Congress international delegates), Canberra (Dr Anna Wong) and Sydney (Grace Chan). This artistic output resulted in the writing of an academic article that was published as the lead paper in the inaugural issue of *Carillon and Bell Culture in the Low Countries (Beiaard- en klokkencultuur in de Lage Landen)* published by Amsterdam University Press.<sup>331</sup> Dr Anna Wong is a senior carillonneur at the National Carillon. Prior to her appointment as the Director of Canberra Museum and Gallery, Dr Wong was the first Heritage Manager at the National Capital Authority (NCA). In this role she was part of the NCA team that initiated the commissioning of the new G and D bells to celebrate the 50th birthday of the National Carillon (the 26th of April 2020).<sup>332</sup>

Due to the flow on effects of the global COVID-19 pandemic, the joint World Carillon Federation and Guild of Carillonneurs in North America Congress was held online for the first time. As a response to the isolation caused by the pandemic, my colleague Dr Wong and I decided to prepare a presentation on wellbeing and placemaking as they relates to bell culture. Rather than the standard Zoom or Teams presentation, I had the idea to present the

---

<sup>331</sup> Wellbeing, placemaking and carillon culture: connecting with our audiences (Chan and Wong, 2022) <https://doi.org/10.5117/BKL2021.1.001.CHAN>

<https://www.aup-online.com/content/journals/10.5117/BKL2021.1.001.CHAN>

See Appendix 7 for a response to this paper from the Mayor of Bathurst (2022).

<sup>332</sup> “National Carillon’s 50th Anniversary...installation of a new G Bell to the carillon (over 5 tonnes) ...Installation of a D Bell (tiny).” <https://www.nca.gov.au/environment/projects/past-projects/national-carillon-upgrade-works>

The bourdon (lowest note) in the National Carillon Canberra is a preexisting F-sharp bell. The National Carillon was originally designed as a transposing instrument.

lecture as a film and create a sense of community by speaking directly to the camera between expansive visual images that created a sense of place as we conveyed the academic content.

Dr Wong agreed and suggested a professional film maker (Mr Charles Hamlyn Harris). I felt that it was important for us to film inside the National Carillon as that was our communities' focal point. From the carillon clavier in the National Carillon, Canberra, Australia, we presented our lecture in a cinematic format: welcoming the global carillon community into our community during a once-in-a-lifetime pandemic.

### **Artistic Process**

#### **Facts**

- The presentation was to be twenty minutes in duration with ten minutes question time.
- The Joint Congress was held on Zoom in June 2021. The host was Ms Ellen Dickinson, College Carillonneur, Trinity College, Hartford, Connecticut, USA.
- The GCNA website was contained information regarding schedule of events and the congress program (which was downloadable as a PDF).

#### **Analysis**

- The film format worked well as my co-presenter and I could construct an engaging intellectual narrative that was illustrated by images from my cloud-based multimedia archive.

- My colleague and I communicated through videoconferencing as there were restrictions to traveling between states in Australia at this stage of the pandemic. Videoconferencing had the additional benefit of teaching us how to communicate efficiently and effectively in the digital realm.

- At the filming, when we could finally work together face to face, my main impression was that human interaction in the real world is very important. Digital communications were useful however it more enriching (and fun) catching up with colleagues in person.

- Working with a filmmaker was an important transdisciplinary feature of this project. Mr Hamlyn-Harris taught us how best to communicate through his medium leading us to realise new ways of expressing our academic ideas.

### **Speculation**

- I speculated on whether the presentation would be well received by the global carillon community.

- The number of delegates who would engage with the purely online format was unclear. Would the livestreamed question-and-answer session work well?

## **Artistic solutions**

- The most effect artistic solution in this project was engaging a professional filmmaker. In consultation with this filmmaker, images I had carefully curated, were carefully paired with the academic ideas to unobtrusively enhance communication.

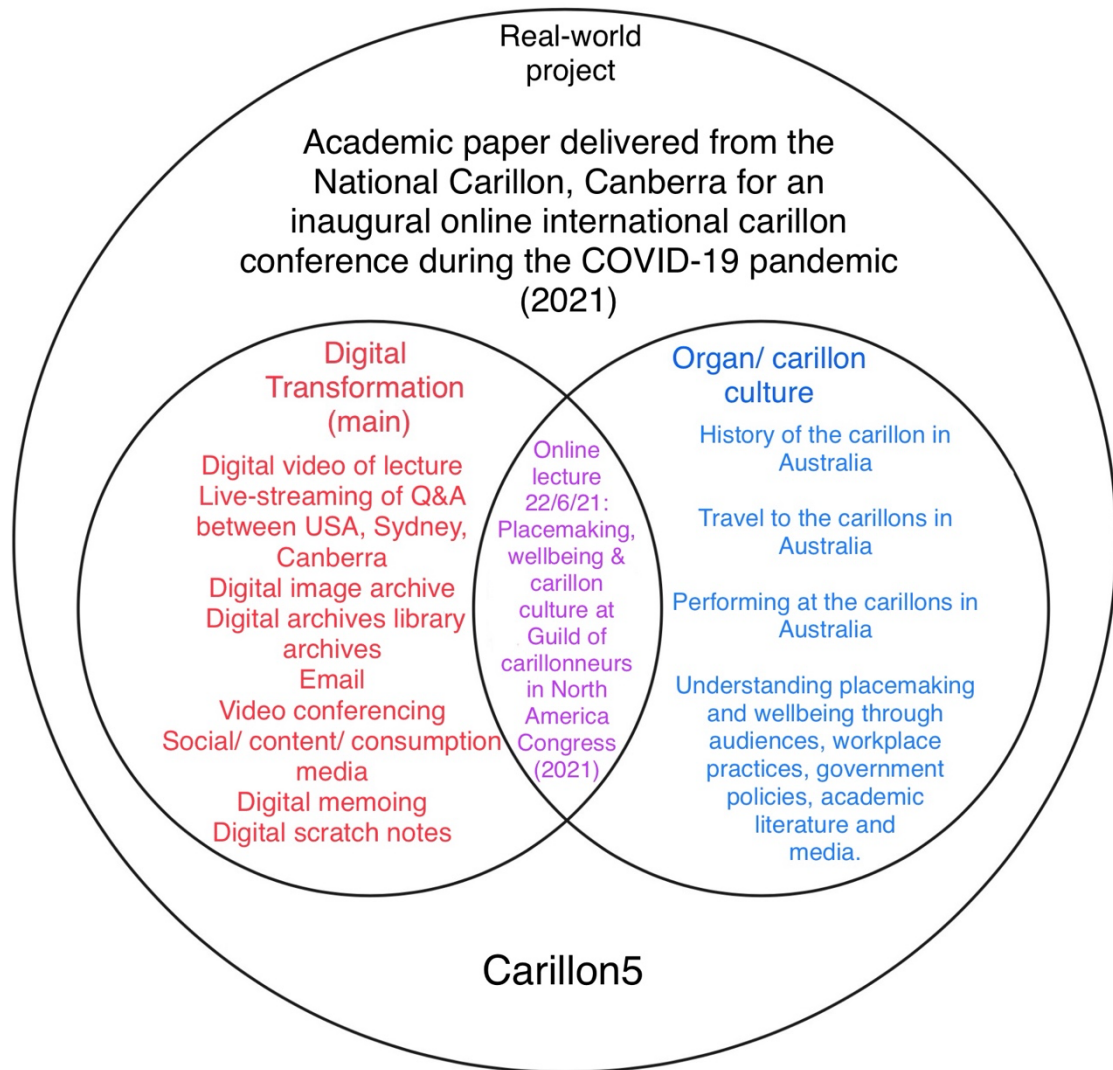
- Speaking directly to the camera, my colleague and I felt that we were personally inviting our colleagues from around the world into our carillon tower to share ideas, music and friendship.

- Post COVID, I was able to reflect on this time, that all artists were globally part of this new learning, developing new knowledge of how to have an artistic and academic presence online (e.g. the Australian Concert Hall livestreaming company start up).<sup>333</sup>

---

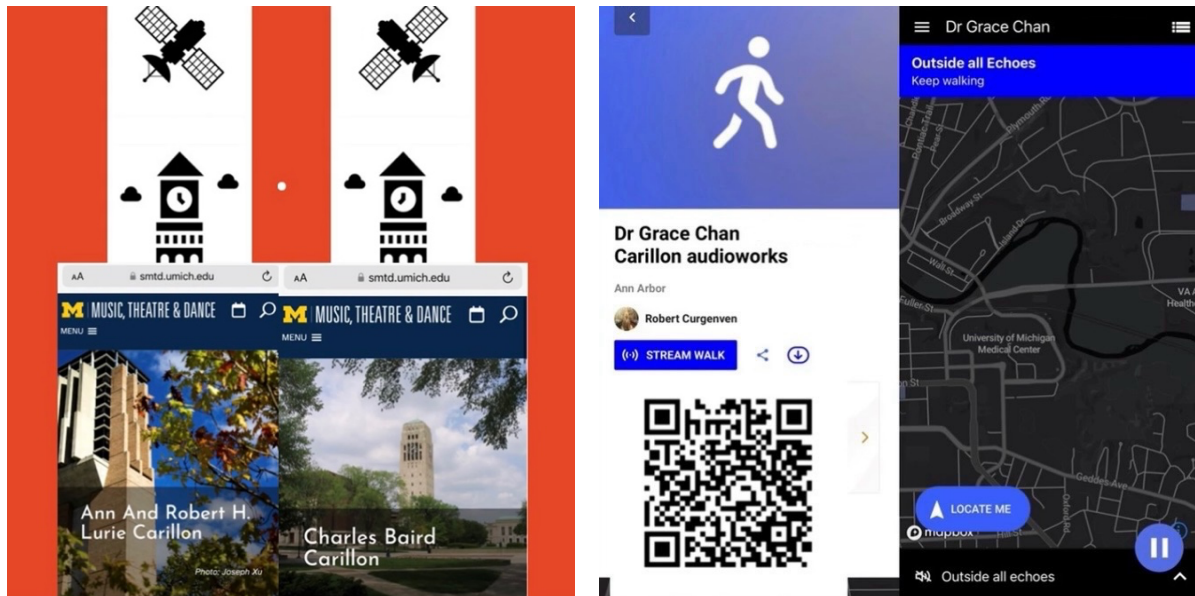
<sup>333</sup> Australian Digital Concert Hall article <https://www.cutcommonmag.com/three-years-on-australian-digital-concert-hall-continues-to-change-the-game-for-the-live-performance-industry/>

Figure 4.29 Venn diagram for Carillon Project 5



#### 4.14 Carillon Project 6: Remotely premiering an Australian carillon composition at university carillon precincts in the United States of America via a geolocation audio experience platform (2023)

Figure 4.30 *Crowning Perpendicular* (Vines, 2023) & “Echoes”



#### [Ann Arbor Carillon Audiowalk](#)

(Hyperlink of the archived webpage only—the audio file is no longer active post conference)

<https://explore.echoes.xyz/collections/XjInsjwhMnS2eZHE>

<https://www.australianmusiccentre.com.au/work/vines-nicholas-crowning-perpendicular>

<https://www.nicholasvines.com/compositions/blog-post-title-four-ad5g9-3l46p-d7j4e-xw9z7-s9exz-45wcj-jrbk4-wsd6e-kcfba>

## **Summary of artistic project**

My main artistic outputs from Carillon Project 6 were two experimental “premiere performances” of an Australian carillon work I commissioned from Dr Nicholas Vines. The work was created in response to a discussion the composer and I had about the nature of ceremony and music. We realised that even an ancient, traditional ceremony, like a coronation, had conduits for innovation and change—in the form of commissioning new music for example. This gradual change was not obvious as often it was transgenerational.

We explored this idea in digital correspondence and also at an academic conference at the University of Michigan. The abstract for our paper is given below. We presented the paper in a film/interview format edited by filmmaker Charles Hamlyn-Harris and a livestreamed question and answer session at the end of the film. This iterative idea between projects developed from Carillon Project 5.

### **“Inventing Future Sounds for Ceremonies: Reimagining Ceremonial Music for the Organ & Carillon” Grace Chan and Nicholas Vines**

Monday, October 2, 2023, 3:50 pm Britton Recital Hall

University of Michigan School of Music Theatre and Dance

Many keystones of the Western classical canon were commissioned for significant royal or aristocratic events such as births, deaths, marriages and coronations. This ceremonial music has historically diffused from “top down”, influencing ceremonial music for sacred and secular events such as graduations and civic celebrations in wider society. For the upcoming British Royal Coronation on the 6th of May 2023: “a new commission for solo organ embracing musical themes from countries across the Commonwealth.” We would like to explore how organ and carillon works are commissioned and composed for ceremonies in contemporary Australian society especially in a time when the idea of “Commonwealth” is evolving. This will involve reimagining and inverting the commissioning and creative process to explore

how music for these ceremonial instruments can be inclusive, diverse and reflect the community in which the music is performed. The proposed work would be for carillon and offer an alternative to the coronation commission's approach. Rather than 'Commonwealth musical themes' - which evoke old notions of nationhood and colonialism, as well as bring up issues of appropriation – the basis of the composition would be original melodies reflecting the multifaceted nature of individuals in a culturally diverse and egalitarian society such as Australia.

## **Artistic Process**

### **Facts**

- The conference *Time Play: Inventing Future Sounds and Scholarship in the Historical Keyboard Realm* was held at the University of Michigan, Ann Arbor, Michigan, USA by the School of Music and Theatre and Dance.

- The University of Michigan has two carillons. The Ann and Robert H. Lurie Carillon and the Charles Baird Carillon.

- The Ann and Robert H. Lurie Carillon is on the north campus and has sixty bells.<sup>334</sup>

- The Charles Baird Carillon is the Burton Memorial Tower and has fifty-three bells.<sup>335</sup>

---

<sup>334</sup> Ann and Robert H. Lurie Carillon <https://smt.d.umich.edu/facilities/ann-and-robert-h-lurie-carillon/>

<sup>335</sup> Charles Baird Carillon in the Burton Memorial Tower <https://smt.d.umich.edu/facilities/burton-memorial-tower/charles-baird-carillon/>

## **Analysis**

- Presenting online from Australia prevented me from premiering the Vines' new carillon work in a real carillon tower.

- I wanted to think of a dynamic and engaging way to "premiere" a carillon work remotely.

- Often carillonists present a video of themselves at the console. The audio can be recorded closer to the bells or from the carillon precinct. The audio can be synchronised with the vision during a livestream or postproduction if it is for a recording.

-I feel this does not convey the sense place and beauty in hearing a carillon work from within an outdoor carillon precinct.

## **Speculation**

- I contacted my composer colleague Robert Curgenvin and asked if he could mix and master a recording of Vines' work *Crowning Perpendicular*, I made at the University of Sydney War Memorial carillon. I respected his work in geolocated listening experiences and always learn from our transdisciplinary engagement.

- I was not sure this would be successful at the end of an academic presentation with instructions given on a slide and QR code. It entailed downloading an app, using headphones

and travelling to the carillon precincts. I told myself to “just do it” as this scenario was similar to any “real” carillon concert i.e. there could be no one listening.

- After the conference, I was not sure if any conference delegates engaged with the piece as an “audio walk” however felt the artistic process of conceiving the idea and working with Curgenven was very rewarding and will spur future collaborations.

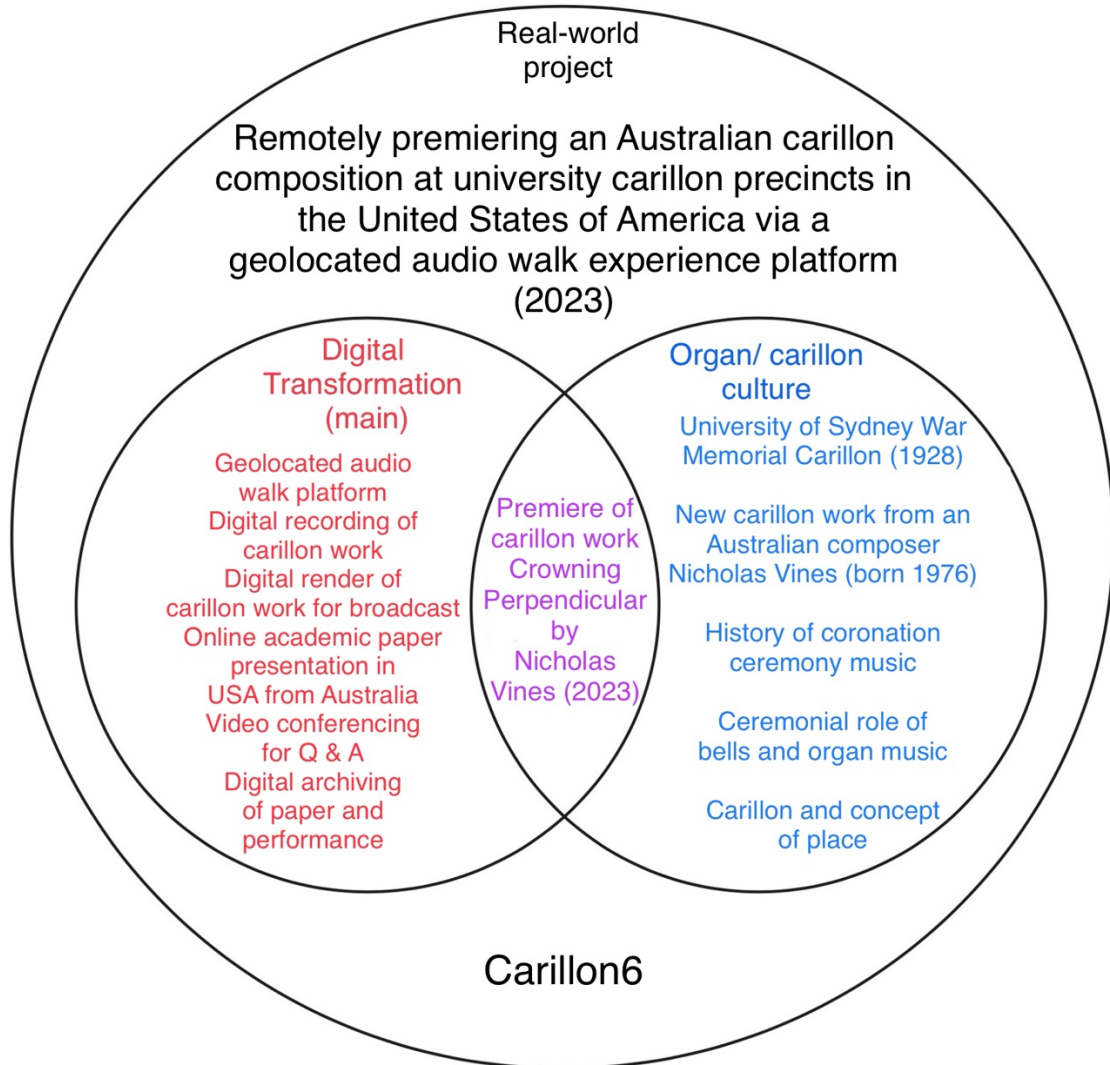
### **Artistic solutions**

- I recorded *Crowning Perpendicular* at the Sydney University War Memorial Carillon on the night of a rare super moon. The late-night lunar ambience (and the fact that the Quadrangle and cloisters were full of moon watchers) led me to perform the work as a much slower and meditative pace than scored by the composer. I played it extremely slowly, enjoying the reverberations between notes—it was less than half speed.

- The recording was uploaded by Curgenven to “Echoes” (see link above)—an application that allows geolocation of sound files. The sound files were geolocated to the two carillon precincts at the University of Michigan.

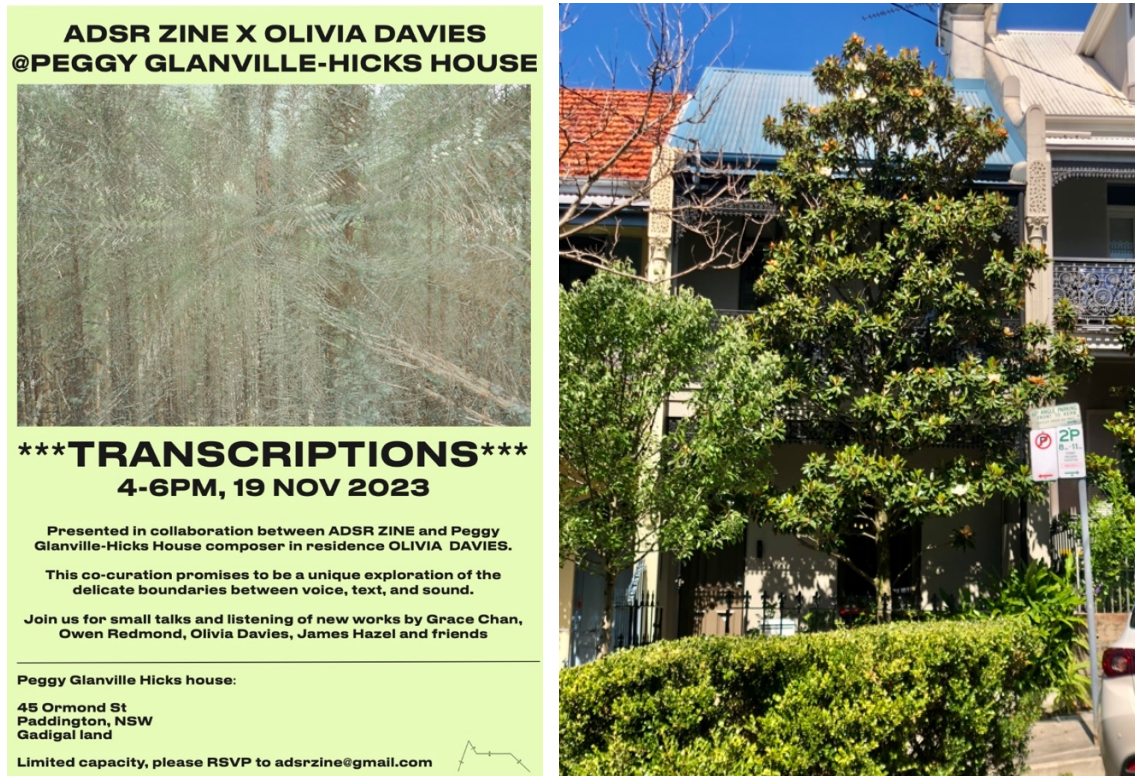
- I will revisit this sound/place experiment and the possibilities it highlighted.

Figure 4.31 Venn diagram for Carillon Project 6



#### 4.15 Carillon Project 7: Premiering an Australian carillon composition as a salon group listening experience at Peggy Glanville-Hicks House for ADSR Zine (2023)

Figure 4.32 Transcriptions: ADSR Zine @Peggy Glanville Hicks House



Social media graphic: Elia Bosshard, Editor ADSR Zine. Peggy Glanville-Hicks House Photo: Grace Chan (2023)

Social media post from ADSR Zine

<https://www.instagram.com/p/CzxCSJwBimO/?igsh=MTRjMXc0Y3FpZ3Jqaw==>

Social media post about [“Transcriptions”](#) event from ADSR Zine

<https://www.instagram.com/p/Czk3lF6r0XR/?igsh=bGMvNzI1cXJhZHQ=>

## **Artistic research statement**

My main artistic outputs from Carillon Project 7 were a talk and facilitated group listening experience at a culturally significant heritage house.

## **Artistic Process**

### **Facts**

- I was asked to present a talk about “transcription” at Peggy Glanville-Hicks House. Peggy Glanville-Hicks was an Australian composer who bequeathed her inner-city terrace house for Australia composers to use as an extended residency. The resident at the time of my artistic output was composer Olivia Davies. The project was a cross pollination between ADSR Zine (an experimental digital publication) and the Olivia Davies composer residency. There was a diverse and engaged crowd at the listening.

- I thought about the art of transcription within organ and carillon culture. I eventually decided to interpret “transcription” as being derived from “transcript” i.e. as a recorded (rather than written or printed) version of material originally presented in another medium.

- I immediately thought of the transdisciplinary experiment with Vines/Curgenven and the University of Michigan Time Play paper.

### **Analysis**

- I felt the best way to convey my ideas was to give a short oral presentation before the listening. The composer Nicholas Vines was present.

- This event was the second public event where the composition had been heard. Both times did not involve being at a carillon precinct.

### **Speculation**

- This led me to speculate: is it too hard for listeners to come to a carillon precinct in Australia (even if they are in the same country)?

- Is the concept of the carillon too hard to grasp in Australia without my verbal explanation?

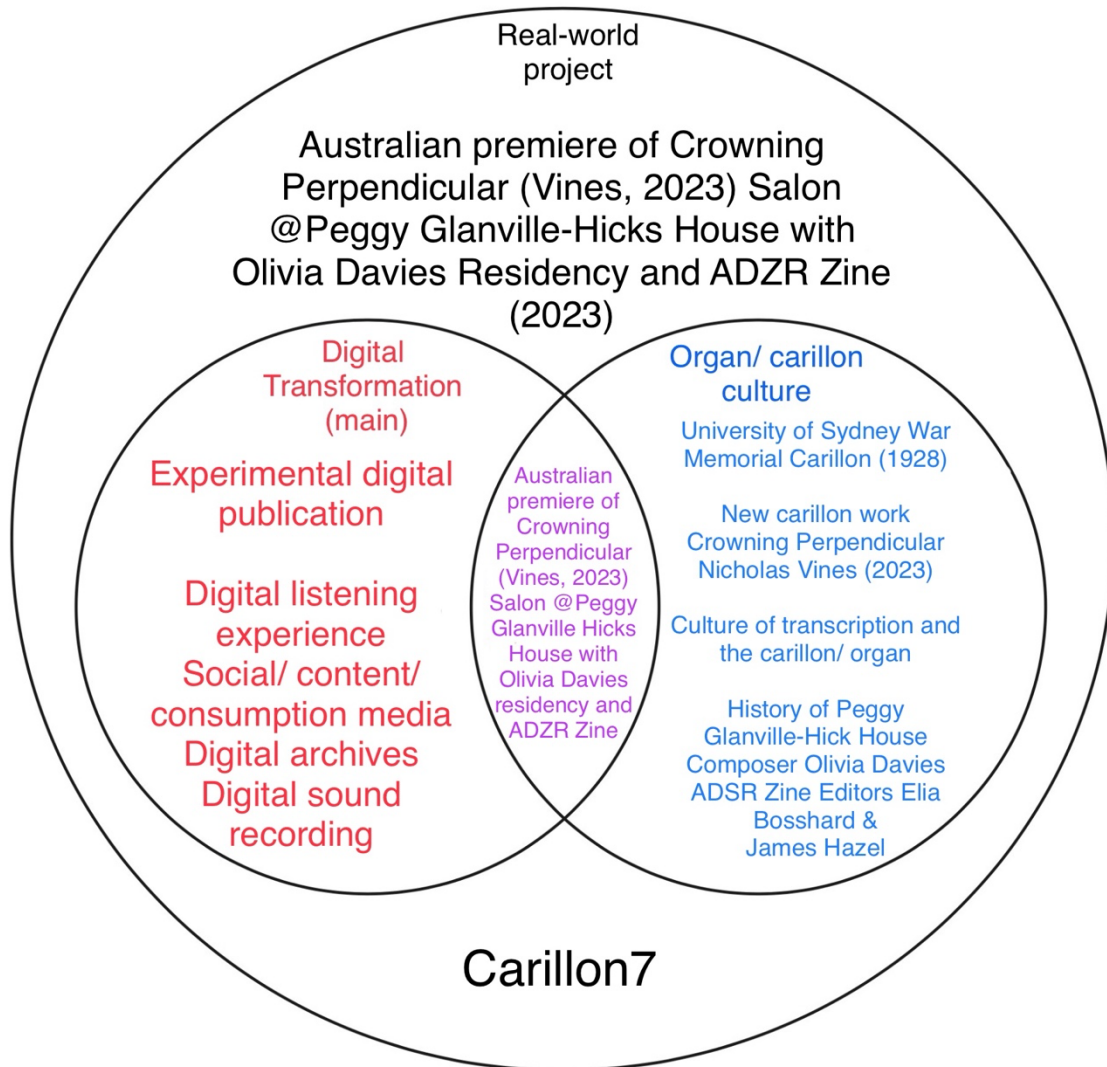
- I also wondered when I would finally be able to “premiere” Nicholas Vines’ work at a real carillon tower. What were my own preconceptions and expectations around “premiering” a work?

### **Artistic solutions**

- I requested high fidelity surround speakers for the group listening event.

- At a carillon precinct, there is usually noise and the activities of daily living. Here at this group listening I requested silence so that we could enjoy Curgenvén’s detailed mix/master which emphasised the reverberation: microtones of decaying sound between note and bell strikes.

Figure 4.33 Venn diagram for Carillon Project 7



#### 4.16 Carillon Project 8: Performing the Ngarigu Snow Song on carillon with Professor Jakelin Troy (Ngarigu) at the Australian Linguistic Society Conference, University of Sydney, Australia (2023)

Figure 4.34 Prof. Jakelin Troy singing and playing the Ngarigu Snow Song during a rehearsal at the mechanical carillon practice clavier in the Sydney University War Memorial Carillon



(Left) Professor Jakelin Troy, Linguist, Director, Indigenous Research, University of Sydney demonstrating the Ngarigu Snow Song during a practice session at the University of Sydney War Memorial Carillon practice clavier<sup>336</sup> (Right) Aboriginal flag<sup>337</sup> University of Sydney War Memorial Carillon. Photos: Grace Chan (2023)

Grace Chan playing the [Ngarigu Snow Song](#) on carillon (an informal 2023 practice session). Video recorded by plant scientist Associate Professor Rosanne Quinell from an elevated turret in the Main Quadrangle opposite to the Sydney University War Memorial carillon. Performed on carillon by Grace Chan with the permission of Professor Jakelin Troy using the score from Troy and Barwick (2020)

<https://youtu.be/vJoRbnBqOF4?si=s-aO9mkURZkjQ58x>

---

<sup>336</sup>Jakelin Troy and Linda Barwick, "Claiming the 'Song of the Women of the Menero Tribe'," *Musicology Australia* 42, no. 2 (2020), <https://doi.org/10.1080/08145857.2020.1945254>; "Professor Jakelin Troy Webpage," 2025, <https://www.sydney.edu.au/arts/about/our-people/academic-staff/jakelin-troy.html>.

<sup>337</sup> "The Aboriginal Flag," 2025, <https://aiatsis.gov.au/explore/aboriginal-flag>.

## **Summary of artistic project**

My main artistic output from Carillon Project 8 is the performance of the Ngarigu Snow Song on carillon—accompanying Professor Jakelin Troy’s singing and body percussion at one of the opening sessions of the 2023 Australian Linguistic Society conference in the Main Quadrangle, the University of Sydney.

This project was a direct result of previous transdisciplinary research work on the evolution of ceremony in Australia with colleagues Dr Janelle Evans (visual artist), Associate Professor Rosanne Quinell (plant scientist) and Professor Troy (linguist) within the Sydney Indigenous Research Network (SIRN).

[This Place:](#)

<https://transdisciplinary-research-science.sydney.edu.au/this-place/>

## **Artistic Process**

### **Facts**

- Professor Troy asked if I could perform with her on the Sydney University carillon. She wanted to sing the Ngarigu Snow increase song from a paper she published with Professor Emeritus Linda Barwick for her linguistic conference delegates. This paper contained a score the authors reconstructed with evidence from musicological sources.<sup>338</sup>

---

<sup>338</sup> Troy and Barwick, "Claiming the 'Song of the Women of the Menero Tribe!'"

Jakelin Troy and Linda Barwick, "Claiming the 'Song of the Women of the Menero Tribe'," *Musicology Australia* 42, no. 2 (2020), <https://doi.org/10.1080/08145857.2020.1945254>

An excerpt from the abstract of the cited paper:

This article aims to re-evaluate Johann Lhotsky's published sheet music 'A Song of the Women of the Menero Tribe near the Australian Alps' to claim it as a distinctively Ngarigu document that speaks to Ngarigu people today. Following a method suggested by Graeme Skinner, we recover additional information, strip out the 'improvements' of the arrangers and create a new Ngarigu-oriented reading with what we hope will be 'real value for song revitalisation' by providing 'usable details' of text, melody and rhythm.<sup>339</sup>

- The performance was planned for the 1st of December 2023 from 0800 —0815. Prof. Troy would be singing in the Main Quadrangle in the presence of Australian Linguistic Society delegates while I would perform in the carillon tower.

### **Analysis**

- I downloaded the academic paper and score. Professor Troy also allowed me access to a digital video recording she made of the Ngarigu Snow Song being sung on her country, Ngunnawal Country in the ACT.

- I decided to play from the score without embellishment or ornamentation.

---

<sup>339</sup> Troy and Barwick, "Claiming the 'Song of the Women of the Menero Tribe'."

## **Speculation**

- I was unsure if the bells would overwhelm a solo singer in the Quadrangle.

- I considered performing with closed shutters in the carillon tower.

## **Artistic solutions**

- I decided to perform the carillon accompaniment softly, with the carillon tower shutters open.

- Carillon Project 8 was brief (15 mins) and compared to other opening ceremonies and commemorations happened relatively spontaneously. This did not affect the deep meaning and force in the act of being given permission by a custodian to perform her song, with her on carillon. I realised that ceremony can be over-planned and overdone. In the end, opening or closing the shutters was not important—only that my colleague and I made music together for her students and colleagues.

- I reflected on why the “write up” for this case study was so brief. Partly it was because the collaboration happened spontaneously and it is hard to document spontaneity in text. However, the joy resulting from this spontaneity was able to be conveyed artistically in our performance. Another possibility may be that an institutional framework (such as a thesis case study format) is at odds with indigenous priorities and the nature of indigenous knowledges. I decided to meet Professor Jakelin Troy and colleagues from the Sydney Indigenous Research Network for future conversations about indigenous cultural intellectual property.

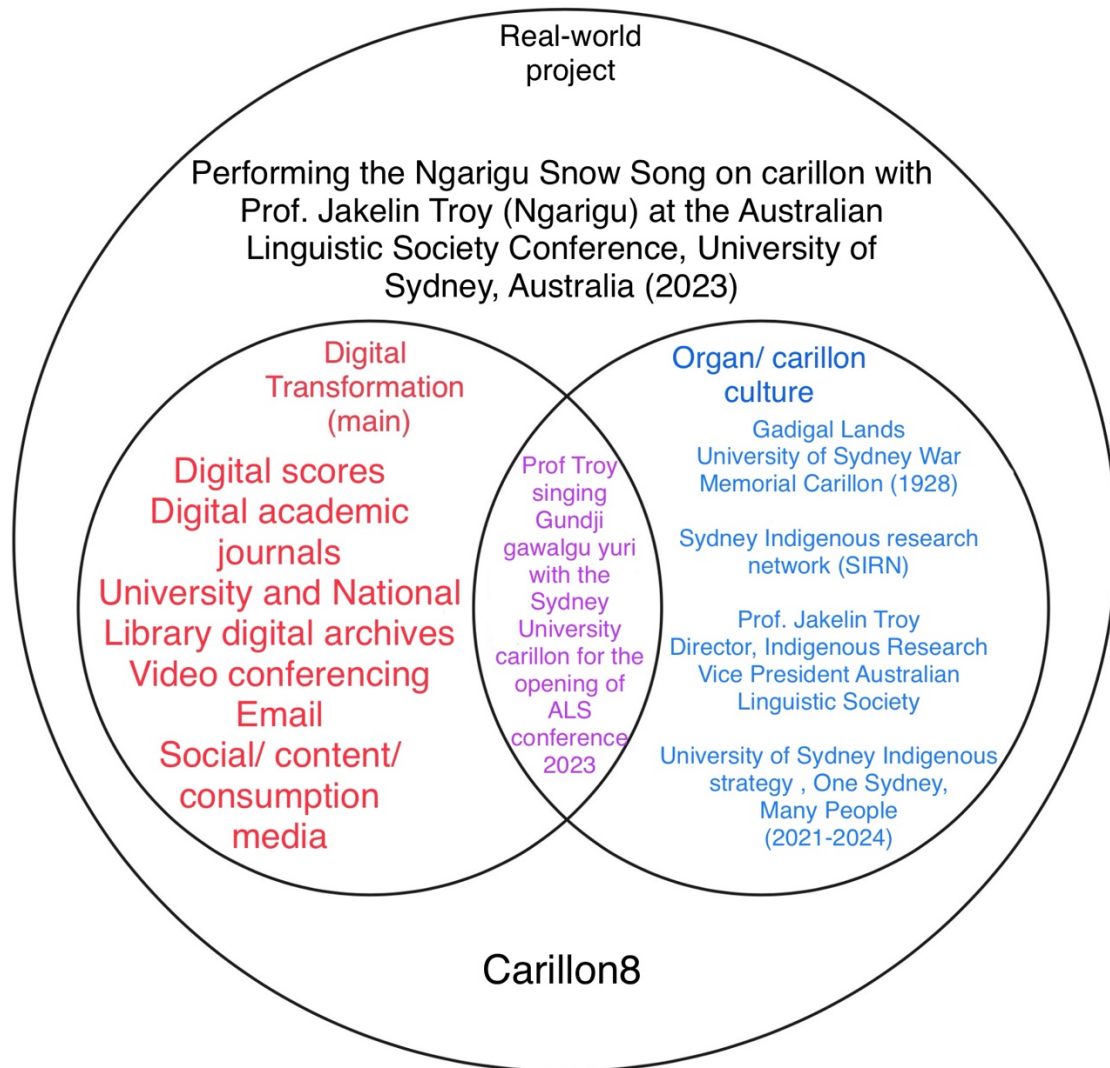
- I reflected on whether I felt comfortable performing the Ngarigu Snow Song without a custodian present (I had the open access score form the published paper). I decided it would not be appropriate performing the song without an indigenous custodian present and explicit permission (I prefer to collaborate with indigenous artists regarding matters of cultural knowledge).

- I reflected on why we did not have any indigenous carillonists at our University despite having many First Nations academics, students and professional staff at the University of Sydney. I hope to ask for permission to discuss this at a Sydney Indigenous Research Network meeting and the annual Garabarala<sup>340</sup> (Knowledge Feast) held at the University's Chau Chak Wing Museum.

---

<sup>340</sup> Garabarala, from the Gadigal language, means "let's sing, dance, yarn and celebrate together." It is an annual forum created by the Sydney Indigenous Research Network founder Professor Jakelin Troy to perform research, share stories and gather over food, music, art, and conversation. (1) <https://www.instagram.com/p/DRN1Bdrk6Si/> (2) <https://transdisciplinary-research-science.sydney.edu.au/this-place/> (3) <https://www.eventbrite.com.au/e/garabarala-the-knowledge-feast-tickets-1790930835339>

Figure 4.35 Venn diagram for Carillon Project 8



## 5 Discussion

The objective of this thesis is to explore the impact of digital transformation on the sustainability of organ and carillon culture through an artistic research methodology. This is achieved through the application of a systematic artistic research approach to a series of real-world artistic projects. The 16 artistic projects (8 organ and 8 carillon) span a decade and are derived from the active professional practice of an Australian organist and carillonist. The real-world artistic projects chosen for this study result from the intersection of digital transformation and contributory aspects of organ/ carillon culture.

The nature of this impact on the sustainability of these intangible cultures will be discussed here Chapter 5. This study is focused on whether the impact was positive or negative with regards to sustainability i.e. did this intersection contribute to “keeping it going,”<sup>341</sup> by stimulating artistic practice, creativity, pedagogy, audience engagement and inspiring sector innovation. Did the impact of digital transformation thwart or promote the sustainability of organ and carillon culture at the end of the artistic process?<sup>342</sup> In this thesis, sustainability is considered a desirable outcome for organ and carillon culture.

The Chapter 1 Introduction and Chapter 2 Literature Review of this thesis drew on evidence from UNESCO Intangible Cultural Heritage documents that outline why for example, society requires and desires safeguarding of the carillon culture of Belgium. Also cited, is UNESCO’s support to sustain organ building culture and bell casting/ music in Germany.

---

<sup>341</sup> Reid, *Educating Musicians for Sustainability*.

<sup>342</sup> The researcher is allowing space for instances where a digital approach seems like a good artistic solution at the beginning of a project and then revealed to be unsuitable at the performance end of the process.

With respect to the artistic projects in this thesis, the qualitative data drawn from contemporaneous artist-researcher notes were delineated into four strands aligning with Dr Paulo de Assis' four reflective questions for artistic researchers namely, (1) what are the facts? (2) what analyses need to be made? (3) what speculations are involved? and (4) what are the artistic solutions that an artist encounters in an artistic project?<sup>343</sup> After this four-pronged interrogation of each artistic project the outcome was an artistic output. The data from these artistic outputs was then organised into a Venn diagram for the narrative, prose based, qualitative comparative analyses in this Discussion chapter.

The following paragraphs will critically review the data for each artistic project, using their Venn diagrams (see Chapter 4 Results for the Venn diagram figures) as a summarising and organising visual aid. Following the reviews of each artistic project, a prose based qualitative analysis will examine if intersections of digital transformation and organ/ carillon culture have an impact on the sustainability of organ and carillon culture. An attempt will be made to identify the nature of this impact through examining patterns that may emerge over the 16 real-world, organ and carillon artistic projects. Therefore, this discussion will attempt to connect the raw data from artistic outputs to themes of sustainability that emerge when digital transformation intersects with organ and carillon culture.

### **Organ Project 1 Discussion**

This real-world artistic project involved commemorating the 175th Anniversary of the City of Sydney with organ music at the Sydney Town Hall Grand Organ (2017) (c.f. Chapter 4.1). The main artistic output was the premiere of *Imitations* by Austin Buckett on pipe organ; a

---

<sup>343</sup> Assis, "Artistic research seminar 2 - artistic research in music."

secondary artistic output was the preparation of an edition of the minimalist score for performance at the Müller organ at the Bavokerk, Haarlem, NL.

This project drew on significant aspects of organ culture. It involved an internationally important pipe organ in the 1890 William Hill & Son instrument located in Sydney Town Hall, Australia. Preparation for the project involved practicing on the historic 1874 J.W. Walker & Son instrument at St Stephen's Anglican Church in Newtown. Other instruments that supported the composition process were the 1973 Sydney Conservatorium Verbrugghen Hall Pogson organ and the 2009 Sydney Conservatorium Klop chamber organ. Human resources within Sydney's organ culture contributed to the artistic project. The composer met with the leading organists in Sydney (e.g. a Director of Music from St Mary's Cathedral, a former Director of St James Church and a Sydney Symphony Orchestra Organist). The City Historian commissioned the work and supported the 6-month composition process with the resources of the City (digital/ social media, marketing and access to Centennial Hall where the 1890 William Hill & Son organ is located).

Aspects of digital transformation that were crucial to this project include the virtual pipe organ (VPO) located in the historical performance division at Sydney Conservatorium. It is here that the composer Buckett workshopped his ideas on a digital virtual sample set of an English romantic organ<sup>344</sup> (the Sydney Town Hall organ is an orchestral organ in the English romantic style). Digital communication tools used between the premiering organist and composer (email and text messaging for scratch notes and video conferencing) contributed greatly to the artistic outcomes of the project. Digital scores, digital audio and video

---

<sup>344</sup> Hereford Cathedral "Father Willis" organ sample set from Lavender Audio.  
<https://www.lavenderaudio.co.uk/organs/hereford/>

resources enriched the compositional and performance aspects of the project. Digital archives were accessed frequently by organist and composer (e.g. the digital archives of the National Library of Australia and the digital archives of the City of Sydney).

In Organ Project 1, digital transformation intersected with organ culture to produce a significant artistic output for the City of Sydney on its 175th Anniversary. This impact assisted in conserving, promoting and using heritage elements of organ culture. At the same time, innovation was supported in the form of a new experimental minimalist organ work. Preservation and innovation coalesce in this project to support the sustainability of organ culture.

### **Organ Project 2 Discussion**

This real-world artistic project involved the world premiere of new music for portative organ in honour of the La Dame à la licorne tapestries (France, c. 1500) coming to the Art Gallery of New South Wales (2018) (c.f. Chapter 4.2). The artistic output for this project was the premiere of two specially composed works for an Australian made portative organ. The works were by leading Australian composers Dr Lyle Chan and Moya Henderson.

The project drew on significant aspects of Australian and international organ culture. The Unicorn tapestry is an iconic, medieval visual art representation of a woman playing a portative organ. The project used a portative organ made in Australia by renowned organ builder Ronald Sharp (1986-88) who designed and constructed the Sydney Opera House pipe organ. The Sharp portative organ is an important item in the Powerhouse Museum musical instrument collection. The project was performed at the state level Art Gallery of New South Wales, uniting French medieval visual art with Australian organ music culture.

Aspects of digital transformation that were crucial to this project include the use of a VPO by the organist to prepare for the performance at the Art Gallery of New South Wales. [Digital resources](#)<sup>345</sup> from the Musée de Cluny, Paris (where the tapestries usually reside) were important to the artistic outcomes of the project. The organist also used a mini keyboard with a digital, large scale integration sound source.

In Organ Project 2 international and nationally significant aspects of organ culture (the medieval positive organ tapestry and the Australian Sharp portative organ) intersect with examples of digital transformation (digital virtual sonic representations and digital archives) to successfully premiere new Australian compositions. A silent museum object was activated as a musical instrument; a contemporary Australian sound world was composed for an ancient French tapestry of international cultural importance. Economic activity was generated through the creation of a music event to supplement the visual art exhibition. In Organ Project 2 digital transformation supports the sustainability of organ culture.

### **Organ Project 3 Discussion**

Organ Project 3 involved an organist performing 100 iterations of Satie's Vexations at the Extended Play festival of new music in City Recital Hall, Angel Place, Sydney (2018) (c.f. Chapter 4.3). The artistic output of this real-world project was the performance these iterations of Satie's Vexations (1893) on a Casio tone SA-76 (2010). Interestingly, the iconic aspect of organ culture harnessed for this project (the Hill magnum opus in the Sydney Town Hall) dates from 1890 (three years before Vexations). The seeming modernity and reputation of Vexations as radical, obscures the fact that it was composed in around 1893.

---

<sup>345</sup> Le Musée de Cluny, Paris. <https://www.musee-moyenage.fr/en/collection/the-lady-and-the-unicorn.html>

City Recital Hall does not have a pipe organ so it was interesting to bring organ culture into a significant concert venue in the City of Sydney through this project. Rehearsing on the 1890 Hill & Son instrument in Sydney Town Hall, tangentially drew this important historical organ into a new music festival context. As an organist this rehearsal of Vexations in Sydney Town Hall rejuvenated my approach to the Hill organ's English romantic, orchestral sound world. The relentless repetition of Satie's work (and blunt instructions) allowed me to explore the variation of timbre as a musical form whilst notation remained static; it was interesting to consider repetition as an experimental musical device (as it was taken to such an extreme). This process led me to read books about organ stops - old organ registration dictionaries found in the Sydney University's Fisher Library.

The aspects of digital transformation that impacted on this artistic project include the portable pulse code modulation (PCM) samples in the Casio digital keyboard used for the performance. Engaging with Dr Lyle Chan, the curator and artistic director of the Extended Play music festival via email and messaging apps, was important to understanding the community-based nature of the durational group performance. I also accessed digital archives of Satie's works (scores) as well as recorded performances via digital music streaming services. Rehearsing at Sydney Town Hall, I made extensive use of digital voice memos, digital scratch notes as images and text on my phone, and digital journalling. Though the audience did not know about my rehearsal process at an acoustic pipe organ (just 10 minutes' walk down the road from City Recital Hall), this undertaking had a profound impact on me as a performing artist. In an interesting inversion, I practiced at a real organ for a public performance on a digital instrument. While performing on the Casio tone, I was able to understand the origins of this mass-produced domestic instrument through "extended play" at the Sydney Town Hall 1890 Hill & Son Grand Organ.

The impact of digital transformation in Organ project 3 was to provide modern, accessible context to heritage aspects of organ culture. The exploration in digital archives and performing on a portable digital instrument transformed a repetitive, durational event to an exploration of the variation form as timbral shift rather than notated iterations. The impact of digital transformation on organ culture in this project was artistically enriching (greatly nourishing my artistic process) and by extension benefiting the large audience at the Extend Play festival of new music at City Recital Hall. Digital transformation intersected with organ culture positively in this artistic project.

#### **Organ Project 4 Discussion**

The artistic output of Organ Project 4 was the Australian premiere of a large-scale (50 minute) organ work at the Sydney Town Hall Grand Organ for the 2020 Sydney Festival, Australia (c. f. Chapter 4.4). This organ work was called *Bronze Lands* and written by composer Robert Curgenvin (Ireland/ Australia). The most significant aspect of organ culture that featured in this project was the historic 1890 William Hill & Son pipe organ in Sydney Town Hall. The composer asked me as the organist/ registrant, to re-imagine the Hill's English romantic sound world for his experimental new work based on interference with a prerecorded acoustic soundtrack (of historic pipe organs in Ireland).

Aspects of digital transformation that greatly assisted in this project include a VPO (installed with the Hereford Cathedral "Father Willis" organ sample set from Lavender Audio). I listened to digital recordings of Curgenvin's previous work as background and used digital communications (e.g. social media, email, instant messaging apps and video calls) to converse with the composer during a 6-month workshopping process when we were in

different countries. The composer lived in Ireland and frequently toured in Europe so digital communications were crucial to the success of this creative project.

To summarise, the impact of digital transformation on the artistic output from the Hill organ led to an innovative composition that sold out at a major international festival in Sydney (2020 Sydney Festival). From Sydney Festival feedback, many people in the audience had never attended a pipe organ recital before *Bronze Lands*. Digital communication was important to the success of this international collaboration. Social media helped me keep in touch with Curgenvin and his ongoing body of work, so that I was able to understand his compositional language despite his touring throughout Europe and his artistic practice being based in Ireland. This project stimulated me to explore further collaborations that existed beyond Sydney and Australia. In this project, the intersection of digital transformation and organ culture served to greatly enhance my creative practice.

### **Organ Project 5 Discussion**

Organ Project 5 involves performing on the University of Sydney Great Hall pipe organ (Rudolf von Beckerath, 1972) during livestreamed university graduation ceremonies (2021–present) (c. f. Chapter 4.5). The artistic output from this ongoing work is the live performance on organ of ceremonial, recital, incidental and ambient music. The ceremonial music is heritage, traditional-style organ music in the form of a processional and recessional. The organ is an important traditional part of the Sydney University graduation ceremonies.

The aspects of digital transformation that feature in this artistic project include livestreaming (which when available on a video sharing platform for repeated views after graduation day, becomes a digital archive), digital programs (accessed by the audience via a QR code) and

digital communications with my workplace supervisor to coordinate repertoire and rostering. The latter was very important. For the ceremonies to go well (three per day during graduation blocks of up to one month, 2-3 times a year), there was a dependence on the organisation of human resources in the form of clear and robust rostering.

Livestreaming was an important feature of this artistic project. The COVID-19 pandemic accelerated the uptake of livestreaming. While it may now seem routine and commonplace, livestreaming of the musician or music was not standard or prevalent in the carillon and organ world pre-COVID; the reason why needs to be understood in the context of organ and carillon culture. The organist was usually in a loft or sitting behind the positive of a large organ. The carillonist is in a tower. The organ and carillon musicians were historically never prominent as a visual entity or solo artist in the modern sense. In church music, the organ supports the liturgy and has a service imperative.

The main impact of digital transformation in Organ Project 5 is to bring organ music to more people. Each graduation season yields over 20 000 unique livestream views (see Appendix 5). The livestreaming also allows for transdisciplinary collaboration with the audio-visual team to bring about an engaging experience for the audience. The videographers improvised their camera shots and angles in response to the organ music that was performed during the recital portion of the graduation ceremony. The cameras zoomed in and out of the audience view to capture spontaneous reactions of the audience to the atmosphere of celebration in the University of Sydney Great Hall. The livestreamed music performed on organ supports this joy and the community's recognition of students' University achievements. The digital aspects of this project served to extend the reach of organ culture to new audiences.

## Organ Project 6 Discussion

The artistic output of this real-world creative project is the digital publication of a lo-fi digital artwork and ‘live’ automated spoken word performance using voice generation for the underground publication ADSR Zine 014 (2021) (c. f. Chapter 4.6). The visual and aural digital artwork produced was a lo-fi 3D digital creation in a low tech 2D digital environment (i.e. a PDF downloadable from a website). The aspect of organ (and carillon) culture featured in this project was the artistic practice of the researcher. I was asked by the Zine editors to discuss my artistic practice as an organist (and carillonist). In this visual artwork, I wanted to couch my own artistic and academic work in the concepts of automation, pixelation, encoding, indexing and the idea of presets.

Digital transformation featured in this project through the commissioning of an “article” by an online, experimental publication (ADRS Zine) that was created to have a may fly-like existence in the digital space (ADSR Zine 2018-2023). The impact of digital transformation on the Zine article about my artistic practice, was as a catalyst in radically re-imagining my autobiography, portfolio and photo archive for a digital environment. My life was automated, pixelated, indexed and encoded. The [synthetic voices](#) designated to read out my portfolio were preset, like registrations prepared for an orchestral transcription performance on a large symphonic organ.<sup>346</sup> This intersection of digital transformation and organ/ carillon culture challenged conventional ways of creating an artist autobiography in digital print.

---

<sup>346</sup> Voice generator <https://voicegenerator.io>

## **Organ Project 7 Discussion**

The artistic output for real-world Organ Project 7 was the 22nd of March 2023 audition for the role of “Organ Service Provider” (or City Organist) at the Sydney Town Hall Grand Organ for the City of Sydney, Australia (2023) (c. f. Chapter 4.7). The aspects of organ culture that feature prominently in this project are the 1890 William Hill & Son pipe organ and the history of the organ and organists at the Sydney Town Hall. Also of relevance, was the history of civic organists in Australia, Europe and USA. Applying for this role was a tender process conducted by the City of Sydney, therefore of relevance, was the concept of cultural sustainability as it features in the policy documents of the City. The tender process was entirely digital up to the point of shortlisting and presenting for the audition at the 1890 William Hill & Son pipe organ in Sydney Town Hall.

The digital resources used for this project include a VPO of an English romantic organ (Hereford Cathedral “Father Willis” organ by Lavender Audio) and digital scores of the organ works I prepared for the audition after being informed by the City of my shortlisting. I also accessed the City of Sydney digital archives, strategic plans and other policy documents that helped me learn about the City and how I could be best of service to the City and its community. I found it useful to listen to digital recordings of the Sydney Town Hall organ from a music streaming service.

The impact of digital transformation on organ culture in this artistic output (an audition recital) was support of my application to be of service to the City of Sydney as a performing artist and cultural leader. The digital resources helped me to prepare an innovative recital program that challenged programming status quo whilst respecting traditional pipe organ culture. It was a privilege to be the first woman shortlisted for the City Organist position in

the City of Sydney: a role that is about innovation on a continuum of tradition, continuity, community wellbeing, placemaking, cultural sustainability and above all, beautiful music for the people in my beloved City.

### **Organ Project 8 Discussion**

The artistic musical output for Organ Project 8 was organ service music for the 7th of April 2024 livestreamed celebration service to commemorate the 150th year anniversary of St Stephen's Anglican Church, Newtown, Australia (2024) (c. f. Chapter 4.8).

The elements of organ (and bell) culture that contributed to this artistic output include the St Stephen's Anglican Church 1874 J.W. Walker & Son pipe organ. The church's 1880 Whitechapel hemispherical chimes also contributed to the celebratory service soundscape. I performed a traditional hymn on the organ (Holy, Holy, Holy), an organ prelude, an organ postlude and some ambient music that suited the festive mood of the occasion.

The aspects of digital transformation that intersected with organ culture included livestreaming, MIDI controlled chimes (the Whitechapel chimes can be played from a wireless keyboard or controlled by a smart phone application). A virtual pipe organ was used to prepare for the Anniversary service and digital scores were used on my iPad for the performances.

The impact of digital transformation in this artistic project was to create a seamless hybridity. Digital transformation improved efficiency and was functional. I was able to prepare the music list efficiently on my iPad (with forScore) and download open access scores from IMSLP.<sup>347</sup> The wireless MIDI keyboard and phone app controlled the chimes so I could stay with organ and still activate the bells. The livestreaming increased accessibility to the service

---

<sup>347</sup> International Music Score Library Project (IMSLP)

and its organ music. The impact of digital transformation on this project was to help the service run smoothly, increase accessibility and encourage the use of a rarely played historic chime.

### **Carillon Project 1 Discussion**

The real-world artistic output for Carillon Project 1 was to learn how to transfer with musicality, repertoire practiced on a carillon practice clavier to main carillon bells at the National Carillon, Canberra (2018–2022) (c. f. Chapter 4.9). Music on main bells can be heard by the public. Music played on the practice clavier can only be heard by the carillonist or others in the room.

The aspects of carillon culture which contributed to this artistic output include the main bells at the 1970 National Carillon, Canberra, the 1970 Taylors mechanical practice clavier in Canberra and the 1923 Taylors mechanical practice clavier from Andover, MA, USA in my home music studio. Carillon method books from the National Carillon library (administered by senior carillonist Ms Astrid Bowler, Tower Librarian) also contributed to these outputs (e.g. carillon methods by Leen ‘t Hart (NL), Koen van Assche (Belgium) and John Gouwens (USA)).

The aspects of digital transformation that were prominent in this real-world project include the digital virtual practice clavier at the National Carillon (Taylor’s 2020). Social media and video sharing platforms assisted in showing me how other carillonists/ carillonneurs performed at their main bells. Online video conferencing allowed me to have remote lessons and “masterclasses” with carillonneurs in the northern hemisphere while at my main bells in Canberra (and they at a carillon console in their country). Digital music streaming, digital

archives and online sheet music stores (Beiaard Centrum, NL and GCNA, USA) helped me learn about the gamut of carillon repertoire performed in Europe, the United Kingdom and USA.

In this project, digital transformation intersected with analogue aspects of carillon culture to contribute to my understanding of how to make music on carillon bells after learning a carillon piece at a simulation (a digital virtual or acoustic mechanical carillon practice clavier). The mechanical practice claviers at the National Carillon and the Sydney University War Memorial Carillon were eventually replaced by a digital virtual instrument (the practice clavier at the Bathurst War Memorial Carillon is a digital virtual instrument). In the process of generating this artistic output, I also learned about carillon repertoire, a carillon audience's ear (how they may hear a carillon recital), and the importance of considering the precinct in which a carillon is situated when performing at main bells. In supporting my learning (i.e. how to play with musicality on the main carillon bells), digital transformation in this project intersected with carillon culture to help sustain the intangible cultural heritage.

## **Carillon Project 2 Discussion**

The artistic output from Carillon Project 2 was the world premiere of an experimental Australian composition at an international music festival in the Palau de la Generalitat, Barcelona (2019) (c. f. Chapter 4.10). This piece was a duet with an electroacoustic sine tone track and was called *The Bells of Barcelona* (Cole, 2019). The aspects of carillon culture that contributed greatly to the artistic output of this project include the 1970 National Carillon in Canberra (where the piece was workshopped and rehearsed) and the carillon of the Palau de la Generalitat, Barcelona (Petit & Fritsen, 1976). Prior to arriving in Barcelona, attending the Queen Fabiola carillon competition in Mechelen and witnessing the craning of the bells into

the new carillon tower of De Rijp, Netherlands, gave me a sense of the depth and diversity of carillon culture. This newfound understanding of European carillon traditions, gained in person through travel outside of Australia, contributed greatly to my performance of the experimental work at the Gothic Palace in Barcelona.

The aspects of digital transformation that supported this project include email, social media, digital scores and the sine tone click track for the new work. The recital premiere was livestreamed and then archived onto a video sharing platform for ongoing public viewing. The impact of digital transformation on this project was significant in helping push carillon repertoire into new, experimental directions. It also helped me feel connected to global carillon culture as a performing musician and artistic researcher. I still have ongoing digital communications with many of the carillonners I met in-person during my travels to the European centres of carillon culture. In this project, a significant positive outcome was digital transformation supporting interaction and ongoing professional networking with the global carillon community despite being based in Australia (the “antipodes”).

### **Carillon Project 3 Discussion**

The artistic output for Carillon Project 3 involved premiering Australian compositions on the Australian War Memorial carillons in Sydney and Bathurst (2021) (c. f. Chapter 4.11). The music performed at the premieres included *Elegy* by Frederick Septimus Kelly (1915) and *GyMEA Lilies* by Moya Henderson (2017). The aspects of carillon culture that were prominent in this project included performance on the 1933 Bathurst War Memorial Carillon (Taylor’s 1933) and preparation for the premiere recitals on the 1928 University of Sydney War Memorial carillon and 1970 National Carillon, Canberra. The artistic process included reading about the history of war memorial carillons in Fisher Library and the Rare Book

Library in the University of Sydney. I also accessed scores composed for other War Memorial and Peace Towers around the world in our University carillon tower's physical library collection.

Aspects of digital transformation that contributed to this project include the use of the digital virtual carillon clavier at the National Carillon, Canberra and the arranging the Kelly and Henderson works on digital notation software. To give background and depth to my performances, I accessed the digital sheet music collection at the Australian War Memorial. Email communication with composer Moya Henderson, helped with my process of arranging the work for carillon (this involved adapting an organ work for carillon with respect to the Henderson piece; the Kelly had to be adapted for carillon from a string orchestra score). The premiere performances in Bathurst were livestreamed to a large audience in Kings Parade, Bathurst. Digital transformation impacted on the carillon culture in this project to support performance, the arranging of music and efficient background research. Livestreaming from the carillon tower gave the audience a new awareness, that a musical artist was performing in the tower and that this carillon was not an automated machine. The livestreaming helped forge a connection between audience and performer, supporting engagement with the local Bathurst community thus contributing to the sustainability of carillon culture.

#### **Carillon Project 4 Discussion**

The artistic output for Carillon Project 4 was carillon music for Sydney University graduations and events. This project involved performing for University graduations and events on a heritage instrument (2021–present) (c. f. Chapter 4.12). These events include student welcome days, faculty funerals and memorials, and weddings. A yearlong event in 2025 was the “Decades Project” where the carillonist team, led by the University Carillonist

Titus Grenyer, celebrated 175 years of The University by performing music in recitals that focused on an allocated decade leading up to 2025.

Aspects of carillon culture that contributed to these artistic outputs include the instrument itself (the 1928 John Taylor and Co. carillon), the 1928 Taylor's mechanical practice clavier and my home studio 1923 Taylor's mechanical practice clavier. The history and culture of the University informed the artistic outputs. Familiarity with University culture was supported by my having been at the University for over 30 years in various roles: as a student, teacher, researcher and musician. Access to University policies and strategic plans were available as documents in our tower.<sup>348</sup> Books discussing the history of the University, Sydney Conservatorium and the War Memorial carillon were accessible in the carillon tower library collection.

Digital transformation intersected with carillon culture through my use of digital scores, digital score readers (e.g. forScore) and the digital archives at the University. Email, social media/ content media and livestreaming were important in engaging with our musician team and audiences. Video conferencing was used for communication with the graduations team. Digital videos and sound recordings were made of some of the recitals. The impact of digital transformation in Carillon Project 4 was to bring carillon culture to a wider audience through recitals that had a University based purpose. Artistic outputs were designed to fit in with University strategy to ensure a student and staff focus as well as broader public engagement. Digital transformation enhanced the sense of community despite the usual physical isolation of the carillonist performing on their own in the carillon tower.

---

<sup>348</sup> These were also available as digital downloads from the University webpages.

## **Carillon Project 5 Discussion**

The creative output for Carillon Project 5 was an academic paper delivered from the National Carillon, Canberra for an inaugural online international carillon conference during the COVID-19 pandemic (2021) (c. f. Chapter 4.13). The online lecture on the 22nd of June 2021, was part of the Guild of Carillonneurs in North America annual conference. It was combined with a meeting of the World Carillon Federation because of unique limitations in travel during the global COVID -19 pandemic.

Aspects of carillon culture that were important to developing the lecture presentation and its video recording, included histories of the carillons in Australia and travel to each of the carillons (which was undertaken by my collaborator Dr Wong and me prior to the pandemic). Having previously performed on all three carillons in Australia, led to an understanding and connection to carillon culture in Australia beyond our local towers. Crucial to the project was an understanding of placemaking and wellbeing through engaging with our audiences, our experience with institutional workplace practices, and an awareness of government policies, academic literature and media around these concepts of wellness/ belonging.

Digital transformation impacted on our project through the format that was chosen to overcome pandemic restrictions – our lecture was digitally recorded on video and broadcast online to the conference delegates; our question-and-answer session was livestreamed from Australia after the recorded video lecture was shown in the online space (the conference was hosted at Hartford, CT, USA). It is true that livestreaming is now commonplace however in 2021 and especially from within a carillon tower, it was novel (for both a lecture and performance). Organists have a tradition of being unseen in an organ loft; carillonists have a tradition of being unseen within the carillon tower – our music is the interface between us and

the audience. The COVID-19 pandemic thus ushered in widespread acceptance of digital communications between towers around the world and between towers and audiences (local and global). Most of the audience for our lecture was in Europe and the USA. I conducted the Q & A session live in Sydney and my colleague Dr Wong was streamed live from Canberra. In this project, impacting constructively on the sustainability of carillon culture was the use of digital image archives, digital library databases and archives, email, video conferencing, social media, as well as digital memoing and scratch notes in the preparation and presentation of the video lecture.

### **Carillon Project 6 Discussion**

The creative output for Carillon Project 6 was to, as an experiment, remotely premiere an Australian carillon composition at university carillon precincts in the United States of America via a geolocation audio experience platform (Echoes) (2023) (c. f. Chapter 4.14).

The title of the Australian carillon work commissioned and premiered was *Crowning Perpendicular* (Vines, 2023). The main elements of carillon culture that impacted on this project are the University of Sydney War Memorial Carillon (where the work was workshopped and recorded), the process of commissioning a new Australian carillon work and understanding the concept of place in deciding to try and premiere the carillon work remotely in the USA via geolocation tools. The history of coronation and ceremonial music was important background information as was understanding the ceremonial role of bell and organ music gained through my own, ongoing professional practice.

Digital transformation that supported this project included a geolocated audio walk platform which hosted a high-fidelity digital recording of the work (made at the University of Sydney

War Memorial carillon). A digital render of the carillon work for broadcast was created by a composer and sound engineer in Ireland (Robert Curgenvin), who I communicated with on email and instant messaging. The large sound files were easily delivered via cloud sharing (between Australia and Ireland). The presentation of the academic paper discussing the piece and project was prerecorded as a digital video. Dr Vines and I livestreamed a question-and-answer session with delegates located in at the University of Michigan, with both of us logging into the livestream from different parts of Sydney. After the lecture presentation, the paper was digitally archived in an online video sharing portal. To summarise, the intersection of digital transformation with carillon culture in this project supported a lecture presentation and experimental carillon premiere (using geolocation tools) at an international music conference in a US University.

### **Carillon Project 7 Discussion**

The artistic output of Carillon Project 7 was the Australian premiere of a carillon composition at a salon group listening experience at Peggy Glanville-Hicks House. The event was hosted by composer Olivia Davies and the editors of ADSR Zine, musicians and visual artists Elia Bosshard and James Hazel (2023) (c. f. Chapter 4.15).

The aspects of carillon culture that contributed to this project include the instrument at the University of Sydney and the carillon composition by Australian composer Dr Nicholas Vines, *Crowning Perpendicular* (2023). Of relevance was an understanding of the culture of transcription within carillon (and organ) culture through my ongoing artistic practice.

Digital transformation supported this project through enabling the underground, experimental digital only publication ADSR Zine to exist. The output in Carillon Project 7 consisted of a

high-fidelity digital listening experience remote from a physical carillon tower. The audience was able to experience a carillon in the culturally important Peggy Glanville-Hick House as a part of the Olivia Davies composer residency. Social media helped promote the event and led to a large, enthusiastic audience attendance. Many of the attendees were not aware of the carillon as a musical instrument prior to the event. Digital transformation acted to turbocharge the possibilities available to carillonists to present their work. It led to thinking “outside the tower”, enabling a new sector of the arts community to experience carillon music and culture.

### **Carillon Project 8 Discussion**

The artistic output for Carillon Project 8 was Ngarigu custodian Professor Jakelin Troy performing body percussion and singing gundji gawalgu yuri (a Ngarigu snow increase song) while I accompanied on the Sydney University War Memorial carillon at the Australian Linguistic Society Conference, Main Quadrangle, University of Sydney, Australia (2023) (c. f. Chapter 4.16). Professor Jakelin Troy is Director of Indigenous Research and Vice President of the Australian Linguistic Society (ALS). She was the convenor of the 2023 ALS conference held at the University of Sydney. Australia.

The aspects of carillon culture that contributed to this project include the 1928 University of Sydney War Memorial Carillon and the carillon precinct which is situated on traditional kangaroo hunting grounds on Gadigal Lands.<sup>349</sup> This project was informed by the artistic researcher/carillonist’s participation and membership in the Sydney Indigenous Research Network (SIRN) (led by Dr Janelle Evans and Professor Jakelin Troy). Awareness of the

---

<sup>349</sup> Personal communication from Professor Jakelin Troy.

University's Indigenous strategy, One Sydney, Many People (2021-2024) informed artistic practice.

Digital elements that supported this project include a digital score and digital academic papers, the University and National library digital archives, video conferencing, email and social media communications. Digital modes of communication worked well with the spontaneity of this project and supported it coming to fruition. Digital transformation impacted on this project in a positive way by allowing me instant access to resources suggested by Professor Troy. Social media also facilitated rapid promotion of the opening carillon music and performance of the Ngarigu Snow Song to conference delegates.

**The impact of digital transformation on the sustainability of organ and carillon culture: summarising patterns that emerged over the 16 organ and carillon artistic projects (2016-2025)**

Intangible cultural heritages (such as organ and carillon culture) are deemed important as they foster a sense of identity, belonging, and wellbeing for communities. Transmission of knowledge regarding these musical cultures is crucial, as is the sense of continuity derived from these living traditions. The flourishing of music cultures supports a cohesive society where wellbeing is prioritised.<sup>350</sup> The achievement of these desirable societal goals can be identified in the 8 organ and 8 carillon artistic projects in this thesis. This section of the Chapter 5 Discussion will contain a text based qualitative analysis that summarises the nature of intersections between digital transformation and organ/ carillon culture as observed in

---

<sup>350</sup> UNESCO, "Artificial Intelligence and Digital Transformation Competencies for Civil Servants."; UNESCO, "Intangible Cultural Heritage "; UNESCO, "Organ craftsmanship and music: Germany."; UNESCO, "Safeguarding the carillon culture: preservation, transmission, exchange and awareness-raising: Belgium."

these artistic projects. The impact of digital transformation on the sustainability of organ and carillon culture will be highlighted with examples from the Organ and Carillon Projects reported in this thesis.

**Table 5.1 The impact of digital transformation on the sustainability of organ and carillon culture**

<p><b>The impact of digital transformation on the sustainability of organ and carillon culture.</b></p> <p>The intersection of digital transformation with organ and carillon culture appears to reinvigorate artistic practice and artistic outputs through encouraging experimentation and innovation. On balance, digital transformation supports the sustainability of organ and carillon culture.</p> <ol style="list-style-type: none"><li>1. Digital transformation intersects with organ and carillon culture to support relevant and engaging artistic outputs.</li><li>2. Digital transformation encourages an experimental “digital mindset.”</li><li>3. Digital transformation supports intangible cultural heritage through innovation, driving the sustainability of tangible cultural heritage (an important role reversal).</li><li>4. Active community participation and vigorous civic engagement appear to be crucial in ensuring the sustainability of organ and carillon culture. This participation and engagement can be digital or non-digital.</li><li>5. Digital transformation has obliterated geographical distance however there is still place for “local distinctiveness” in organ and carillon culture as seen in the examples of Australian organ and carillon culture identified in this study.</li><li>6. Digital transformation supports the sustainability of organ and carillon culture. It is reinvigorating artistic practice to make organ and carillon performance and culture relevant, accessible and appealing in contemporary society, so ensuring its continuation.</li></ol>
--

These key findings in Table 5.1 are discussed in greater detail below.

### **1. Digital transformation intersects with organ and carillon culture to support relevant and engaging artistic outputs.**

The results of this doctoral study demonstrates that when digital elements are incorporated into organ or carillon artistic projects, it enhances their relevance to their intended audience. Digital tools such as livestreaming allow the audience to access organ and carillon culture from their homes anywhere in the world. An organ example from the results and discussion is the livestreaming at University graduation ceremonies (**Organ Project 5**). An example from a carillon project is livestreaming of Amanda Cole’s work from the Gothic Palace in Barcelona (**Carillon Project 2**). Engagement is key a concept, especially in the context of sustainability. If an audience cannot relate to the intangible fruits of organ and carillon culture (the music) or access them, there is a negative impact on cultural sustainability.

### **2. Digital transformation encourages an experimental “digital mindset”**

Digital transformation encourages a mindset of exploration and experimentation. There are new digital tools and possibilities constantly being invented in the digital realm. As demonstrated in the literature review, the organ and carillon are magnets for new technologies. It is important that organists and carillonists are alert to this fertile environment, as innovation is a key driver of reinvigorating musical cultures for future generations. This can be seen in the carillon project experimenting with geolocated applications to premiere a carillon work recorded in Sydney in two carillon precincts in Michigan, USA (**Carillon Project 6**). Another example from the results and discussion is the experimental carillon duet with sine tones (**Carillon Project 2**).

**Figure 5.1 Organist Grace Chan with registrants John Wilton and Elia Bosshard at the Sydney Town Hall 1890 William Hill & Son Grand Organ, Sydney, Australia (Organ Project 1). Photo: Damian Shaw (2017), with the kind permission of the City of Sydney Archives.**



**3. Digital transformation supports intangible cultural heritage through innovation, driving the sustainability of tangible cultural heritage (an important role reversal).**

Digital transformation supports intangible cultural heritage through innovating: an example is the use of virtual practice instruments to support learning, teaching and performance (**Carillon Projects 1 and 3; Organ Projects 1, 2, 4, 7 and 8**). This creates a new cohort of musicians who then seek the “real” instrument. This drives the maintenance and sustainability of the tangible culture. Examples abound in the “digital literature review” and the 16 Projects reported in the results and discussion of this thesis. A digital survey of current organ/ carillon culture reveals the flourishing of virtual practice claviers for both the organ and carillon. The study results align with the findings from the literature, showing that access to digital virtual representations supports the artistic output on the physical, tangible instrument and do not diminish the importance of actual/ real instruments.

**4. Active community participation and vigorous civic engagement appear to be crucial in ensuring the sustainability of organ and carillon culture—this participation and engagement can be digital or non-digital.**

The digital technologies used in the organ and carillon artistic projects, encouraged community involvement with organ and carillon culture. The “listening salon” for Vines’ work is an example of a digital rendering of carillon music becoming an added artistic output. This allowed accessibility and participation by an audience remote from the carillon tower (**Carillon Project 7**). Sydney University livestreaming of graduation ceremonies (featuring an organ recital, processional, recessional, ambient and incidental organ music at least eighty-times a year; **Organ Project 5**) is another example of engagement through a digital portal. Organ Project 5 highlights that human engagement is the key ingredient: it can be digital (on the livestreams) or in person (within the University of Sydney Great Hall). Transdisciplinary

collaboration is also crucial and rewarding for all collaborators and the audience. An example is the camera person improvising camera shot with the organ music, by zooming in on a “waving” soft toy while the organ completes a cadenza in one of the [Organ Project 5 hyperlinks](#). Spontaneous moments of improvised creativity, celebration (and fun!) can only win future friends for organ and carillon culture and support the sustainability of these intangible cultural heritages.

**5. Digital transformation has obliterated geographical distance however there is still place for “local distinctiveness” in organ and carillon culture as seen in the examples of Australian organ and carillon culture identified in this study.**

Digital doesn’t just mean accessing organ and carillon culture in other hemispheres—digital technologies can also support the flourishing of local cultures. This aligns with the ASEAN cultural mapping document’s emphasis on the “local distinctiveness” of cultures to support sustainability.<sup>351</sup> Within my artistic practice, in the course of this study, I transitioned from using digital exploration to learn about northern-hemisphere carillon culture to creating and exploring locally made carillon content (e. g. “Pep Carillon” livestreams from the University carillon tower). I also started to generate my own organ and carillon digital content (e.g. the various iterations of Vines’ *Crowning Perpendicular*). Artist-led cultural mapping theory was also a resource that supported local distinctiveness. The scholarship quoted in the introduction of this thesis regarding the antipodes, islands and the living laboratory of a cultural ecosystem surround by ocean, is relevant to this discussion point. “Local distinctiveness” was the default in an age of ocean travel however in the digital realm this has been diluted. The results and discussion analyses from this study alerted me to the need to

---

<sup>351</sup>Cook and Taylor, "A Contemporary Guide to Cultural Mapping: An ASEAN-Australia Perspective." pp 22-23.

establish our own digital carillon culture from Australia—having local digital iterations seems to be an important component of organ and carillon culture into the future.

As artificial intelligence and the metaverse take shape, it is crucial for organists and carillonists to consider populating that space with artistic integrity and creative output. This raises ethical issues in the AI space that is important for future research: how do we protect the intellectual property of musical artists who populate the digital space in the age of generative AI tools?

**6. Digital transformation supports the sustainability of organ and carillon culture—it is reinvigorating artistic practice to make organ and carillon performance and culture relevant, accessible and appealing in contemporary society, so ensuring its continuation.**

This can be seen throughout the projects in this study where I often collaborated on multiple occasions with the same artist on different projects via the digital realm. This was made possible by digital communications. The intersection of digital transformation with organ/carillon culture had a cumulative effect. Digital archives generated for artistic projects were reused in more than one project. This activity appeared to be important in seeding a local culture of collaboration and transdisciplinary discovery of new knowledge. Performing a major project on the same instrument multiple times, led to me re-accessing my own artistic building blocks. Initially, I was using digital tools to explore organ and carillon culture external to my practice. The outward forays within organ and carillon were still important, however it felt satisfying to realise that I had digitally archived and embodied artistic knowledge.

The main finding of this study, looking at the impact of digital transformation on organ and carillon culture, is that the influence of digital is on balance positive. As can be seen from the diverse projects surveyed in the results, artistic outputs were supported by digital cultural assets and also enhanced by digital transformation. The impact of digital transformation on organ and carillon culture is one of reinvigoration through increasing relevance, accessibility and societal engagement.

### **Interpretation of findings**

The findings in this study on the whole, align with the literature surveyed at the beginning of this thesis. The “digital literature” I surveyed gave an accurate impression of the impact of digital transformation that became apparent in the results. The sustainability literature concerning intangible heritage and culture, highlighted the tensions between heritage and sustainability as concepts gazing in opposite directions: heritage to the past and sustainability to the future. The results of this study revealed that digital transformation acted to support both the heritage of organ and carillon culture (e.g. the digital archives of virtual historical organs) and also sustainability (e.g. these archives made functional and playable by musicians as VPOs).

### **Theoretical implications**

The theoretical implications of this study are that concepts of what is “real”, “virtual” or “actual” needs to be re-evaluated philosophically in this digital age. Definitions of tangible and intangible heritage may also need re-evaluation. Virtual practice organs can be used as an example. The instrument is a physical instrument. It is the functional interface for virtual archives of historical instruments. They can therefore be considered an example of a tangible cultural asset if considering it a physical instrument. They can also be considered an

intangible cultural asset if one is thinking these practice organs as a virtual representation of a particular organ (e.g. the historical Müller organ at the Bavokerk, Haarlem). These theoretical implications are potentially areas of further philosophical research.

### **Unexpected findings**

There were unexpected findings in this study. The main one was that human connection and engagement relating to organ and carillon culture still flourished in the digital realm. The anecdote from the Sydney University graduate in the introduction is a good example (highlighting an in-person graduation ceremony experience leading to the subject studying carillon and becoming a carillonneur). This example suggested that livestreaming ceremonies may be a risk: that digital transformations could be de-personalising. However, a high level of human connection to place was achieved in the projects in this study that embraced a digital space for engagement – especially the University graduation ceremonies. The ability of livestreams of organ music to capture the atmosphere of celebration at ceremonies and events was unexpected. It is unexpected but very welcome. This is an important plank in understanding how digital transformation can be harnessed for the sustainability of organ and carillon culture.



**Figure 5.2 Organist Grace Chan performing on the Ronald Sharp Powerhouse Museum portative organ at the Art Gallery of New South Wales in the presence of the c. 1500 La Dame à la licorne tapestry “Hearing.” (Organ Project 2) Photo: Benoît Deney (2018).**

## **Important themes identified in the discussion**

The process of writing the narrative prose analyses in this discussion revealed some crucial themes. These themes are elaborated on below and relate to virtual representations, ceremony and ritual and the idea of hybridity.

### **1. The use of virtual representations of organs and carillons to support artistic projects**

Digital virtual representations of organs and carillons were prominent in the digital cultural assets mapped in this artistic research study. Access to the physical tangible instrument was still important and both styles of instruments were important to the artistic process. **Carillon Project 1** generated the insight that learning a piece of music needs to be embodied on both main bells and practice clavier (virtual or mechanical). In this study the most frequently used “simulation” sample set (English romantic) reflected the type of instrument that was present in the artistic researcher’s country—this will be different according to the “local distinctiveness” of each artist’s real-world workplace milieu.

### **2. The sustainability of organ and carillon culture in a digital world is related to ceremony and ritual embracing technology**

The continuation and flourishing of organ and carillon culture for future generations is closely linked to the instruments being continually used for human ceremonies and rituals (i.e. continuity is important). This was a common theme in this study from the graduations (**Organ Project 5, Carillon Project 4**) to the events at War Memorial carillons (**Carillon Project 3**). As ceremony and ritual embrace digital communication portals such as livestreaming, organ and carillon culture will always intersect with digital transformation, hence the importance of a “digital mindset.” This aligns with the literature reviewed from the

University of Technology course on digital transformation for the creative industries where I first heard this terminology “digital mindset”.<sup>352</sup>

### **3. All the artistic projects were hybrid: they used both digital and non-digital cultural assets.**

The projects were chosen because they exhibited intersections between digital transformation and organ and carillon culture. I acknowledge that this was in the purposive design of the study as outline in the methodology. A pattern that emerged was that digital and non-digital cultural assets used in the artistic process had equal importance and weighting: the use was synergistic, iterative and cyclical. A common human concern surrounding new technologies is that of replacement by technology (e.g. digital for acoustic or machine for human).

Replacement of the real instrument by a virtual instrument was not seen in this study. The artistic outputs in this study were all incubated in a genuinely hybrid creative environment that held space and respect for real instruments and human musicians.

### **Practical implications of digital transformation within organ and carillon culture**

The implications of this research are that organists and carillonists need to be prepared to have an experimental digital mindset regarding their practice. Institutions that teach the organ and carillon may have to invest in virtual representations of the physical tangible instrument for teaching and learning purposes. This is an example of digital transformation supporting the sustainability of organ and carillon culture (creating new musicians). A theoretical insight I gained from analysing the qualitative data in this study is that livestreaming is a future archive for my artistic practice. This is new knowledge for my practice that I derived from

---

<sup>352</sup> Having a digital mindset refers to being open to digital solutions or possibilities that may enhance creative work. See Chapter 2 Literature review in this thesis.

generating the artistic outputs in this study. This documentation can be accessed rapidly and efficiently, so supporting iterative and cyclical creative processes: a “live” stream is a future recording and documentation. If indexed, it is an archive. If cyclically accessed, an iterative part of my artistic process.

### **Limitations of the study**

A limitation of this study is that it may not be generalisable to other intangible culture scenarios. The study design, being an artistic research methodology, relies on the reflexivity of the researcher. The purposive case selection not being probability-based also leads to this study being less generalisable.

### **Future research directions**

Future research directions include exploring the intersection of ceremony and digital transformation as this study has alerted me to how important the ceremonial context is for the cultural sustainability of organ and carillon culture. The ontological and epistemological implications of virtuality raised by the artistic outputs and results of this study will be an area of future philosophical research.

## 6 Conclusion



Figure 6.1 Alkmaarse stadsbeiaardier (Alkmaar City Carillonneur) Dr Christiaan Winter (2009-) pointing to a pinned carillon drum at the Waagtoren, Alkmaar, NL. Photo: Grace Chan (2023)

Computer van eeuwen her,  
enen of nullen,  
die bits zeggen:  
aan of uit.

De tijd wordt  
met muziek  
in stukken  
gehamerd.

De lucht trilt  
bij herhaling en  
strak geordend  
zingt het zwerk.

Christiaan Winter,  
Zaandam, NL, 2025<sup>353</sup>

---

<sup>353</sup> Christiaan Winter, "Untitled," Poem, *Klok & Klepel* 131 (2025).

Computers from centuries ago,  
ones or zeros,  
bits\* that say:  
on or off.

Time  
is hammered  
into pieces  
with music.

The air  
vibrates repeatedly  
and the sky  
sings in tight order.

Christiaan Winter,  
Zaandam, NL, 2025

\*Along with its meaning as a binary digit (the smallest unit of data in computing representing 0 or 1) the word “bits” in Dutch also has connotations of being snappy, sharp-toned, biting and curt (C.W.)  
Translation from Dutch to English: Grace Chan

The image above is of a pinned drum in an automated musical clockwork mechanism for the carillon in the Waagtoren (Weight House), Alkmaar, NL. The poem is composed by Alkmaar’s current City Carillonneur Dr Christiaan Winter—Alkmaar has continuously had a City Carillonneur since 1541. The Waagtoren has had a pinned drum to play music for its clock since around 1690 (W. Spraackel.)<sup>354</sup> The poem evokes the musical, technological and historical concepts that old carillon drums represent and was published in the #131 2025 Winter Journal of the Royal Dutch Carillon Society (Koninklijke Nederlandse Klokkenspel-Vereniging). In this poem, the mechanical transformation of the carillon by the automating drum technology still requires the continuity of successive carillonneurs’ hands to program music.<sup>355</sup> The resulting artistic output, at the intersection of mechanical transformation and carillon culture is described as “song” thus ending the work with a sense that the

---

<sup>354</sup> <https://www.openmonumentendag.nl/monument/waagtoren-uurwerk-en-beiaard/>

The melodies on this historic drum are still changed twice a year by the City Carillonneur. The term for this is “versteken” which in Dutch means removing and inserting pins in the drum that lift bells clappers to play music.

<sup>355</sup> Winter, "Untitled."

carillonneurs' work over generations has reverberated as a human voice that travels beyond the terrestrial and mortal. The "bits", the pins of the old drum that are helping make music in this poem, are a timely reminder of Ng's quote at the beginning of this thesis, that organs and carillons are "at once perpetually old and yet perpetually new".<sup>356</sup> Organs and carillons are at once ancient musical instruments and also throughout their history, a magnet for the latest technologies of an era. It is apt to contemplate this ancient mechanical ancestor of MIDI<sup>357</sup> at the end of a thesis exploring the impact of digital transformation on the sustainability of organ and carillon culture.

This thesis has found that the intersection of digital transformation with organ and carillon culture appears to reinvigorate artistic practice and artistic outputs through encouraging experimentation and innovation. Digital transformation intersects with organ and carillon culture to support relevant and engaging artistic outputs by encouraging an experimental "digital mindset" i.e. for organists and carillonists to be open to digital solutions that may creatively contribute to their artistic practice. The artistic projects in this thesis show that digital transformation supports intangible cultural heritage through innovation, driving the sustainability of tangible cultural heritage. This is an important role reversal as the physical heritage imperatives of a carillon tower or pipe organ previously dominated institutional priorities of conservation. Active community participation and vigorous civic engagement appear to be crucial in ensuring the sustainability of organ and carillon culture as can be seen the 16 artistic projects. This participation and engagement can be digital or non-digital. Furthermore, digital transformation has obliterated geographical distance but there is still

---

<sup>356</sup> Ng, "The Heritage of the Future: Historical Keyboards, Technology, and Modernism." p 1.

<sup>357</sup> MIDI is an acronym for Musical Instrument Digital Interface. While MIDI is digital and the pinned carillon drum is mechanical, both serve the same fundamental purpose: storing, transmitting and reproducing musical performance data (the notes, the timing, and the dynamics) as opposed to the actual sound.

place for “local distinctiveness” in organ and carillon culture as seen in the examples of Australian organ and carillon culture identified in this study. Indeed, the rapidity that digital transformation confers upon the artistic process needs to be weighed with the more human timescales sometimes needed for creativity. Being in the antipodes geographically no longer enforces isolation due to the benefits of digital transformation—however, care needs to be taken to harness the positive aspects of Australia being a living laboratory of innovation due to physical distance from the status quo and rigid structures (see Chapter 1 Introduction).

On balance, the data from the 8 organ and 8 carillon artistic projects in this thesis, demonstrates that digital transformation has the impact of supporting the sustainability of organ and carillon culture. When digital transformation intersects with organ and carillon culture in an artistic output, it is revitalizing artistic practice to make organ and carillon performance and culture relevant, accessible and appealing in contemporary society—so ensuring its continuation. Thus, integrity in leading with artistic practice (rather than solely focussing on commercial rewards)<sup>358</sup>, an experimental “digital mindset,” active community participation and vigorous civic engagement appear to be crucial in ensuring the long-term relevance and appeal of the organ and carillon. These key findings point to ideas or strategies that may encourage the sustainability of organ and carillon culture. One strategy could be to use virtual representations of organs and carillons to support artistic projects. For organists and carillonists needing to practice and prepare for creative projects and service work, these digital virtual instruments lead to increased accessibility, reduced costs, engagement with historical sound worlds and a lessening the environmental burden (via reducing air travel to

---

<sup>358</sup> c.f. Sonus Paradisi and Organ Art Media mission statements in the Chapter 2 literature review; also c.f. the artistic research scholarship by Arlander highlighting the need for artists to sometimes “fail” and that funding of artistic projects needs to be careful not to just insist on “excellence” without making room for the failure of artistic experiments.

hear and learn from important organs and carillons at their original location). A second strategy may be to understand the ceremonial contexts that surround the organ and carillon. The sustainability of organ and carillon culture in a digital world is closely associated with ceremony and ritual embracing technology (and being part of this digital transformation of ceremony/ ritual). A third strategy that emerged from the data in this thesis involves embracing hybridity: all the artistic projects were enhanced by drawing on both digital and non-digital cultural assets. The sustainability of organ and carillon culture in a digital world will be supported if the practitioners of intangible cultural heritages such as music can synergistically create in both realms.

This is the first study to examine the impact of digital transformation on the sustainability of organ and carillon culture. It incorporates artistic outputs from a decade of my artistic practice as an organist and carillonist in Australia and worldwide. It has generated insights that will assist organists and carillonists, as well as custodians of organs and carillons to understand how digital transformation can be harnessed to ensure these intangible musical cultures are sustainable for future generations. Being an organist and carillonist has allowed me to be part of keystone moments in many people's lives such as births, marriages, graduations, celebrations and deaths. It has been a privilege to conduct this research on intangible musical cultures that provide the soundtrack to a human lifetime.

I hope the findings in this thesis have been of interest.



**Figure 6.2** The University of Sydney Great Hall during an examination period (when the University organ and carillon must be silent). Photo: Grace Chan (2025)

## 7 Bibliography

- Ampt, Robert, and Tony Butler. *The Sydney Town Hall Organ: William Hill & Son's Magnum Opus*. Woodford, N.S.W: Birrale Publishing, 1999.
- Ang, Juan Lyn, Sarah Ah-Moye, Leah N. Kim, Vuong Nguyen, Adrian Hunt, Daniel Barthelmes, Mark C. Gillies, and Hemal Mehta. "A Systematic Review of Real-World Evidence of the Management of Macular Oedema Secondary to Branch Retinal Vein Occlusion." *Eye (London)* 34, no. 10 (2020): 1770-96. <https://doi.org/10.1038/s41433-020-0861-9>.
- Arlander, Annette, Bruce Barton, Melanie Dreyer-Lude, and Ben Spatz. *Performance as Research : Knowledge, Methods, Impact*. First edition. ed. New York: Routledge, 2018. doi:10.4324/9781315157672.
- Arora, Aarti B., Rebecca L. Bubp, Jörg Matthes, Christine S. Davis, and Robert F. Potter. "Scratch Notes." 1-2. Hoboken, NJ, USA: John Wiley & Sons, Inc, 2017.
- Arthaus, Musik, Nat Lilenstein, Isoir André, Chapelet Francis, Saorgin René, Jean Boyer, Tim Hardy, et al. *History of the Organ: Latin Origins, Featuring music by Pierre Attaignant, Antonio de Cabezón, Girolamo Frescobaldi, Francisco correa de Arauxo, François Couperin, Nicolas de Grigny, and Louis-Claude Daquin*. Germany: ArtHaus Musik, 2012.
- Assis, Paulo de, *Logic of Experimentation: Reshaping Music Performance in and through Artistic Research*. Orpheus Institute Series. Leuven: Leuven University Press, 2018. doi:10.11116/9789461662507.
- . "Music 2.0 and Artistic Research. Beyond a Thousand Years of Western Art Music." *Forum* 30, no. 1/2 (2023): 54-63. <https://doi.org/10.5117/FORUM2023.1/2.007.ASSI>.
- Assis, Paulo de and Lucia D'Errico. *Artistic Research : Charting a Field in Expansion*. London, UK: Rowman & Littlefield International Ltd, 2019.
- AustralianGovernment. *2025 Digital Transformation Strategy*. Australia: Commonwealth Government, 2018.
- Ball, Matthew. *The Metaverse : And How It Will Revolutionize Everything*. First edition. ed. New York, NY: Liveright Publishing Corporation, a division of W.W. Norton and Company, 2022.
- Barwick, Linda, and Joseph Toltz. *Quantifying the Ineffable? The University of Sydney's 2014 Guidelines for Non-Traditional Research Outputs*. Sydney Conservatorium of Music, 2017., in *Perspectives on Artistic Research in Music*, edited by Robert Burke and Andrys Onsman, 67-77. Lanham, Maryland & Oxford: Lexington Books, 2017.
- Bennett, Dawn, Anna Reid, and Peter Petocz. "Creative Workers' Views on Cultural Heritage and Sustainability." *Journal of aesthetics & culture* 6, no. 1 (2014): 24476-13. <https://doi.org/10.3402/jac.v6.24476>.
- Bischoff, Eva. "Settler Imperialism and Indigenous Peoples in Australia." In *The Palgrave Encyclopedia of Imperialism and Anti-Imperialism*, edited by Immanuel Ness and Zak Cope, 2436-43. Cham: Springer International Publishing, 2021.
- Boudousq, Clotilde, Vuong Nguyen, Adrian Hunt, Mark Gillies, Javier Zarranz-Ventura, Louise O'Toole, Els Mangelschots, et al. "Real-World Unmet Needs in the Management of Poorly Responsive Neovascular Age-Related Macular Degeneration in Europe: Data from the Frb! Registry." *Ophthalmology retina* (2024). <https://doi.org/10.1016/j.oret.2024.01.004>.

- Brauchli, Bernard. *The Clavichord*. Cambridge Musical Texts and Monographs. Cambridge ;: New York, 1998.
- Bromham, Lindell, Keaghan J. Yaxley, and Marcel Cardillo. "Islands Are Engines of Language Diversity." *Nature ecology & evolution* 8, no. 10 (2024): 1991-2002. <https://doi.org/10.1038/s41559-024-02488-4>.
- Buchanan, Ian. "A Dictionary of Critical Theory." Oxford: Oxford University Press, 2010.
- Burke, Robert, Andrys Onsman, and Ebscohost. *Perspectives on Artistic Research in Music*. Lanham: Lexington Books, 2017.
- Caruso, Loris. "Digital Innovation and the Fourth Industrial Revolution: Epochal Social Changes?". *AI & society* 33, no. 3 (2018): 379-92. <https://doi.org/10.1007/s00146-017-0736-1>.
- Chan, Grace. "The Impact of Post-Covid Digital Transformation on Global Bell & Carillon Culture." Performers( ) Present 2023: Flowing Resonances, Singapore, YST Conservatorium, 2023.
- Chan, Grace, and Neal Peres da Costa. "Two Hand, Two Feet and Both Eyes: Incorporating Eye-Tracking Technologies into Virtual Pipe Organ Performance." Conference on music and eyetracking, Max Planck Institute for Empirical Aesthetics, Frankfurt, Germany, August 17th-18th, 2017 2017.
- Chan, Grace, and Anna Wong. "Wellbeing, Placemaking and Carillon Culture: Connecting with Our Audiences." *Beiaard- en Klokkencultuur in de Lage Landen* 1, no. 1 (2022): 5-29. <https://doi.org/10.5117/BKL2021.1.001.CHAN>. <https://www.aup-online.com/content/journals/10.5117/BKL2021.1.001.CHAN#:~:text=A%20sense%20of%20place%20and,connectedness%2C%20social%20inclusion%20and%20participation>.
- Chessell, James. "The Coming Ai Revolution." Word from the Editor-in -Chief, *Australian Financial Review* (Australia), 6 June, 2025 2025.
- Chrétien-Ichikawa, Sabine, and Karolina Pawlik. *Creative Industries and Digital Transformation in China*. 1st 2022. ed. Singapore: Palgrave Macmillan, 2022. doi:10.1007/978-981-19-3049-2.
- Chung, Hokyung, and Jongoh Lee. "Community Cultural Resources as Sustainable Development Enablers: A Case Study on Bukjeong Village in Korea Compared with Naoshima Island in Japan." *Sustainability* 11, no. 5 (2019): 1401. <https://doi.org/10.3390/su11051401>.
- Cook, Ian, and Ken Taylor. *A Contemporary Guide to Cultural Mapping: An Asean-Australia Perspective*. Indonesia: ASEAN, 2013.
- Cox, Nathan Robert. "Bach, Js, Gott Soll Allein Mein Hertze Haben Bwv 169." Honours Recital #2, Sydney Conservatorium of Music, 2018.
- CreativeAustralia. *Digital Culture Strategy 2021-2024*. Australia: Creative Australia, 2021.
- . *Generative Ai and Creative Work*.
- . *In Real Life: Mapping Digital Cultural Engagement in the First Decades of the 21st Century*. Australia: Creative Australia, 2021.
- Czarnocka, Małgorzata, and Mariusz Mazurek. "Deleuze's Conception of Virtuality Versus Virtual Computer Objects." *Foundations of science* 29, no. 4 (2024): 871-83. <https://doi.org/10.1007/s10699-023-09921-0>.

- d'Alessandro, Christophe, and Markus Noisternig. "Of Pipes and Patches: Listening to Augmented Pipe Organs." *Organised sound : an international journal of music technology* 24, no. 1 (2019): 41-53. <https://doi.org/10.1017/S1355771819000050>.
- Dalton, Mike. "The Unusual Anzac Day Tribute Ringing out from an Australian University." (9 News website), 2025. <https://www.9news.com.au/national/anzac-day-the-unusual-anzac-day-tribute-ringing-out-from-an-australian-university/326b9d1d-b805-4a62-8c46-b6737c329d33>.
- Deleuze, Gilles, and Charles T. Wolfe. "The Actual and the Virtual." *Any (New York, N.Y.)*, no. 19/20 (1997): 19.6-19.7.
- Duxbury, Nancy, W. F. Garrett-Petts, Alys Longley, Nancy Duxbury, Alys Longley, and W. F. Garrett-Petts. . Routledge Research in Culture, Space and Identity. 1st ed. Oxford: Routledge, 2019. doi:10.4324/9781315110028.
- . *Artistic Approaches to Cultural Mapping: Activating Imaginaries and Means of Knowing*. Routledge Research in Culture, Space and Identity. 1st ed. Oxford: Routledge, 2019. doi:10.4324/9781315110028.
- . "An Introduction to the Art of Cultural Mapping: Activating Imaginaries and Means of Knowing." 1-21. United Kingdom: Routledge, 2019.
- Duxbury, Nancy, and M. Sharon Jeannotte. "The Role of Cultural Resources in Community Sustainability: Linking Concepts to Practice and Planning." *International journal of sustainability policy and practice* 8, no. 4 (2013): 133-44. <https://doi.org/10.18848/2325-1166/CGP/v08i04/55409>.
- Evans, Graeme, Nancy Duxbury, David MacLennan, and W. F. Garrett-Petts. "Cultural Mapping and Planning for Sustainable Communities." 45-68: Routledge, 2015.
- Evans, Janelle. "Painting the Unfamiliar: Why the First European Paintings of Australian Animals Look So Alien to Our Eyes." *The Conversation* ( 2023). [https://theconversation.com/painting-the-unfamiliar-why-the-first-european-paintings-of-australian-animals-look-so-alien-to-our-eyes-202719?utm\\_medium=article\\_native\\_share&utm\\_source=theconversation.com](https://theconversation.com/painting-the-unfamiliar-why-the-first-european-paintings-of-australian-animals-look-so-alien-to-our-eyes-202719?utm_medium=article_native_share&utm_source=theconversation.com).
- Ford, Karrin. "The Pedal Clavichord and the Pedal Harpsichord." *The Galpin Society journal* 50, no. 50 (1997): 161-79. <https://doi.org/10.2307/842569>.
- Fullagar, Kate. *The Atlantic World in the Antipodes : Effects and Transformations since the Eighteenth Century*. Ebl. Newcastle: Cambridge Scholars, 2012.
- Garner, Benjamin. "Building Your Own Practice Instrument." *The American organist (1979)* 55, no. 5 (2021): 62-63.
- Garton, Stephen. *The Cost of War: War, Return and the Re-Shaping of Australian Culture*. Sydney: Sydney University Press, 2020. doi:10.2307/j.ctvz7k2xh.
- Giannakeff, Leon. "The Evolution of an American Practice Organ." *The American organist (1979)* 53, no. 3 (2019): 56-59.
- Gillies, Mark C. Mbbs PhD, Judy M. PhD Simpson, Christine Mbbs Gaston, Grace Mbbs Hunt, Haipha BSc Ali, Meidong M. D. Zhu, and Florian M. D. Sutter. "Five-Year Results of a Randomized Trial with Open-Label Extension of Triamcinolone Acetonide for Refractory Diabetic Macular Edema." *Ophthalmology (Rochester, Minn.)* 116, no. 11 (2009): 2182-87. <https://doi.org/10.1016/j.ophtha.2009.04.049>.

- Gillies, Mark C. Mbbs PhD, Judy M. PhD Simpson, Meidong Mbbs PhD Zhu, Grace Mbbs Hunt, Haipha BSc Ali, and Christine Mbbs Gaston. "Intravitreal Triamcinolone." *Ophthalmology (Rochester, Minn.)* 116, no. 3 (2009): 591-91. <https://doi.org/10.1016/j.ophtha.2008.09.044>.
- Goehr, Lydia, David Davie, Kathy Kiloh, Jake McNulty, Gunnar Hindrichs, John Rink, and Paulo de Assis. *Virtual Works – Actual Things: Essays in Music Ontology*. Orpheus Institute Series. Leuven: Leuven University Press, 2018. doi:10.26530/OAPEN\_1000227.
- Gray, David E. *Doing Research in the Real World*. London: Sage Publications, 2004.
- Green, Garard, Nat Lilenstein, Musik Arthaus, and Press Alexander Street. *History of the Organ, History of the organ. Vol. 1 : Latin origins*. Germany: ArtHaus Musik, 2012.
- Grenyer, Titus. "Carillon Newsletter." *Carillon Newsletter* (Sydney), 2025.
- Grimshaw, Mark. *The Oxford Handbook of Virtuality*. Handbook of Virtuality. New York: Oxford University Press, 2013.
- Hector, Hamish. "Icymi: The Week's 7 Biggest Tech Stories from Apple's Beautiful Liquid Glass to the Xbox's Surprise Handheld Launch." *Techradar*, 2025. <https://www.techradar.com/tech/icymi-the-weeks-7-biggest-tech-stories-from-apples-beautiful-liquid-glass-to-the-xboxs-surprise-handheld-launch>.
- Hilbert, Martin. "Digital Technology and Social Change: The Digital Transformation of Society from a Historical Perspective." *Dialogues in clinical neuroscience* 22, no. 2 (2020): 189-94. <https://doi.org/10.31887/DCNS.2020.22.2/mhilbert>.
- Hosagrahar, Jyoti. "Culture: At the Heart of Sustainable Development Goals." 2023. <https://courier.unesco.org/en/articles/culture-heart-sustainable-development-goals>.
- Hosseini, Elahe, and Alireza Rajabipoor Meybodi. "Proposing a Model for Sustainable Development of Creative Industries Based on Digital Transformation." *Sustainability (Basel, Switzerland)* 15, no. 14 (2023): 11451. <https://doi.org/10.3390/su151411451>.
- Howard, Keith. "Musical Instruments as Tangible Cultural Heritage and as/for Intangible Cultural Heritage." *International journal of cultural property* 29, no. 1 (2022): 23-44. <https://doi.org/10.1017/S0940739121000436>.
- Hunt, Adrian R., Vuong Nguyen, Catherine P. Creuzot-Garcher, Socorro Alforja, Pierre-Henry Gabrielle, Javier Zarranz-Ventura, Martin Guillemin, *et al.* "Twelve-Month Outcomes of Ranibizumab Versus Aflibercept for Macular Oedema in Branch Retinal Vein Occlusion: Data from the Frb! Registry." *British journal of ophthalmology* 106, no. 8 (2022): 1178-84. <https://doi.org/10.1136/bjophthalmol-2020-318491>.
- Jeannotte, M. Sharon, and Nancy Duxbury. "Advancing Knowledge through Grassroots Experiments: Connecting Culture and Sustainability." *The Journal of arts management, law, and society* 45, no. 2 (2015): 84-99. <https://doi.org/10.1080/10632921.2015.1039739>.
- Jeans, Susi. "The Pedal Clavichord and Other Practice Instruments of Organists." *Proceedings of the Royal Musical Association* 77, no. 1 (1950): 1-15. <https://doi.org/10.1093/jrma/77.1.1>.
- Keating, John D. *Bells in Australia*. Carlton, Vic: Melbourne University Press, 1979.
- Kim, Yae Ji. "The Clavichord During the Classical Era: A Gentle Voice but a Giant among Keyboards." Sydney Conservatorium of Music, 2014.

- King, Andrew, Evangelos Himonides, S. Alex Ruthmann, Evangelos Himonides, Andrew King, and S. Alex Ruthmann. *The Routledge Companion to Music, Technology, and Education*. Routledge Music Companions. 1 ed. Oxford: Routledge, 2017. doi:10.4324/9781315686431.
- Kinsela, David, and Dr Greg Young. *A Guide to the Conservation and Maintenance of Pipe Organs*. Sydney: Crown Copyright, 1983.
- Lim, Liza, "Ecological Time " *Liza Lim Composer*, 2025, <https://lizalimcomposer.com/category/ecological-time/>.
- Magnusson, Thor. "Musical Organics: A Heterarchical Approach to Digital Organology." *Journal of new music research* 46, no. 3 (2017): 286-303. <https://doi.org/10.1080/09298215.2017.1353636>.
- Makuvaza, Simon. *Aspects of Management Planning for Cultural World Heritage Sites : Principles, Approaches and Practices*. 1st 2018. ed. Cham: Springer International Publishing, 2018. doi:10.1007/978-3-319-69856-4.
- Margulis, Elizabeth Hellmuth, and Elizabeth Hellmuth Margulis. "34music as Language." In *The Psychology of Music: A Very Short Introduction*, 0: Oxford University Press, 2018.
- Matthews, T. J., and K. Triantis. "Island Biogeography." [In eng]. *Curr Biol* 31, no. 19 (Oct 11 2021): R1201-r07. <https://doi.org/10.1016/j.cub.2021.07.033>.
- McPherson, Angus. "Extended Play: A New Music Perfect Storm." *Limelight*, 2/8/2018, 2018. <https://limelight-arts.com.au/features/extended-play-a-new-music-perfect-storm/>.
- Merriam, Sharan B. and Elizabeth J. Tisdell. *Qualitative Research : A Guide to Design and Implementation*. The Jossey-Bass Higher and Adult Education Series. Fourth edition. ed. San Francisco, CA: Jossey-Bass, a Wiley brand, 2016.
- Mizen, Ronald. "Chalmers' First Budget Will Include a Chapter on 'Wellbeing'." *Australian Financial Review* (Australia), 7/7/2012 2017. <https://www.afr.com/policy/economy/chalmers-first-budget-will-include-a-chapter-on-wellbeing-20220707-p5azvt>.
- Mullin, Randall. "Hauptwerk: What It Is, and What It Can Do for You as an Organist." *The American organist* (1979) 43, no. 7 (2009): 66.
- Neugebauer, Reimund. *Digital Transformation*. 1st 2019. ed. Berlin, Heidelberg: Springer Vieweg, 2019. doi:10.1007/978-3-662-58134-6.
- Ng, Tiffany Kwan. "The Heritage of the Future: Historical Keyboards, Technology, and Modernism." eScholarship, University of California, 2015.
- Nickleson, Patrick. "The Message of the Carillon: Bells as Instruments of Colonialism in Twentieth-Century Canada." *Intersections (Toronto. 2006)* 36, no. 2 (2016): 13-25.
- Oldham, Gary. "Obituary: Susi Jeans." *Independent* (UK), 1993. <https://www.independent.co.uk/news/people/obituary-susi-jeans-1478498.html>.
- Orr, Scott Allan. "In Situ Acoustic Analysis of Two Twentieth-Century Heritage Carillons." *Heritage science* 9, no. 1 (2021): 1-15. <https://doi.org/10.1186/s40494-021-00482-8>.

- Patel, Aniruddh D. , "Four Questions About the Relationship between Music and Language." *Oxford University Press*, 2012, <https://blog.oup.com/2012/10/relationship-between-music-and-language-neuroscience/>.
- Pearson, Keith Ansell. "The Reality of the Virtual: Bergson and Deleuze." *MLN* 120, no. 5 (2005): 1112-27. <https://doi.org/10.1353/mln.2006.0020>.
- Penny, Jean. "Reflections on Practice-Led Research Methods and Their Application in Music Performance Research." *Malaysian Music Journal* 3, 2 (2014): 84-92.
- Peres da Costa, Neal. *Off the Record: Performing Practices in Romantic Piano Playing*. 1 ed. United Kingdom: Oxford University Press, 2012. doi:10.1093/acprof:oso/9780195386912.001.0001.
- Reid, Anna. *Educating Musicians for Sustainability*. Isme Series in Music Education. 1 ed. United Kingdom: Routledge, 2021. doi:10.4324/9781003044642.
- Reid, Anna, Neal Peres Da Costa, and Jeanell Carrigan. *Creative Research in Music : Informed Practice, Innovation and Transcendence*. Isme Specialist Themes in Music Education. New York: Routledge, 2021.
- Reid, Anna, Peter Petocz, and Dawn Bennett. "Is Creative Work Sustainable? Understanding Identity, Motivation, and Worth." *Australian journal of career development* 25, no. 1 (2016): 33-41. <https://doi.org/10.1177/1038416216637089>.
- Richards, Lyn. *Handling Qualitative Data: A Practical Guide*. Core Textbook. Fourth edition ed. London: SAGE Publications, 2021.
- Robinson, Rebecca S., and Alex C. Michalos. "Purposive Sampling." 5243-45. Dordrecht: Springer Netherlands, 2014.
- Robson, Colin and Kieran McCartan. *Real World Research : A Resource for Users of Social Research Methods in Applied Settings*. Fourth Edition. ed. Chichester: John Wiley & Sons Ltd., 2016.
- Röllli, Marc, Ian Buchanan, K. George Varghese, and N. Y. Manoj. "Virtual Ontologies: Heidegger, Deleuze and the Concept of the Event (Ereignis, Événement) 1." 48-59: Routledge, 2022.
- Rombouts, Luc. *Singing Bronze*. Leuven University Press, 2014. doi:10.11116/9789461661814.
- Shah, Janika, Vuong Nguyen, Adrian Hunt, Hemal Mehta, Barbara Romero-Nuñez, Javier Zarranz-Ventura, Francesco Viola, *et al.* "Characterization of Poor Visual Outcomes of Diabetic Macular Edema: The Fight Retinal Blindness! Project." *Ophthalmology retina* 6, no. 7 (2022): 540-47. <https://doi.org/10.1016/j.oret.2022.03.007>.
- Sherman, Rachel E., Steven A. Anderson, Gerald J. Dal Pan, Gerry W. Gray, Thomas Gross, Nina L. Hunter, Lisa LaVange, *et al.* "Real-World Evidence — What Is It and What Can It Tell Us?." *The New England journal of medicine* 375, no. 23 (2016): 2293-97. <https://doi.org/10.1056/NEJMs1609216>.
- Sloboda, John, and John Sloboda. "Music as a Language." In *Exploring the Musical Mind: Cognition, Emotion, Ability, Function*, 0: Oxford University Press, 2004.
- Speerstra, Joel. *Bach and the Pedal Clavichord: An Organist's Guide*. Eastman Studies in Music. Vol. 26, Rochester, NY: University of Rochester Press, 2004. doi:10.1017/9781580466349.

- Stade, Koenraad J. H. van "Discovering Ideals of Expressivity and Artistry in 19th-Century Vocal Performance: Re-Enacting Schumann's Dichterliebe." The University of Sydney, 2022.
- Thistlethwaite, Nicholas, Geoffrey Webber, Nicholas Thistlethwaite, and Geoffrey Webber. *The Cambridge Companion to the Organ*. Cambridge Companions to Music. Cambridge University Press, 1999. doi:10.1017/CCOL9780521573092.
- Troy, Jakelin, and Linda Barwick. "Claiming the 'Song of the Women of the Menero Tribe'." *Musicology Australia* 42, no. 2 (2020): 85-107.
- UNESCO. *Artificial Intelligence and Digital Transformation Competencies for Civil Servants*: UNESCO, 2022.
- "Culture Is Key in Achieving a More Sustainable World." 2025, accessed January, 2025, <https://www.unesco.org/en/articles/culture-key-achieving-more-sustainable-world>.
- "Intangible Cultural Heritage ", 2025, accessed January 2025, 2025, <https://ich.unesco.org/en/home>.
- "The Operational Guidelines for the Implementation of the World Heritage Convention." <https://whc.unesco.org/en/guidelines/>.
- "Organ Craftsmanship and Music: Germany." UNESCO, 2017, accessed January, 2025, <https://ich.unesco.org/en/RL/organ-craftsmanship-and-music-01277>.
- "Safeguarding the Carillon Culture: Preservation, Transmission, Exchange and Awareness-Raising: Belgium." 2014, accessed January, 2025, <https://ich.unesco.org/en/BSP/safeguarding-the-carillon-culture-preservation-transmission-exchange-and-awareness-raising-01017> (Selected in 2014 on the Register of Good Safeguarding Practices).
- Vidal, Paulina. "Prime Minister Anthony Albanese Attends Kyle Sandilands' Wedding, Despite Criticism." 2023 (Australia), 2023. <https://www.abc.net.au/news/2023-04-29/anthony-albanese-chris-minns-avoid-media-kyle-sandilands-wedding/102282432>.
- Wang, Nancy, Adrian Hunt, Vuong Nguyen, Janika Shah, Samantha Fraser-Bell, Ian McAllister, Daniel Barthelmes, Mark Gillies, and David Squirrel. "One-Year Real-World Outcomes of Bevacizumab for the Treatment of Macular Oedema Secondary to Retinal Vein Occlusion." *Clinical & experimental ophthalmology* 50, no. 9 (2022): 1038-46. <https://doi.org/10.1111/ceo.14139>.
- Winter, Christiaan. "Traditie/ Tradition." *Klok & Klepel* 129 (2025).
- . "Untitled" (Poem) *Klok & Klepel* 131 (2025).
- Wong, Anna. "Keeping House for Different Masters : History, Heritage and House Museums in Australia." 2007.
- Yeadon, Daniel Edward. "The Sydney Conservatorium Early Music Ensemble: An Activity-Theoretical Study of the Impact of Period Instruments, Historically-Informed Performance and a Unique Pedagogy on Tertiary Group-Learning Experiences." Sydney Conservatorium of Music, 2016.
- Young, Dr Greg, Professor Deborah Stevenson, Greg Young, and Deborah Stevenson. *The Ashgate Research Companion to Planning and Culture*. 1 ed.: Routledge, 2013. doi:10.4324/9781315613390.
- Young, G., Clark, I., Sutherland, J. *Mapping Culture: A Guide for Cultural and Economic Development in Communities*. Canberra: Australian Government Publishing Service, 1995

## 8 Web Links

### In order of appearance in thesis

#### Acknowledgements

Jos van der Kooy: Grote of Sint Bavokerk Haarlem, NL  
<https://www.youtube.com/watch?v=QJj9VAVNcYw>

Jos van der Kooy: Westerkerk, Amsterdam, NL <https://www.youtube.com/watch?v=JKLJD04ua1A>

Jos van der Kooy: Philharmonie, Haarlem, NL <https://www.youtube.com/watch?v=rVED6TeaJf8>

Christiaan Winter: De Ontzetsuite (450 jaar Alkmaar Ontzet) <https://www.youtube.com/watch?v=Kq6Ow-Qo3nA>

#### 1 Introduction

"Safeguarding the carillon culture: preservation, transmission, exchange and awareness-raising: Belgium," 2014, accessed January 2025, <https://ich.unesco.org/en/BSP/safeguarding-the-carillon-culture-preservation-transmission-exchange-and-awareness-raising-01017> (Selected in 2014 on the Register of Good Safeguarding Practices).

Organ craftsmanship and music: Germany," UNESCO, 2017 <https://ich.unesco.org/en/RL/organ-craftsmanship-and-music-01277>.

"Digital Transformation," Policy Issue, Organisation for Economic Co-operation and Development, 2025, accessed February 2025, <https://www.oecd.org/en/topics/policy-issues/digital-transformation.html>.

"Vienna Symphonic Library," 2000, <https://www.vsl.co.at>.

"Electronic Carillons," 1835, 2025, <https://www.verdin.com/electronic-carillon-bells/>; "Digital Carillons," 1975, 2025, <https://www.chimemaster.com/digital-carillons>.

"Deus Cantando (God Singing)," 2009, [https://ablinger.mur.at/speaking\\_piano.html](https://ablinger.mur.at/speaking_piano.html); "Speaking Piano," 2009, <https://www.youtube.com/watch?v=muCPjK4nGY4>.

Liza Lim, "Ecological time " *Liza Lim Composer*, 2025, <https://lizalimcomposer.com/category/ecological-time/>; "How Liza Lim is breaking down barriers in music composition," The University of Sydney, 2025, <https://www.sydney.edu.au/news-opinion/news/2025/03/17/how-liza-lim-is-breaking-down-barriers-in-music.html>; "Sustainability at Sydney," University of Sydney, <https://www.sydney.edu.au/about-us/vision-and-values/sustainability.html>; Reid, *Educating Musicians for Sustainability*.

"Zeiss Callisto eye Computer assisted cataract surgery," Zeiss Medical Technology, 2025, <https://www.zeiss.com/meditec/en/products/surgical-microscopes/ophthalmic-microscopes/callisto-eye.html>.

"Orpheus Instituut," 2025, <https://orpheusinstituut.be>; "Paulo de Assis: Artistic research in music," Visioning the future: artistic research doctorate in Ireland, University College Cork, 2020, <https://artisticdoctorateireland.com/events/music/>.

"Annette Arlander Website," 2025, <https://annetearlander.com>.

Virtual pipe organ console by Kees Noorlander (2015), Noorlander Orgels, Pascalstraat 10, 3771RT Barneveld, The Netherlands, [info@noorlanderorgels.com](mailto:info@noorlanderorgels.com); Hauptwerk software by Martin Dyde (2002) and Milan Digital Audio, <https://milandigitalaudio.com/about/>; Sample sets by Professor Helmut Maier OrganArt Media <https://www.google.com/search?client=safari&rls=en&q=organ+art+media&ie=UTF-8&oe=UTF-8>, Jiri Zurek Sonus Paradisi <https://www.sonusparadisi.cz/en/project.html>, David Butcher Lavender Audio <https://www.lavenderaudio.co.uk>, Brett Milan Martin Dyde Milan Digital Audio <https://milandigitalaudio.com/instruments/>.

"Artistic research seminar 2 - artistic research in music," University College Cork, 2020, 2025, <https://www.youtube.com/watch?v=jGQDH-gYUDQ> (Visioning the future: artistic doctorates in Ireland Open Resource YouTube Playlist).

"Monument," in *Oxford English Dictionary* (Oxford University Press). <https://www.oed.com/search/dictionary/?scope=Entries&q=monument>.

Aniruddh D. Patel, "Four questions about the relationship between music and language," *Oxford University Press*, 2012, <https://blog.oup.com/2012/10/relationship-between-music-and-language-neuroscience/>.

"Swifts, Darling Point Rd, Darling Point," 2025, <https://ohta.org.au/organs/organs/DarlingPointSwifts.html>.

"Organ Historical Society of Australia," 2025, <https://ohta.org.au/the-organ-in-australia/>.

John D. Keating, *Bells in Australia* (Carlton, Vic: Melbourne University Press, 1979).

"Antipodes," in *Oxford English Dictionary* (Oxford University Press). [https://www.oed.com/dictionary/antipodes\\_n?tl=true](https://www.oed.com/dictionary/antipodes_n?tl=true).

"Sydney Town Hall," Organ Historical Society of Australia, 2005, accessed 7 Jan 2025, 2025, <https://www.ohta.org.au/conf/Sydney/SYDNEYTOWNHALL.html>.

"City of Sydney," City of Sydney, 2025, <https://www.cityofsydney.nsw.gov.au/things-to-see-and-do/grand-organ-sydney-town-hall>.

"Merriam-Webster," (Encyclopaedia Britannica). <https://www.merriam-webster.com/dictionary/curio>.

"National Carillon," National Capital Authority, 2025, <https://www.nca.gov.au/points-interest/national-carillon#>.

Daniel Moulton at the Sydney Town Hall Grand Pipe Organ Fugue State Films, "https://www.youtube.com/watch?v=wwmcIesEkQ0," 2019.

"On Artistic Research: From the classical dualism to a unifying approach," (Video lecture), University College Cork, 2020, 2025, <https://www.youtube.com/watch?v=DY12C8120Qs> (Visioning the future: artistic doctorates in Ireland Open Resource).

## 2 Literature review

Hamish Hector, "ICYMI: the week's 7 biggest tech stories from Apple's beautiful Liquid Glass to the Xbox's surprise handheld launch," *TechRadar* 2025, <https://www.techradar.com/tech/icymi-the-weeks-7-biggest-tech-stories-from-apples-beautiful-liquid-glass-to-the-xboxs-surprise-handheld-launch>." Carillon Culture," <https://www.immaterieelerfgoed.nl/en/beiaardcultuur>.: "The carillon owners are often municipalities, but university boards, church councils and individuals can also own a carillon."

Sheng soloist Wu Wei <https://www.youtube.com/watch?v=Xios4KtjG2A>

Traditional Korean Instruments: Saenghwang <https://www.youtube.com/watch?v=aFoih6gjcBs>

Kuljit Bhamra: What is a harmonium? <https://www.youtube.com/watch?v=R3iltQ5Fm2c>

Bronze Bells: Bianzhong <https://www.youtube.com/watch?v=kJaMCKVOFJM>

"Intangible Cultural Heritage ", 2025, accessed January 2025, 2025, <https://ich.unesco.org/en/home>.

"Emu Music," [https://emumusic.com/?srsltid=AfmBOoqT\\_RQaeH0ONxAkHvekrIc9EATqequO4BzKitygctE8j6uPmtZ-](https://emumusic.com/?srsltid=AfmBOoqT_RQaeH0ONxAkHvekrIc9EATqequO4BzKitygctE8j6uPmtZ-).

"St Stephen's Newtown, Walker and Son pipe organ (1874)," <https://www.sydneyorgan.com/StStN.html>.;

"Whitechapel hemispherical chimes. Newtown: Australia. St Stephen's Anglican Church," <http://www.towerbells.org/data/AUNWTNSS.HTM>.

"Songs of Home at Swifts," Sydney Living Museums/ Museums of History, NSW, 2019, <https://www.australianmusiccentre.com.au/event/songs-of-home-at-swifts>.; Paulina Vidal,

"Prime Minister Anthony Albanese attends Kyle Sandilands' wedding, despite criticism," 2023 (Australia) 2023, <https://www.abc.net.au/news/2023-04-29/anthony-albanese-chris-minns-avoid-media-kyle-sandilands-wedding/102282432>.

"An Evening with the Honourable Malcolm Turnbull," Wolper Jewish Hospital, 2019, <https://wolper.com.au/an-evening-with-the-hon-malcolm-turnbull/>.

"Tower Bells," World Carillon Federation, <http://towerbells.org>. "The carillon in Dutch culture," Access Netherlands, 2023, 2025, <https://access-nl.org/features/the-carillon-in-dutch-culture/>.

Grace Chan interviewed by Chris Morgan 2BS Radio Bathurst <https://m.soundcloud.com/bathurstbroadcasters/hump-day-march-24-2021-bathurst-war-memorial-carillon> 27:45

Anna Lapwood Instagram <https://www.instagram.com/annalapwoodorgan/?hl=en> YouTube <https://www.youtube.com/c/annalapwoodorgan> Webpage <https://annalapwood.co.uk>

Joey Brink YouTube <https://www.youtube.com/@joeybrinkbells>

PepOrgan, YouTube, 2020, [https://www.youtube.com/channel/UC5QU4J8-8a\\_UN4mKDyG\\_LNQ](https://www.youtube.com/channel/UC5QU4J8-8a_UN4mKDyG_LNQ).

"CULTURAL AND CREATIVE LIFE: Titus Grenyer ignites the future of the Sydney Town Hall organ, Meet the 25-year-old organist keeping historic traditions alive with a modern outlook," 2023, <https://news.cityofsydney.nsw.gov.au/articles/titus-grenyer-ignites-the-future-of-the-Sydney-Town-Hall-organ>.

"News: Meet the new University Organist and Carillonist\_3 July 2024," 2024, <https://www.sydney.edu.au/news-opinion/news/2024/07/03/meet-the-new-university-organist-and-carillonist.html>.

Titus Grenyer University Carillonist Sydney University Instagram account reel <https://www.instagram.com/reel/DIvAoUdhC5J/>

Grenyer compositions The Jacaranda (for the 175th Anniversary of the University of Sydney, 2025), The Flame Tree (for the 175th Anniversary of the University of Sydney, 2025). White Crosses (Grenyer, 2025) <https://www.youtube.com/watch?v=a7WS7wy1pm8> The Jacaranda Grenyer, 2025) [https://www.youtube.com/watch?v=q\\_kuPYV5uC8](https://www.youtube.com/watch?v=q_kuPYV5uC8)

"June Wellness Session: Yoga with live organ music in the Great Hall," 2025, <https://whatson.sydney.edu.au/event/8a47b6aa-c01e-498a-8c4b-1edc620b1525/June%20Wellness%20Session:%20Yoga%20with%20live%20organ%20music%20in%20he%20Great%20Hall>.

Study in the Great Hall organ music event in 2025. Study in the Great Hall Titus Grenyer/ Grace Chan <https://whatson.sydney.edu.au/event/01aeaf35-5b28-40c8-aa21-cea9f0371b4d/STUVAC:%20Study%20in%20the%20Great%20Hall,%20v2.0>

Final recital 175th Anniversary Carillon Recital by University Organist and Carillonist Titus Grenyer [https://www.youtube.com/watch?v=q\\_kuPYV5uC8](https://www.youtube.com/watch?v=q_kuPYV5uC8)

"#studywithme," YouTube, 2025, <https://www.youtube.com/watch?v=0EN8uAUwYbA>.

"The University of Sydney Carillon - Channel 9 News Story," Channel 9 News, 2025, <https://www.youtube.com/watch?app=desktop&v=rKtnxuPAYP4>

Mike Dalton, "The unusual Anzac Day tribute ringing out from an Australian university," (9 News website) 2025, <https://www.9news.com.au/national/anzac-day-the-unusual-anzac-day-tribute-ringing-out-from-an-australian-university/326b9d1d-b805-4a62-8c46-b6737c329d33>.

Guild of Carillonners in North America Associate Carillonner Exam (ACE) which is involves digital submission of scores and recordings for remote assessment. <https://www.gcna.org/exam-associate>

"Daniel Guo," 2025, <http://accompanistsguildofnsw.org.au/product/daniel-guo/>

"Music and science hit the right note. Piano virtuoso Daniel Guo is one of an elite group of students merging their science and musical talents in a unique dual degree.," 2013, <https://www.unsw.edu.au/newsroom/news/2013/01/music-and-science-hit-the-right-note>.

"Franco Composition Contest," 2025, <https://www.gcna.org/music/contests/composition>.

"82nd Annual GCNA Congress — 12 June 2025 A.M. Livestream of 2025 GCNA Franco Competition Winners: Three scenes from Alentejo by Daniel Guo (AUS); Performed by Jeremy Chesman (USA)," 2025, <https://www.youtube.com/watch?app=desktop&v=IsvHSJuGgCQ>.

"Three scenes from Alentejo; First Prize, 2025 GCNA Franco Composition Contest," Guild of Carillonners in North America, 2025, <https://www.gcna.org/music-store#!/PDF-Three-Scenes-from-Alentejo/p/756044815>.

"Obituary: Susi Jeans," *Independent* (UK) 1993, <https://www.independent.co.uk/news/people/obituary-susi-jeans-1478498.html>.

Digital virtual carillon practice clavier by Reinold van Zijl for the University of Sydney War Memorial Carillon <https://youtube.com/shorts/gQeXKTA0mZU?feature=share>

Demonstration of a Reinold van Zijl digital virtual carillon practice clavier for the University of Sydney War Memorial Carillon <https://youtube.com/shorts/vjBqDIUGSFI?feature=share>"

"Chiming Away: Discovering The History of The Memorial Bell Tower," The Phillipian, Phillips Academy, 2016, 2025, <https://phillipian.net/2016/09/30/chiming-away-discovering-history-memorial-bell-tower/>.

Dr Christiaan Winter is the city carillonner of Alkmaar (2009-present), village carillonner of De Rijp, lecturer at the HKU/ Netherlands Carillon School, president of the Carillon Centre of the Netherlands and the Royal Dutch Carillon Society, editor of Yearbook of Carillon and Bell Culture of the Low Countries and Director of Music at the Nicolaas Kerk, Amsterdam. He was a programmer for NCRV radio and church musician of Oude Kerk, Amsterdam. <https://www.hku.nl/en/study-at-hku/utrechts-conservatorium/the-netherlands-carillon-school>; <https://notenmaker.nl>

Video of Annie Gao performing on an acoustic carillon practice clavier by Reinold van Zijl, NL <https://www.youtube.com/live/u7YeCCczJ9g?t=7357s>

"Facebook post to carillonner group re: new chamber practice clavier," Facebook, 2025, <https://www.facebook.com/groups/110196189127982>.

Video of Dutch carillonneur Boudewijn Zwart demonstrating a Reinold van Zijl digital virtual carillon practice instrument for USA carillonneur France Newell <https://www.youtube.com/watch?v=eCezGq8fIeg>

Frances Newell digital virtual practice clavier video demo:  
<https://www.youtube.com/watch?v=eCezGq8fIeg>

"If you build it, they will learn," 2017, 2025, <https://www.rochester.edu/newscenter/build-it-and-they-will-learn-carillon-242652/>.

"A Crash Course in Carillon Construction," YouTube, 2017, accessed January 2025,  
<https://www.youtube.com/watch?v=6YmQFm6fQE4>.

"Clock-O-Matic company webpage," 2026, <https://www.clock-o-matic.com/en/>.

Annie Gao, "Carillon+ in North America," Facebook, 2025,  
<https://www.facebook.com/groups/110196189127982>.

"The Carillon: Living Heritage is Music to Everyone's Ears," The Low Countries, Investment and Trade, 2019, <https://www.the-low-countries.com/article/the-carillon-living-heritage-is-music-to-everyones-ears/#:~:text=Carillon%20Plus&text=In%202000%2C%20this%20culminated%20in,the%20general%20Low%20Countries'%20mood>.

"In the final minutes of the Mahler, Young led the orchestra, soloists, choir and organ to a glorious, life-affirming conclusion. But people in the audience and watching the TV simulcast may have noticed that the organist, David Drury, was not sitting high up in the organ loft, but was at a digital organ with the rest of the orchestra on the stage. The electronic sound – while not lacking in grandeur – was piped through a bank of speakers." <https://www.theaustralian.com.au/arts/sydney-opera-house-organ-damaged-by-rain-event/news-story/19f2ede9a6172f9f4087ecd9fbcf35b84#:~:text=An%20accident%20above%20the%20stage,lot%20of%20water%20coming%20down>.

"Bronzen Piano," 2013, 2025,  
[https://www.bronzenpiano.com/?fbclid=IwY2xjawKpYdxleHRuA2FlbQIxMABicmlkETE5NHRDWFI5dlFkVTkzV25yAR7c4uqjMoPFGjW1pwCKyeGmW0TykqWyOJd\\_UMYlbI5\\_YO-QBuYx4DnwcayI3g\\_aem\\_0Sq63BasZMMb-vcSfJiuVg](https://www.bronzenpiano.com/?fbclid=IwY2xjawKpYdxleHRuA2FlbQIxMABicmlkETE5NHRDWFI5dlFkVTkzV25yAR7c4uqjMoPFGjW1pwCKyeGmW0TykqWyOJd_UMYlbI5_YO-QBuYx4DnwcayI3g_aem_0Sq63BasZMMb-vcSfJiuVg).

Koen Van Assche and Anna-Maria Reverte, Facebook,  
<https://www.facebook.com/photo.php?fbid=411115931085261&id=100065605714730&set=a.387529393443915>.

"Bronzen Piano Webpage," 2025, <https://bronzenpiano.com>.

Koen Van Assche, Facebook, 2025, <https://www.facebook.com/search/top/?q=bronzen%20piano%20>.

Dr Esther Yae Ji Kim and Professor Menno van Delft performing the Johann Wilhelm Hässler (1747–1822) Sonata C major on clavichord <https://www.youtube.com/watch?v=vbGD5fkf7n4>

Dr Esther Yae Ji Kim performs Timur Ismagilov's Fantasia for Clavichord  
<https://www.youtube.com/watch?v=J48qRSbpFpI>

Correct, but not beautiful performance I and II <https://share.google/DCS3qsuVl619NUVpo> and  
<https://share.google/OcPAy5aOuZE5UVwqP>

"Digital," Organisation for Economic Co-operation and Development, 2025,  
<https://www.oecd.org/en/topics/digital.html>.

"The Impact of Post-COVID Digital Transformation on Global Bell & Carillon Culture," Performers(') Present 2023: Flowing Resonances, 2023, <https://www.ystmusic.nus.edu.sg/research-performers-present-2023-day-1/>.

Digital transformation for the creative industries, University of Technology, Sydney  
<https://open.uts.edu.au/insights/success-stories/how-creative-industries-can-upskill-for-digital-transformation/>

"Culture is key in achieving a more sustainable world," 2025, <https://www.unesco.org/en/articles/culture-key-achieving-more-sustainable-world>.

Jyoti Hosagrahar, "Culture: at the heart of sustainable development goals," 2023,  
<https://courier.unesco.org/en/articles/culture-heart-sustainable-development-goals>.

"The Operational Guidelines for the Implementation of the World Heritage Convention,"  
<https://whc.unesco.org/en/guidelines/>.

Organ Historical Society of Australia, 2025, accessed January 2025, 2025, <https://ohta.org.au> (OHTA webpage).

"Dr Jiri Zurek Biography," 2025, [https://www.bachlund.org/Prelude\\_and\\_Fugue\\_in\\_D\\_major.htm](https://www.bachlund.org/Prelude_and_Fugue_in_D_major.htm).; "Jiri Zurek (b. 1974) ...is currently a researcher at the Institute for Classical Studies of the Academy of Sciences of the Czech republic"

"Sonus Paradisi," 2003, <https://www.sonusparadisi.cz>.

"Organ Art Media," 2002, <https://www.organartmedia.com/en/>.

"Vienna Symphonic Library - Bells," <https://www.vsl.co.at/search?keyword=bells>].

Go Blue Bells, University of Michigan <https://gobluebells.com/2016/09/21/lurie-carillon-samples/>

"Download Lurie Carillon samples," University of Michigan, 2016,  
<https://gobluebells.com/2016/09/21/lurie-carillon-samples/>.

"National Carillon Practice Clavier (2020)," 2021,  
<https://www.facebook.com/JohnTaylorBells/posts/throwbackthursday-to-our-project-for-the-national-carillon-canberra-which-was-co/3556433717789408/>.

"Artistic research! Where are we today?" Music and Practice, 2023,  
<https://www.musicandpractice.org/enquete-vol-10-brown/>.

"Real-World Evidence," 2024, accessed January 2025, <https://www.fda.gov/science-research/science-and-research-special-topics/real-world-evidence>.

"Visioning the future: artistic research doctorates in Ireland," University College Cork, Ireland, 2020,  
<https://www.youtube.com/watch?v=vwjsRSchOhg>.

[1] Barwick and Toltz, *Quantifying the Ineffable? The University of Sydney's 2014 Guidelines for Non-Traditional Research Outputs*.

Paulo de Assis, "Artistic research seminar 2 - artistic research in music."  
<https://www.youtube.com/watch?v=jQGDH-gYUDQ>

Paulo de Assis, "On Artistic Research: From the classical dualism to a unifying approach."  
<https://www.youtube.com/watch?v=DYI2C8120Qs>

## 4 Results

Documentary, Imitations for pipe organ (2017): The sound of Sydney Town Hall organ  
<https://www.youtube.com/watch?v=fitKU0FfDYI>

Imitations for pipe organ live video recorded at the 2017 premier by the City of Sydney and uploaded to YouTube by composer Austin Buckett (aka Austin Benjamin aka Utility).

<https://www.youtube.com/watch?v=JwWY5Xq42-Y>

Social media video made by the City of Sydney for wide distribution across tradition and new media channels to promote the 175th Anniversary world premiere.

[https://www.facebook.com/cityofsydney/videos/a-new-soundscape-for-town-halls-grand-organ/10155212458998892/?locale=de\\_DE](https://www.facebook.com/cityofsydney/videos/a-new-soundscape-for-town-halls-grand-organ/10155212458998892/?locale=de_DE)

State Library of New South Wales, The Dictionary of Sydney for the City of Sydney Exhibition "Our City: 175 years in 175 objects" curated by the City Historian Dr Lisa Murray.

[https://dictionaryofsydney.org/blog/our\\_city\\_175\\_years\\_in\\_175\\_objects](https://dictionaryofsydney.org/blog/our_city_175_years_in_175_objects)

ArtGalleryofNSW, "The Lady and the Unicorn,"

<https://www.artgallery.nsw.gov.au/artboards/theladyandtheunicorn/>.

Angus McPherson, "Extended Play: a new music perfect storm," *Limelight*, 2/8/2018, 2018,

<https://limelight-arts.com.au/features/extended-play-a-new-music-perfect-storm/>.

Margaret Leng Tan describes how she was the first the woman to graduate from Julliard and how she started on the toy piano. <https://www.youtube.com/watch?v=6lTMcwP3b7A>

24 hr performance of Satie Vexations <https://www.youtube.com/watch?v=jZNknHHgm0M>

A performance of Satie Vexations that was just under 10 hours

<https://www.youtube.com/watch?v=gImDzmNuEDA>

Sydney Festival 2020 Webpage promotion for *Bronze Lands* by Robert Curgenvén.

<https://2020.sydneyfestival.org.au/events/bronze-lands>

"*Bronze Lands (Tailte Cré-Umha)* - Live at Sydney Festival 2020 [Part I - VI]," Band Camp, 2020,

<https://robertcurgenvén.bandcamp.com/track/31-bronze-lands-tailte-cr-umha-live-at-sydney-festival-2020-part-i-vi>.

Robert Curgenvén records <https://www.recordedfields.net/records/rfe04/>

Robert Curgenvén Organist and Composer webpages <https://www.recordedfields.net/>

Gaudeamus Igitur being performed for a University of Sydney graduation ceremony (1:01 min)

<https://www.youtube.com/watch?v=uDCaq7yBINQ>

Recessional for graduation ceremony in the University of Sydney Great Hall (0:22 sec)

[https://www.youtube.com/watch?v=mvzPz\\_-AZic](https://www.youtube.com/watch?v=mvzPz_-AZic)

Excerpt graduation ceremony feature organ stops (0:11 sec)

<https://www.youtube.com/watch?v=jOsriZ7wDAI>

Camera shot panning out from organist (0:17 sec) <https://www.youtube.com/watch?v=0jLadp6b9-c>

Camera shot panning out from organ loft (0:28 sec) [youtube.com/watch?v=a4ra8xjiFw&feature=youtu.be](https://www.youtube.com/watch?v=a4ra8xjiFw&feature=youtu.be)

Spontaneous, light-hearted moment during Graduation Ceremony. The videographer improvises candid shots of the audience according to the music the organist plays. The organist cannot see the broadcast.

(0:08 sec) <https://www.youtube.com/watch?v=G5-KnS3oJy8>

YouTube upload of A New Venetian Coronation 1595 (Paul McCreesh, Director)

<https://www.youtube.com/watch?v=G5-KnS3oJy8>.

Instagram page for ADSR Zine

<https://www.instagram.com/p/CgdtQhcryO8/?igsh=MXR4aHNxdW9saDJvcA%3D%3D> As with the nature of Zines, the Zine has now closed. The Instagram page still exists as an archive.

"ADSR Zine (2019-2023)," <https://jameshazel.net/05-1>.

"ADZR Zine 014" <https://www.instagram.com/p/CSNIDDUBW4d/?igsh=YjJ1MGUydnJwcTJ4>

lo-fi audio work example <https://www.youtube.com/channel/UCSJ4gkVC6NrvII8umztf0Ow>

Lecture presentation: Re-imagining musical programming on the Australian carillons (2023), Sydney Conservatorium of Music, The University of Sydney YouTube archive

<https://www.youtube.com/watch?v=MhCEbUYLiBk>

"Sustainable Sydney 2030-2050 Continuing the Vision," 2023,

<https://www.cityofsydney.nsw.gov.au/sustainable-sydney-2030-2050>.

"Recommendation for appointment of Miss Lillian Frost at City Organist, 1926-1934," City of Sydney Archives, Between 12th May 1926 and 3rd January 1934,

<https://archives.cityofsydney.nsw.gov.au/nodes/view/744557?keywords=lillian+frost&type=all&highlights=eyJwIjoiaZnJvc3QiLCIyIjoibGlsbGhbiJ9>.

"Lillian Frost," <https://adb.anu.edu.au/biography/frost-lillian-mary-12930>.

Hereford Cathedral Father Willis Pipe Organ sample set made by Lavender Audio and used with Milan Digital Audio Hauptwerk software (Martin Dyde, 2002) on a Kee Noorlander 3 manual MIDI virtual pipe organ, Dali Mentor surround speakers, subwoofer and a RME Babyface Pro soundcard.

[hymnary.org https://hymnary.org/text/holy\\_holy\\_holy\\_lord\\_god\\_almighty\\_early](https://hymnary.org/text/holy_holy_holy_lord_god_almighty_early)

Sydney Organ Society webpage listing of the 1874 Walker and Son, UK pipe organ at St Stephen's Anglican Church Newtown, Australia. <https://www.sydneyorgan.com/StStN.html>

Promotion from the National Capital Authority for the 50th anniversary of the National Carillon

<https://www.youtube.com/watch?v=c98s40TzHXY>

Amanda Cole biography and video <https://www.amandacolemusic.com/video>

Tower Bells Website with global carillon specification listings

<http://www.towerbells.org/data/ESBRCLPG.HTM>

"Elegy by F.S. Kelly at the commissioning of Bathurst War Memorial Carillon," 2021,

[https://www.australianmusiccentre.com.au/event/bathurst-war-memorial-carillon-bells.;](https://www.australianmusiccentre.com.au/event/bathurst-war-memorial-carillon-bells;)

"Elegy for string orchestra: in memoriam Rupert Brooke,"

<https://www.australianmusiccentre.com.au/workversion/kelly-frederick-septimus-elegy-for-string-orchestra/14586>.

Video of Carillonist Grace Chan performing Gynea Lilies (Moya Henderson) at the Bathurst War memorial carillon during Bathurst Festival of Bells 8/5/21 (0:37 sec)

<https://www.youtube.com/watch?v=M2IZ11D0Frw>

"Gynea Lilies by Moya Henderson at Bathurst Festival of the Bells," 2021,

<https://www.australianmusiccentre.com.au/event/festival-of-bells-classical-vibes>.

Elegy for String Orchestra (Kelly, FS)

[https://imslp.org/wiki/Elegy\\_for\\_String\\_Orchestra\\_\(Kelly%2C\\_Frederick\\_Septimus\)](https://imslp.org/wiki/Elegy_for_String_Orchestra_(Kelly%2C_Frederick_Septimus))

Australian War Memorial Sheet Music collection <https://www.awm.gov.au/collection/C2094733>

Video of Edward Grantham teaching Grace Chan how to improvise a chromatic scale passage on the University of Sydney War Memorial carillon. (0:43 sec) <https://www.youtube.com/watch?v=RmwAc-IOgD4>

University of Sydney Places of Interest <https://www.sydney.edu.au/engage/visit/places-of-interest.html#carillon>

The Australian War Memorial website had digital archives related to war and music. Australian War Memorial Sheet Music collection <https://www.awm.gov.au/collection/C2094733>

"Beyond 1914," University of Sydney, accessed 7 Jan 2025, 2025, <https://heuristic-usyd.cloud.edu.au/heuristic/?db=ExpertNation&ll=Beyond1914>.

University of Sydney Archives: carillon <https://archives-search.sydney.edu.au/nodes/view/22198>

Australian Digital Concert Hall article <https://www.cutcommonmag.com/three-years-on-australian-digital-concert-hall-continues-to-change-the-game-for-the-live-performance-industry/>

Ann and Robert H. Lurie Carillon <https://smt.d.umich.edu/facilities/ann-and-robert-h-lurie-carillon/>

Charles Baird Carillon in the Burton Memorial Tower <https://smt.d.umich.edu/facilities/burton-memorial-tower/charles-baird-carillon/>

Jakelin Troy and Linda Barwick, "Claiming the 'Song of the Women of the Menero Tribe'," *Musicology Australia* 42, no. 2 (2020), <https://doi.org/10.1080/08145857.2020.1945254>; "Professor Jakelin Troy Webpage," 2025, <https://www.sydney.edu.au/arts/about/our-people/academic-staff/jakelin-troy.html>.

"The Aboriginal Flag," 2025, <https://aiatsis.gov.au/explore/aboriginal-flag>.

Garabarala social media and ticketing

(1) <https://www.instagram.com/p/DRN1Bdrk6Si/>

(2) <https://transdisciplinary-research-science.sydney.edu.au/this-place/>

(3) <https://www.eventbrite.com.au/e/garabarala-the-knowledge-feast-tickets-1790930835339>

## 6 Conclusion

<https://www.openmonumentendag.nl/monument/waagtoren-uurwerk-en-beiaard/>

## Appendices

Austin Buckettt

# **IMITATIONS**

for pipe organ

(2017)

DURATION: 15'

Commissioned by the City of Sydney  
for the 175<sup>th</sup> Anniversary of the City of Sydney Council  
November 2017

### Description

During the course of the performance the organist assembles different configurations of 5 selected note-groupings in C-minor using weights on keys. Through a repeated process of moving the wind supply in and out of the organ pipes the principal interest of the work is to generate different overtones and harmonic 'reflections' from sustained densities.

Each set of 'reflections' almost function as a type of imitation of the previous sustained texture. A distortion of a texture that was once stable and is now harmonically unstable. The organ is an early example of the idea of imitative 'presets' that imitate pre-existing instrumentation – artificial representations of woodwind, brass and percussion blur into a single plenum. In essence these modules could continue to cycle through configurations of registers, manuals and timbral selections for hours and this could serve as a future extended variation of the work.

Sustained harmonic inversions in close intervallic arrangements create internal loops of different overtones through audible beats. Through the use of systematically removing and re-sending wind supply into the pipes a type of multiphonic reflection is uncovered during the entry and decay of structures. Each interchangeable 'module' is a different arrangement of the same materials, expressed through different ranges and stop combinations.

After each arrangement of weights on the organ keys is configured, the blower is switched on. Once the notes have reached their full sound, a stopwatch will be started to sustain each 'module' within a one-minute framework, and the blower is then turned off, followed by the stopwatch being reset and notes re-configured for the next module until the end of the work.

### *Performance process —*

- 1) Configure weights arrangement on manuals
- 2) Switch blower ON
- 3) When all notes fully sounding, start stopwatch
- 4) After 1'00" is reached switch blower OFF
- 5) Reset stopwatch
- 6) Once all notes and overtones have decayed repeat process for next module

\*Efficiency of key arrangements can be enhanced by adding weights during the end of the decay process, when no influence of new keys entering is apparent. This allows most configurations to be ready when the previous module has decayed.

### Stop numbers

Stops are to be numbered from bottom to top. A list of numbers with associated stops for each manual and pipe lengths are listed below (numbered specifically for the premiere performance on the Sydney Town Hall instrument). Future performances on different instruments can aim to match the timbral make up of registration presets.

Although this score is notated for 5 manuals of a large organ, the work can be performed on two or more manuals. On any size of instrumentation, the fundamental importance is that a selection of stops that parallel the chosen registers of the work are chosen, and that the durational framework and exact performance process could be followed as listed above. The size of the organ and stop selections will determine if registration assistants are required for efficient set-up and re-entry into each module.

Note combinations in manuals other than the Great and Swell are secondary doubling colours for balance throughout the instrument, and may be omitted on smaller organs for future performance. The concept of a fairly even spread throughout the instrument is important for the projection of harmonic 'reflections'/overtones during the decay and re-entry of modules.

It is important to consider registration options that most directly generate frequency beating/oscillation in performance. Once appropriate stops are selected, stickers with numbers should be placed on selected stops for future performance. This is for ease of execution during reconfiguration points for stop assistants.

### Registration List & Numbers

\*Example in order of position (top to bottom) on the instrument of premiere, Sydney Town Hall Grand Organ, Nov, 2017

\*Numbers on stickers should ascend consecutively from bottom to top of the stop board

ECHO	SOLO	SWELL	GREAT	CHOIR
1 = VIOL D'AMOUR 8 2 = UNDA MARIS 2 RKS 3 = LEBLICH GEDACKT 8 4 = VIOL D'AMOUR 4 5 = ECHO DULCIANA 6 = FLAGOLET 2 7 = BASSET HORN 8 8 = CORNET 4 RKS	1 = OPEN DIAPASON 8 2 = VIOLIN DIAPASON 8 3 = FLAUTO TRAVERSO 8 4 = DOPPEL FLOTE 8 5 = STOPPED DIAPASON 8 6 = OCTAVE 4 7 = FLAUTO TRAVERSO 4 8 = HARMONIC FLUTE 4 9 = HARMONIC PICCOLO 2 10 = COR ANGLAIS 8 11 = CORNO DI BASSETTO 8 12 = ORCHESTRAL OBOE 8 13 = OCTAVE OBOE 4 14 = TUBA CLARION 4	1 = OPEN DIAPASON 8 2 = SALICIONAL 8 3 = DULCIANA 8 4 = VOX ANGELICA 8 5 = HOHL FLOTE 8 6 = OCTAVE 4 7 = GEMSHORN 4 8 = HARMONIC FLUTE 4 9 = ROHR FLOTE 4 A = 3 TWELFTH B = 2 FIFTEENTH C = 1 PICCOLO D = MIXTURE 4 RKS E = FURNITURE 5 RKS 12 = CLARION 4	1 = CONTRA BOURDON 32 2 = BOURDON 16 3 = DOUBLE OPEN DIAPASON 16 4 = OPEN DIAPASON no2 8 5 = OPEN DIAPASON no4 8 6 = HARMONIC FLUTE 8 7 = SPITZ FLUTE 8 8 = GAMBA 8 9 = HOHL FLUTE 8 10 = ROHR FLUTE 8 11 = QUINT 6 12 = PRINCIPAL 4 13 = GEMSHORN 4 14 = OCTAVE 4 A = 3 TWELFTH B = 2 FIFTEENTH C = SHARP MIXTURE 4 RKS D = FURNITURE 5 RKS 15 = POSUANE	1 = OPEN DIAPASON 8 2 = DULCIANA 8 3 = FLAUTO TRAVERSO 8 4 = HOHL FLOTE 8 5 = LEBLICH GEDACKT 8 6 = CELESTINA 4 7 = VIOLINO 4 8 = LEBLICH FLOTE 4 A = 3 TWELFTH B = 2 FIFTEENTH C = 2 DULCET D = DULCIANA MIXTURE 3 RKS 9 = VOX HUMANA 8 10 = OCTAVE OBOE 10

PEDAL
1 = DOUBLE OPEN DIAP WOOD 32 2 = DOUBLE OPEN DIAP METAL 32 3 = CONTRA BOURDON 32 4 = OPEN DIAPASON METAL 16 5 = OPEN DIAPASON WOOD 16 6 = VIOLONE 16 7 = DULCIANA 16 8 = BOURDON 16 9 = QUINT 12 10 = OCTAVE 8 11 = PRESTANT 8 A = TWELFTH 6 B = FIFTEENTH 4 C = MIXTURE 4 RKS D = MIXTURE 3 RKS E = MIXTURE 2 RKS 12 = CONTRA TROMBONE WOOD 64 13 = CONTRA POSUANE METAL 32

### Registration assistants

The involvement of 2 registration assistants will allow for fast transitions between each module and their corresponding re-configurations. Once silence from the previous module's decay is reached, assistants on each side will re-configure presets/combinations, whilst the organist re-configures key weight combinations (before switching wind supply back on). All or most of this should occur within the short fermata marking at the end of each module, however for the sake of efficiency and optimum smoothness there is a certain point in the decay where new key weights and stops don't clearly influence the outcome of harmonic 'reflections'. During this time period re-configurations can occur for both registration assistants and organist, however only after making sure in rehearsals that this doesn't effect the overtones and texture during the decay of each module.

### Key Weights

Any type of weight can be used to perform the operation of configuring notated harmonies on available manuals. Lead key weights are fine, as well as felt or rubber wedges. The reason bolts are used and recommended is due to their ease in covering 2 notes at a time, allowing the process of setting up each configuration to be efficient and swift during crucial transition points.



\*Example of weights covering two keys per time assisting with efficient transitioning between sections.

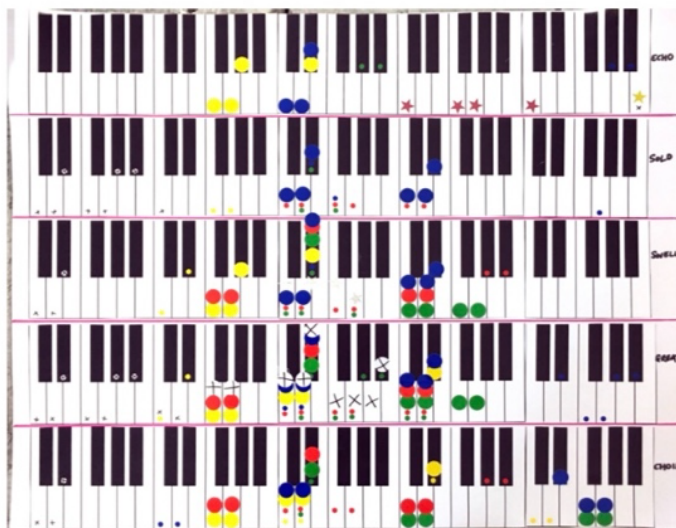
### Optional colour system

1) *Stops* — Once stops of similar timbral properties are selected, the use of coloured stickers that represent each module and the associated registrations can assist with efficient transitioning. This method might be particularly helpful for larger instruments with a large amount of registration options (such as the premiere instrument at Sydney Town Hall).



\*Associated colour coding for each module (1-10), followed by both registrants and organist.

2) *Manual colours* — Colour coding for weight positions and harmonies can be useful on larger instruments that have more than 3 manuals. When configuring each combination the organist will have a particularly virtuosic part between transitions. Changing voicings can be assisted over several manuals with a colour system corresponding with the registration colours that represent each module.



\*Colours correspond with each module and registrants also follow this system. Organist Grace Chan has used stars to represent optional materials throughout.

Coupling could also be used (if using a mechanical instrument) to extend doubled harmonic patterns to other manuals for efficiency in transitions between modules.

#### 'Optional' Materials

Materials marked throughout the work as 'optional' are up to the organists discretion however shouldn't always be played. The mix and levels of these materials are important in relation to their inclusion: arpeggios, notes or melodies should be barely audible – they should be fragments that are only just discernable within the overall textural mass. They are optional activities that serve the purpose of contributing to the overall complexity of harmonic information, and the patterns that we interpret within these dense, sustained and harmonically active textures.

#### Stopwatch

Once key weights are configured for each module the organist is to use a stopwatch to time the sustained length of each section. This must occur when all notes are fully sounding/speaking. Once the sustained harmonic structure has reached 1'00", the organ wind supply/blower should be switched off, after this the organist should reset the stopwatch for the next module. Wait for the module to fully decay and briskly re-configure notes for the next section (keys of the current module should be left on while configuring weights for the next, allowing for a smoother transition between modules especially if the forthcoming section is fairly dense.

\*If the organ blower switch is away from arms reach for the organist, another person will be required to follow cues from the organist to switch the wind supply on and off

#### Open Form

Each module is numbered in the top right corner of each page. The order in which these modules are performed is up to the discretion of the performers. This may be decided in advance with reference to a new structural permutation, on the day of the performance, or if material is learned well enough and communicated in real time during performance. This is in part a homage to the improvisatory history of organ performance.

#### Work duration

The full piece is approximately fifteen minutes, however different instruments will have different decay and re-entry durations for each module. Work duration will slightly vary depending on each instrument.

#### Note

Thank you to Grace Chan for her relentless enthusiasm throughout making this work. I'm very grateful for her significant investment of time and energy, and for introducing me to so many works and traditions. Thank you to Koen van Stade for his valued assistance, and openness to be a springboard for ideas. Thanks to Dr Lisa Murray, City Historian, for her support and for facilitating this project with the City of Sydney. Thanks to my friend and registrant John Wilton and to Elia Bosshard for her constant positivity and encouragement.

This piece is dedicated to my grandmother Aline Lyons aka. 'GUNG', who always encourages my practice, and who also performed an inspiring hymn-like improvisation on the Town Hall organ in September, 2017.

# 1

7 - 9

SOLO

A - B - C - D

SWELL

B - A - D

GREAT

B - C - D

CHOIR

0'00" 1'00"

CONFIGURE SWITCH ON WIND SUPPLY

RECONFIGURE SWITCH OFF WIND SUPPLY

Detailed description: The image shows a musical score for four parts: SOLO, SWELL, GREAT, and CHOIR. Each part is represented by a staff with a clef and a key signature of one flat. The SOLO part is in bass clef and contains a whole note chord. The SWELL part is in bass clef and contains a whole note chord. The GREAT part is in bass clef and contains a whole note chord. The CHOIR part is in treble clef and contains a whole note chord. Below the score is a timing diagram with a horizontal axis. A vertical line at 0'00" is labeled 'CONFIGURE' and 'SWITCH ON WIND SUPPLY'. A vertical line at 1'00" is labeled 'RECONFIGURE' and 'SWITCH OFF WIND SUPPLY'. The diagram shows a trapezoidal shape between these two lines, indicating a change in configuration over time.

# 7

Musical score for four parts: SWELL, GREAT, CHOIR, and PEDAL. The score is written in treble clef for SWELL, GREAT, and CHOIR, and bass clef for PEDAL. The key signature has one flat (B-flat). The SWELL part has a melodic line with notes 2-3-4-7-8. The GREAT part has a melodic line with notes 5-6-7-8-9-10-13. The CHOIR part has a melodic line with notes 5-6-7-8-9-10 and a dynamic marking of  $8^{pizz}$ . The PEDAL part has a melodic line with notes 1-2-3-4-5-6 and a dynamic marking of  $A-B-C-D-E-1-2-13$ . Below the score is a timing diagram showing a horizontal line with a vertical tick at 0'00" and another at 1'00". The diagram is labeled 'CONFIGURE' at the start and 'RECONFIGURE' at the end. A triangle pointing right is labeled 'SWITCH ON WIND SUPPLY' and is positioned between 0'00" and 1'00". A triangle pointing left is labeled 'SWITCH OFF WIND SUPPLY' and is positioned at 1'00".

AUSTIN BUCKETT  
**IMITATIONS**  
For solo pipe organ (2017)

Bavo edition (2018)  
Editors: Grace Chan  
Koen Van Stade

DURATION: 10'

The organ must have at least 3 manuals. Featured manual and stop selections in this score may be adapted to a particular instrument's parameters – with general reference to selected pipe lengths and colours in the registration list.

This work was premiered on the Sydney Town Hall Hill and Son organ (1889) on the 5<sup>th</sup> November, 2017. This edition is specifically configured for the Müller organ (1738) in St Bavo's church, Haarlem and takes into account St Bavo's 6 seconds of reverberation time.

### Description

Through a repeated process of moving the wind supply in and out of the organ pipes the principal interest of the work is to generate different overtones and harmonic 'reflections' from sustained densities. Each set of 'reflections' almost function as a type of imitation of the previous sustained texture. A distortion of a texture that was once stable and is now harmonically unstable.

The organ is an early example of the idea of imitative 'presets' that imitate pre-existing instrumentation – artificial representations of woodwind, brass and percussion blur into a single plenum. In essence these modules could continue to cycle through configurations of registers, manuals and timbral selections for hours and this could serve as a future extended variation of the work.

Sustained harmonic inversions in close intervallic arrangements create internal loops of different overtones through audible beats. Through the use of systematically removing and re-sending wind supply into the pipes a type of multiphonic reflection is uncovered during the entry and decay of structures. Each interchangeable 'module' is a different arrangement of the same materials, expressed through different ranges and stop combinations.

After each notated chord is depressed, the blower is switched on. Once full sound is reached, a stopwatch will be started to sustain each 'module' within a 30 second framework. The blower is then turned off, followed by the stopwatch being reset and notes re-configured for the next module until the end of the work.

#### *Performance process —*

- 1) Configure chord on manuals
- 2) Switch blower ON
- 3) When all notes fully sounding, start stopwatch
- 4) After 30 seconds is reached switch blower OFF
- 5) Reset stopwatch
- 6) Once all notes and overtones have decayed repeat process for next module

It is important to consider registration options that most directly generate frequency beating/oscillation in performance. In this Bavo Edition (2018), registration choices were carefully selected to achieve this aim on the Müller organ. Transitions between each module and their corresponding re-configurations should be enacted rapidly to maintain continuity and tension in the work. Once silence from the previous module's decay is reached, the organist may depress the next chord before switching the wind supply back on. All or most of this should occur within the short fermata marking at the end of each module. There is a certain point in the decay where depressing the chord of the next module does not influence the outcome of harmonic 'reflections'. During this time period re-configurations can occur for both registrants and organist.

#### 'Optional' Materials

Materials marked throughout the work as 'optional' are played at the organist's discretion. The mix and levels of these materials are important in relation to their inclusion: arpeggios, notes or melodies should be barely audible – they should be fragments that are only just discernable within the overall textural mass. They are optional activities that serve the purpose of contributing to the overall complexity of harmonic information, and the patterns that we interpret within these dense, sustained and harmonically active textures.

#### Open Form

The order in which these 10 modules are performed is at the discretion of the organist.

#### Work duration

The full piece is intended to be 10 minutes in duration. Different instruments will have different decay and re-entry durations for each module. Work duration will vary slightly depending on each instrument's re-entry and decay time. Each organ, acoustic and audience size will have its unique decay "fingerprint" which will add to the living nature of the work.

# VII

BW: P8, O4, N3, Sexq, Mix, Cym, Sch8  
HW: P16,, B16, O8, O4, Q3, Mix, Sch, Ter, Tr16, Tr8  
RW: P8, O4, So2, Sexq, Mix, Cym, Cor, F16, Tr8  
Ped: P32, P16, S16, Rq12, O8, Qp6, O4, Mix, Rq3, Baz32, Baz16, Tr8, Tr4, C2  
K: HW+BW, HW+RW, Ped+BW, Ped+HW, Ped+BW

The image shows two musical staves. The top staff is labeled 'HW' and uses a treble clef with a key signature of one flat (B-flat). It contains a whole note chord consisting of the notes G4, A4, B-flat4, and C5. The bottom staff is labeled 'Ped.' and uses a bass clef with a key signature of one flat. It contains a whole note chord consisting of the notes G2, A2, B-flat2, and C3. Below the staves is a diagram for a blower control. It features two horizontal lines that taper to points at the ends, representing a volume or intensity envelope. The left taper is labeled '0'00"' and the right taper is labeled '0'30"'. Below these tapers, the text 'Turn on blower' is positioned on the left and 'Turn off blower' is on the right, with a horizontal line connecting them to indicate the duration of the blower effect.

**From:** Orgelfestival Haarlem <[office@organfestival.nl](mailto:office@organfestival.nl)>  
**Date:** 1 April 2018 at 01:44:28 AEDT  
**To:** Grace Chan <[gcha4667@uni.sydney.edu.au](mailto:gcha4667@uni.sydney.edu.au)>  
**Cc:** Austin Buckett <[austinbmusic@gmail.com](mailto:austinbmusic@gmail.com)>, Austin Buckett <[studio@austinbuckett.com](mailto:studio@austinbuckett.com)>  
**Subject: Re: Young composers submission Haarlem Organ Festival 2018: Imitations for solo pipe organ**

Dear Grace and Austin,

Thank you, the composition is received well. I will contact you as soon as possible whether you will be admitted to the Young Composers Masterclass.

Just one question: Grace, will you play the piece in Haarlem?

Kind regards,

Peter Ouwerkerk



Peter Ouwerkerk  
*General Manager*

International Organfestival Haarlem  
[www.organfestival.nl](http://www.organfestival.nl) | [office@organfestival.nl](mailto:office@organfestival.nl)



## Vexations

[pitches respelled by Lyle Chan]

*In order to play the theme 840 times consecutively, it would be good to prepare oneself in advance, and in the deepest silence, by serious immobilities.* Erik Satie

**Slow**

2

⊕ At the sign it is customary to present the theme in the bass

THEME

3

Original French:

Pour se jouer 840 fois de suite ce motif, il sera bon de se préparer au préalable, et dans le plus grand silence, par des immobilités sérieuses

A ce signe il sera d'usage de présenter le thème de la Basse

## Appendix 4

### bronze lands timings

1.02	first tone	1
1.39	(pause?)	
1.49	back again	
1.58	(pause?)	
2.57	chord start	
5.27	bass	2 to 6
10.07	build up (slow crescend	7
10.27	build down - to 10.43	8
11.13	new section	9
11.27	ostinato	
13.27	bass starts	
15.58	second section starts	10
17.28	(hiss starts)	11

(together)  
2' Fifteenth  
3' Twelfth

07:00 GREAT  
8' Open Diapason #3

(together)  
4' Harmonic flute  
4' Principal

10:43 OFF RC AND GC TOGETHER

SWELL (RC OFF)	GREAT (GC
OFF)	
2' Fifteenth	4' Principal
3' Twelfth	4' Harmonic

11:10 PEDAL  
8' Bass Flute  
8' Octave

12:30 GREAT  
4' Harmonic flute

13:00 GREAT  
8' Open Diapason #1

13:12 GREAT  
8' Open Diapason #4  
8' Open Diapason #2

13:27 SWELL  
2' Fifteenth Rapid notes (look at  
RC) (C C# D#)

13:37 OFF GREAT  
Open Diapason #1

15:00 GREAT  
4' Octave

1  
GC Registrations  
FINAL

Bronze Lands  
Curgenven (2019)

Registrations for Sydney Town Hall Grand Organ  
Australian Premiere @ Sydney Festival 2020

00:00 SWELL -> GREAT (COUPLE)

PEDALS  
16' and below No 32 Contra Bourdon

SWELL  
8' Höhl Flote

GREAT  
8' Höhl Flote

02:49 GREAT  
8' Röhr Flote Wait for pedal to come off  
(look at RC)

03:30 GREAT  
8' Spitz Flote

Walk to swell

SWELL

03:50 8' Vox Angelica

04:40 4' Octave

04:50 8' Dulciana

05:10 4' Röhr flote

05:27 GREAT  
8' Harmonic Flute

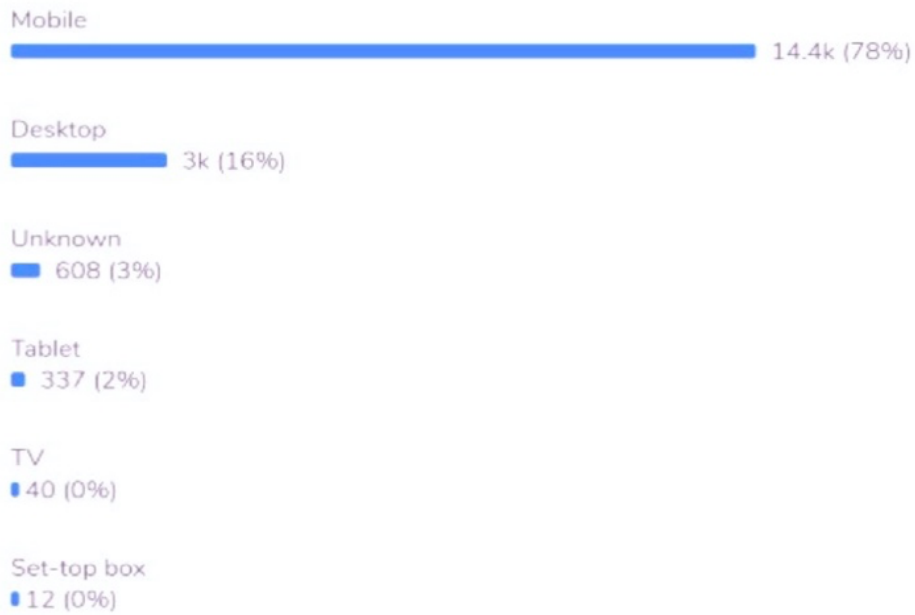
05:40 SWELL  
4' Harmonic Flute

06:20 SWELL

Graduation ceremony livestream viewing statistics (29/4/2024-2/6/2024)

With permission from the Organ & Carillon Unit, The University of Sydney

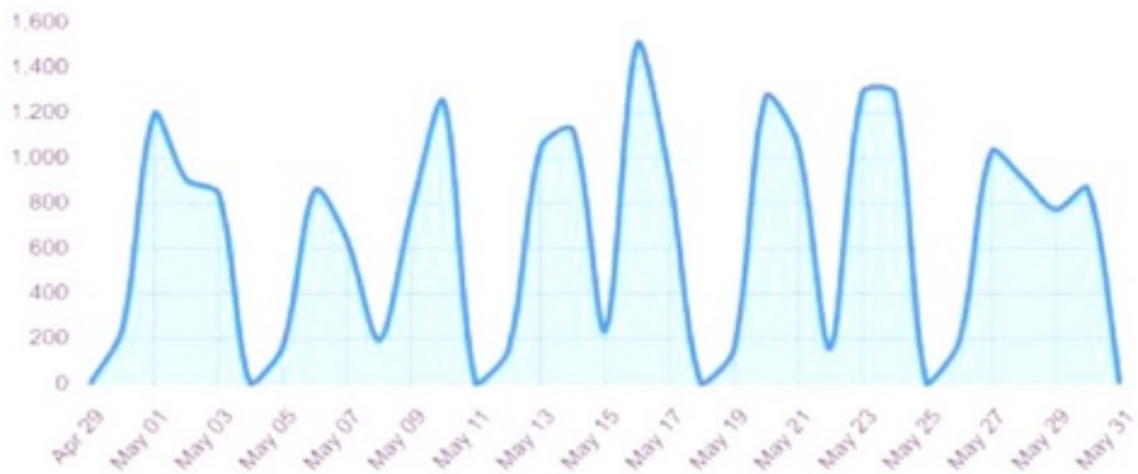
## DEVICES



## VIEWER RESOLUTION



# VIEWS PER DAY



Date	Total Viewers Per Day
Monday 29/04/24	
Tuesday 30/04/24	244
Wednesday 01/05/24	1,197
Thursday 02/05/24	906
Friday 03/05/24	845
Saturday 04/05/24	
Sunday 05/05/24	170
Monday 06/05/24	861
Tuesday 07/05/24	639
Wednesday 08/05/24	197
Thursday 09/05/24	775
Friday 10/05/24	1,254
Saturday 11/05/24	
Sunday 12/05/24	152
Monday 13/05/24	1,049
Tuesday 14/05/24	1,129
Wednesday 15/05/24	237
Thursday 16/05/24	1,509
Friday 17/05/24	931
Saturday 18/05/24	
Sunday 19/05/24	152
Monday 20/05/24	1,275
Tuesday 21/05/24	1,065
Wednesday 22/05/24	159
Thursday 23/05/24	1,292
Friday 24/05/24	1,288
Saturday 25/05/24	
Sunday 26/05/24	192
Monday 27/05/24	1,031
Tuesday 28/05/24	909
Wednesday 29/05/24	774
Thursday 30/05/24	868
Friday 31/05/24	
Saturday 01/06/24	
Sunday 02/06/24	

# COUNTRIES

Australia



People's Republic of China



United States of America



Hong Kong



India



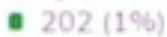
Malaysia



Canada



Singapore



Vietnam



Other



<b>Total Unique Viewers</b>	18,353
<b>Cumulative Watch Time</b>	7 months, 27 days, 18:05:30
<b>Average Watch Time per viewer</b>	00:18:39

Viewer Stream Resolution	Total Viewers
1620x 1080px	16,554
1280x 720px	7,800
853 x 480px	5,988
320x 180px	5,323
512x 288px	4,460
640x 360px	3,782

Device Type	Total Viewers
Mobile	14,358
Desktop	2,998
Unknown	608
Tablet	337
TV	40
Set-top box	12

Country	Total Viewers
Australia	10,420
People's Republic of China	4,192
United States of America	467
Hong Kong	462
India	432
Malaysia	295
Canada	212
Singapore	202
Vietnam	195
Other	1,476

## SCREENSHOT THUMBNAIL COMPILATION 2014 – 2021 GRACE CHAN, ORGANIST & CARILLONNEUR

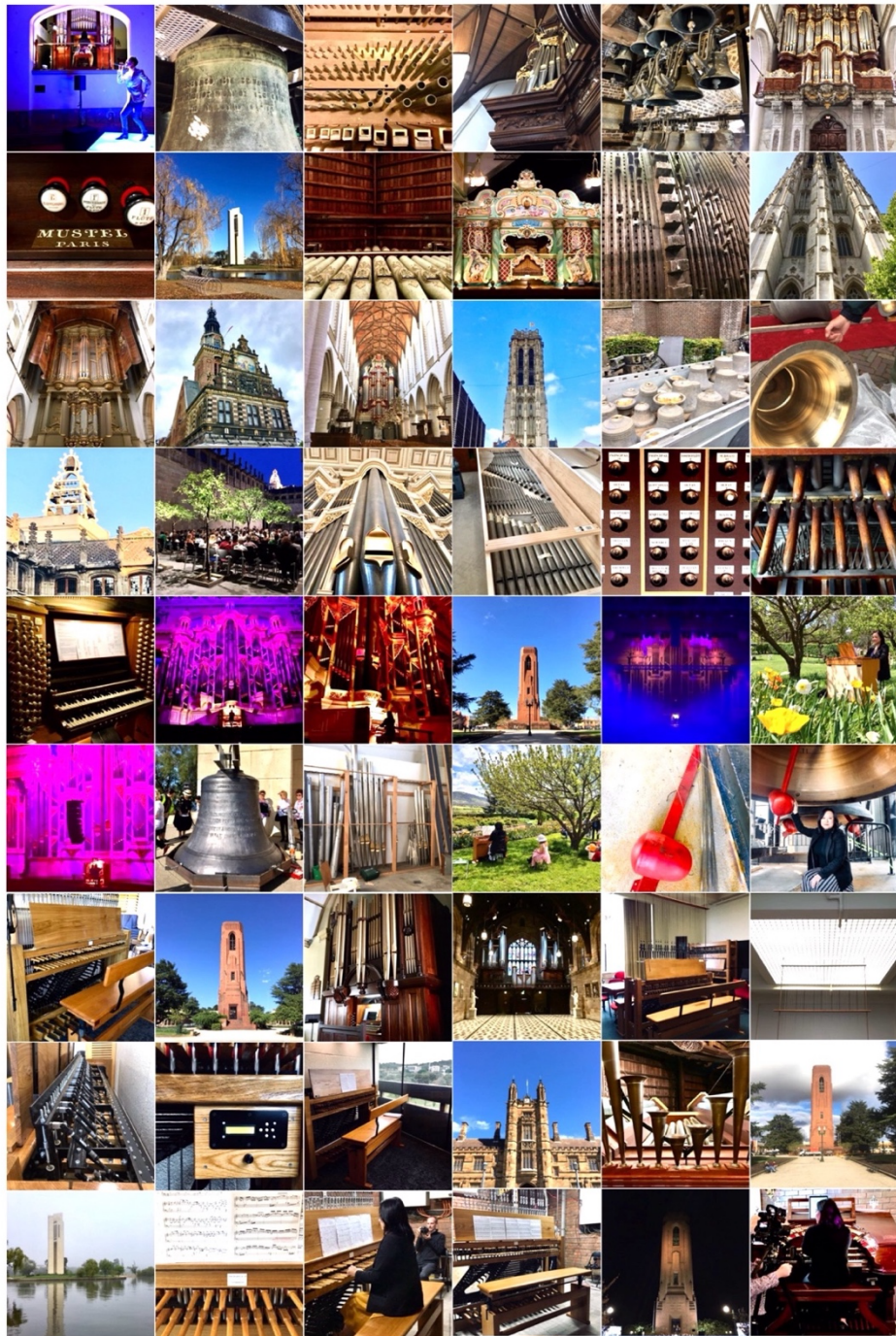
copy TEXT ROLL below  
paste into ANY VOICE GENERATOR  
view THUMBNAILS L -> R

EXAMPLE

<https://voicegenerator.io>

START\_GRACE CHAN ORGAN CARILLON\_REAL\_VIRTUAL\_PIPES\_BELLS\_2014 to 2021. Handel House replica chamber organ SAINT GEORGE'S HANOVER SQUARE LONDON UNITED KINGDOM. Mechanical tracker action NEWTOWN AUSTRALIA. Portative organ ART GALLERY OF NEW SOUTH WALES AUSTRALIA. La Dame à la Licorne portative organ music premiere ART GALLERY OF NEW SOUTH WALES AUSTRALIA. Tremulant and Cornopean 8 foot organ stop Walker and Son 1874 organ SAINT STEPHEN'S NEWTOWN AUSTRALIA. St BavoKerk carillon HAARLEM NETHERLANDS. Premiere Imitations for pipe organ Buckettt 2017 City of Sydney archival photo SYDNEY TOWN HALL AUSTRALIA. William Hill & Son organ City of Sydney 175<sup>th</sup> anniversary archival photo SYDNEY TOWN HALL AUSTRALIA. National Carillon Canberra AUSTRALIA. Equilateral triangle under-view NATIONAL CARILLON CANBERRA AUSTRALIA. Carillon clavier NATIONAL CARILLON CANBERRA AUSTRALIA. Davidson 1874 Australian-made organ BATHURST AUSTRALIAN GOLDFIELDS. Shapes 1 Roman Haubenstock-Ramati graphical score on music desk SYDNEY TOWN HALL ORGAN AUSTRALIA. Centre-façade pipe SYDNEY TOWN HALL ORGAN AUSTRALIA. F-Sharp bell NATIONAL CARILLON CANBERRA AUSTRALIA. 1972 Rudolf von Beckerath organ UNIVERSITY OF SYDNEY GREAT HALL AUSTRALIA. Spire for Vlnhockspel bells SAINT STEPHEN'S NEWTOWN AUSTRALIA. Sandstone spiral staircase to organ loft GREAT HALL UNIVERSITY OF SYDNEY AUSTRALIA. Carillon clavier batons NATIONAL CARILLON CANBERRA AUSTRALIA. Steel stairs to bell chamber NATIONAL CARILLON CANBERRA AUSTRALIA. Façade pipes Fincham Hobday organ SYDNEY AUSTRALIA. Rear vision mirror Fincham Hobday organ SYDNEY AUSTRALIA. Sauer organ BASILEX VAN DE HELIGE NICOLASS AMSTERDAM NETHERLANDS. Carpeted stairs to clavier room UNIVERSITY OF SYDNEY WAR MEMORIAL CARILLON AUSTRALIA. Gold filigree of façade pipes SYDNEY TOWN HALL ORGAN AUSTRALIA. Giant bamboo SAINT STEPHEN'S NEWTOWN AUSTRALIA. DoopsgesindeKerk HAARLEM NETHERLANDS. Maker's plaque Müller organ SAINT BAVOKERK HAARLEM NETHERLANDS. Müller organ SAINT BAVOKERK HAARLEM NETHERLANDS. Organ loft SYDNEY AUSTRALIA. Carillon clavier NATIONAL CARILLON CANBERRA AUSTRALIA. National Carillon Canberra ASPEN ISLAND LAKE BURLEY GRIFFIN AUSTRALIA. Alkmaar carillonneurs since 1541 WAAGTOREN ALKMAAR NETHERLANDS. Pinned wheel for carillon automation WAAGTOREN ALKMAAR NETHERLANDS. State roofing WAAG TOREN ALKMAAR NETHERLANDS. Treble bells WAAGTOREN ALKMAAR NETHERLANDS. Flûte d'amour 4 foot stop DORPSKERK GROOTSCHERMER NETHERLANDS. Organ pipes STOMPETOREN NETHERLANDS. Bathurst War Memorial Carillon BATHURST AUSTRALIA. Virtual 3 manual organ SYDNEY CONSERVATORIUM AUSTRALIA. Art of Organ Playing WT Best on virtual organ music desk SYDNEY CONSERVATORIUM AUSTRALIA. Müller organ SAINT BAVO KERK HAARLEM NETHERLANDS. Marcussen & Son main organ Hoofdforgel LAURENSKERK ROTTERDAM NETHERLANDS. Maker's plaque Taylor's carillon clavier NATIONAL CARILLON CANBERRA AUSTRALIA. Letsameu pipe organ SAINT ANDREWS CATHEDRAL SYDNEY AUSTRALIA. Powering bellows SAINT STEPHEN'S NEWTOWN AUSTRALIA. Mouth of façade pipes Fincham Hobday organ SYDNEY AUSTRALIA. Crushed white granite composite panel wall NATIONAL CARILLON CANBERRA AUSTRALIA. Casio pre-programmed synthesizer Vexations at CITY RECITAL HALL EXTENDED PLAY MUSIC FESTIVAL LYLE CHAN SYDNEY AUSTRALIA. Vexations Eric Satie. F-sharp bell NATIONAL CARILLON CANBERRA AUSTRALIA. Taylor's practice clavier SYDNEY AUSTRALIA. Fincham Hobday 1885 pipe organ ex-GAWLER SOUTH AUSTRALIA now SYDNEY. Silver Party Sydney Children's Hospital SYDNEY AUSTRALIA. 1970 F-Sharp bourdon bell NATIONAL CARILLON CANBERRA AUSTRALIA. Fincham Hobday pipe organ SYDNEY AUSTRALIA. Vater-Müller organ loft view OUDEKERK AMSTERDAM NETHERLANDS. Carillon bells OUDEKERK AMSTERDAM NETHERLANDS. Vater-Müller organ OUDEKERK AMSTERDAM NETHERLANDS. "Grainger" Mustel Paris art harmonium SYDNEY CONSERVATORIUM AUSTRALIA. National Carillon Canberra AUSTRALIA. Façade pipes wooden ceiling SAINT STEPHEN'S NEWTOWN AUSTRALIA. Automated street organ MUSEUM SPEELKLOK UTRECHT NETHERLANDS. Pinned wheel automating Utrecht Dom carillon UTRECHT NETHERLANDS. Utrecht Dom carillon UTRECHT NETHERLANDS. 1646 van Hagerbeer Schnitger organ SAINT LAURENSKERK ALKMAAR NETHERLANDS. Waag carillon historic cheese weighing station ALKMAAR NETHERLANDS. Saint Bavo GroteKerk HAARLEM NETHERLANDS. Sint Rombouts carillon tower MECHELEN BELGIUM. Laudy bells 2019 carillonneer Christaan Winter DERJIP, NETHERLANDS. Bell for first new Dutch carillon in 50 years DERJIP NETHERLANDS. Gothic Palau sine tone and carillon premiere Amanda Cole BARCELONA SPAIN. Gothic palace courtyard BARCELONA SPAIN. Sydney Town Hall grand pipe organ SYDNEY AUSTRALIA. Hargraves South Island Organ Company boxed pipe work TIMARU NEW ZEALAND. Computer touch screen virtual organ console stops SYDNEY AUSTRALIA. Taylor's mechanical carillon practice clavier batons SYDNEY AUSTRALIA. 127 stop 1886 William Hill and Son organ Curgenven Bronze Lands premiere for Sydney Festival 2020. Playing Pachelbel ciacona D minor SYDNEY TOWN HALL ORGAN AUSTRALIA. Playing Pachelbel ciacona F minor SYDNEY TOWN HALL ORGAN AUSTRALIA. War Memorial Carillon BATHURST AUSTRALIA. Video still Curgenven Bronze Lands live Sydney Town Hall Sydney Festival 2020 AUSTRALIA. Waltz through the Tulips Floriade RE-IMAGINED COVID 2020 LANYON HOMESTEAD THARWA AUSTRALIAN CAPITAL TERRITORY AUSTRALIA. Performing registration changes with composer Robert Curgenven Bronze Lands SYDNEY TOWN HALL AUSTRALIA. 2021 Ngunnawal bell smoking ceremony with Ngunnawal elders NATIONAL CARILLON CANBERRA AUSTRALIA. Pipe work South Island Organ Company TIMARU NEW ZEALAND. Alexandre harmonium Waltz through the Tulips for Floriade RE-IMAGINED curated Anna Wong LANYON HOMESTEAD THARWA AUSTRALIAN CAPITAL TERRITORY AUSTRALIA. Red clapper installation NATIONAL CARILLON CANBERRA AUSTRALIA. Hand connecting with red clapper 2021 Ngunnawal G bourdon bell NATIONAL CARILLON CANBERRA AUSTRALIA. Carillon clavier SYDNEY UNIVERSITY WAR MEMORIAL CARILLON AUSTRALIA. War Memorial Carillon BATHURST AUSTRALIA. 1874 Davidson organ BATHURST AUSTRALIA. Beckerath organ GREAT HALL UNIVERSITY OF SYDNEY AUSTRALIA. Clavier room SYDNEY UNIVERSITY WAR MEMORIAL CARILLON AUSTRALIA. Grid grill for clapper wires from main clavier to bell chamber UNIVERSITY OF SYDNEY WAR MEMORIAL CARILLON AUSTRALIA. Pistons 2020 virtual carillon practice Taylor's UK NATIONAL CARILLON CANBERRA AUSTRALIA. Control panel 2020 virtual carillon practice clavier NATIONAL CARILLON CANBERRA AUSTRALIA. Virtual carillon practice clavier NATIONAL CARILLON CANBERRA AUSTRALIA. Blackett Wilkinson clock tower MAIN QUADRANGLE UNIVERSITY OF SYDNEY AUSTRALIA. Trumpets mounted enchamade GREAT HALL UNIVERSITY OF SYDNEY AUSTRALIA. War Memorial Carillon BATHURST AUSTRALIA. Misty day Lake Burley Griffin PARKES AUSTRALIAN CAPITAL TERRITORY AUSTRALIA. Bach Chaconne D minor from Violin partita NATIONAL CARILLON CANBERRA AUSTRALIA. Performing Frederick Septimus Kelly's 1915 Elegy in Memorium Rupert Brooke War Memorial Carillon first concert 20 March 2021 BATHURST AUSTRALIA. Performing at Bathurst Festival of Bells BATHURST AUSTRALIA. Last Post ceremony 7<sup>th</sup> May 2021 BATHURST WAR MEMORIAL CARILLON KINGS PARADE BATHURST AUSTRALIA. Playing Bach D minor toccata ABC National News Old Regent Theatre National Trust listed Wurliizer organ ATKINSON FAMILY HOME HURSTVILLE NEW SOUTH WALES AUSTRALIA. END. 975 WORDS





Link to paper mentioned in letter:

<https://www.auponline.com/content/journals/10.5117/BKL2021.1.001.CHAN>



**Office of the Mayor**

Civic Centre Telephone 02 6333 6111  
158 Russell Street Facsimile 02 6331 7211  
Private Mail Bag 17 council@bathurst.nsw.gov.au  
Bathurst NSW 2795 www.bathurst.nsw.gov.au

6 June 2022

Dr Grace Chan  
Sydney Conservatorium of Music  
University of Sydney

Via email: [gcha4667@uni.sydney.edu.au](mailto:gcha4667@uni.sydney.edu.au)

Dear Dr Chan

**Re: Academic Paper – Wellbeing, Placemaking and Carillon Culture**

Thank you very much for forwarding a copy of yours and Dr Anna Wong's academic paper, which features the Bathurst War Memorial Carillon. The paper makes very interesting reading and I wholeheartedly agree with the linkage that you have made to wellbeing, placemaking and carillon culture.

The Bathurst War Memorial Carillon is a focal point of the community here in Bathurst and is playing an even more dynamic role with the installation of the clavier and extra bells. In October this year, it will be the focal point for the women and men of the HMAS Bathurst led by Commanding Officer Kimberley Healy, to exercise their right to Freedom of Entry to the city. This is a symbolic ceremony that goes back to at least the time of the Roman Empire.

On behalf of the people of Bathurst, I wish you well in the release of the paper via the World Carillon Federation and Guild of Carillonners of North America.

If you should visit Bathurst again, please do not hesitate to contact me.

Yours faithfully

[Redaction]

Cr Robert Taylor  
MAYOR OF BATHURST

Reference: RT:ED: 04.00021  
Enquiries: Cr R Taylor 02 6333 6201

BATHURST REGION... FULL OF LIFE