



Preserving creative process in the digital age: Findings from a survey of contemporary composers

Jessica Grimmer and Stephanie Akau

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Abstract

Introduction. Digital tools have become ubiquitous in the process of music composition and documentation of composers' lives and careers. This material and subsequent scholarship are at risk due to the obsolescence of hardware and software, fragility and variety of digital file formats, media prone to degradation. This paper presents survey results on composers' process and knowledge of preservation practices.

Method. The survey was designed in GoogleForms and distributed through email to music theory and composition faculty at Big10 universities, major conservatories, and professional organization listservs. The survey assessed compositional workflows and respondents' knowledge and implementation of preservation practices through quantitative and free-response qualitative questions.

Analysis. The survey generated qualitative data, examined thematically; quantitative responses were analysed for trends.

Results. The results demonstrate a need for a central, open resource to guide composers through implementation of preservation practices to ensure longevity of their work.

Conclusion. This survey is the first to bridge the disjunction between composers' creative process and preservation practices. Results illustrate wide usage of digital tools and proprietary file types and indicate a concerning lack of preservation knowledge. It will inform a toolkit that offers guidance on long-term preservation, to bring composers into confident stewardship of their creative legacies.

Introduction

The process of composing music, encountered in preliminary sketches, manuscripts, and performances, has formed a central tenet of musicological and theoretical research for nearly two centuries. These primary source materials reveal the development of musical works and, when considered with records of composers' professional and personal activities, enhance understanding of music history and cultural memory. Documentation ensures the continuity of this research. As composers have increasingly adopted digital media, the records essential for future scholarship have likewise transitioned into digital formats.

Digital technologies are integral to all stages of musical creation. Composers now consider notation software, digital audio workstations (DAWs) and other specialized tools as essential to their process as pencil and paper were to their predecessors. They make use of digital platforms to plan projects, collaborate, and document their careers. These actions generate digital documentation that serves as evidence of contemporary creative work. Despite their importance to the cultural record, the long-term preservation of this documentation remains at risk. Software and hardware obsolescence, the diversity and fragility of proprietary file formats, media degradation, and non-existent or inconsistent metadata all threaten their long-term viability. Without intervention, significant absences may emerge in the historical record.

This paper addresses these challenges by presenting findings from a survey of composers about their processes, workflows, and preservation practices. The survey results identify the most common workflows employed by composers, the types of records they generate, and how composers are saving and storing their work, highlighting potential areas of intervention. Based on these results and continued collaboration with stakeholder communities, the authors plan a widely accessible toolkit of resources, workflows, and best practices to bridge the gap between composers' personal documentation and the digital preservation capacities of archival and memory institutions. The toolkit also promises to be a site of connection between music creators who form cultural heritage and the curators and archivists entrusted with its maintenance and access.

Histories and futures of sketch study

The study of sketches and other materials generated in the process of composition emerged in the 19th century primarily surrounding the works of Beethoven. This marks the Romantic-era shift in the view of composer-as-craftsman to that of composer-as-artist, and, in the case of Beethoven, the near-worship as solitary genius (Sallis, 2015). The practice expanded, and the field of philology—reconstructing texts from their variants—grew in the 1970s to include genetic criticism, which focused instead on reconstructing the process of creation by analyzing drafts, sketches, and revisions (Hay, 2004). Though musicologists rarely embrace the term '*genetic criticism*,' their work in archival research and sketch studies surrounding a given creator or creation frequently makes use of this approach. Studies of topics including Mozart's fragments, Clara Schumann's notebooks, and Stravinsky's sketches offer tangible evidence of the creative process and shaping how later generations understand canonical figures. Archival study of works created in the 20th century with increasingly extended models of the types of materials included research into the archives of composers David Tudor, Mario Bertoncini, and Gayle Young (Bertolani et al., 2020; Hall & Sallis, 2004).

Recent scholarship in digital musicology highlights how creative documentation affects interpretation and facilitates dissemination through more accessible channels than traditional academic publishing. *Beethovens Werkstatt* [Beethoven's Workshop] resignifies the strong history of genetic criticism with Beethoven while using digital editorial tools to illustrate his compositional process to scholars and the

public in a highly adaptable format (Muxfeldt, 2016; Novara, 2019). The *Digital Image Archive of Medieval Music* (DIAMM) enables comparison of manuscripts of early polyphony. Extending these approaches, Neumann (2025) argues for a rethinking of digital philology in music: while traditional editions seek a definitive score and centre the composer, his proposed ‘*interpretations editions*’ integrate multiple textual sources, performer annotations, and audio-visual data (p. 11). Using Schubert’s *Winterreise* and Dietrich Fischer-Dieskau’s annotated copies and recordings and as case study, Neumann encodes variants in tempo, dynamics, timbre, and diction drawn from recordings, positioning performers’ creative labor as co-equal with composers. Such broad digital projects converge with and are born of a broadly conceived definition of creative documentation.

Preservation of creative documentation also enables the recognition of previously marginalized voices within the canon. The rediscovery of Florence Price’s manuscripts in 2009, for example, catalysed renewed scholarly and performative engagement with her oeuvre, substantially altering her cultural reception (Clark, 2024). Access to manuscript material has also enabled computer-assisted access to Price’s music. Tao-Tao He, Martin E. Malandro, and Douglas Shadle (2025) recently released a catalogue of 112 of Price’s art songs in MuseScore, MusicSML, MIDI, and PDF format, and using this dataset, created a model Florence Price Piano Accompaniment Generator. Such examples demonstrate how the preservation and re-presentation of creative traces, inclusive of manuscripts and digital remediation, continue to shape both scholarly inquiry and cultural memory.

Digital tools

For music creators, the problem appears particularly acute. Composers’ portfolios now include notation files, Digital Audio Workstation (DAW) projects, audio recordings, digital correspondence, and multimedia collaborations. Many are produced in proprietary formats that risk rapid obsolescence. A recent study of notation software highlighted the fragility of these files, which are often unreadable even a decade after their creation (Akau et al., 2023). Archival institutions are well-versed in digital preservation, but little guidance is provided to creators and music scholars—frequently the primary stewards of their files for decades. Digital files may only enter archival custody after becoming inaccessible or degraded beyond restoration. Alternatively, the sheer volume of digital files in proprietary formats may prove insurmountable to limited archival staff, preventing future access and scholarship (Rothenberg, 1998).

Much of the knowledge transfer around preservation occurs through so-called ‘*grey literature*,’ which circulates outside traditional scholarly venues (Patrickson-Stewart, 2025). For music creators, this includes memos from professional organizations, instructional blog posts or articles, online guides, or even listicles aimed at practitioners. While these serve as conduits for preservation practices to be translated, distilled, and made accessible to working composers, this piecemeal dissemination is nearly always detached from research frameworks and frequently addresses only a solitary issue rather than address the entire ecosystem.

Notation software

Notation software is now an omnipresent fixture of the compositional process. Phil Farrand and John Borowicz released Finale v1.0 in 1988 (T. Johnson, 2009). It was preceded by Leland Smith’s Score in 1980, and IBM’s Personal Composer and Apple Macintosh’s Professional Composer in 1984. Still, Finale established itself as the dominant commercial notation software through the 1990s as composers gravitated to its usability and engraving options (Pahwa, 2024). Finale was joined by competitors with serious followings: Sibelius (1993), MuseScore (2002) and Dorico (2016) (Bryam-Wigfield, 2021). Each

of these commercial softwares offer relatively intuitive user interfaces, and generate clean engravings favoured by publishers, as well as helpful MIDI-driven playback options.

The sheer volume of the files generated with these digital notation software and their environments presents a pressing challenge to contemporary music archiving. As early as 2000, information scholars identified the distinct risks of digital music, particularly the fragile formats and insufficient metadata (Lee, 2000). These issues are particularly pronounced in the context of notation, where access to proprietary software is often necessary for intelligibility. Without the programs that render them, notation files risk becoming inert data with limited research or performance value.

Recent scholarship has proposed frameworks for addressing this fragility. Boutard, Guastavino, and Turner (2013) advance a digital archives framework for technologically dependent artworks, stressing that preservation must encompass both files and their interpretability and sustainability over time. Johnston (2020) situates these concerns in the wider digital preservation landscape, pointing to systemic obstacles such as cost, infrastructure, and the need for specialized human expertise. In both cases, the emphasis falls on countering obsolescence and ensuring continued usability, priorities directly relevant to the fate of notation software and its outputs. Practical interventions have begun to emerge. The Software Preservation Network's FCoP project (2019), for example, has undertaken targeted efforts to preserve notation and composition software, documenting environments and workflows to ensure that digital scores remain interpretable as tools evolve.

Additional platforms

Suites of software and platforms used in the compositional process also exist entirely distinct from traditional notation. Digital audio workstations (DAWs) such as Pro Tools, Logic, and Ableton Live function as digital environments for recording, editing, and producing music. DAWs rely on proprietary file types, plug-ins, and frequently updated software versions. For preservation and access purposes, this can result in a project created in one version becoming inaccessible or incomplete when opened in a later release. Similarly, shifting availability of plug-ins can alter the audio quality and availability. Digital preservation of DAW-created materials must include analysis of dependencies; the ecosystem of creation may prove as important as the end result (Johnston, 2020).

Max/MSP presents a different set of challenges. Developed in the 1980s at Paris's *Institut de recherche et coordination acoustique/musique* [Institute for Research and Coordination in Acoustics/Music] (IRCAM), Max is a visual programming language for music and multimedia that allows users to design patches that generate or process sound in real time (Puckette, 1985, 1988). The works that result from this tool are frequently interactive and rely on live inputs, in turn dependent on specific hardware configurations. Preserving these works and the genetic process of their creation will require unique approaches to maintain their intelligibility by providing access to the patch code, performance contexts and conditions that animate the electronic realizations (Boutard, 2013; Puckette, 2024).

Graphical notation tools like INScore, MaxScore, or earlier experimental platforms further complicate preservation efforts. These systems allow composers to break from traditional staff notation, often integrating dynamic or interactive visual elements. Like traditional notation software, these works risk obsolescence if their rendering software is discontinued or stripped of interactive contexts (Bressan et al., 2009; Calatayud, 2022; Fober et al., 2013; Hope, 2020; Lepetit-Aimon et al., 2016).

Finally, computer music programs including Csound, SuperCollider, and Pure Data provide programming-based approaches to sound synthesis and algorithmic composition. Like many other proprietary software, the longevity of materials created in these environments is threatened by updates to compilers and audio engines. As with many of the previously considered digital tools,

archivists must consider preserving the code as well as alternate open source means of playback that do not rely on recreating the exact circumstances of a work's creation (Bosma, 2016; Ng et al., 2008).

Recordings

International organizations have established standards and best practices for preserving audio and audio-visual recordings. The International Association of Sound and Audio-visual Archives published *Guidelines on the Production and Preservation of Digital Audio Objects* (IASA, 2009) and subsequently standards for handling carriers (IASA, 2014). The Audio Engineering Society (AES) and European initiatives like PrestoCenter, which focuses on research and training, complement these standards (Digital Preservation Coalition, 2015). The International Federation of Library Associations and Institutions and UNESCO also communicate global guidelines (IFLA 2004; UNESCO, 2003). In the United States, the widely adopted guidelines (Brylanski et al., 2015) from the Association for Recorded Sound Collections (ARSC) and the Library of Congress's National Audio-Visual Conservation Center (NAVCC) have laid a strong foundation for recorded sound and moving image preservation.

While these standards and frameworks provide needed and widely accepted strategies for long-term preservation and access, they nearly always treat recordings primarily as finished documents. From the perspective of philology or genetic criticism, recordings may also serve as evidence of process rather than only product. Cook (2013) demonstrates how recordings capture the creative agency of performers, reframing performance as a site of authorship. Arbo (2025) argues that different types of recordings (studio, live, or documentary) fundamentally shape our understanding of a musical 'work.' Pedersen (2023) extends this by illustrating how digital infrastructures and metadata mediate the listening experience itself. Moreover, as composers increasingly work directly with audio, recordings become stand-ins for sketches; with standards well established, the challenge then becomes identifying appropriate slivers for preservation.

Portfolios

Digital environments complicate the creation, maintenance, and preservation of personal archives that have anchored significant cultural scholarship across the humanities. Archival scholars have traced how individuals have grappled with personal digital recordkeeping (Beagrie, 2008; Cox, 2009; McKemmish, 1996), and digital art historians have illustrated how fragile artistic workflows can endanger the cultural record (Rinehart & Ippolito, 2014). Research on writers' digital practices, for example, reveals disorganized, poorly labelled, and highly distributed digital files, written-over files, and unnecessary duplicates (Becker & Nogues, 2012).

A growing body of work extends these concerns to the preservation of personal portfolios, blogs, and websites—spaces where contemporary creators self-document their professional and artistic identities. Contemporary composers document their work and identities through a range of digital platforms, from Jennifer Jolley's candid, long-running blog (*Why Compose When You Can Blog?*) and Nico Muhly's widely read but now-archived personal blog, to Missy Mazzoli's deliberately curated professional website and Caroline Shaw's polished online portfolio. C. C. Marshall, et al. (2006) demonstrate how individuals' digital belongings often fall victim to neglect or obsolescence, underscoring the difficulty of sustaining personal archives over time. At the same time, Besser (2018) highlights the technical challenges of preserving websites containing streaming media, a format increasingly used by artists to disseminate their work.

One of the most prominent initiatives in this area is *Archiving the Websites of Contemporary Composers*, a project led by the Moving Image Archiving and Preservation (MIAP) program at New York University (NYU) in partnership with the Internet Archive and NYU Libraries (New York University,

2015–2018). This project systematically documented and archived composers' websites, tackling both technical and curatorial challenges of capturing public-facing digital traces. By approaching composers' personal sites as primary records of the creative practice, the MIAP project illuminated how self-published digital portfolios require proactive preservation strategies if they are to remain accessible for future scholarship.

Survey methods

With an understanding of the broad types of digital materials composers generate, the importance of these materials to musicologists' research, and preservation difficulties therein, the emerging questions were how and if composers preserve digital materials that could make their way to archives for study. To answer these questions, we borrowed processes from Samuels's (1986) documentation strategy while utilizing lessons learned from unsuccessful documentation strategy projects to plan for practical, sustainable outcomes. We designed, distributed, and analysed a mixed methods survey of contemporary, working composers with the goal of understanding the *'form of substance of available documentation'* of creators working in the field, alongside their current knowledge and implementation of preservation techniques (Samuels, 1986, p. 116).

Scope

The research scope was defined as specifically as possible to avoid too large a domain that impeded previous projects (J. Marshall, 1998). The survey's target audience was classical composers, the majority of whom, as indicated by the results of the survey, typically work with pen and paper or its digital equivalent. It did not include musicians outside the classical genre whose compositional process may not utilize notation. It also does not include popular music artists or commercial songwriters whose creative processes can be deeply entwined with the recording industry. Music production files are among the most endangered and this audience deserves research and recommendations that address their specific preservation needs (Digital Preservation Coalition, 2025).

Limitations

Though the survey found its way to those who make their living primarily through composition or a combination of composition and teaching, it may have missed early career composers not employed by large universities or major conservatories. A future survey could be distributed to faculty at smaller universities. The survey focused on music materials and did not address preservation of contextual items of works, such as correspondence, program notes, etc., since preservation guidance of textual materials exists in other parts of archival best practice.

Design

The survey was designed and administered in Google Forms, which allowed for collection of quantitative and qualitative data. Before distribution the survey received exemption from the University of Maryland Institutional Review Board since neither the survey questions nor the survey tool collected personally identifiable information. Participants gave consent for their anonymous answers to be used for research purposes through the final question in the survey. The survey consisted of eleven multiple-choice questions and eighteen free-response questions broken into three main sections: demographic information, creative practice and compositional tools, and preservation knowledge and confidence.

Distribution

The survey was distributed to the composition community through emails to faculty at universities belonging to the Big Ten athletic conference, major music conservatories, and listservs run by the

Music Library Association and American Musicological Society. All 18 Big Ten universities confer degrees in music performance, music education, musicology, music composition, and music theory. The conservatories are private institutions that offer similar degree programs with more concentrated study of music. These schools employ multiple composers at different stages in their careers with access to music technology through their institutions, thereby encouraging a variety of representation in the possible responses. Email invitations to participate in the survey reached a total of 115 faculty and 3431 listserv recipients. The survey was open for eight weeks. One email reminder was sent via the listservs before it closed.

Analysis

Google Sheets generated quantitative data visualizations. Data from free-response options that allowed participants to expand on close-ended questions were counted and totalled (for example: *Please elaborate on the format types you save*). Responses to open-ended questions were considered individually and analysed based on larger emerging themes.

Demographics

With 77 respondents, the response rate was 2%. 40(53%) identified as *established career*, 23(31%) as *early career*, 16(21%) as students and the remaining four identified outside these categories. In an intersecting question regarding employment, 25(33%) were employed in music within academia, and 23(30%) in the music industry. Five (7%) stated they were in a related industry, 7(9%) were employed in unrelated industry, and 17(22%) responded with *other*, stating they were a self-employed composer or retired. Because the survey was distributed primarily to composition faculty it was expected that the majority of respondents would compose in the classical genre, which the results confirmed. 69(90%) of the 77 respondents described the genre in which they compose as *classical* or specified more granular classifications, such as *chamber music*, *wind band* or *opera*. Additional responses included jazz 8(10%), soundtracks for media 8(10%), and musical theatre 5(6%).

Survey results

Creative process

The survey unsurprisingly revealed that nearly all composers made use of digital tools in their process; only one indicated that they used no digital tools. The other 76 respondents use music notation software, such as Sibelius, Finale, or MuseScore, corroborating earlier research (Akau et al., 2023), and underscoring the attendant risks of proprietary software.

59% (46) of respondents use DAWs in their compositional process. While not as widely used as notation software, DAWs and computer-aided software are subject to the same market and obsolescence risks. When comparing the use of notation software and DAWs, it is evident that the composers are using DAWs alongside or in conjunction with notation software rather than, perhaps, using the DAW to replace it.

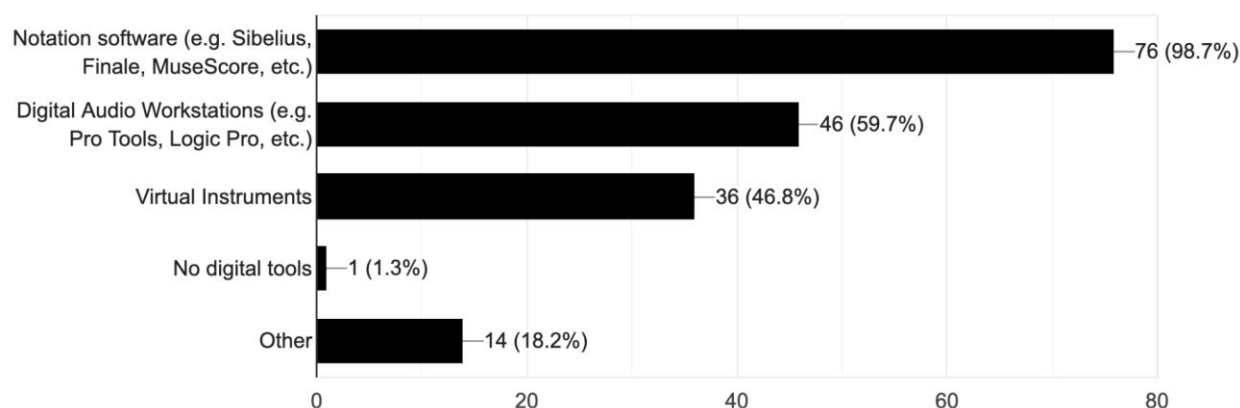


Figure 1. Digital tools used in compositional processes.

All five respondents who used computer-aided composition software referenced Cycling's 74 Max. In addition, four of these users also utilized Python, Supercollider, Web Data, PureData, and other unspecified programming languages. While preservation of programming languages and scripts is fairly straightforward, their use within complex proprietary environments may complicate preservation efforts.

There is a noticeable difference between the use of analogue and digital tools vis a vis sketches vs later versions. 96% of respondents utilize digital tools at least half the time while composing but only 6(8%) use them exclusively when starting a composition. In spite of the ubiquity of notation software use by the survey participants, 45(56%) use traditional pen and paper at least half the time when they begin sketching ideas, furthermore, half this group use only traditional pen and paper for sketches. These composers, therefore, work in a 'transitional-medium zone' in which a creator moves between analog and digital mediums depending on which best suits their process (Molloy, 2019, p. 328). This is a strong indication that recommended preservation actions must address physical and digital materials since both are still inherently tied to the compositional process.

Preservation process

The next section evaluated the types of materials the composers save and how they are stored. All respondents save digital scores, a predicted result if their music is receiving performances. Of the 33(43%) who specified the format of their digital score, 19 stated they use the native formats of the proprietary notation softwares Finale, Sibelius, or Dorico. 32(42%) save in PDF format. While PDF is widely used for documents, in the same question, only two respondents indicated they save PDFs in addition to digital scores. Therefore, it is likely that their PDFs are printable versions of their digital scores.

In the free-response option on formats, more participants shared the type of format they use for their audio and video recordings than their digital scores. Most save audio recordings [73 (95%)] and video recordings [56 (73%)] in common formats. Examples of formats provided by respondents included AIFF, MP3, WAV, MOV, and MP4. Twelve included the current host of their audio files, the websites YouTube, Soundcloud, Dropbox, and GoogleDrive, and hardware like a laptop, iPhone, or external hard drive. At least two-thirds of respondents are utilizing three storage methods to prevent data loss, consistent with the recommended practice of storing at least two copies on different media (Library of Congress, n.d.).

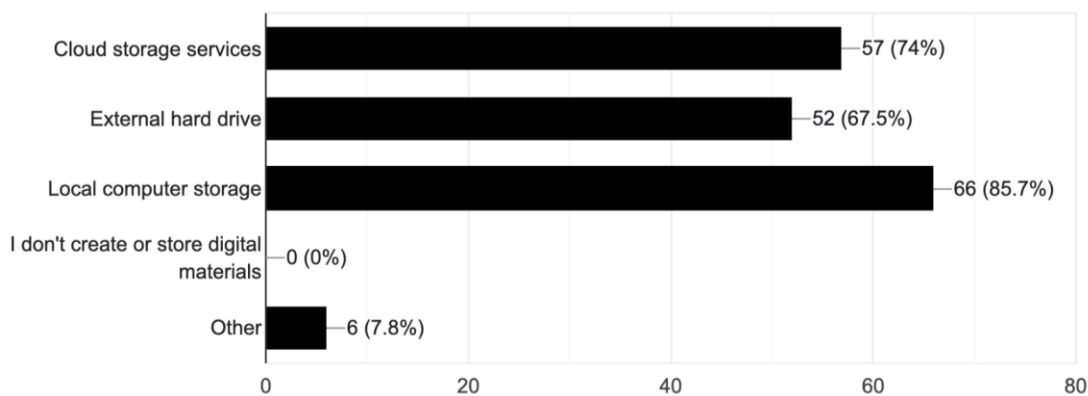


Figure 2. Storage media for digital materials.

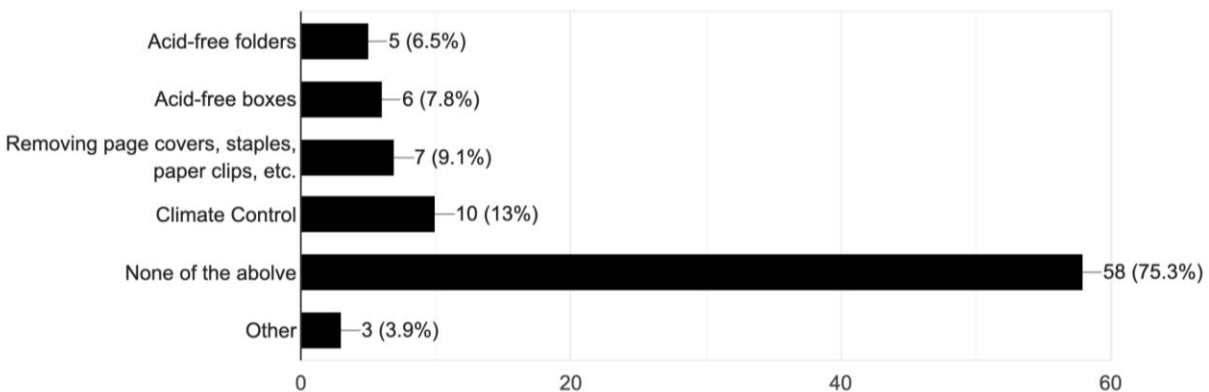


Figure 3. Storage methods for physical materials.

Storage of digital materials posed a strong contrast to storing physical materials; far fewer respondents utilize acid-free storage or climate control, though 53(69%) keep physical manuscripts. While the prohibitive cost, lack of awareness, and practicality of those preservation environments are probable factors contributing to their low usage, physical scores do not face the same obsolescence risks as digital materials and their preservation needs are rarely as pressing.

When asked if they purposely destroy or neglect any elements of their creative process, a mere 1% of respondents save their sketches or early versions. The overwhelming majority either discard drafts, delete files, or overwrite digital versions as they refine a piece. Respondents cited the pragmatic concerns of a lack of physical or digital storage space, while others believe that sketches lack artistic or scholarly value once a final or published version exists.

This troubling practice is a major contributing factor to loss of musical heritage (Istvantidy, 2020). Sketches and early versions are not incidental by-products but essential traces of creativity. They reveal the possibilities a composer considered, revisions that shaped a work, and illustrate the mediation between artistic concept and the realities of practice. In philological study, sketches function as variant manuscripts to provide evidence for reconstructing textual transmission, critical editions, and author intention (Hay, 2004). For genetic criticism, their absence closes off any inquiry, which depends on comparing stages of creation to understand the evolution of a work (Boutard, 2013;

Neumann, 2025). Without sketches, future scholars may only encounter the ‘final’ version of a composition and will be denied insights in its genesis. Since sketches are vital to understanding the creative process and thereby hold more research value than a published version, it is incumbent upon archivists to convince composers they are worth the space they require.

Preservation confidence

When asked to rate their digital preservation knowledge on a scale from 1-5, 57(74%) rated themselves average or above. They know steps they can take to mitigate immediate data loss but are unsure of best practices when it comes to long-term accessibility of digital materials. In evaluating responses for what would help preserve their work, the phrase ‘I should’ appeared- ‘I should organize my scores,’ ‘I should write out my scores on paper,’ ‘I should have better file naming conventions,’ that illustrates a divide between what composers think they could do to better preserve their work and which actions they feel they can realistically undertake.

Preservation concerns

Preservation concerns fell into four broad categories: cost, storage, organization, and time/effort. Those concerned about cost related it to storing digital materials in the cloud, saying recurring monthly fees prevent them from increasing the storage capacity though they hoped to utilize it to safeguard additional copies of files. Here is an opportunity for archivists to address fixity and curation so that composers do not pay for more storage than they need. A common concern related to storage was lack of physical space, which respondents foresaw compounding throughout their careers. One saw digitization as a solution to their physical storage problem. Another is grappling with the cognitive dissonance of desiring less clutter in their living space while acknowledging they must continue to store materials in case they are needed later.

Lack of organization was one of the most frequently cited concerns that must be remedied by the composers themselves. By gaining intellectual control over their materials, composers will have taken the first step in preservation best practice (Digital Preservation Coalition & Redwine, 2015). The survey results also reveal that this community is an eager audience for advice that archivists can provide regarding file naming and directory structure. Fortunately, such resources already exist (National Archives and Records Administration, 2017; Stanford University Libraries, 2023).

Respondents’ lack of time and effort was the main barrier to mitigating their concerns about the longevity of their materials. The activities they would like to attempt, such as re-saving files in open formats, developing file directory structures, and de-duplicating materials, require an enormous (but necessary) initial time investment before a preservation workflow could be established. Four respondents wished they could hire assistants to undertake preservation efforts on their behalf, evidence that they understand the importance of preservation actions that suffer from lack of attention and deprioritization to projects with deadlines and financial incentives.

Their concerns represent an overarching fear of losing access to their work. One respondent worried they would be unable to open an old file in a newer version of the software to make revisions and would have to re-engrave an entire score. Some are already experiencing data loss; said a respondent, ‘I’ve lost files of older versions of songs before when I hadn’t backed them up.’ When asked what information would better help them preserve their work, another said, ‘I would love a set of guidelines to follow that feels less haphazard and slapdash than my current method of put things in as many places as possible,’ a tacit acknowledgement that file redundancy can lessen the risk of data loss but is being performed without a perspicuous purpose, or ‘benign neglect’ (C. C. Marshall, 2007, pp. 59–60). Their anxieties over backward compatibility of formats, and hardware and software obsolescence are

challenges familiar to archivists working in digital preservation, yet survey respondents were unaware that these professionals exist. Only 11(14%) follow best practices. How, then, can archivists effectively address composers' preservation concerns?

Digital preservation in the 'contact zone'

Costis Dallas's (2016) research invites us to rethink how digital curation happens in practice. Dallas reimagines Pratt (1992) and Clifford's (1997) term 'contact zone' as a negotiated relational space where archivists, creators, and other stakeholder communities can engage in the messy work of preserving and sustaining access to digital heritage without placing an undue burden on archivists and their institutions (Boles, 1987; Malkus, 2008). For Dallas (2016), the key is to step away from the idea that curation belongs only to professional archivists or formal institutions. Instead, it is something that emerges 'in the wild,' wherever people are already curating, remixing, saving, or circulating cultural materials (p. 9).

The invocation of the 'contact zone' offers a productive lens through which to reconsider the preservation of contemporary composers' digital workflows. We can imagine a realistic scenario: a composer drafts a score in Sibelius, exports a MIDI file to Logic for orchestration, shares a .pdf with performers through Dropbox, and tracks revisions through emails with several individuals. Each of these steps generates fragile digital traces: multiple file formats, proprietary software versions, cloud dependencies, and easily lost or flattened metadata. Rather than reifying preservation as a custodial imperative lodged solely within archival institutions and their collection policies, we might reconceive it as a zone of encounter between three sets of actors: the composers who create and organize the files; archivists, who bring expertise in metadata, storage, and access; and music scholars, who interpret and contextualize the traces of creativity. The 'contact zone' represents a collaborative space where preservation happens iteratively and relationally.

Our imagining of the 'contact zone' is based in archival outreach involving collaboration between stakeholder groups, a positive outcome from documentation strategy projects that otherwise did not fulfil their goals (Ericson, 1997; E. S. Johnson, 2008). Samuels's (1986) final documentation strategy activity, selection, and placement of materials is not an outcome of this research. The survey made clear that archivists should not couch preservation advice within the context of acquisition. Only two of the 77 respondents had formal agreements with an institutional archive. Many doubted they would reach a level of notoriety to warrant such an outcome, yet their preservation needs are no less important. To be effective, outreach efforts must transcend the boundaries of institutions into Dallas's 'contact zone,' in which all stakeholders work cooperatively to preserve collective cultural heritage (2016).

Future work

Istvantidy (2020) wrote, 'losses inherent from simply not capturing heritage could be minimised through more vigorous community engagement as well as physical and online presence, at minimal cost' (p. 340). With this in mind, our project will generate two tangible forms of archival outreach. First, we will develop a publicly accessible and regularly updated online toolkit (website) that provides composers with extensible preservation workflows based in archival best practices to convert their scores, sketches, and personal papers into sustainable formats, along with resources for file directory structure and naming. The website will function as the primary 'contact zone' for stakeholders and main resource for outreach. Designed in collaboration and community with a board (Berland et al., 2023; Malkmus, 2008) of composers, archivists, and scholars, the toolkit will be structured for long-term sustainability that can adapt as practices surrounding digital formats and preservation evolve.

Rather than relying on overstretched institutions, the toolkit will empower composers to undertake preservation actions before they lose access to their work.

We will also co-edit and serve as contributing authors of a collected volume on preserving musical creation in the digital age that incorporates stakeholder considerations, symposium discussions, and preservation case studies. The handbook will invite contributions from composers, archivists, and industry professionals who create and maintain digital composition tools, bringing them into permanent dialogue with one another. It will situate composers' practices within the frameworks of archival studies and musicology, offering both a record of current practices and a forward-looking guide for institutions and scholars who aim to safeguard artistic processes in the digital age.

Conclusions

The preservation of notation software, while not without its difficulties, is comparatively straightforward: composers can export their materials into open file types, while archivists focus on sustaining file readability and preservation best practices. By contrast, tools such as DAWs, Max/MSP, and computer music environments pose far more complex challenges. Their outputs are bound to interactive processes, evolving ecosystems of plug-ins, or custom programming languages, making them resistant to traditional archival approaches that prioritize stable artifacts. As Boutard and Guastavino (2013) observe, *'archiving musical works with technological components raises several preservation issues since the goal is not to archive the recording of the performance but the means to re-perform the work'* (p. 750).

Addressing these challenges requires new models of collaboration. Composers, archivists, and the wider musical and cultural heritage communities cannot work in silence, and instead must embrace the contact zone to allow for early interventions that anticipate and rise to meet interpretive and technical challenges of preserving the work of contemporary musical practice. Composers can inform of their workflows and the types of digital technologies they employ. Music scholars can situate these practices within broader artistic and analytical traditions, helping to identify the parts of the archival sliver most important for preservation. Finally, archivists can advise on collaborative workflows that allow for preservation that will not overwhelm memory institutions if or when they become the stewards of these materials. The outcome of this type of interdisciplinary collaboration is not yet known, and the ways in which the creative process of music composition can be captured in sustainable and accessible ways remains an open question. Yet this survey makes clear that preserving music created in the digital age depends on building infrastructures that value process as much as product, ensuring that today's experimental and technologically mediated practices do not disappear.

This work is more urgent than ever. Our survey was distributed on August 26th, 2024, the very same day that MakeMusic announced it would end development on Finale, no new versions would be released, and that support would cease (Dell'Era, 2024). Following much outcry, it was clarified that existing installations would still function, and authorization would remain for the foreseeable future. The demise of the three-decade old titan of the industry was, for many composers—not just Finale users— a signal that their work rests on a precarious foundation. While certainly a tense time for composers, this inflection point has galvanized composers' interest in learning to better preserve their own materials.

Our survey is the first to bridge the divide between composers' creative process and understanding and implementation of preservation. The results illustrate the wide usage of digital tools and generation of proprietary file types most vulnerable to preservation pitfalls. It also points to a concerning lack of basic preservation knowledge. Bringing composers into stewardship of their own

materials requires confronting the interwoven qualities of personal archives and recognizing the growing reliance of institutional archives on personal preservation and archiving activities. Our project outcomes will help composers capture and maintain their creative legacies with the goal of safeguarding music cultural heritage through future generations.

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About the authors

Jessica Grimmer is a lecturer and co-director of the Center for Archival Futures at the University of Maryland. Her research examines the intersection of archives and digital musicology, with particular attention paid to sustaining digital knowledge infrastructures, music encoding, and pedagogy. She received her PhD in historical musicology from the University of Michigan and her master's degree in Library and Information Science degree from the University of Maryland. She can be contacted at jgrimmer@umd.edu.

Stephanie Akau is a Senior Archivist at the Library of Congress Music Division. She holds a Master of Library and information science degree from San José State University and a Doctor of Musical Arts in clarinet performance from the University of Cincinnati College-Conservatory of Music. She can be contacted at stephanie.akau@gmail.com.

References

- Akau, S., McKinney, J., & McNellis, R. (2023). Preferred preservation formats for digital music scores: A Survey of University Music Faculty. *Notes*, 79(4), 495-523.
<https://doi.org/10.1353/not.2023.a897455>
- Arbo, A. (2025). Types of recording, types of performance and the ontological identity of musical works. *Philosophies*, 10(1), 24. <https://doi.org/10.3390/philosophies10010024>
- Beagrie, N. (2009). Digital curation for science, digital libraries, and individuals. *International Journal of Digital Curation*, 1(1), 3-16. <https://doi.org/10.2218/ijdc.v1i1.2>
- Becker, D., & Nogues, C. (2012). Saving Over, Over-Saving, and the Future Mess of Writers' Digital Archives: A Survey Report on the Personal Digital Archiving Practices of Emerging Writers. *The American Archivist*, 75(2), 482-513. <http://dx.doi.org/10.17723/aarc.75.2.t024180533382067>
- Bergland, K., Caboverde, E., Carli, A., Gibson, C., & Sussmeier, S. (2023). Preservation. *Notes*, 80(1), 22-28. <https://doi.org/10.1353/not.2023.a905311>
- Bertolani, V., Nakai, Y., and Santacesaria, L. (2020). What does musicology have to do with archiving? Three case studies. *Intersections/Intersecciones*, 40(1), 55-75.
<https://doi.org/10.7202/1096482ar>.
- Besser, H. (2018). Archiving websites containing streaming media. International Internet Preservation Consortium Web Archiving Conference, Wellington, New Zealand, November 12-15, 2018.
<https://doi.org/10.2352/issn.2168-3204.2017.1.0.11>

- Boles, F. (1987). Mix Two Parts Interest to One Part Information and Appraise Until Done: Understanding Contemporary Record Selection Process. *The American Archivist* 50(3), 356-368. <https://doi.org/10.17723/aarc.50.3.63847173723211xp>
- Bosma, H. (2016). "Computer music as born-digital heritage." In *Proceedings of the International Computer Music Conference (ICMC)*, Utrecht, the Netherlands, September 12-16, 2016. <https://quod.lib.umich.edu/cgi/p/pod/dod-idx/computer-music-as-born-digital-heritage.pdf?c=icmc%3Bidno%3Dbbp2372.2016.053%3Bformat%3Dpdf> (Internet Archive)
- Boutard, G. (2013). *Preserving the intelligibility of digital archives of contemporary music with live electronics*. Doctoral dissertation, Concordia University. <https://escholarship.mcgill.ca/concern/theses/9593tz661> (Internet Archive)
- Boutard, G., Guastavino, C., & Turner, J. (2013). A digital archives framework for the preservation of artistic works with technological components. *International Journal of Digital Curation*, 8(1), 42-65. <https://doi.org/10.2218/ijdc.v8i1.237>
- Bressan, F., Canazza, S., Orio, N., & Rodà, A. (2009). Preserving today for tomorrow: A case study of an archive of interactive music installations." In *Proceedings of Workshop on Exploring Musical Information Spaces (WEMIS)*, Corfu, Greece, October 1-2, 2009. https://csc.dei.unipd.it/depirro/media/depirro/DePirro_InfoMus/opere/Caos-delle-sfere-flipper/depirro.20091002.pdf (Internet Archive)
- Brylanski, S., Lerman, M., Pike, R., & Smith, K. (Eds.). (2015). *ARSC guide to audio preservation*. Association for Recorded Sound Collections. <https://www.clir.org/wp-content/uploads/sites/6/pub164.pdf> (Internet Archive)
- Calatayud, P. F. (2022). *Pure Data and INScore: Animated notation for new music*. arXiv. <https://arxiv.org/pdf/2208.04877> (Internet Archive)
- Clark, M. (2024). Polishing hidden gems: An interview with John Michael Cooper on the state of Florence Price scholarship. *The American Music Teacher*, 74(1), 26-31. <https://research.ebsco.com/c/cncs21/viewer/pdf/uej2bto6tz>
- Clifford, James. (1997). *Routes: Travel and translation in the late 20th century*. Harvard University Press.
- Cox, R. J. (2009). Digital curation and the citizen archivist. In *Proceedings from DigCCurr 2009*, Chapel Hill, North Carolina, United States. Digital curation: Practices and promises, 102-109. <http://d-scholarship.pitt.edu/2692/> (Internet Archive)
- Dallas, C. (2016). Digital curation beyond the "wild frontier": A pragmatic approach, *Archival science*, 16(4) 421-457. <http://dx.doi.org/10.1007/s10502-015-9252-6>
- Dell'Era, G. (2024). "The End of Finale." Accessed August 31, 2025. <https://www.finalemusic.com/blog/end-of-finale-new-journey-dorico-letter-from-president/> (Internet Archive)
- Digital Image Archive of Medieval Music (DIAMM). (n.d). University of Oxford. <https://www.diamm.ac.uk/> (Internet Archive)

- Digital Preservation Coalition. (2025). The global bit list of endangered materials.
<http://doi.org/10.7207/dpcbitlist-25>
- Digital Preservation Coalition & Redwine, G. (2015). Personal digital archiving. DPC Technology Watch Report. <http://dx.doi.org/10.7207/twr15-01>
- Fober, D., Letz, S., Orlarey, Y., & Bevilacqua, F. (2013). Programming interactive music scores with INScore. In Proceedings of Sound and Music Conference, Stockholm, Sweden, July 2013.
<https://hal.science/hal-00851956>. (Internet Archive)
- Hay, Louis. (2004). Genetic criticism: Origins and perspectives. In J. Deppman, D. Ferrer, & M. Groden (Eds.), *Genetic criticism: Texts and avant-textes*, 17–27. University of Pennsylvania Press.
- He, T.-T., Malandro, M. E., & Shadle, D. (2025). The Florence Price art song dataset and piano accompaniment generator. In Proceedings of the International Society for Music Information Retrieval Conference, Daejeon, Republic of Korea, September 21–25, 2025.
<https://doi.org/10.48550/arxiv.2506.23130>
- Hope, C. (2020). “The future is graphic: Animated notation for contemporary practice.” *Organised Sound*, 25(3), 382–391. <http://dx.doi.org/10.1017/s1355771820000096>
- Istvantidy, L. (2020). How does music heritage get lost? Examining cultural heritage loss in community and authorised music archives. *International Journal of Heritage Studies*, 27(4), 331–343. <https://doi.org/10.1080/13527258.2020.1795904>
- Johnson, E. S. (2008). Our archives, our selves: Documentation strategy and the re-appraisal of professional identity. *The American Archivist* 71(1), 196–202.
<https://doi.org/10.17723/aarc.71.1.81386n13w71j15v3>
- Johnson, T. (2009, September 9). One snapshot from Tom’s Finale history slideshow. *MakeMusic: The Finale Blog*. <https://www.finalemusic.com/blog/one-snapshot-from-toms-finale-history-sideshow/> (Internet Archive)
- Johnston, L. (2020). Challenges in preservation and archiving digital materials. *Information Services & Use*, 40(3–4), 229–245. <https://doi.org/10.3233/ISU-200090>.
- Jolley, Jennifer. (n.d.). Why compose when you can blog? Accessed September 1, 2025.
<https://www.whycompose.com> (Internet Archive)
- Lee, B. (2000). Issues surrounding the preservation of digital music. *Archivaria*, 50, 194–207.
<https://archivaria.ca/index.php/archivaria/article/download/12783/13977/0> (Internet Archive)
- Lepetit-Aimon, G., Fober, D., Orlarey, Y., & Letz, S. (2016). “INScore expressions to compose symbolic scores.” In Proceedings of the First International Conference on Technologies for Music Notation and Representation (TENOR), Cambridge, United Kingdom, May 27–29, 2016.
https://www.tenor-conference.org/proceedings/2016/19_Lepetit-Aimon_tenor2016.pdf (Internet Archive)

- Library of Congress. (2020). Music notation: Preferred preservation formats for digital scores. <https://guides.loc.gov/music-notation-preferred-preservation-formats-for-digital-scores> (Internet Archive)
- Library of Congress. (n.d.). Personal archiving: Preserving your digital memories. Accessed September 10, 2025. https://www.digitalpreservation.gov/personalarchiving/documents/PA_All_brochure.pdf (Internet Archive)
- Malkmus, D. J. (2008). Documentation strategy: Mastodon or retro-success? *The American Archivist* 71(2), 384-409. <https://doi.org/10.17723/aarc.71.2.v63t471576057107>
- Marshall, C. C. (2007). How people manage personal information over a lifetime. In W. Jones & J. Teevan, (Eds.) *Personal information management: Challenges and opportunities*. University of Washington Press.
- Marshall, C. C., Bly, S. & Brun-Cottan, F. (2006). The long-term fate of our digital belongings: Toward a service model for personal archives. In *Proceedings of the IS&T Archiving Conference*, Ottawa, Canada, June 18-23, 2006. <https://doi.org/10.48550/arXiv.0704.3653>
- Marshall, J. A. (1998). Documentation strategies in the twenty-first century? Rethinking institutional priorities and professional limitations. *Archival Issues* 23(1), 59-74. <https://doi.org/10.31274/archivalissues.10866>
- Mazzoli, Missy. (n.d.). Missy Mazzoli, Composer. Accessed September 1, 2025. <https://missymazzoli.com> (Internet Archive)
- McKemmish, S. (1996). Evidence of me... [Personal recordkeeping]. *Archives and Manuscripts*, 24(1), 28-45. <https://doi.org/10.1080/00049670.1996.10755757>
- Molloy, K. (2019). Literary archives in the digital age: issues and encounters with Australian writers. *Archives and Manuscripts*, 47(3), 327-342. <https://doi.org/10.1080/01476895.2019.1631863>
- Muhly, N. (n.d.). Nico Muhly Blog. Accessed September 1, 2025. <https://web.archive.org/web/20150901000000/http://nicomuhly.com/news>
- Muxfeldt, K. (2016). Review: Beethovens Werkstatt. *Journal of the American Musicological Society*, 69(3), 855-868. <https://doi.org/10.1525/jams.2016.69.3.855>
- National Archives and Records Administration. (2017). Best practices for file naming. <https://records-express.blogs.archives.gov/2017/08/22/best-practices-for-file-naming/> (Internet Archive)
- Neumann, J. (2025). "(Digital) philology for/of multiple creative processes: Considering notation, recordings, and digital editions." In *Proceedings of the 12th International Conference on Digital Libraries for Musicology (DLfM 2025)*, Seoul, Republic of Korea, September 26, 2025, 10-18. New York: ACM. <https://doi.org/10.1145/3748336.3748338>
- New York University, Internet Archive, & New York University Libraries. (2015-2018). Archiving the websites of contemporary composers. <https://tisch.nyu.edu/cinema-studies/miap/research-outreach/research/archiving-composers.html> (Internet Archive)

- Novara, E. (2019). Eine Schumann-Werkstatt? Zur Übertragbarkeit der Methoden vom Projekt »Beethovens Werkstatt« auf andere Komponisten. <https://doi.org/10.25366/2020.66>
- Pahwa, N. (2004, September 26). Your favourite musician's app is about to disappear. *Slate Magazine*. <https://slate.com/technology/2024/09/finale-music-notation-software-shutting-down-how-the-program-became-so-widely-used.html> (Internet Archive)
- Patrickson-Stewart, S. G. (2025). Grey literature. In *The Encyclopedia of Libraries, Librarianship, and Information Science* Volume 1, 438-445. <https://doi.org/10.1016/B978-0-323-95689-5.00110-3>
- Pedersen, A. H. (2023). Listening from within a digital music archive: Metadata and digital music use. Doctoral dissertation, Lund University. https://lucris.lub.lu.se/ws/portalfiles/portal/145395347/Andreas_Helles_Pedersen_HELA2.pdf (Internet Archive)
- Puckette, M. (1988). The Patcher. In *Proceedings of the International Computer Music Conference (ICMC)*, Cologne, Germany, September 20-25, 1988. <http://hdl.handle.net/2027/spo.bbp2372.1988.046> (Internet Archive)
- Puckette, M. (2024). A framework for preserving real-time electronic music realizations. In *Proceedings of the International Computer Music Conference (ICMC)*, Seoul, Republic of Korea, July 7-13, 2024. <https://msp.ucsd.edu/Publications/icmc24-reprint.pdf> (Internet Archive)
- Puckette, M. & Vercoe, B. (1985). Synthetic rehearsal: Training the synthetic performer. In *Proceedings of the International Computer Music Conference (ICMC)*, Burnaby, British Columbia, Canada, August 19-22, 1985. <https://quod.lib.umich.edu/cache//b/b/p/bbp2372.1985.043/bbp2372.1985.043.pdf> (Internet Archive).
- Rinehart, R & Ippolito, J. (2014). *Re-collection: Art, new media, and social memory*. MIT Press.
- Rothenberg, J. (1998). Ensuring the longevity of digital information. *International Journal of Legal Information*, 26(1-3), 1-22. <https://doi.org/10.1017/S0731126500000469>
- Sallis, F. (2015). *Sketch studies past and present*. In *Music Sketches*. Cambridge University Press.
- Samuels, H. W. (1986). Who controls the past? *The American Archivist* 49(2), 109-124. <https://doi.org/10.17723/aarc.49.2.a46657j81vug0073>
- Software Preservation Network. (2019). Preserving musical notation and composition software (FCoP project). <https://www.softwarepreservationnetwork.org/preserving-musical-notation-and-composition-software/> (Internet Archive)
- Stanford University Libraries (2023). Data best practices and case studies research guide. <https://guides.library.stanford.edu/data-best-practices> (Internet Archive)

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