Systematising (at) the Present for the Future: Reflections on Archiving Electroacoustic Music

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INTRODUCTION

The process of archiving electroacoustic music brings together the ideas, interests and aims of many different groups – researchers in archival studies, music researchers with, among others, historical, socio-cultural and editorial perspectives, as well as composers and performers – looking at a very diverse set of sources ranging from tape to computer-based generative algorithms. Defined by Simon Emmerson and Denis Smalley as '[m]usic in which electronic technology, now primarily computer-based, is used to access, generate, explore and configure sound materials, and in which loudspeakers are the prime medium of transmission',[1] electroacoustic music mostly derives from a practice of non-paper-based notation or transmission. Technologies are – as means of artistic expression – at the heart of this music, inheriting compositional ideas, techniques and working processes, as well as information on instrumentation, sound and performance practice, which incorporates knowledge that often has yet to be identified for every piece individually. The challenges raised by electroacoustic music, however, do not fit

together with the conventions of an archival practice whose historical focus, as computer music designer Serge Lemouton points out, has been on collecting, documenting and preserving music and its artifacts primarily based on texts or written materials. As a result, Lemouton argues, libraries are especially trained to handle music as paper-based documents, but are rarely prepared for formats that exist in a non-written form.[2] Handling the electroacoustic as well as the, nowadays often, digital content thus requests new approaches to archiving, which also includes the question of how to adequately maintain a piece in a certain (original, reconstructed or actual) state taking into account the close interconnectedness between the technologies, the genesis and the appearance of a musical work, as well as the various positions and production steps these technologies can be employed in.

Archiving electroacoustic music therefore means dealing with new challenges that arise from the specificities of the sources. While all archiving approaches include the processes of categorising, selecting, and maintaining materials, as well as the question of how to provide access to the archived sources, technology-based artistic formats always require an extra consideration of the state of technology embedded, as the criteria for these processes face new questions, goals, and mechanisms. For example, the answers to the question of how to provide sustainable access to archived compositions may differ from those on how to provide sources that enable a future (performable) existence of this very same composition. Hence, decisions on the strategy to archive technology significantly influence the archived sources and *vice versa* – and they can also alter the appearance of the archived composition. At the same time, these processes are not (yet) embedded in a wider tradition on archiving (digital) music technologies. This article outlines two possible perspectives on archiving electroacoustic music, focussing especially on challenges and approaches connected to the technologies embedded in electroacoustic music compositions from the 1980s and 1990s.

CATEGORISING ELECTROACOUSTIC MUSIC

Categorising sources related to electroacoustic music brings various systematic challenges, many of them directly or indirectly related to aspects based on technology. Among other manifestations, this is mirrored very prominently in terminological inconsistencies within the descriptions and documentations compositions of electroacoustic music and their performances. For instance, general terms such as 'tape', 'computer' or 'live electronics' are not always used to name technical objects, they can also serve as some kind of superordinate term

for a composition, whilst the technical outline is not described by this word.[3] The description 'ordinateur' ('computer'), for example, encompasses compositions with different technical outlines, each including digital calculation processes at some point in the compositional process. It can appear, for example, in the description of compositions to indicate the use of computer technology for sound processing during the genesis of a fixed-media composition;[4] to describe the use of a specifically composed computer program whose output is recorded into one representative fixed-media piece;[5] to describe the use of real-time sound processing programmed in Max;[6] but also to signify the use of IRCAM's 4C sound processor.[7] However, the usage of these superordinate terms for categorisation has to be discussed, taking into account that the implemented technology has to be continuously updated or adapted due to the fast and ongoing technological advancements. How does the categorisation of the premiere relate to the growing number of (technical) versions and variations that exist for any singular composition? Should, for example, a non-custom-made digital synthesis module embedded in a complex digital workstation be categorised as 'synthesizer' or 'live electronics/sound processing', seeing that it has been later substituted by a Max patch?

From an archival point of view, questions of classification appear throughout the entire documentation process. While presenting her reflections on the documentation process from the context of exhibition in 1951, librarian Suzan Briet emphasized the role and the information assigned to (archived) documents. To her, documents provided the basis to either retrace a specific phenomenon at a later point in time, or to make it able to be experienced again. For her, the process of documenting hereby starts with describing the phenomenon to be archived along four general categories: object, activities, forms and organisations. This is used to create an 'instruction' that can be transformed in four degrees of abstraction (instruction, exploration, diffusion, organisation).[8] An electroacoustic music piece, for example, can be described in Briet's system as 'b. Object or artistic creation' (object), appearing as 'performances, live or recorded' (activities) as well as in programs and on disks (forms), taking place at concerts and theatres (organisations).[9] Challenges caused by technology come into play when looking at the 2nd degree of abstraction, '[s]ources of documents,' which is described as exploring the phenomenon along bibliographic activities resulting e.g. in a list of sources, and also in the 3rd degree of abstraction, '[c]ollectively used or individually adapted documents,' including analysis, selection, transformation and reproduction of the content. Both steps, which Briet considers to be done by the archiving institution,[10] are inevitably interlinked with the need for a precise description of the technology embedded in the composition, as well as a fundamental understanding of the technical features employed – knowledge that in electroacoustic music

is shared among a rather specialized group of people also as practical and tacit knowledge.[11] In turn, the 4th degree of abstraction, 'Documentology', which for Briet includes the task of developing a general standardisation,[12] is directly linked to the description of the sources and phenomena, indirectly pointing back at the challenge posed by terminological inconsistencies.[13] Hence, Briet's approach is grounded upon a documentation process that starts with the description of what is being considered for archival along a previously developed categorisation.

This is opposed by the challenge of developing categorisations for sources that already exist, which in the field of electroacoustic music means to work with a diverse set of source materials resulting from various documentation approaches, ranging from compositions on magnetic tapes to computer programs, but which also includes signal floor plans, analyses, program notes, concert reviews, (audio/ visual) recordings of performances and occasionally also scores – many of them coming along with differing (historically or context based grown) ideas of categories, assignments, traditions and assumptions. Looking at the embedded technologies and their documentation, the sources often tell incomplete stories, opening up space for speculation and challenging their categorisation. This is amplified by the fact that most compositions incorporate more than one significant use of technology. For example, how to classify a composition that includes a real-time sound synthesis set-up which is employed like a synthesizer that also requests the spatialisation of sound during a performance?[14]

At the same time, technologies are assumed to be both significant for an individual composition and always in need of care and updates due to their practical life span. As a consequence, archiving electroacoustic music must be done with constant overlap of two seemingly opposing approaches, working on existing sources on the one hand, and creating new documentation on the other – a process that is driven by an ongoing iterative circuit of multiple (technological) adaptions.

THE AIMS AND APPROACHES OF ARCHIVING

One of the major aims for archiving electroacoustic music is a sustainable preservation of the related documents, including technological devices, software, and newly created forms of documentation. However, when reviewing the source material, it becomes clear that before asking about preservation techniques or the possibility of maintaining technologies, there are other questions that must be considered: what precisely should be preserved – the expression of the composer, the sources themselves, the impression of the composition at a defined state, or

information necessary to enable a new performance of a work? Which source materials can be considered to meet this need? And, as Guillaume Boutard and Catherine Guastavino point out to be one of the central questions, on the basis of which documentation should preservation be addressed?[15] All of these questions share the need to think about the relationship between documents and documented phenomenon, as well as the distinguishable possible aims of archiving – and how these two aspects relate to each other.

For Briet it is clear that documents should be seen as symbolic signs whose purpose is to allow a certain experience to be understood in retrospect. However, retracing what a former experience means and what is necessary to make this possible is not uncontroversial.

In musicology, for example, most information derives from examining former performances' documentation such as audio and video recordings, descriptions of the performance, audience reports and interviews with musicians and composers; and usually it is also possible to conduct further research concerning the genesis of a work, the production environment, the piece's position within a composer's oeuvre, and presumably also specific compositional and musical aspects of the piece and the specific performance of interest. This allows one to examine, retrace and somehow understand what happened at a defined moment in time, providing insight concerning the experience of the performance.[16]

Guillaume Boutard and Catherine Guastavino, in contrast, aim to develop a framework to formalise and archive knowledge that is embedded in the creative process.[17] They state that 'the preservation of musical works involving electroacoustic technologies requires preserving the means to re-perform the work'.[18] Therefore, they propose to collocate, describe and analyse all potential agents[19] that may be involved in the creation and performance process of a piece, as well as these individual roles of these agents and the scope of their actions.[20] A composition appears to be defined as an interplay of entities with shared knowledge dedicated to a common artistic project, each holding a partial knowledge of this composition. The composition is thus the result of a sum of (distributed) parts of knowledge, wherein technology and its related elements can be one of these entities holding – more precisely, having embedded within the inherent information – a certain (individual) knowledge on a composition, which depends on the role it is assigned to by the composer.

Both approaches follow the overarching goals of archiving and are mutually interlinked, however, their inherent perspectives differ almost diametrically: while the source-driven approach looks at an existing state of source material and develops techniques to keep these sources accessible, the information-driven approach focusses on developing a new description that provides background knowledge that

will allow a phenomenon to be recreated. While focusing on preserving existing sources assumes that these sources already contain the significant characteristics of a composition, the approach which aims to trace and formalise underlying (and also tacit) knowledge suggests that this hidden information is also a key part of a composition. Thus, both approaches incorporate slightly differing assumptions on how a composition can be represented by a specific source material – and hence can be adequately preserved. A recording, for instance, is for Nicholas Cook a representation of a performance,[21] and in Boutard and Guastavino's approach a recording does not suffice for archiving an electroacoustic piece of music. Consequently, each approach to archiving results in different documentation and selection processes, hereby mirroring the implicitly assumed relationship between documents and archived phenomena. This does not mean that these approaches are mutually exclusive. Indeed, both approaches overlap constantly and, taken together, can provide the best possible understanding of a composition. But to avoid misunderstandings and misinterpretations, as well as benefit from these standpoints in order to develop sustainable and practical archiving approaches for electroacoustic music, it is necessary and useful to clearly distinguish their respective structures, aims and assumptions.

CONCLUSION

Thinking about the approach to archiving electroacoustic music brings to mind many well-known questions – archival as well as music research related ones – which should be discussed now against the background of the challenges deriving from genuinely technology-based artworks.[22] Even though archival efforts are guided by a wide variety of interests, capacities and needs, as well as fostered (to a varying degree) by existing archiving strategies, which are, as of yet, only rarely outlined more precisely within the aims of archiving institutions, the question of how to archive electroacoustic music nevertheless tackles very basic structural questions debated within the field. For example, many of the sources related to electroacoustic music compositions are held at various institutions which are not necessarily specialised in this field, who bring along their specific, and sometimes very diverse, interests and capacities,[23] and who may also struggle with the practical challenges of the technology-bound contents of these sources. Reflecting on how to archive electroacoustic music also means discussing the status of the archived sources as well as the positions ascribed, as dealing with the implemented technologies requests a sensitive balancing act between the various perspectives, interests and aims of artists, researchers and institutions. Lemouton

claims that for a substantial preservation of these compositions, it is necessary to bring together the actors, individuals, and institutions who are already involved.[24] Their cooperation would not only benefit from the specialisation of each actor, while allowing the congregation of knowledge from a wide variety of perspectives and aims, it could – in sum – provide the basis for a rich and commonly shared knowledge on the entire field of electroacoustic music.

Notes

1 Simon Emmerson and Denis Smalley, 'Electro-Acoustic Music', *Grove Music Online*, 2001. Available: https://doi.org/10.1093/gmo/9781561592630.article.08695.

2 See Serge Lemouton, 'The Electroacoustic Repertoire: Is There a Librarian?', *Array. The Journal of the ICMA,* 9, 2020 (issue: *Archiving*, ed. by Miriam Akkermann). Available: https://doi.org/10.25370/array.v20202625.

3 See e.g. Miriam Akkermann, 'Vocabulary Ruts in Mixed Music – Multifarious Terms with Many Ascriptions', in: *Proceedings of the International Computer Music Conference,* ICMC, Santiago de Chile, 2021. Available: https://doi.org/10.5281/zenodo.4161673.

4 See e.g. Jonathan Harvey, *Mortuos plango, vivos voco* (1980), 'pour sons concrets traités par ordinateur'. Available: https://brahms.ircam.fr/works/work/9030/ [19 September 2021].

5 See e.g. Fabien Lévi, *Soliloque sur* [X, X, X et X] (2002), 'commentaire par un ordinateur d'un concert mal compris de lui', resulting in *Soliloque sur Olga, Arnold, Franz et Thomas* (2002). Available: https://brahms.ircam.fr/works/work/14107/ [19 September 2021].

6 See e.g. Edmund Champion, *CORAIL (CORAL)* (2001), 'an interactive computer music environment […]. The program runs on a Macintosh computer using Max/MSP'. Available: https://www.edmundcampion.com/project_corail/index.html [19 September 2021].

7 See e.g. Luciano Berio, *Chemins 'ex' V* (1980), 'pour clarinette et ordinateur 4C'. Available: https://brahms.ircam.fr/works/work/6770/ [19 September 2021].

8 See Suzanne Briet, *What Is Documentation?*, trans. by Ronald E. Day, Laurent Martinet, and Hermina G. B. Anghelescu, Lanham: Scarecow Press, 2006, pp. 18–19.

9 Briet, *What Is Documentation?*, p. 18.

10 Briet, *What Is Documentation?*, p. 19.

11 See e.g. Laura Zattra, 'Les origines du nom de RIM (Realisateur en Informatique Musicale)', *Actes des Journées d'informatique musicale JIM 2013,* Saint-Denis: s.n., 2013, pp. 113–120, and Nicolas Donin, 'Filling Gaps between Current Musicological Practise and Computer Technology at IRCAM', in: *Modern Methods for Musicology*, ed. by Tim Crawford and Lorna Gibson, Surrey: Ashgate, 2009, pp. 47–58.

12 Briet, *What Is Documentation?*, p. 19.

13 The challenges of a standardisation applicable to different genres of music can be seen e.g. along the developments and debates related to the German Common File of Standardisation 'Gemeinsame Normdatei GND'. See Katrin Bircher and Barbara Wiermann, 'Normdaten zu "Werken der Musik" und ihr Potenzial für die digitale Musikwissenschaft', *BIBLIOTHEK – Forschung und Praxis* Preprint, no. AR 3218, 2018. Available: https://edoc.hu-berlin.de/bitstream/handle/18452/19897/AR_3218_Bicher_Wiermann_Preprint_BFP_2018.pdf?sequence=1 [15 August 2021].

14 See e.g. Marc Monnet's composition *Bosse, crâne rasé, nez crochu* (1998–2000) for ensemble, MIDI-piano and diffusion. The use of the 'clavier électronique/MIDI/synthétiseur' as described in the instrumentation can be categorised as synthesizer, however, the piece is entitled 'pièce pour piano solo et ensemble avec électronique en temps réel' naming 'Electronic device: temps réel, spatialisation'. Available: http://brahms.ircam.fr/works/work/13252/ [20 September 2021], while is not further specified if 'live electronics' signifies the real-time sound processing (which may be assumed) or the diffusion (which is not further detailed in the basic work description) – or both.

15 See Guillaume Boutard and Catherine Guastavino, 'Following Gesture Following: Grounding the Documentation of a Multi-Agent Creation Process', *Computer Music Journal*, XXXVI/4, 2012, pp. 59–80: 59. Boutard and Guastavino refer here to Nicola Bernadini and Alvise Vidolin, 'Sustainable Live Electro-Acoustic Music', in: *Proceedings of the International Sound and Music Computing Conference*, 2005. Available: http://smc.afim-asso.org/smc05/papers/NicolaBernardini/Bernardini-Vidolin-SMC05-0.8-FINAL.pdf.

16 See e.g. Laura Zattra, 'The Assembling of Stria by John Chowning: A Philological Investigation', *Computer Music Journal*, XXXI/3, 2007, pp. 38–64. Available: https://doi.org/doi:10.1162/comj.2007.31.3.38.

17 For the collection of other models, see Guillaume Boutard and Catherine Guastavino, 'Archiving Electroacoustic and Mixed Music: Significant Knowledge Involved in the Creative Process of Works with Spatialisation', *Journal of Documentation*, LXVIII/6, 2012, pp. 749–771: 752 ff. Available: http://dx.doi.org/10.1108/00220411211277028.

18 Boutard and Guastavino, 'Following Gesture Following: Grounding the Documentation of a Multi-Agent Creation Process', p. 59.

19 For the definition of the agents, Boutard and Guastavino refer to Laura Zattra who outlines that an electroacoustic music work is constituted by the interplay of six physical agents (composer, listener, performance devices, performer/instrumentalist, musical assistant, instruments for sound generation) and four processes (compositional process, score production, interpretation, performance). See Laura Zattra, 'The Identity of the Work: Agents and Processes of Electroacoustic Music', *Organised Sound*, XI/2, 2006, pp. 113–118: 114 ff.

20 See Boutard and Guastavino, 'Following Gesture Following: Grounding the Documentation of a Multi-Agent Creation Process', p. 60, and Boutard and Guastavino, 'Archiving Electroacoustic and Mixed Music Significant Knowledge Involved in the Creative Process of Works with Spatialisation', p. 750.

21 See Nicholas Cook, 'Between Art and Science: Music as Performance', *Journal of the British Academy,* 2014, pp. 1–25: 13. Available: https://doi.org/10.5871/jba/002.001.

22 For example, questions concerning a work's identity, the role of the music's embedded technology, on authorship, and on performance practice. To these topics see Boutard and Guastavino, 'Archiving Electroacoustic and Mixed Music'; Zattra, 'The Identity of the Work'; Simon Emmerson, 'In What Form Can 'Live Electronic Music' Live On?', *Organised Sound*, XI/3, 2006: pp. 209–219, available: https://doi.org/10.1017/S1355771806001427; Miriam Akkermann, 'Neue Versionen, Neue Urheber. Archiv-Zuwachs durch Technikentwicklung', in: *Tipping Points. Interdisziplinäre Zugänge zu neuen Fragen des Urheberrechts*, hrsg. von Simon Schrör, Baden-Baden: Nomos, 2020, pp. 241–252, available: https://doi.org/10.5771/9783748910664; Sebastian Berweck, *It Worked Yesterday: On (Re-)Performing Electroacoustic Music*, Doctoral Dissertation in Music, Humanities and Media, University of Huddersfield, 2012 (http://eprints.hud.ac.uk/17540/).

23 See e.g. Gianmario Borio, 'Music Archives in the Twenty-First Century: The Challenges of Politics and Technology', *Archival Notes. Sources and Research from the Institute of Music,* 3, 2018, pp. 137–145: 138.

24 Lemouton names here composers, computer music designers, publishers, creation centres, and national as well as international governmental structures. See Lemouton, 'The Electroacoustic Repertoire: Is There a Librarian?', p. 13.