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Listening from within a Digital Music Archive

Metadata, Sensibilities, and Music Histories in the Danish Broadcasting Corporation's Music Archive

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PO Box 117
221 00 Lund
+46 46-222 00 00

Nowa, Charles

Durand, Paul

Arditi

"Mingus plays Piano".

17588-LP

JAZZ

Mingus: Myself when I am real.

Duke, V.: I can't get started.

Green, J.: Body and soul.

Mingus: Roland Kirk's message.

Razaf: Memories of you.

Mingus: She's just Miss Popular hybrid.

Mingus, Charlie (klaver)

12.64. ML.

IMPULSE

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2

Andreas Helles Pedersen

Listening from within a Digital Music Archive

METADATA, SENSIBILITIES, AND MUSIC HISTORIES
IN THE DANISH BROADCASTING CORPORATION'S MUSIC ARCHIVE

Digital technologies and metadata are increasingly intervening in use and consumption of music. This thesis offers an analysis of the role of metadata in contemporary music streaming practices. The study sees a correlation between archival strategies and the presentation of recorded music, and it exemplifies this by examining the structuration of the digital music archive of the Danish Broadcasting Corporation (DR). Through readings of historical documents, platform interfaces, and database configurations, the study amplifies that digital wrapping can have an impact on how music is experienced. The study addresses formations of metadata in DR's digital music archive and discusses how these can deepen and change the perception and reception of music releases. This thesis argues that metadata can support many different narratives that are delivered concurrently, and with DR's digital music archive as a case study it highlights that the history of recorded music is nonlinear and can point in multiple directions.



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LISTENING FROM WITHIN A
DIGITAL MUSIC ARCHIVE

Listening from within a Digital Music Archive

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Danish Broadcasting Corporation's Music Archive

ANDREAS HELLES PEDERSEN



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Prelude

I am not sure what I am looking at. It is a web browser window, but it looks like some sort of app, like a music streaming service. It is called */Diskoteket*.¹ I realize that it is a web-based search system only accessible via a user-login on DR's private network. That makes sense. It seems that it is made for searching in, I assume, their music archive, but it also seems that it is possible to play back and listen to music. Really? I had no idea that they had developed such a platform with that functionality.

It is the summer of 2015, and I am introduced to */Diskoteket* by my new boss. I am a student employee at *Diskoteket*, meaning 'the discotheque', or de facto 'record collection', which is the name of the Department of the Music Archive at the Danish Broadcasting Corporation (DR).² It is exciting to be here. *Diskoteket*; this mythical entity for Danish music lovers, music collectors and nerds, that we all know is housed at DR, but only the fewest have visited. I have just arrived at my desk after having been shown around in the vinyl collection. The cathedral of grooves, a sanctity of wax.

¹ Italics are used when employing proper nouns for the first time in the body text. Italics are further used for introducing salient concepts that motor the thesis' theoretical foundation, and italics appear as emphases in argumentation. Italics are not used for quotation. Quotes in the body text are enclosed in double quotation marks, unless they are block quotes. Single quotation marks are used to draw attention to a certain word as part of argumentation or clarification.

² *Diskoteket* [the discotheque] was the name of the Department of the Music Archive in the years 1952-2017. In 2017 the department rebranded itself as *DR Musiktjenester* [DR Music services]. Accordingly, I refer to both *Diskoteket* and *DR Musiktjenester* throughout the thesis depending on historical context, just as I, when speaking of the time before 1952, refer to the department as *Grammofonarkivet* [The Gramophone Archive]. Throughout the thesis, I will generally speak of the department as the Department of the Music Archive. When discussing DR's in-house digital music platform, I refer to */Diskoteket* (with a deliberate backslash).

There are hundreds of thousands of records stored in humidity-controlled rooms. Shelf after shelf. The records are organized with a meticulous numbering system. It used to be managed by index cards, then an electronic database. And now this, /Diskoteket.

It seems to be more than just a digital catalogue of the music archive. It is clearly not a system just for finding records. It is possible to see cover art, to read information about personnel, to get recording data. And, as mentioned earlier, to listen to the music. Is it a music streaming service? As far as the playback functionality goes, yes. But, it has no selling points such as curated playlists and there are no algorithms capturing the user in an unbreakable feedback loop. There are some algorithms, yes, but they seem to be connected to broadcasting history and the airtime of certain tracks.

No, /Diskoteket is not a music streaming service as such. It is a digital music archive. /Diskoteket is just as much a music archive as the actual location of the releases is a music archive. A comprised pixel-driven space, translating the spatiality of the storage rooms. It is a representation of the music archive. No, that is not accurate. It is more than that. It is an interface into the music archive, but it works in its own ways. It is a digital music archive and *not* a physical music archive. Those are not entities that can be equaled directly. This digital music archive has its own qualities, its own sensibilities. It is a mediation of the physical archive, but it is not just mediating the physical archive. On the contrary, it makes for a unique experience of the records and how they are interconnected. The history of recorded music surely is not one thing – it changes due to collection, to archival practice, to presentation. It is sensual, discontinuous, and negotiable.

Three months later, in the fall of 2015, I am offered a position as a *music registrar*. The job description is to register metadata from music releases into the database underlying DR's digital music archive. But a small part of the job also includes maintaining the physical archive, meaning that being a music registrar at DR includes being a music archivist. Having a digital music archive naturally means caring for the database as if it is a physical archive. Just as it means being knowledgeable of all the quirks of the digital music archive.

This job provides me with insight into the inner workings of the music archive, both physically and digitally, and I get to experience how the two

archival types are connected, yet how they differ from each other. The knowledge of how such a platform is organized, of the value-laden choices that lie behind its presentation, makes me compare /Diskoteket with *Spotify*. I use Spotify privately, on my phone on the go and on my laptop at home, but I also crosscheck releases on Spotify at work. Thus, I engage with both platforms daily. Comparing the two turns into a hobby of mine, almost a compulsion. These two platforms are not alike; /Diskoteket is clumsier on functionality but heavier on information, and Spotify is not grounded and might be influenced by external factors.³ But, the element of playback makes them comparable.

It starts to crystallize. Both /Diskoteket and Spotify are dynamic reservoirs of statements and knowledge systems about music driven by their digital design and their users in tandem. My interactions with the platforms result in very different musical experiences. The continuity of my own idea of the history of recorded music is questioned by simple yet consequential variations in digital design. These two platforms make me contextualize and listen to the same music in different ways. History is our difference of times, but here I am experiencing two incongruent versions

³ A recent example of external factors influencing Spotify's content, thereby challenging its archival qualities, occurred in January 2022, where Neil Young and Joni Mitchell removed their music from the streaming service in protest of Spotify's decision to host the podcast *The Joe Rogan Experience*, in which presenter Joe Rogan made controversial remarks about Covid-19 vaccines. Such actions have huge ramifications, in that they impact an array of playlists and mixes algorithmically personalized for Spotify's users as well as impacting the singular users, who are dependent on Spotify in order to have the discographies of Neil Young and Joni Mitchell within their reach. This is an example of external factors that emphasizes some complex ambiguities of contemporary music use, of consumption and listening. What does it mean when people no longer buy a physical item containing music but buy access to a platform distributing the music in digital format, only to experience certain music being removed overnight? The personal music archive, be it physical or digital or both, is taken apart and connected to a commercial juggernaut that is in its right to change content and functionality as it pleases. Neither Spotify nor its users might regard the streaming service as a music archive, but when music disappears from its platforms, is Spotify then echoing a dual ontology as both a consumer service and an archive? The reliance on something being on the streaming service is, for sure, showcasing an epistemological issue that feeds into the discussion of what an archive is and to who an archive belongs.

of what my times are to become – two contrasting temporal foundations for my understanding of the history of recorded music; two differing chronologies springing from the same music; two singular events.

Two windows filling out my screen, one /Diskoteket the other Spotify, representing the same release, perfectly aligned and juxtaposed in split-screen manner. Pressing play and listening while being informed by the infrastructural logics of the platforms. First /Diskoteket, then Spotify. My own situated knowledge resonating in two different ways before my eyes, through my ears and inside my-self.

/Diskoteket is a digital environment of music releases. It is accessible for all DR employees. It is maintained and expanded by music registrars. It is intended for radio hosts, music editors, and other people related to the broadcasting of music radio. It is also used by staff working with productions for television, as well as teams developing webpages and apps for streaming. DR's digital music archive is relevant for numerous work-processes in the daily production of content at DR.

1. Introduction

All archives denote a politicized systematization. Whatever their goals are, they are designed from strategies, convictions and virtues. Archives contain objects that are catalogued, organized and stored in order to be found, contextualized and presented. Archives are places for storing and spaces for rethinking. Archives are thus historical. In order to be this way, archives, conceptually, are the inner structure of statements; they define “*the system of* [the statements’] *enunciability*” and “*the system of* [the statements’] *functioning* [his italics]” (Foucault, 2002b, p. 146). This is pointed out by Michel Foucault in his underlining of the need for expanding the concept of the archive. To him, the concept signifies more than a physical place for the storing of cultural data. It also covers the structuring of discourses that manage and direct all statements. Archives are the modalities of both thinking and expression. Archives are nothing less than, as Jussi Parikka in relation to Foucault’s thinking puts it, the “*conditions of existence* [his italics]” (2012, p. 6). The discursive formations of archives are vital to bear in mind when seeking to understand what archives actually do. This is true for all archives, from the *Great Library of Alexandria* to a picture folder on a smartphone. What is in the archive? Why is it there? How can it be retrieved? How is it presented? In what ways can it be put to use?

In order to excavate the reasoning for statements or the origination of discourses, Foucault develops an *archaeological method* for decoding the archive. The archaeological method hollows the structures of statements and discourses out. It shows how to obtain *historical knowledge*. “My aim”, Foucault writes, “is to uncover the principles and consequences of an autochthonous transformation that is taking place in the field of historical knowledge” (2002b, p. 17). In my reading, this is to take on an archival attitude to any object of study. What does an object tell at its archival in-

duction and what does it purvey as part of the archive? The historical knowledge of an object is not the same before the act of archiving as afterwards. That is, basically, Foucault's argument with this theory of history: history, and knowledge, is discontinuous and non-chronological. This argument is worth keeping in mind when analyzing archives today, and it gains newfound relevance in the case of digital archives.

I agree that archives, conceptually, steer historical and cultural discourses and thus are making up people's statements. Accordingly, I also understand the archive as a structurer of epistemologies. In terms of music archives, the politics of storing and presenting music releases⁴ is a determining factor for the way the history of recorded music can be told and perceived. Depending on scope and focus, a given music archive might create certain narratives and amplify certain storylines that another music archive does not get into. This can be the case even though the music archives in question contain the same music releases. The music releases can be categorized and contextualized differently according to their *metadata*. One might think that the historical and cultural discourses of two identical music archives will be similar, but that is never the case. A music archive is conditioned by the way music archivists frame the descriptive, structural, and administrative metadata of the releases. Archival approaches can differ greatly when it comes to accentuating release-relevant information. This fact makes for different discursive formations and dissimilar historical knowledge. The epistemologies of one music archive can never be equated with the epistemologies of another music archive. As cultural objects, the music releases of a music archive are defined by the strategic organization of their metadata.

Metadata-structures are the defining trait of digital music archives. As we know from Foucault, every composition of statements is, conceptually, an archive, wherefore all digital music platforms must be considered as such. An on-demand subscription service such as Spotify, marks out a digital music archive. Similarly, a tax-funded collection of digitized music

⁴ I henceforth speak of 'releases' as an umbrella-term to include all types (albums, singles, EP's etc.) on all formats (vinyl, CD's, digital files etc.). In order to avoid confusion, I will not use the term 'record' even though it often is the vernacular for album releases on vinyl. I also abstain from using the term 'phonogram', as this is a legal term in the English-speaking countries that refers to 'sound recordings'.

releases within a public service media organization, such as the Danish Broadcasting Corporation (DR), marks out a digital music archive. DR is an esteemed public service institution that launched in 1925 as a radio broadcasting service. From its inception, the institution has been financed and maintained by the Danish state to function in accordance with principles of public service and educational ideals. In effect, Danish broadcasting was a State monopoly. DR's monopoly on radio lasted until 1984, and in 1988 the institution's monopoly on TV was ended as well. As a public service institution, DR is tax funded and must work in agreement with multiannual public service contracts that since 2003 have been negotiated between DR and the Danish Ministry of Culture. The tax funded model and the public service contracts lead to a political aim of offering and distributing content that is not necessarily the most popular at the time. Instead, the content must be considered important and relevant for public service purposes. DR's business model is politically regulated, and because of this it is an institution that is obliged to be of relevance and increase market share, while it must simultaneously focus on content that is not offered by commercial providers.

The scope and politics of an on-demand subscription service and a public service media archive are of course different. Yet, the scope and politics of such archives are effectuated due to metadata. Recommendations and search retrievals are qualities of digital music archives that depend on how metadata are operationalized. Digital music archives are defined by the way relations are made between music releases and metadata. Archival strategies rest on such relations, and thus metadata define how a digital music archive can facilitate the history of recorded music. As an example, DR's digital music archive has an explicit focus on operationalizing metadata in order to put attention to the interconnection of music releases. Thereby, it is an archive that can tell different and concurrent histories of recorded music.

Research Question and Thesis Structure

This study seeks to understand how DR's digital music archive constructs and steers metadata as a way of facilitating different versions of the history of recorded music. The digital music archive's structuration is reflected on

1. INTRODUCTION

DR's in-house digital music platform */Diskoteket*, which is a platform for streaming as well as for transferring music onto DR's broadcasting servers. This means that the communication of music on */Diskoteket* has the potential to impact practices of music radio production at DR.

The general research question of the study is divided into two parts. The first part emphasizes the relationship between DR's digital music archive's inner functioning and the potential histories of recorded music that can be obtained from the archive. This part of the question has a theoretical perspective and I approach it by associating practices of digital music archiving with visual presentation and levels of interaction on */Diskoteket*. The first part of the research question is as follows:

- In what ways do politics, ideals, and practices of digital design and the registering of metadata guide the structuring of DR's digital music archive?

This part of the research question is approached with inspiration from media archaeology as well as the wider field of new media studies.

The second part of the research question emphasizes how attention to metadata can potentially impact the experiences of */Diskoteket*'s users. This part of the question has a methodological perspective that reaches into the theoretical perspective. I approach it by studying interfaces and interpreting historical documents concerning the development of DR's digital music archive as well as by analyzing interviews about practices and progressions of */Diskoteket*. The second part of the research question is as follows:

- How is the communication of the history of recorded music on */Diskoteket* configured by the digital music archive's infrastructure?

This part of the research question is answered with a layered methodology of reading historical documents, analyzing interviews, doing observations, and by taking a materialist approach to the digital music archive.

This two-part research question applies to my empirical material and helps me to develop an overarching argument concerning digital music archives. My argument is that digital technologies and metadata enable coexisting historical narratives of recorded music across time, geography,

musical genre, and ideology. These potential narratives I introduce through the term *digital music history*. The perception of such histories creates epistemologies of recorded music that may change and vary from situation to situation. This is a modality that I call *historicized listening*. As metadata facilitate coexisting historical narratives they give meaning and purpose to digital music archives. They support the digital music archives' political intentions. Thus, metadata reflect institutional strategies.

The thesis is empirically grounded and sees a strong relation between methods and theories. The two-part research question guides my overall implementation of my research and is the engine for accounts and discussions of this *cover paper*.⁵ As this thesis constitutes a compilation thesis, it is divided into two parts. The first part is this cover paper, and the second part consists of four research articles that have all been written within the framework of the research project. The first part introduces the central themes of the research project as well as binds the articles together by accentuating how they, as singular studies in themselves, fit into, and feed from, the general research question. The second part, as said above, consists of the four research articles.

In this cover paper, the four articles will be referred to as follows in Table 1. The numbering refers to the chronology of the conception of the articles.

Table 1. Overview of articles, including publication status.

Title	Reference	Status
Digital Music Use as Ecological Thinking: Metadata and Historicized Listening <i>The Nordic Journal of Aesthetics</i> 59, 97–116	Article One	Published in the <i>Nordic Journal of Aesthetic Studies</i> , May 21, 2020.
On Digital Music History: A Contemplation on Digital Archives and Musical Experience <i>Music in the Disruptive Era</i> , D. Hurwitz & P. O. Eslava (Eds.), Turnhout: Brepols, 127–144	Article Two	Published in the Anthology <i>Music in the Disruptive Era</i> , July 7, 2022.
The digital archiving of music at the Danish Broadcasting Corporation – history, ideals, taxonomy <i>Swedish Journal of Music Research</i> , vol. 104, 41–76	Article Three	Published in the <i>Swedish Journal of Music Research</i> , September 12, 2022.
Music discoveries that could have been: a variantology of the Danish Broadcasting Corporation's music archive <i>Journal of Sonic Studies</i>	Article Four	In Review for the <i>Journal of Sonic Studies</i> .

⁵ I speak of this introductory chapter in toto as the 'cover paper' (in Swedish *kappan*) in order to avoid any confusion, in that this cover paper includes a chapter entitled 'Introduction' (which is the present chapter).

1. INTRODUCTION

Each of the four articles respond to their own research questions relating to the project's general research question presented above. All four articles have their own particular subjects while being at the same time closely connected to the overall project.

Article One concerns aesthetics. Here, I ask the following question: *What impact do metadata have on actual listening situations via digital music platforms, and what are their roles in listeners' historical understanding of recorded music?* The article approaches the act of using a digital music platform as occasions of change or becoming, and it analyzes the aesthetic situation of searching and listening via a digital music platform as an ecology in which the history of recorded music is fluid. In order to show this, the article lifts out examples of strategic programming of metadata on /Diskoteket.

Article Two discusses the premise of conceptualizing music history in times of streaming and digital archiving. I argue for a principle of inclusivity in contemporary music historiography that takes the perceptions and experiences of the users of /Diskoteket seriously. Theoretically, I take an interdisciplinary approach and pair certain takes on music historiography (specifically Carl Dahlhaus' dialectic history (1983) and Lydia Goehr's analysis of the work-concept (2007)) with ethnographic methods by interviewing employees at DR about music history and digital media. My question in this article is: *How is musical meaning-making altered by streaming practices and digital archiving of music, and how can the new epistemologies be grasped in terms of music historiography?*

Article Three brings historical perspectives to the study's topic. Here, I go into details with DR's music archive and I meticulously account for the development of the digital music archive and the digital music platform /Diskoteket. I analyze visions and strategies of the archive and assess its actualization in relation to an *institutionalized music history* at DR, pertaining to the following question: *What ideals and framings lie underneath the historical development of DR's digital music archive, and how can an institutionalized music history at DR be traced in online music presentations?* The article delves into the practices of constructing and operationalizing metadata and finds that these reflect non-synchronized histories of music.

Article Four turns to a speculative approach. Here, I read the digital music archive of DR through an imaginary media frame and ask: *How do*

administrative decisions at DR influence the structure and functionality of the digital music archive, and to what extent are down-voted solutions playing into this? In this article, I dissect the political climate surrounding DR's music archive and I find that rejected ideas and visions for music communication seep into the structuring of metadata, making the digital music archive open for non-linear lines in the history of recorded music.

The cover paper presents and reviews the research project as a coherent whole. It assembles five chapters, beginning with this introduction that describes the study's academic ambitions as well as introduces DR's digital music archive. Chapter Two is a review of previous research that has informed the approach of the study. Chapter Three describes and assesses the study's methodology as well as presents its material. Chapter Four unfolds the conceptual framework of the research project. And Chapter Five is a conclusion on the research project that summarizes and evaluates the study's findings and assesses the methodology and theoretical framework, just as it discusses future perspectives.

The cover paper is followed by the four articles written during the course of this research project. In the vein of the study's approach, the four articles are not exhibited chronologically but instead through a conceptual structure that positions them in relation to historical developments in DR's music archive. The articles are interspersed with short introductions that set the scene for what is to come. All articles are presented in the formats that they have been published or submitted in.

The format of the compilation thesis suits this study, in that I can approach the issue of digital archiving of music by various means. By writing articles that can be combined via this cover paper, I integrate different methodological components in the study. This is a tactic that amplifies the inherent heterogeneity of the history of recorded music. The somewhat fleeting nature of the empirical material is another argument for conducting the thesis in the article-based format. To write and publish research articles during the course of the study proves to be an appropriate setup for handling a material that is in a state of change during the entire process.

An Overview of DR's Music Archive

As this study is the first to have an explicit focus on DR's music archive, I must now present the basic progression of the archive as well as describe /Diskoteket's elementary characteristics. The historical information about the archive is further elaborated in Articles Three and Four; nevertheless, this section also points out how DR's digital music archive differs from on-demand subscription services and it accentuates how the infrastructure of DR's digital music archive is mindful of music formats and aware of *mediality*. This overview provides a reasoning for using DR's digital music archive as a case study for research on digital music archives, digital music platforms, and the history of recorded music.

The central music archive of DR was established in 1949 under the name *Grammofonarkivet* [The Gramophone Archive], inspired by the early music archives of Sveriges Radio (SR) and the BBC. From its founding in 1925 and up until 1949, the employees at DR acquired and used their own music collections for radio broadcasting of music. Thereafter, when *Grammofonarkivet* was launched, a systematized acquisition of music releases was established and during the 1950s the collection of music releases grew rapidly (cf. Article Three; Michelsen et al., 2018a, p. 148). In March 1952, the radio and TV host Otto Leisner was appointed as general manager of *Grammofonarkivet*, which later that same year changed its name to *Diskoteket* [The Discotheque]. Under its new guises, the collection expanded its acquisitions in terms of musical genres, which changed the music profile of the archive. This opened for a new aesthetics of radio at DR that diverged from the customary flow radio by incorporating speakers in between the aired music. The expansion of the music archive's contents and its eligibility led Leisner to design an archival infrastructure building on interrelated release-information, which is the very idea that the digital music archive is sculpted around today.

The key to the archive's structuring is taxonomy. Leisner's approach to the registering and archiving of music builds on a very strict method of dividing release-relevant information into searchable categories. From 1949 until 1978, DR's collection of music releases was managed by an archive of index cards; the releases were described on up to eight cross-referencing

index cards (Michelsen et al., 2018a, p. 148). The taxonomical categories on these index cards include: the physical music releases as well as the tracks, artists and compositions represented on the releases. This logic of having search-retrievable categories crossing each other's qualities is still in function today. It is a main attribute of DR's music archive that has survived the movement of archival management from index cards over two distinct electronic search systems to the digital music platform, /Diskoteket, of today. The traits of the index cards are present in the electronic search system, *DISØ*, from 1978 as well as in the upgraded search system, and database, *MUSA*, from 2000. In Article Three, I provide an elaborate account of these electronic search systems and describe their impact on /Diskoteket.

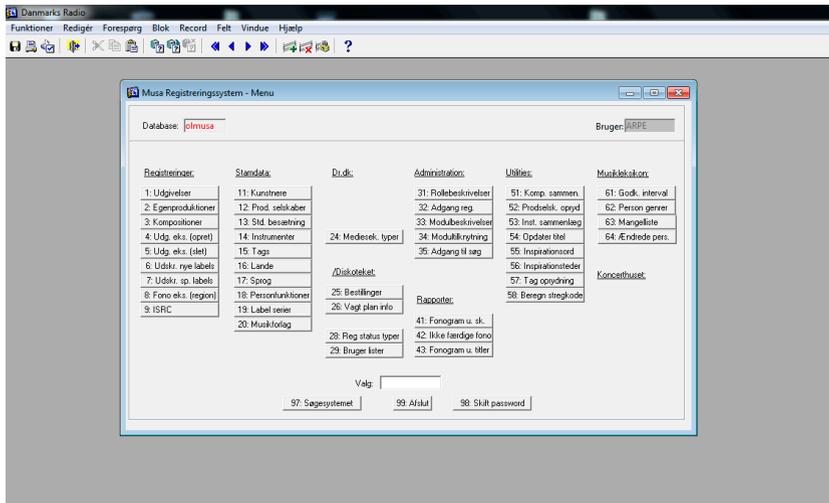


Figure 1. Front page of the software MUSA Reg showing access points into the database. The four primary entities of the digital music archive are located in module 1: Releases (including Tracks), module 3: Compositions, and module 11: Artists. With this software the music registrars can add and alter metadata in the database. Sound quality, which is defined to at least have a bit rate of 1.411 kbps at 16 bit, can also be checked here after music files are uploaded to the database. Source: DR.⁶

⁶ In order of precision and to avoid unclear interpretations, this caption is a direct quote of the caption to Figure 2 in Article Three.

1. INTRODUCTION

The MUSA database is the cornerstone of DR's digital music archive. It improves the opportunities for making specialized searches based on an operationalization of metadata. Figure 1 shows the entry points to the database through the registration software *MUSA Reg.*⁷ The database makes it possible to contextualize searches, based on e.g. a composition, in order to get a grip of the archive's full amount of tracks, spanning genres and temporal benchmarks, taxonomically registered in relation to said composition. Even though I focus on the music archive's epistemological logic of presenting and making music available, it is important to note that the operationalization of metadata to a large extent happens due to an optimization process. Such a process was instigated for the sake of creating smoother and semi-automatized procedures in the reporting of aired music to the different organizations handling the financial rights of songwriters, performing artists and record companies. This is an ontological fact of the digitization of DR's music archive that needs to be noticed and assessed in the analysis of interrelated metadata and how they impact the archive's communication of the history of recorded music. The MUSA database is not developed due to an archival wish for exhibiting the complex relationality of music releases, and it is not necessarily operationalizing its metadata as a way of telling histories of recorded music. Not originally, that is. In the latter part of the 2000s, the Department of the Music Archive at DR began to verbalize strategic ambitions to make the music archive more than an archive: to develop a digital counterpart to the physical archive that users themselves can visit. Again, it is important to stress that the outset for the digital music archive as well as /Diskoteket rests on a quest for optimization and reduced costs in the processes of music radio production and broadcasting. However, it is equally as important to emphasize that the Department of the Music Archive itself is expanding the ways that metadata can be related and operationalized in terms of search retrievals and contextualized interfaces. In Article Three, I give a detailed account of these developments and in Article One, I discuss how metadata can inoculate the actual listening situation with historical weight.

⁷ Short for MUSA Registreringssystem [MUSA registration system].

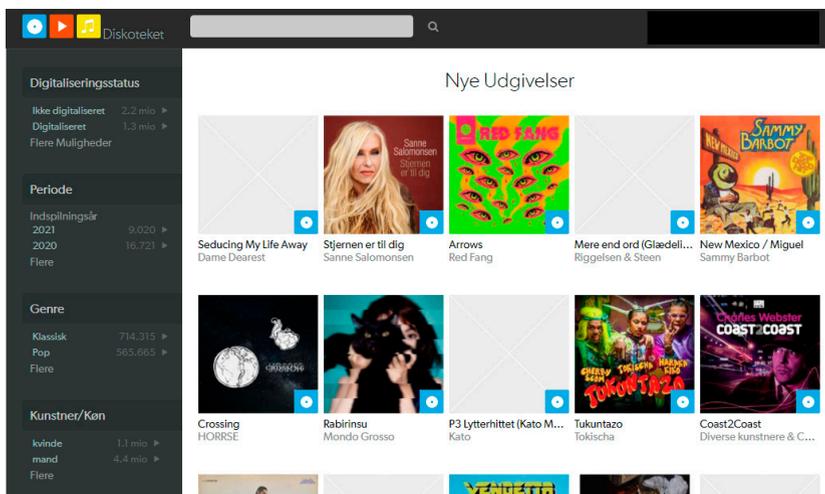


Figure 2. The front page of /Diskoteket (screenshot is taken in the afternoon 2021.11.09). The front page is in sync with the database and changes every time a new release is added. Source: DR.⁸

/Diskoteket, which can be seen in Figure 2, is a digital music platform that can be accessed via a DR employee-ID. It is browser-based, but it bears resemblances to the Internet applications that are common for on-demand subscription services such as Spotify. Where the commercial streaming services are cloud-based and therefore want to use as little bandwidth as possible, thereby compressing the music as audio files, /Diskoteket is built on a fixed server that stores the original audio files next to compressed ones that are created for streaming via the platform. This means that the streaming experiences are different, in that the playback latency on /Diskoteket is higher than on, for example, Spotify. /Diskoteket does not deliver its music in small packets that are saved on and ingrained in one's personal media devices and can be buffered instantly. The goal of /Diskoteket is to inhabit true archival qualities side by side with the qualities of streaming. The fact that the original audio files are stored next to compressed and stream-

⁸ In order of precision and to avoid unclear interpretations, this caption is a direct quote of the caption to Figure 3 in Article Three.

ing-ready audio files is a rather unique asset of DR's digital music archive. For the users, it is not possible to experience the original audio files while streaming, but it is possible to download audio files with the original sound quality into one's personal DR audio download folder. /Diskoteket is a digital music platform that works due to the logic of streaming practices as well as functions as a gateway to DR's digital music archive.

On /Diskoteket it is possible to engage with interactive user features such as liking tracks and artists and making playlists. Such active involvement of inviting users to customize their experiences is clearly inspired by commercial streaming services. Nevertheless, on /Diskoteket it is not an option to follow pre-arranged or algorithmically constructed playlists, thus staying (or staying captured) in a calculated metrics of music supply and access (for a perspective on this, see Morris, 2015a; Drott, 2018b; Prey, 2018). The fact that /Diskoteket does not incorporate an automation of participatory features is a main difference between this digital music platform and its commercial counterparts. The politics of /Diskoteket differs a lot from, say, the politics of Spotify. DR's digital music archive does not have automated recommendation systems and data harvesting as main features (cf. Morris, 2015a), but it *does* do analyses of user data to a certain degree in order to improve functionalities. These user data analyses are not initiated by the digital system itself, as a full-blown *feedback loop*, but by people from the Department of the Music Archive. The reasoning behind these analyses comes either from the department itself (and is thus about bettering the user experience) or from higher up in the administrative system at DR (and is thus about optimizing music radio production practices or fulfilling goals of cultural policy). /Diskoteket is not driven by control to the extent of commercial streaming services, but it is important to keep in mind that this digital music platform in some regards is just as biased and measured.

DR's music archive is a Janus head because it contains two different versions of itself: a physical collection of music releases and a digital database of sound files and information. Whenever I speak of 'DR's music archive' without any connotative description, I include both archival types because I aim at shedding light on larger strategic lines and historical decisions. Otherwise, I speak of 'DR's physical music archive' and 'DR's digital

music archive'. The reason for dividing the archive into two lies in the fact that these archival types are not just differing in their materiality; they are actually not versions of the same collection. There are many overlaps, and the physical music archive is in actuality included in the digital music archive. However, it is not so the other way around. As an institution, DR is not digitizing their music archive one-on-one. DR has created a digital music archive that works along its own lines and grows progressively, disregarding the physical music archive. Over the course of the last decade, the digital music archive's acquisitions primarily consist of born-digital content. Conceptually, there is a variance between the physical music archive and the digital music archive that problematizes the fact that the entire music collection is administered under one – under the Department of the Music Archive. The two archival types appear and function as two singular units, while abiding by one specific managerial layer.

When digitized, all music formats are converted to the same audio file quality in order to be able to be streamed via /Diskoteket. Yet, as mentioned, the digital music archive keeps the original audio files next to the converted ones. Music formats are important to DR's music archive, and the digital music archive in fact keeps the original formats right under its surface. A release that is digitized from a vinyl tells this story on the release interface on /Diskoteket; the user experience is that of streaming, but the format from which the release has entered the platform is still explicated. In attempting to formulate a format theory, Jonathan Sterne has underlined that “[*f*ormat denotes a whole range of decisions that affect the look, feel, experience, and workings of a medium. It also names a set of rules according to which a technology can operate [his italics]” (2012, p. 7). /Diskoteket is a certain medium steered by its format, which embeds other formats into its structure and thus nods to other (and earlier) mediums that operate through other protocols. DR's digital music archive gives emphasis to the mediality of music and music formats and thereby underscores the mediatic qualities pertaining to the history of recorded music. Mediums, formats, and archival taxonomies are *not* hidden from the users of /Diskoteket. Therefore, DR's digital music archive provides a great case study for research into the connection between digital infrastructures and the history of recorded music.

Why this Study?

With this study, I provide knowledge of the digital music archive's role in music radio production at DR. In recent years, extensive research on music on Danish radio has been published and much of it naturally examines the influence of DR and how this public service media institution makes use of music.⁹ Besides some sporadic references, the work of the Department of the Music Archive at DR goes unnoticed in this research, which means the connection between the digital music archive and the broadcasting of music on radio at DR is unobserved. By offering a history of DR's music archive with a focus on the development of the digital music archive, this thesis discloses that practices of music radio production at DR in the last two decades have, to an extent, been formed by the digital music archive. The process of developing a digital music archive is executed by DR's management in favor of a politics of optimization with the aim of smoothening the already implemented practices. It is new knowledge that there is a strategic connection between DR's digital music archive and the institution's broadcasting practices. This knowledge brings new aspects to elements of previous research pertaining to music scheduling and day-to-day work of music editors.

The empirical scope of my research is limited to DR, specifically to DR's digital music archive, where I have access to /Diskoteket and the registration software MUSA Reg due to an affiliation with the Department of the Music Archive (I elaborate on this in Chapter Three and in Articles Three and Four). This access provides a distinct understanding of the internal logic of DR's digital music archive. Even though the study focuses on one specific case, its realizations and understanding of metadata are also of relevance for research into on-demand subscription services. Recent music streaming studies either regard music streaming as a practice and a part of

⁹ An example can be found in the research project *A Century of Radio and Music in Denmark: Music Genres, Radio Genres, and Mediatization* (RAMUND), which ran from 2013-2018 and was funded by The Danish Council for Independent Research. The main aim of this research project was to combine research fields such as musicology, anthropology and media studies with cultural theory and nurture a theoretical contribution focusing on genre cultures and mediatization. See e.g. Michelsen et al., 2018a; Michelsen et al., 2018b.

people's everyday experiences and knowledge production (e.g. Hagen, 2015; Nowak, 2016) or as a part of largescale corporate-controlled business activities (e.g. Drott, 2018a; Prey, 2018; Rex Pedersen, 2020). Recommendations and playlists are understood by way of algorithmic processes, either as co-constituting everyday consumption practices (e.g. Åker, 2018) or as facilitating control and surveillance (e.g. Drott, 2018b). In this study, the premise is turned around and I instead examine how imaginaries of the history of recorded music impact the experience of music streaming. I show how releases and tracks are connected across time, musical genre, and geographical space, and argue that metadata can amplify such connections and frame a new understanding of music history. This is a music history that reaches beyond chronology and produces concurrent narratives.

DR's digital music archive is constructed around differing ideals of history that come from different concepts of time. DR's institutional take on the history of recorded music is based on an approach to the use of history that is closely associated with a linear and causal understanding, stemming from the Enlightenment's reckoning of chronology (cf. Tanaka, 2019, p. 42). DR's digital music archive supports the linear logic by setting metadata in motion that can silence and remove unwanted noise in the immediate presentation of music releases. However, the digital music archive is also operationalizing metadata in order to underline that the history of recorded music is circular and very diverse and thus *does not* fit into a fixed metrics of chronology. Hence, this study demonstrates that the music releases in DR's digital music archive are presented and made navigable due to coexisting historical narratives, and that provides an answer to my general research question. The historical synchronicity defines the politics, ideals, and practices behind the structuring of DR's digital music archive and these, by extension, influence /Diskoteket's communication of the history of recorded music. In evolving *historicized listening*, I argue that the epistemologies of recorded music vary and are negotiable as a consequence of the digital systems that make present-day engagements with music possible. By proposing *digital music history*, I regard these variable epistemologies of recorded music as singular digital experiences with music that continually determine and negotiate our individual situated versions of the history of recorded music. Such conceptual deliberation amplifies DR's digital music archive

and shows that it is an archive with a heterogeneous relation to the past. DR's digital music archive reaches into the internal communication on /Diskoteket and further into aspects of music radio broadcasting.

The Chapters

The chapters that follow will examine DR's digital music archive and clarify how its formation is linked to the history of recorded music.

Chapter One has discussed the concept of the archive and explicated that DR's digital music archive is a collection of music releases as well as a certain system of directing statements about music releases. The chapter has also outlined this thesis' research question and described its structure. Furthermore, the chapter has introduced the common music archive of DR and elaborated on the development of the digital music archive and the digital music platform /Diskoteket. In this context, Chapter One has motivated the reason for using DR's digital music archive as a case study. Finally, the chapter has summarized how the thesis has provided new knowledge about DR's digital music archive and it has described that metadata can facilitate different versions of the history of recorded music.

Chapter Two provides an overview of previous research that has informed this study, inspired its interdisciplinary approach, and impacted its theoretical scope. The chapter outlines recent discussions and important findings in music radio studies and music streaming studies and positions the thesis in relation to these. It tunes in on pertinent considerations within new media studies and media archaeology and amplifies how these considerations resonate with the thesis. The chapter also makes a note on how to think about music without focusing on music, which is a take on historical analysis that zooms in on technological circumstances. In continuation, it makes a note on history and time. Finally, the chapter briefly introduces to archival studies and accounts for the thesis' inspiration from this tradition.

Chapter Three describes the need for an interdisciplinary methodology and considers the empirical material of the thesis. The chapter explains how my approach to DR's digital music archive has been informed by ethnographic methods such as interviews and participant observation. It

then juxtaposes this approach with interfacial analyses of /Diskoteket as well as my usage of the registration software MUSA Reg, just as it describes my readings of historical documents pertaining to the development of DR's digital music archive. Besides, the chapter goes through the process of data collection and it evaluates the construction of the material as well as considers the ethical issues of the study.

Chapter Four develops a conceptual framework focusing on the role and meaning of metadata in digital archiving of music. This chapter proposes a theoretical approach to listening that focuses on the referential qualities of recorded music, and it argues for an expanded temporal understanding to verbalize how listening can open toward new historicized connections. The chapter defines a notion of music history that takes off in people's perceptions with and alongside digital media technologies. By tuning into the concept of the digital music archive, the chapter explains how the structuring of metadata leads to a more detailed and complex understanding of recorded music. It is argued that in DR's digital music archive, metadata outline various presentations of music history, and that certain sensibilities to metadata determine their production as well as their appearance and effect. Finally, the chapter conceptualizes how the temporal expansion of digital media technologies impacts the perception of the history of recorded music. This is argued through a description of the infrastructure of DR's digital music archive, which makes the operationalization of metadata possible.

In Chapter Five, I recapitulate the thesis' discussions and my line of reasoning. However, this chapter also opens new perspectives and questions orbiting music streaming and digital music archives. This is a study of DR's digital music archive and it is a study of how this archive facilitates different versions of the history of recorded music. Yet, it is also a study that points to future difficulties and uncertainties when it comes to doing research into music streaming and into the music communication of public service media.

2. Previous Research: Inspirations and Implications

In this chapter, I review previous research that has informed my interdisciplinary approach to DR's digital music archive, and I focus on aspects concerning the second part of my research question: *How is the communication of the history of recorded music on /Diskoteket configured by the digital music archive's infrastructure?* First, I provide an overview of tendencies within studies of music radio. Here, I have a focus on a Scandinavian context and especially recent studies of DR and music radio. Second, I account for trends in research addressing new media technologies and music streaming. Here, I introduce studies considering the nexus of recommendation and surveillance. Often, such studies are inspired by critical theory and connect to recent inclinations within new media studies. Third, I present some overarching lines within new media studies and media archaeology that have been inspirational for this thesis' conceptual framework. Common for this research is a theoretical curiousness toward an understanding of how (digital) media determine our situation (cf. Kittler, 1999, p. xxxix) and regulate contemporary society. An addendum to this section tunes into historical thinking of music that focuses less on music than on music's technological and infrastructural circumstances, and the section closes off with a note on history and time. Fourth, I highlight some trajectories in archival studies that this thesis finds inspiration in, and in terms of digital archives I draw a line between new media studies and archival studies. Finally, I situate the thesis within music radio studies, while emphasizing that it also draws on a range of other disciplines.

Music Radio Research

Even though research into music radio dates back to the formative years of the medium, it must be noted that most of the influential studies had not been issued until the late 1980s. There can be many explanations for that, but the advent of television as a medium is in all likelihood an important factor. The impact and position of television in people's everyday lives from the 1950s onward restructured the then attention of media sociological research, and it was not until studies in social and cultural historiography found a new devotion to the medium of radio in the 1980s that musicology and media studies began to take music on radio seriously.

It is worth stressing that thinkers of the Frankfurt School did original work on music radio in the 1930s and 1940s. An important aspect of the work of the Frankfurt School was to create understanding of new technologies and how these could influence media cultures and people's media practices. Notably Theodor W. Adorno, in developing a sociology of music, described the radio as a vehicle for pseudo-individualization that expunged any sense of criticism in the listener toward social realities (Adorno 1945, p. 214). In his usual poetic panache, he provided a scornful diagnosis of the radio's impact as leading to "regression in listening" and "atomized listening" (Adorno, 1991) because of a growing commodification and standardization of music. For Adorno, the main problem lay in the inevitable amalgamation of music and medium, and his scope was thus concentrated at aesthetic experiences.

When the interest in radio studies began to bloom in the 1980s, music radio was not paid much attention. Radio studies as a field of research took off in native English-speaking countries (Michelsen, 2018a, p. 16) as a theoretically diverse approach stemming from cultural studies. Therefore, early studies within the field did not regard music on radio as a separate object of study, but they acknowledged the role music played in terms of radio programming practices. Thus, music was, at this point, not regarded as a defining 'genre' on radio. In putting historical focus on radio as a central medium of the 20th century, media scholar Andrew Crisell has done influential work for the field of radio studies. His analyses are sculpted within a semiotic framework, in which he decided to deal with the radio

presenter of music instead of the music as such (Crisell, 1994). This view on the radio host, or the DJ, as the only determinant of meaning in music radio is of course a restricted approach, but it is worth keeping this outlook in mind when approaching music radio studies today, as it was defining of the reintroduction of radio as an academically relevant subject.

Early 1980s efforts in studying music radio carried on the torch from the Frankfurt School in that a sociological mindset prevailed. These approaches were driven by cultural studies and excelled in writing social histories of music radio. Paddy Scannell has analyzed music policies at the BBC, during the institution's formative years (1981) as well as, in collaboration with David Cardiff, created understanding of program policies and how social connections between institutions and audiences occur (1991). This was seminal work that widened the knowledge of how public service media institutions connect to, influence, and even steer national musical cultures. The cultural power of a public service media institution such as the BBC has later been investigated by Georgina Born (2005a). Born had immersed herself in the institution in the 1990s, and she describes the British communications landscape at the time as defined by ideas of neo-liberal economics, leading to an ideological emphasis on management theory.

Sociocultural histories of music radio at the BBC were generally among the first Anglo-American studies of impact (e.g. Frith, 1988; Barnard, 1989), and the then aspirant research field of popular music studies (also very much coming from a point of departure in cultural studies) carved out a more direct connection between radio studies and musicology. In a Canadian context, Jody Berland has explored the relationship between pop music from around the world and local listeners (1990) and she argues that music radio in fact expands the musical world view of local listeners. The music is often very much not local, but international, and the technological mediation of music made possible due to specific music formats let the boundaries of music and listeners cross each other. This analytical argument is still widespread as seen in more recent studies, such as J. Mark Percival's investigation of the dialectic of music pluggers from the record industry and music programmers at radio stations (in his case, the BBC) that seeps into the ears of the audiences and defines "the sounds of popular music" (2011, p. 459).

A Scandinavian Perspective

In this section, I provide a peek into the Scandinavian context of music radio research in relation to public service media institutions. I do this because the studies that I will mention have been informative for my own approach at the institution of DR. It is important for me to emphasize the methodological indebtedness that my study bears to these earlier academic efforts.

The sociology of music and radio lingers on in terms of some Scandinavian approaches from the 1980s onward. Per Drud Nielsen (1981) has described the ideology of everyday music and analyzed how popular music radio can steer the formation of people's everyday activities. Nielsen, in echoing Adorno's critique of the radio, took on the everyday music as a non-conscious advocate for musical regression and escapism from the daily chores, and he did so in, amongst other things, an analysis of DR's music radio channel P₃, which is a radio channel directed at younger listener segments that launched in 1963.¹⁰

In the 1990s, an interdisciplinary research project was launched in Sweden that had as its goal to examine and create understanding of the workings of the Swedish public service media up until the break of media monopoly in 1992 and 1993. This project was called *Etermedierna i Sverige* [Swedish Broadcasting Media] and it has sponsored many studies in Swedish media history, one of which is Alf Björnberg's historical investigation of music genre and radio programming at the Swedish Radio (SR) from 1929 to 1995 (1998). This is a seminal effort in Scandinavian music radio studies, in which Björnberg moves back and forth between musicology and media studies. He states at the inception of his work, that "music is never presented, used or experienced as 'just music'" (ibid., p. 15 (my translation)). Continuing, he asserts that by building a historical narrative

¹⁰ In the spring of 2022, P₃ was rebranded as a cross-medial product. This is a constellation in which P₃ merges with DR₃. DR₃ launched as a flow TV channel in 2013 and was relocated as an online streaming offer in 2020. Under the name P₃, the main goal is to bring programs and thematic content together in a cross-medial context that resembles the youth segment's media practices, so the rebranded P₃ produces across online TV streaming, podcasts, DR's websites, radio and social media (mainly Instagram and Facebook).

in which he zooms in on the dichotomization between so-called high culture and popular culture, he gains an understanding of “the media-musical field as a composite whole” (ibid., p. 17 (my translation)). Björnberg describes the methodology as institutional ethnography (ibid., p. 18), which is reminiscent of Born’s work at IRCAM (Born, 1995), and this approach makes it possible for him to create a cartography of the inner dynamics of “the music program-producing departments and their impact on the design of the actual programs” (Björnberg, 1998, p. 18 (my translation)). It should be noted that this methodology of institutional ethnography is further refined by Born in her later work at the BBC (2005a)

In combining studies of music radio and music streaming, Patrick Burkart and Susanna Leijonhufvud have recently made a claim of critique directed at SR that uncovers how recent cultural policy making and media laws in Sweden are letting SR merge with the business model of Spotify (Burkart & Leijonhufvud, 2019). Convincingly, they show how legislative strings are pulled, making Spotify a “digital librarian for all public media” (ibid., p. 178), which they dub a “Spotifyfication of public service media” (ibid.). This analysis is backed up by publications from the research project *Streaming Heritage*¹¹, which argues that elite lobbying and national political strategies are part of Spotify’s structure (Fleischer & Snickars, 2018; Eriksson et al., 2019, pp. 19-29). Burkart and Leijonhufvud look at SR’s gramophone archive through the strategic consequences of Spotifyfication, and they maintain that the archival memory of this archive is reduced because of a heavy downscaling in producing and cataloging metadata as well as a dismissal of many skilled employees at the archive. (Burkart & Leijonhufvud, 2019, pp. 179-180). They reveal how these political ties obscure the public service obligations and that in a quest for increased customer engagement, Spotify is incorporated on SR’s web products as an enhanced media service (for more on Spotify’s position in Swedish culture, see Leijonhufvud, 2018).

¹¹ The research project *Streaming Heritage: Following Files in Digital Music Distribution* ran from 2014-2018 and was funded by the Swedish Research Council.

DR and Music Radio

In this section, I will provide a selected walkthrough of recent music radio research in a specific Danish context. This body of work is foundational for this thesis' point of departure in terms of methodology as well as object of study. Due to my affiliation with the Department of the Music Archive at DR, I have special(ized) knowledge of the digital music archive's role in the daily practices of music radio production and broadcasting, which is why, in Article Three, I pose a critique of certain takes on music scheduling.

Within the last decade, two extensive research projects on Danish radio history have been conducted. The first project was entitled *LARM Audio Research Archive* (2010-2014) and was funded by *The National Programme for Research Infrastructure* under the Ministry of Higher Education and Science. The goal of this project was to develop a digital infrastructure for the digitization and archiving of broadcasted radio in Denmark, and it has resulted in an online archive called *LARM.fm*, which is accessible for researchers and students affiliated with Danish institutions of higher education.¹² This project was promising of interesting radio research to be conducted in cultural historical manners (Jensen et al., 2015, p. 10), and in connection to the project, several doctoral theses have been written (e.g. Abildgaard, 2014; Lawaetz, 2014; Mortensen, 2014).¹³ Besides usage by one larger research project, the LARM.fm infrastructure, in terms of causing new research that enlightens aspects of Danish radio history, has been at somewhat of a standstill in the last couple of years. This has been the case even though the access to materials fundamentally changed the prospects for research into Danish radio. The second project was called *A Century of Radio and Music in Denmark: Music Genres, Radio Genres, and Mediatization* (RAMUND) (2013-2018) and was funded by *The Danish Council for Independent Research*. This project took advantage of the LARM.fm infra-

¹² As I am affiliated with Lund University, I do not have access to this research infrastructure. Yet, in October 2021 I was provided guest access to the LARM.fm platform via an affiliation as visiting researcher with the Department of Musicology at Aarhus University.

¹³ For a thorough introduction to the LARM project, I refer to the printed matter published by the research group, see Andersen et al., 2013.

structure, in that it was focusing on widening the understanding of the convergence of music as an aesthetic category and radio as a specific medium for communicating sound and listening to music. The overarching aim of the RAMUND project was to take the assemblage of music radio apart and analyze the many different, and opposing, agents and practices that constitute the multifaceted mediation of genre cultures and social structures produced by the relations between local music cultures and radio.¹⁴ The RAMUND project took on this issue via studies of the Danish state radio. It was a research project that followed tentative lines by way of painting a picture of a national media history, and specifically a history of Danish music radio. The project has resulted in an array of publications that creates valuable insight into the historical workings of DR and amplifies and problematizes the ways that DR has influenced, and still influences, Danish musical cultures and local listeners.

An important part of much recent research concerning music radio production at DR has a focus on the complexity of the human-nonhuman agencies driving music programming forward. Several studies employ a theoretical framework based on the Actor-Network Theory (ANT) of Bruno Latour (2005), and in that way they widen the knowledge of the effect organizational structures have on radio production and thus on the positioning of listeners (see Krogh, 2018; Wallevik, 2018, 2019).¹⁵ A common factor for much recent research on music radio at DR can be found in a critical approach to the assemblage of music radio production. In this assemblage, a multiplex of human and nonhuman actors interact with and intervene on each other. The complexity of the assemblage is not fully illuminated in this research, in that the digital automatization and communication between internal platforms and broadcasting systems tend to be

¹⁴ For more about the project in detail, see the website of the project: <https://cc.au.dk/ramund/>, and especially the page on problematizing music and radio: <https://cc.au.dk/ramund/about-the-project/problematizing-music-and-radio>).

¹⁵ ANT is a theoretical approach used to describe the interconnectedness of everything. Some music streaming studies are inspired by ANT as well. As an example, Leijonhufvud (2018) employs the ANT of Latour (2005) so as to create a wider understanding of technology's impact on the human body (and vice versa), and she uses the approach in order to open up the black box of Spotify's corporate model, seeing it in relation to other actors and as a way to imagine social relationships between actors.

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forgotten (cf. my critique in Article Three). The digital networks are of course part of ‘the network’ of ANT. Therefore, in order to create an understanding of the meshwork of music radio production within a public service media organization such as DR, it is crucial to examine how, and why, digital systems are structured in certain ways and not just how they are used. I agree that a conceptual framework such as ANT is of relevance in the analysis of music radio production. Yet, I see a tendency in invoking cultural analysis that leads to an overlooking of the temporal aspects of the politics of music radio (e.g. cf. Krogh’s reading of Born’s concept of a musical assemblage (Krogh, 2018; Born, 2005b, 2011)). A social focus is of course important when describing the assemblage of music radio at DR; but it is necessary also to widen the understanding of the digital functioning in the production of music radio today when activating a concept such as the assemblage.¹⁶ By giving attention to DR’s digital music archive, I seek to do just that.

Music Streaming Research

The expanding canon of literature on music streaming reveals that several aspects are deemed to be of importance. In this section, I will concentrate on two of these: music’s role in everyday life and music and technology. As this review will show, these two aspects are closely connected and complement each other.

It can be argued that the question of music and the everyday dates back to Adorno’s critique of radio as well as his critique of technological reproduction of music. For Adorno, the very idea of recording music and broadcasting it, and, even worse, selling it, fetishized music and produced a commodity listening, removing the human force from music and making it a consumer good (Adorno, 2009). The philosophical weight of such a

¹⁶ Mads Krogh (2018) combines ANT with assemblage theory when analyzing how music genres and formats are integral parts of a rationalization process in DR’s music programming. Krogh is especially inspired by Born’s theorizing of a musical assemblage (Born, 2005b), which I discuss in depth in Article One, and he agrees with Born in her reading of the assemblage as layers of social mediation (Born, 2011), which I comment on in Article Three.

statement is heavy and invites to cultural critique. Still, as Timothy Taylor stresses, it can be difficult to read through the assumptive character of the claim because it lacks either historical or ethnographic ballast including an analysis of consumption practices that, depending on genre or listener segment, vary far and wide (Taylor, 2016, p. 25). Anahid Kassabian, in nurturing a concept of ubiquitous listening, valorizes the Adornian notion of an expert listener as an integral part of how a distributed subjectivity is categorized (Kassabian, 2013, pp. xxii-xxiii). In the last decade, many studies have focused on how media practices are defining of the experience of music today (e.g. Kassabian, 2013; Hagen, 2015; Nowak, 2016; Johansson, 2018), and in regards to music streaming the scope of some studies lies in music as an action and as an activity, as musicking (cf. Small, 1998; see e.g. Hagen, 2015; Leijonhufvud, 2018).

Adorno walks through much recent research on music, the everyday, and technology, as a specter prophesizing dangers, but also possibilities. His formal categorizations of listening is echoed by Tia DeNora. She sees music as central to the everyday construction of meaning, and in theorizing ‘music as a technology of the self’ she argues for a force in the plethora of layers of listening to music that partakes in the everyday listener’s self-constitution (DeNora, 1999, 2000). Adorno also plays a role in Sterne’s definition of mediation (2012, p. 9). Sterne points out that Adorno views mediation as being present in the object itself. This connects to a statement he makes about the MP3 format being “a *political modulation* of private listening experience [his italics]” (Sterne, 2013, p. 111), by which Sterne, in my reading, means to underline that the modulatory nature of listening is ingrained in the media, and in the specific technical formats, that mediate music. Subjectivity is immanent in the listening modalities put forth by digital encoding of music formats, in that “contemporary media forms strive at once for some form of universality [...] even as they allow for the irreducibility of private, subjective experience” (ibid., p. 113).

The common denominator for most research into music’s role in everyday life, lies in an interest in and attention to the technological reproduction of music. Here, lines can again be drawn back to the Frankfurt School. A critical stance against technology and reproduction can be found in Adorno’s sociology of music, and his speculation on regressive modes of

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listening as embedded in the commodification of music was sparked due to technological progress. Of even greater importance for recent studies into the question of technological reproduction of music is Walter Benjamin's theorizing of an artwork's loss of aura when technically reproduced (Benjamin, 2015b). Benjamin focused on the visual arts and he put attention to their confluence with the then emerging medium of film. When reproduced a work of art loses its unique existence in time and space (ibid., p. 222), which is a positive tendency in that ritualistic dependencies can be removed from the experience of art. Thus, art is democratized in its reproduction. An interesting aspect in this regard lies in Benjamin's provocative statement that technological reproduction leads to an experience free of equipment.¹⁷ Mark Katz (2010) examines the impact of recordings of music via seven 'phonograph effects', many of which indirectly stem from Benjamin's diagnosis. Katz' approach, grounds in a discussion of the way in which recordings of music have changed the way we listen to music. He points out that recording and replaying of music have affinities with Benjamin's democratizing view on mediation (ibid, p. 17), and phonograph effects such as 'portability', '(in)visibility' and 'repeatability' are very much indebted to the portrayal of experiencing via equipment as an equipment-free experience. Technological reproduction of music is not only about ontological matters; it concerns cultural and epistemological issues as well.¹⁸

¹⁷ Benjamin juxtaposes the painter and the cameraman and he claims that the painter has a natural distance to reality, whereas the cameraman "penetrates deeply into its web" (2015b, p. 227) and let viewers see how things are behind the scene, so to speak. It is a question of mediation, and Benjamin argues that a fully-fledged mediation obfuscates the fact that the experience is mediated. He writes: "[F]or contemporary man the representation of reality by the film is incomparably more significant than that of the painter, since it offers, precisely because of the thoroughgoing permeation of reality with mechanical equipment, an aspect of reality which is free of all equipment" (ibid.).

¹⁸ In his cultural history of sound reproduction, Sterne points out that "reproduction does not really separate copies from originals but instead results in the creation of a distinctive form of originality: the possibility of reproduction transforms the practice of production" (Sterne, 2003, p. 220). Benjamin links artifice and artificiality, Sterne explains, and thus authenticity and presence are not more "real" before reproduction than after.

Recommendation and Surveillance

In this section, I will emphasize recent literature about how strategies of control are steering music streaming. I do this because such analyses have been helpful for my understanding of the way DR's digital music archive constructs its digital infrastructure.

The strategies of on-demand subscription services can be, and have often been, characterized as levels of control. For one thing, these services control the distribution of music, yet, as Burkart has argued, they are also channeling the control of consumption into the hands of the music industry: "music rental supplants owning and collecting recorded music" (Burkart, 2014, p. 404). The comment on music as a rental is made due to the fact that music streaming services are subscription- and access-based and competing with the prevalent idea of music sales and ownership. Such an arrangement strengthens the position of the music industry; the subscription model lures users onto the services and the industry regains control and power of distribution and consumption (see e.g. Vonderau, 2015; Drott, 2018a). The adventures of file-sharing practices are restrained (Johansson & Werner, 2018, p. 14).

The evolution in music formats impacts music's role in people's everyday lives. Sterne (2012) has shown the transformational power of the MP3 format, which has been an important factor in changing contemporary music culture. In relation to this, Jeremy Wade Morris (2015b) has uncovered how digitization has morphed music as a commodity. He introduces the term 'digital music commodity', which signifies the move away from tangibility and physical packaging to the intangibility of encoded audio files as specific strands of ones and zeroes. Morris explicates that the digital music commodity is an ontological compound of mediation, in fact a result of 'remediation' understood as "the representation of one medium in another" (Bolter & Grusin, 1999, p. 45). By way of earlier music formats and media technologies, digital music files accessed via on-demand subscription services are moving along the music industry's infrastructures (see Devine, 2019b) and gain a newfound force in terms of discovery. Critical voices have warned about how the abundance of music goes against discoveries and will lead to decontextualized perceptions due to algorithmic

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recommendation (Snickars, 2017; Drott, 2018a; Prey, 2018). Yet, the streams of music can also integrate and re-contextualize the music in new digital ecosystems, making for a datafication of listening (Rex Pedersen, 2020; Werner, 2020). The remediation of music and how it is presented (and made open for contextualization) merges in a musical narrative by way of “algorithmic effects” (Morris, 2015a, p. 458). In this way the music is communicated via a sort of cultural intermediary, which Morris speaks of as an ‘infomediary’ (ibid.). On the platforms of streaming services, music is juxtaposed and combined into personal narratives by way of algorithms and data mining techniques developed by infomediaries, that is, by certain agents specializing in shaping the encounter and experience of music content. Thus, music is part of data feedback loops that form a situation, in which music is treated and understood, not as music as such, but as media content made to fit certain corporate agendas (cf. Maasø & Hagen, 2019; Rex Pedersen, 2020).

On on-demand subscription services, recommendation is closely connected to strategies of surveillance. Recommendation of music exerts control and reflects a power-structure that leads to further recommendation (cf. Morris, 2015a; Drott, 2018a), creating an assemblage of curation and economic interests. In this context, Robert Prey (2018) has decoded how users of music streaming platforms are being constructed by the constant movement of recommendation based on listening behavior. Prey speaks of an ‘algorithmic individuation’, which he conceptually underpins with reference to Gilbert Simondon’s theory of individuation (Simondon, 2009) as well as Gilles Deleuze’s epistemological analysis of contemporary times in the essay *Postscript on the Societies of Control* (1995). Recommendation creates users as multiplicities, or, in Deleuzian terms, as “endlessly subdividable ‘dividuals’” (Prey, 2018, p. 1092; cf. Deleuze, 1995, p. 180). On on-demand subscription services, recommender systems promise a personal(ized) user experience, and this brands music as a pervasive aspect of people’s everyday lives (cf. Kassabian, 2013; Hagen, 2015; see also Drott, 2018a, pp. 335-336). Due to the experience of personal recommendation, music can function as an entrance for tracking users and creating widened pictures of their ideals, feelings, and interests; recommendation hooks, captures and traps users (Seaver, 2019). As part of contemporary society,

on-demand subscriptions services exercise control, while also wielding disciplinary power as theorized by Foucault (1995). Recommendation thus makes music into a technology of surveillance (Drott, 2018b). Further, algorithmic recommendation might also have effect on the music creators and artists (O'Dair & Fry, 2020).

The Case of Spotify

I will end this section by briefly honing in on Spotify. I do this because Spotify has been a comparative counterpoint to /Diskoteket throughout this study when I have needed to relativize my analyses of the platform. In addition, Spotify is the most influential music streaming service on the market, at least in a Western European context. But what is Spotify exactly? It is a provider of music, a music streaming service that through subscription models distributes millions of tracks. However, it is also a political entity embedded in the monetary schemes of the major record labels (that own large percentages of shares in the company) (Rex Pedersen, 2018; Hesmondhalgh, 2019; Vonderau, 2019). The model of Spotify works due to impervious strategies of computation that are hidden from outsiders, and, rightly so, Spotify has often been described as an obscure and impenetrable assemblage of information, data tracking and economic interests, or as a black box (Åker, 2018; Drott, 2018b; Eriksson et al., 2019; Burkart & Leijonhufvud, 2019; Wellink, 2022). The metaphor of the black box seems fitting as a categorization of Spotify. Media scholar Alexander Galloway points out that the black box is “an opaque technological device for which only the inputs and outputs are known”, which might be approached with a “tactic of anonymization and aggregation” (Galloway, 2021, p. 217). As part of the Streaming Heritage project, Eriksson and others (2019) have developed and carried out such tactics; they make “interventions” into Spotify, in which they, invisible in the fog of computation, disturb and spy on the traffic streams and algorithmic logics of Spotify. With a methodology of trial-and-error and putting oneself on the line, they have launched a record label and provided “self-produced “music” and spammed Spotify with “obscure sound materials”” (ibid., p. 70) just as they have captured data via self-developed structures in order to widen the knowledge of Spo-

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tify's recommender systems by launching gendered listening bots (ibid., pp. 139-147). It is a tactic of nonexistence (Galloway & Thacker, 2007, pp. 135-137), in that they are there but are not accounted for by Spotify.¹⁹ Such a research project presents how a blend of autoethnographic and digital methods can be of use in research strategies toward Spotify.

Leijonhufvud (2018) clarifies that Spotify as a streaming service is unique due to its dominant position in the Swedish music business, as well as due to its affiliation with Swedish public service media (cf. Burkart & Leijonhufvud, 2019) (Leijonhufvud, 2018, p. 23). The muddiness of the structure of Spotify is made thicker by this national and political anchoring, and it is further complicated by its connection to a specific part of Swedish academia, namely The Royal College of Technology (KTH) (ibid., pp. 132-133; see also Fleischer, 2017; Fleischer & Snickars, 2018; Eriksson et al., 2019). Spotify has a certain 'Swedishness' (Fleischer & Snickars, 2017). This Swedish connection constitutes a problem area for research into Spotify because it strengthens the categorical quality of a 'black boxing' of the streaming service. In order to decode some of the future prospects of the company's infrastructures and ideals, unusual methods might be of help. For instance, by going through job postings it is possible to get "important clues about how corporations organize, allocate resources, and both perceive and brand themselves" (Eriksson et al., 2019, p. 194).

New Media Studies

The conceptual framework of this thesis builds on critical thinking within recent media theory and media archaeology that I find inspirational for describing and interpreting data-structures and infrastructural movements in DR's digital music archive. By inscribing this study in new media frame, I can validate and evaluate my readings of interfaces and my usage of the registration software MUSA Reg. Such a theoretical backbone makes it possible to trace the inner workings of DR's digital music archive and as-

¹⁹ Galloway and Eugene Thacker describe this tactic as permeable, as being fully there by being absent: "The subject has full presence but is simply not there *on the screen*. It is an exploit. [...] One's data is there, but it keeps moving, of its own accord, in its own temporary autonomous ecology [their italics]" (Galloway & Thacker, 2007, p. 135).

sess how its structuration constitutes its understanding of the history of recorded music.

New media studies denote quite a heterogeneous research field. In general, studies of new media are defined by a high level of interdisciplinary approaches, combining academic disciplines such as critical theory, aesthetics, social sciences, and computer science. In 2001, Lev Manovich published *The Language of New Media* and made the first systematic study and theory of new media that described affinities between digital technologies and earlier media formats such as film and the camera. This type of research makes way for a cultural and political critique of contemporary digital media culture. In terms of the concept of the archive, there has been a variety of discussions of the meaning of digital storage (Chun, 2008, 2011; Ernst, 2013b), mass digitization and big data (Thylstrup, 2018), and the conceptuality of the digital archive (Parikka, 2012; Ernst, 2013b; Thylstrup et al., 2021). Manovich states that the digital archive is pervaded by an organizational modality that follows the non-hierarchical logic of the database (2001, pp. 218-221). According to Manovich, the database embodies a radical change between a pre-digital and a digital world.

Many studies of new media acknowledge the approach of Friedrich Kittler, who deems storing and transfer of information as primary factors of change in the twentieth century (1990, 1999). In Kittler's view, media sculpt and steer people's perceptions and intercommunication (1999), just as media technologies are closely connected to the human physiology (1990). His thinking is of course about media and our doings with or by media, but it is as much a history of knowledge.²⁰ One of Kittler's great contributions is his focus on communications networks that obfuscate the division of hu-

²⁰ Kittler builds his methodology for writing histories of knowledge, and of science, on Foucault's definition of discourses (cf. Foucault, 2002b) and on Jacques Lacan's order of the physical reality (symbolic, imaginary, real) (Lacan, 2006). Kittler's mixture of the thinking by Foucault and Lacan leads to an interest in the internal logic of discourses, which leads him to explore the writings of the physiologist Hermann von Helmholtz, who was inspired by Edison's recording technologies for his own physical experiments (see Kittler, 1999, p. 28; Peters, 2004). Kittler develops a historiography of assessing the human-non-human relation by examining settings of communication, wherefore it, in my view, can be problematic to speak of his thinking as media materialism (cf. e.g. Parikka, 2012).

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mans and nonhumans.²¹ In honing in on communication, such a view on history somewhat aligns with the theoretical tradition of feminist posthumanism (e.g. Haraway, 1991; Hayles, 1999; Braidotti, 2013) and with ontological perspectives on computation (e.g. Hansen, 2004, 2015; Parisi, 2013; Bratton, 2016). Settings and transfers of communication are determinative for new media and the societal changes that they cause. After the turn of the twenty-first century, or the so-called digital turn, new media play a substantial role in the way people perceive, conceive of, and react to things, to each other, and to the world. Studies seek to understand the communication between entities in terms of, amongst others, networks (e.g. Galloway, 2010; Galloway & Thacker, 2007; Jagoda, 2016; Chun, 2017), interfaces (e.g. Galloway, 2012; Bratton, 2014; Pold & Andersen, 2018), and algorithms (e.g. Galloway, 2004; Parisi, 2013; Stiegler, 2014).

A formative strand of new media studies relates to cybernetics²², in that this theoretical tradition can be the key to understanding impenetrable systems of calculation and computation. Cybernetics is thus definable for networks and algorithms. Cybernetics as an area of research and thinking is developed in the 1940s by the mathematician Norbert Wiener, who regarded all systems to generally be the same; this goes for the systems of humans, animals, and machines (Wiener, 1950). These systems are networks that process data in basically the same ways. The networks are logical and determined, and they function due to 'feedback loops', which is an essential term in cybernetics as well as in new media studies in general. Feedback loops constitute the exchange of information in a communications network and they can be regarded as the self-reflection of any system (and simply as the modern conception of information). In cybernetics, feedback loops make sense of/with machines because feedback is joined

²¹ Mass media change the relationship between media and humans. Kittler (1999) speaks of so-called Man and views people as adjuncts to media technologies and systems. Decades prior to that, Marshall McLuhan (2001) famously argued that the medium is the message and that the content of one medium is always another medium, meaning that the communication and transfer of information in itself are so strong, that they trump any specific content that might be carried by them. For more on mass media's role in human history, see Peters, 1999, 2010.

²² Etymologically, the concept of cybernetics stems from Greek, *kybernétes*, which means steersman.

with information (cf. Hayles, 2010). Cybernetics can change the general discourse of information and disrupt common notions of embodiment (Haraway, 1991; Hayles, 1999), just as cybernetics can obscure logics of control due to systems that self-regulate via feedback (cf. e.g. Deleuze, 1995; Tiqqun, 2020). Thinking in lines of cybernetics points out that information is not only the transfer of data in and/or between machines. As philosopher Eugene Thacker (2004, 2010) amplifies, Biology is information too, and this fact feeds into terms of new media such as networks (Galloway & Thacker, 2007) and algorithms (Parisi, 2013).

Such movements of information create a self-sustainable structure in which the movements carve out the structure's infrastructure. The scope of such a structure can vary from the concrete and focus on literary texts in digital space (e.g. Kirschenbaum, 2008, 2021), over the abstract and consider humans and technology as coevolving (Hayles, 2012), to the ungraspable and reflect on planetary-scale computation (Bratton, 2016). Common for studies of new media is a necessary philosophical rethinking of agency. New media entail a shift from human agency to distributed agency (cf. e.g. Latour, 2005), which reintroduces an ontological interest in materiality as well as calls for an epistemological curiosity of processes and relationalities. Process philosophy and an attention to multiplicities fill a substantial part of the theoretical web of new media studies, for example when it comes to concepts such as ecologies (Guattari, 2000; see also Fuller, 2005; Hörll, 2017) and assemblages (Deleuze & Guattari, 1987; see also Bennett, 2010; DeLanda, 2016).

For my approach to the inner workings of DR's digital music archive, the trends and ideas summated so far in this section play a substantial role. To use /Diskoteket is to stream music, and streaming practices entail an interconnectedness of bodies, of people and machines, of cultural data and opinions, of historical awareness and uses and abuses of history. Such an interconnection, or an assemblage, continually repositions and is reconstituted in a rhizome-like manner (cf. Deleuze & Guattari, 1987). The digital music archive grounds on a mobility created by its infrastructure. Infrastructures make things move (Thylstrup, 2018; Straw, 2021) and they are constituted by materials, buildings and cables, resources and work forces. A digital music archive demands cultural techniques that spur the archive

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to mediate music. “At once things and relations”, Kyle Devine and Alexandrine Boudreault-Fournier write, “infrastructures are material forms of mediation that connect the worlds of culture and nature” (Devine & Boudreault-Fournier, 2021, p. 5). As such, consideration of infrastructures can widen our attention span and demystify the black box of the digital processes underlying the digital music archive.

The history of recorded music is a history of materiality. Kittler spoke of an oscillation between hardware and software, between culture being driven by material and symbolic factors (Kittler, 1992). Following that logic, the living conditions of recorded music has moved from engravings on shellac and vinyl to machinic code (Kittler, 1999; see also Devine, 2019b). This material history is an infrastructural history, in that the circumstances of record production, of technical and technological playback of music, and of storing and retrieving music have shifted. In Kittler’s approach, knowledge is found in materiality and not in the meaning of the material. Meaning arises from circuits of information, from communication, and this circuitry aligns with an infrastructural materiality.

Infrastructures in fact lead communication. They direct distribution of information and suggest possible interpretation. Because of this, infrastructures are the historicizing capacity of an archive, as they accentuate times that go beyond what is new in terms of technology. This is a media archaeological view on the potentialities of history (cf. Gitelman, 2006; Huhtamo & Parikka, 2011) that challenges the causal conviction of linearity as change. Variation as improvement is not necessarily changing the course of history. In the archive there exist multiple times that are made possible due to the infrastructural logic of the archive. In media archaeology, the archive can be approached by the method of variantology (Zielinski, 2006) and it can be analyzed by way of deep times (Zielinski, 2006; Parikka, 2017). Non-actualized aspects of the archive might impact the epistemologies of the archive as much as the actualized aspects, and thus they can be regarded as imaginary media (Kluitenberg, 2011).

The media archaeological rethinking of historiography extends the concept of the archive to include consideration of the media systems running the archive (Parikka, 2013, p. 28). The infrastructure of any archive guides the content just as it guides the historical understanding of the archive. The

archive is not just a fixed place for storing of cultural data. It never was. The archive is generative and its ontology is defined by processual qualities. This trait has become stronger with the digital archive. Historian Stefan Tanaka describes how digital information expands our past so that it “is not just becoming larger, it remains varied and is changing” (Tanaka, 2013, p. 36).

Media Technologies and Music History

I will provide here a brief note on two related takes on music history that put focus on mediality and technology. In recent years, the discipline of musicology has seen attempts to formulate historiographic approaches that do not necessarily focus on music. These attempts rather orbit around music. In the beginning of the 1990s, Gary Tomlinson stressed that musicologists focus too much on the music that they prefer and, even though they do ideological critiques, they are rooted in the logic of Western modernity. Tomlinson argued that the task of music researchers should be to leave the music as it is and instead “interrogate our love for the music we study” (Tomlinson, 1993, p. 24). Music, he stressed, is a part of people’s world-making processes. Two decades later, Tomlinson follows through on this thought when he tells the story of human modernity through a description of the conditions of music’s mediality, through a million years of music (Tomlinson, 2015). Technological mediation has always, from the inception of humanity, defined music. Tomlinson writes music history through notions of deep time and deep history and he maps how the technological and the social have always been connected.

Tomlinson’s view relates to Devine’s later notion of a ‘musicology without music’ (2019a). Devine’s notion is a method to accentuate music’s mediatic connections with, and it is a tactic that can describe and critique music’s political ecology (Devine, 2019b). Devine’s errand is to examine the materialities of communication in the tradition of Kittler and the German media theory following him (*ibid.*, p. 23), and he does so by investigating how music releases are made, what they are made of, who do the labor, and what can and will happen to the remains of music when discarded: “The point is that shellac, plastic, and data *are* music and that they instantiate not only recognizably musical experiences but also other

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forms of musical involvement and human investment that are only arbitrarily and ideologically distinguished from “music” as such [his italics]” (ibid., p. 183). Such musical involvement and human investment get visible in the practices of archiving music releases, which the present study is a testament of.

History and Time

It takes an openness toward temporal fluidity to think about the history of recorded music in terms of presentation, interactivity, and relationality. It is to think about it in terms of communication, change, and mediality. In order for me to create a foundation for understanding the historicity of recorded music, to see the historical trajectories within and around tracks and releases, I need to abstain from conceptualizing music history in a chronological frame. DR’s digital music archive contains many oddities and potentialities that might change common perceptions of artists, releases, tracks, or compositions, if they are amplified. Yet, such narratives stay forgotten in a linear logic. Here, I show how powerful neo-liberal economics can be when implemented as an ideological management (cf. also Born, 2005a) striving for rationalization (cf. Chapters Three and Five, and Articles Three and Four). I call this a politics of optimization. It is a logic that applies music history as a means to ensure progress in music radio production and broadcasting. DR’s institutional take on music history is a history of progress.

The conceptual outset of media archaeology is important for my understanding of time as circular and deep, going through matter and materials (cf. Zielinski, 2006; Parikka, 2015, 2017), and as critical for communicative exchanges (e.g. Chun, 2008; Ernst, 2013a). Such a theoretical attunement finds its roots in post-structural theories of history, such as Foucault’s archaeological approach (2002b) and genealogical method (1995). To Foucault, archaeology is a rejection of reading straightforward narratives of progress in the historical record, and genealogy is a critical mindset of suspicion toward common procedures in which the reader de-familiarizes events and points out systemic issues of power and control. Parikka (2012) underlines that media archaeological examination must begin in the middle

of things,²³ which is an epistemological point of departure with reference to the rhizomatic thinking of Deleuze and Félix Guattari (1987) as well as Deleuze's concept of *difference* (2014). An important errand for media archaeology is to invert time and deflate the idea of history as progress.

History is the study of change, and it is important to understand how change happens. The idea of history as progress roots in the logic of Western modernity and is thus a measurement by which order can be enacted. As Benjamin (2015c) puts it, such a perception is to meet the future with one's back turned against it. If one is not open toward the "differentials of time" (Benjamin, 1999, p. 456), history will be caught in the storm of progress that keeps open the angel of history's wings and "propels him into the future to which his back is turned" (Benjamin, 2015c, p. 249).²⁴ To perceive of history in such a manner is to understand historical time as constructing spaces that we all navigate in.²⁵ According to Benjamin, history is defined by nonlinearity and circular movements. History must take heed of the pasts and how they are enmeshed. Pasts cannot be experienced simultaneously, and therefore they can be said to function within an interdependence of memory and forgetting (cf. Ricœur, 2004). Paul Ricœur discusses why some historical events gain prevalence over others and he points to the problematic issue of forgetting as an inevitable part of memory. As the media archaeology of Wolfgang Ernst (2013a) hints at, such motions of memory are ingrained in the digital archive as well. Memories might be subdued, but they are always already there. Deleuze and Guattari (1987) would argue that all pasts are a part of what is experienced, because pasts are singular plateaus binding otherwise heterogeneous elements together. History is change; it is a continual relativization of the state of things, which acknowledges that things can be understood in dif-

²³ For an understanding of historical movements via media and mediation, see Galloway, 2014.

²⁴ In Article Three (Pedersen, 2022a, p. 69), I read Benjamin's metaphor of the angel of history into the institutional progress of DR as well as into the discursive progress of music history.

²⁵ Henri Lefebvre makes such an analysis of historical time and argues that it creates the space of nation-states, all the while time is being "solidified and fixed within the rationality immanent to space" (1991, p. 21).

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ferent ways and make for different narratives. If the pasts are not recognized, there will be no future (Hartog, 2016).

The present is where change happens. The present contains all pasts, as an infinite historical record that can be consulted in order to understand present events. Tanaka (2019) has recently argued that history as such consists of multiple times that can induce an experience of change as happening within a metric of chronological time, precisely because history is not chronological. Tanaka states that:

“[t]hese multiple times coexist; they might be independent, and at different points, they interact, coincide, conjoin, or collide. From this activity, interaction, repetition, or recurrence give rise to patterns and commonality – the spatialization of time” (ibid., p. 145).

This epistemological grip on history is formative for my historical understanding, and it fits DR’s digital music archive as well, in that its memory system is constructed to fit abundance. Tanaka’s aim is to decenter chronology by rejecting the temporal logic of linearity and causality; the general conceiving of social structures is built on clock-time that materializes in watches and calendars, which is a Western construct of rationalization and order.²⁶ In his decentering of chronology, Tanaka amplifies a relation between media archaeology and a repurposed past. He explains that the goal of Siegfried Zielinski (2006) is to unmark time-periods and events as old or outmoded and instead find “modes of understanding and interacting that might offer suggestions for our future” (Tanaka, 2019, p. 156). He continues that the goal includes searching “for hints for how people and things interoperate (and how we might re-present these complex interactions)” (ibid.).

²⁶ Tanaka (2019, p. 42) argues that this linear understanding is ingrained in historical discourses due to the Enlightenment’s reckoning of chronology. In terms of music history, this perception is mirrored in Lydia Goehr’s discussion of the work-concept (2007), which, she argues, is an idea stemming from the institutionalization of history around 1800 that puts discursive power and chronological logic into music from before 1800 as well as into music from non-classical genres. Goehr also sees aspects of a chronological logic materialize in constructions that are meant to be historical in a certain way (2008), when she analyzes the monumentalism of intentional ruins by Albert Speer during the Third Reich as a “pastness of the work”.

The structuring of information and the levels of communication in DR's digital music archive can make users of /Diskoteket realize that the history of recorded music was always nonlinear and negotiable. By introducing nonlinear ideas of history to DR's digital music archive it becomes possible to hone in on its digital infrastructure and assess how it constitutes the content of the archive and how it sets out to use recorded music's pasts. I examine how infrastructural qualities are inherent to music streaming, and by zooming in on DR's digital music archive, I show how two historical convictions can operate next to each other. I will elaborate on this in Chapter Three. DR's digital music archive supports the linear status quo of the history of recorded music as well as disrupts it.

A Note on Archival Studies

To shed light on the elements of DR's digital music archive that facilitate how music is presented and can be interacted with, I briefly need to reach into some deliberations that see history as narrative and archives as charged political vessels. First, I will bring up the archive as such, and second, I will touch upon digital archives.

Foucault (2002b) does not see the archive as an institution, but rather as a law for what can be said. He conceives of the archive as a system of statements that make up discourses (ibid., p. 146). For Foucault, the archive indicates a theory of history that makes it possible to interpret events in juxtaposition. As an order of discourses, the archive is an order of history that is heterogeneous and moves along multiple lines. The discursive formations that can be read out of an archive are biased, even systemic; but, to grapple with such discourses is to understand, and ultimately detach, the politicized systematization of the archive. Relatedly, Jacques Derrida (1995) illustrates how the concept of the archive is relevant for critical theory. Where Foucault traces discursive rules and epistemes from the Renaissance and forward, Derrida discusses the origin of the term 'archive' in Greek antiquity. Etymologically, archive comes from *arkhē*, which can mean both beginning and commandment, and Derrida argues that this linguistic duality connects the archive to the way it, historically, has been part of government and part of power. He is further interested in the *ark-*

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heion, which etymologically is the building of an archive: “initially a house, a domicile, an address, the residence of the superior magistrates, the *archons*, those who commanded” (ibid., p. 9).²⁷ Hereby, Derrida creates a connection between the archive as an institution and the political power governing it.

Both Foucault’s and Derrida’s definitions are somewhat restrictive as to what archives are, what they can do, and what they store. Both views are also limiting as to the technologies through which they function. Yet, they shift the focus on the archive as a source, to the archive as a subject, and thus they open up for critical and political readings of archives (cf. e.g. Carter, 2006; Cifor & Wood, 2017). Archives enact an art of governance (cf. Stoler, 2002, p. 269), which is the main locus of Ann Laura Stoler’s methodological framing of making ethnographies of, rather than extractions from, the archive (ibid., p. 276). Stoler examines colonial archives and accentuates that we ought to read such archives through their systems, by seeking to understand the people evolving the archives to see what their intentions could have been. She speaks of moving along the archival grain (2009), which is an approach that can crack open the regimes of colonialism by emphasizing how colonial archives are systems of expectation (Stoler, 2002, p. 276). The archives represent a political system and must be understood as such, as active parts upholding the political system. There is a power in the production of the archive itself (ibid., p. 272) that is foundational for exercising a true critique of the archive. As Stoler points out: “We need to read for [the archive’s] regularities, for its logic of recall, for its densities and distributions, for its consistencies of misinformation, omission, and mistake – *along* the archival grain [her italics]” (ibid.). In reading political power into the infrastructural movements of DR’s digital music archive, I am informed by Stoler’s methodological framing.

There is a close connection between new media studies and archival studies. In media archaeological thinking the digital archive is both a concept for knowledge production and a configuration for aesthetic experi-

²⁷ This reading of the archive is sometimes related to thinking within new media and cybernetics, in that Derrida with this reading provides with a theory that fits protocols, networks, and control.

ence (cf. e.g. Parikka, 2012; Ernst, 2013a). The digital streams of information make up databases and their connections to digital platforms. Thus, the digital archive cannot be perceived as a stable space for storing of data. Rather, the digital archive is a certain medial construction that contains data, which can be interacted with (cf. Kirschenbaum, 2021, p. 27). Digital infrastructure is a key component in the digital archive, as it is the infrastructure that makes communication of stored data possible. Digital infrastructures make it possible to get subsumed by digital media and intelligibly move around on a digital platform, from interface to interface. Interfaces are important for the digital archive, as they are the thresholds into the archive. When surfing a digital platform, the user encounters numerous interfaces, meaning the immediate interface changes again and again. Wendy Chun sees this continual change as “productively spectral” (2011, p. 60), as a way to rework the interfaces. By attuning to the interfaces and considering them as having agency, it is possible to widen the understanding of the underlying processes of computation. As with Stoler’s methodology, this is to read political power into the digital archive.

I round this section off with a note on metadata. Metadata have always been essential for the archive, as they are the cartographic information making navigation and searching possible. Museums, libraries, and music collections all have different traditions and metadata practices that are fortified by institutional ideas about the data they store (Pettersson & Dahlgren, 2021, p. 108). Search retrievals and contextualization depend on strict taxonomies, otherwise the archive will lose its purpose (*ibid.*, p. 109). Digital archives normally are viewed as structurers of big data, and to do a critique or tell histories of big data, metadata are needed – otherwise, it will be impossible to know about values and ideologies of the people producing the archive (cf. Acker, 2021, p. 321). Metadata are guiding future uses of the archive, designed to find, protect, and access what is archived (Gilliland, 2017). Yet, as they are part of the archive, they are also part of an institution. Thus, archivists, or experts of a given archive, are naming and structuring the archive via metadata techniques that will always make biases present (Gartner, 2016). In terms of the digital music archive, metadata ensure a materiality in the digital music files, making them perceptually tangible. Morris describes metadata as micro-material paratexts that

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“condition the ways objects perform, how they look, and how they are received” (2015b, p. 83). Metadata envelop the music and make it disposed to interrelations and continual contextualization.

Situating the Thesis

I move between a selection of issues ranging from music radio and recorded music, over history, to software and digital archiving. These issues go together and form an interdisciplinary study that is curious to understand how the digital archiving of music can influence music streaming practices. I tap into a web of ideals and practices that all impact the prospects of the history of recorded music. By that, I situate the thesis within music radio studies and connect it with elements of music streaming studies, such as searching, presentation, and musical experience. Yet, it will be imprecise to say that I deem one particular strand of research to be of more importance than others. That much is clear from this chapter’s literature review. I draw inspiration from musicology as well as new media studies; from history and historiography; from archival studies and from cultural and critical theory. And as Chapter Three will show, I also draw on ethnographic methods.

I develop a material perspective to the study of music radio at DR that looks at the actual music of the broadcasts, not as sound but as ordered and categorized digital entities that direct music radio production aspects. Via such a perspective, I examine the structuring and the potential communication of music releases in DR’s digital music archive. Such a perspective has been largely absent in relation to studies of music radio in general, including recent studies of music radio at DR. To amplify this perspective, I navigate in the overlaps between music streaming, digital archives, music radio production, and music history.

3. Methodology and Material

In this chapter, I describe the outset for the analysis by way of presenting my methodology and material, and I put attention to the second part of my research question: *How is the communication of the history of recorded music on /Diskoteket configured by the digital music archive's infrastructure?* It is important to keep in mind, as this is a compilation thesis, that there are singular parts (the four articles) and there is the thesis as a whole (that is, this cover paper plus the four articles). This duality is imperative to be mindful of when addressing methods as well as materials, as some are present in both parts, others only in a single part, and others again are only present in some of the articles but still play a part in combining all of the thesis' aspects. I begin the chapter by describing my methodology. I put focus on how parts of my research have been informed by ethnographic methods; I illustrate my readings of /Diskoteket's interface and DR's digital music archive's infrastructure; and I show how the study has used historical methods. Thereafter, I describe my empirical material. I go through the process of obtaining and treating my material, and I account for the ways that I have assembled a combination of interviews, observations, and notes on exploration by usage. I round the chapter off by reflecting on ethical issues, including the potentially problematic issue of being close to the material I study.

Methods for Making a Material Crystallize

In order to understand the inner workings of DR's digital music archive and amplify its potential for constructing histories of recorded music, an important first step was to understand the digital music platform /Diskoteket through descriptions of doings and experiences of employees

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at DR. A widened understanding of how this platform appears to its intended users helped to qualify an interpretation of my own usage and experience of it. In the following section, I will show how such knowledge to some extent has been gained through ethnographic methods.

Over the course of the last century, the concept of ethnography has evolved and been repurposed by a number of disciplines one way or another interested in the unfolding of human lives (Hammersley & Atkinson, 2019; Andersson, 2021, p. 63). In terms of music radio studies, the methods of ethnography have been used to gain insight into structural problematics of public service institutions (e.g. Born, 2005a) as well as to describe how certain personalities can sculpt the identity of a radio channel (e.g. Wallevik, 2018). By going there and being there, my study has emerged in dialogue with such music radio ethnographies.

I engage in different approaches on an ongoing basis. In December 2019 and January 2020, I conducted ten interviews with employees at DR working with music communication²⁸, and during the spring of 2021 I did three two-hour in-depth interviews with Thomas Dose, the head of the Department of the Music Archive at DR, and in spring 2022 he and I had a few loosely based conversations and e-mail correspondences as well as a single two-hour in-depth interview. This aside, I have observed and engaged with employees at the Department of the Music Archive and I have participated in internal meetings and day-to-day discussions of tasks and strategies. The methods have provided me with a basis for understanding the complexity of the department's work. In addition, between September 2018 and August 2022 I did a high amount of explorative usage of archival software, of /Diskoteket and of broadcasting platforms. Such a methodological tactic makes it possible to capture (a peek into) people's own experiences of their doings, as well as to observe said doings in context. What people say and what they do are equally important, though not always the same. It is imperative to understand both as a nexus of meaning-making. In order to create a widened understanding of how people use and experience /Diskoteket as a work tool as well as a music streaming platform,

²⁸ To avoid misunderstandings I will refer to the ten interviewees as either employees at DR or as my participants.

and to get a hold of their perception of this platform's relation to their individual understandings of the history of recorded music, I need to understand their everyday, trivial connection to the platform. When put into a media studies frame, the overarching question, as seen from a standpoint informed by ethnographic methods, is to work for creating an understanding of how technology is meaningful to people in their everyday doings. This question, transferred to the specificity of the organization of DR and with a strict focus on /Diskoteket, fills up a substantial part of my approach. Via interviews, I obtain knowledge about the role /Diskoteket plays in the practical and editorial work processes that are part of DR's music communication, and through active participant observation (cf. e.g. Spradley, 1980; Hammersley & Atkinson, 1994) I test and review the issues described by the employees at DR. This approach provides understanding of how the technology works and let me realize the extent to which it impacts my participants' workdays.

Above I mentioned that my engagement with ethnographic methods is an important first step in order to penetrate the organizational formation of DR's music archive. I see such an approach as widening the understanding of how this formation is structuring the ways that recorded music is presented. I work from the hypothesis that an openness toward experiences of the users of /Diskoteket can inform both my archival research and my own doings with the platform. This of course must be taken with reservations, in that I come from a starting point as a former fulltime music registrar in the Department of the Music Archive at DR and still have a freelance affiliation with the department.²⁹ Perhaps, if I did not possess the insider perspective

²⁹ Since I started my employment as a doctoral student in September 2018, I have been related to the Department of the Music Archive at DR on a freelance contract. Here, my area of responsibility is to maintain and evolve the part of the digital music archive that has to do with *egenproduktioner* [in-house productions], which is an area of the archive that I have chosen to leave out of this study due to its very different character that does not relate to the subject matter of the history of recorded music. I also decided to omit this part of the archive from the very beginning because of my contractual involvement that focuses on these productions. My empirical material is navigating around conflicts of interests, and that is an active and productive part of my approach, but to include the perspectives of *egenproduktioner* in my research would be to ignore the compound of positions that I, consciously, step in and out of in this study.

of the archive, I would regard this differently. But, acknowledging my insider-knowledge as a point of departure for venturing into DR's music archive has led me to do interviews and participant observation early on in the process. To be within DR's music archive is an important part of my method that requires reflexivity and continual assessment of my own position and relation to the digital music archive's infrastructure.

Ethnography, Reflexivity, Technography

Acknowledging my own chimeric position in doing this research at DR's music archive had repercussions for the way I had to conceive of doing participant observation. I repurposed my approach due to empirical changes spotted along the way, and thus one of my strategies was the following of people's actions and associations. To follow people and to follow the thing (cf. Marcus, 1995) is part of the method of being within the music archive. In order to understand the multiplex of data relevant for producing knowledge of DR's music archive, it is imperative to assess all the affective dimensions of the material, including my own.

Approaching DR's music archive with an array of methods that allows me to paint a picture of how the history of recorded music is expressed as a multiplicity leads me into a tendency of gathering information as a mass archiving of all kinds of data. But what is of importance? By obtaining too much information I might risk missing crucial elements of what makes the culture affiliated with music communication at DR unique, just as it might obscure my readings and analyses of the operationalization of metadata in the MUSA database. Data as an ideology has led us to a shift toward big data, which in the end might obfuscate the picture more than deepen it (Markham, 2017). We ought to ask ourselves: how and why am I doing research in this or that situation? 'The more data the better' is not necessarily a helpful mantra because it could lead me to believe that I have access to a complete picture (Baym, 2013).

I have been aware of how and when I am giving agency to the different aspects of my material. While doing interviews as well as participant observation, I have been conscious of my own position and thus built reflexivity into my methodology (cf. Mao, 2018; Coffey, 2018, p. 45). Reflexive obser-

vation has been part of my approach in exploring functions of /Diskoteket. To integrate reflexivity is to get a wider understanding of the object of study by giving value to one's own reactions. Reflective practices are important in the active participant observation because of the tension between the dual roles of participant and observer. Reactions occurring as a result of interactions with technology, including online platforms, also need reflexive observation (cf. Markham, 2008). Reflexivity can help one to be aware of biases and assumptions as well as cope with one's emotional involvement. When it comes to the discursive formations emerging in my participants' thoughts on music history and the use of digital music platforms, it would be dishonest to leave out my own perspective. Especially due to my affiliation with the Department of the Music Archive. The method of being within the digital music archive is closely related to reflexive observation, in that my presence is the reason for my perceptions. I am embedded in my material (cf. Hine, 2015), and in order for me to see the digital music archive's internal lines I need to reflect on my own convictions and expectations, and on my own idea of the history of recorded music.

I tend to put reflexivity into my actions as well as intentions. In order to understand my object of study, I go into dialogue with people who are experts in their respective fields. Music registrars and radio hosts at DR have expert, practical knowledge of how DR's digital music archive works and how it is used in daily routines, and by "linking expertise to skill, competence, attention and practice" instead of to the "skilled knowing" of an "intellectual" (Boyer, 2008, p. 39), I get a glimpse of the institutional lines within the archive. I regard skilled doing as definable of an expert and skilled knowing as definable of an academic and an intellectual (cf. *ibid.*), however these are fluid positions that one constantly moves between. To seek knowledge from people with skills and competences seems the right way to go, and the fact that I myself have such skills and competences makes me capable of reading and analyzing DR's digital music archive in a qualified manner. Yet, as I am also an academic studying an object that I am an expert of, including studying other experts, I walk a line of critical distance. It is imperative to acknowledge that the positions are fluid and that there is no dualism between them. I must recognize how and when I speak as an insider and how and when I make judgements as an academic.

To produce data from my own position as an expert of the object of study can be described as *technography* (cf. Kien, 2008). As a methodological concept, technography is a way of developing ethnographic deliberations so that they are seen as part of interactions with technology. It is to view an everyday social situation involving technology as dependent on technology (ibid., p. 1102). It is to understand what people are doing with technology, and to understand how they are doing it and why they are doing it. It is to create an understanding of how technology is meaningful to people in their everyday doings. As such, technography is a methodological way to frame the work relations of the people I have interviewed, just as it is a reflexive take on my own doings with DR's digital music archive. Describing the technological experience of using /Diskoteket and making changes to the MUSA database has been a way for me to situate DR's digital music archive as a construction that has impact on how histories of recorded music can emerge, converge, and be created anew.

Usage of the Digital Music Archive

My insider perspective lets me read DR's digital music archive from within, and this provides me with a complex picture of the digital music archive's infrastructure. By excessive use of /Diskoteket and the registration software MUSA Reg, I get a detailed empirical experience of what the infrastructure behind the digital music archive does to the visual presentations of commercially released music. From the very beginning of this study, I have looked for what the infrastructure does, and how it does it. By continual usage of the MUSA database, I get intimate knowledge of how the infrastructure works and how it determines the interfaces of the digital music archive. In the following section, I describe my readings of /Diskoteket and hereby explicitly reflect what it means to be inside DR's digital music archive. Thus, I amplify how I am producing my knowledge of the archive from within. First, I will describe how I have been doing analyses of /Diskoteket's interfaces. Then I will explain some basic functionalities of MUSA Reg, which constitute the appearance and interactivity of /Diskoteket. I give details about how I have been using this software to widen my understanding of the digital music archive's infrastructural movements of metadata.

Interrelations of Interfaces

In order to do qualified analyses of interfaces on /Diskoteket, I have sought to understand how the platform works in normal everyday use, and I have aimed at describing how it looks. From my insider perspective, I know that some of the key functionalities of /Diskoteket focus on a practice of creating relations between tracks in the MUSA database. This practice of operationalizing metadata is determinative for a track's immediate interface on the platform.

It is straightforward that the metadata of a track will be shown on the track's interface when registered in the MUSA database.³⁰ This is a simple procedure of highlighting annotated information on the interface of a track in order to deepen the picture of said track. Such metadata can be affiliated with categorical groups, so-called meta-tags, meaning that a categorical group will be accessible via a link on the track interface. As an example, a recording country is such a group. But, in DR's digital music archive some elements of a track's full metadata-picture can be connected to other tracks. This means that the surface that meets the eye is not just a surface of user-friendliness. In such cases, the metadata are operationalized and set to make the user experience transferrable.³¹ In Article Four, I provide an analytical example of relations between metadata that makes the interface of a track point to another interface in order to deepen itself. I reference this example below.

³⁰ The interface as a term indicates an array of contact points between humans and machines, especially computers, but also between layers of software and hardware, and between communications of data in digital networks (see Cramer, 2011).

³¹ This function of the interface shows affinities with the concept of the metainterface (Pold & Andersen, 2018). The interface appears generalized at the same time as it is abstracted and can lead across the archive. The interface is in front of the user of /Diskoteket, but it might lead the user nowhere specific.

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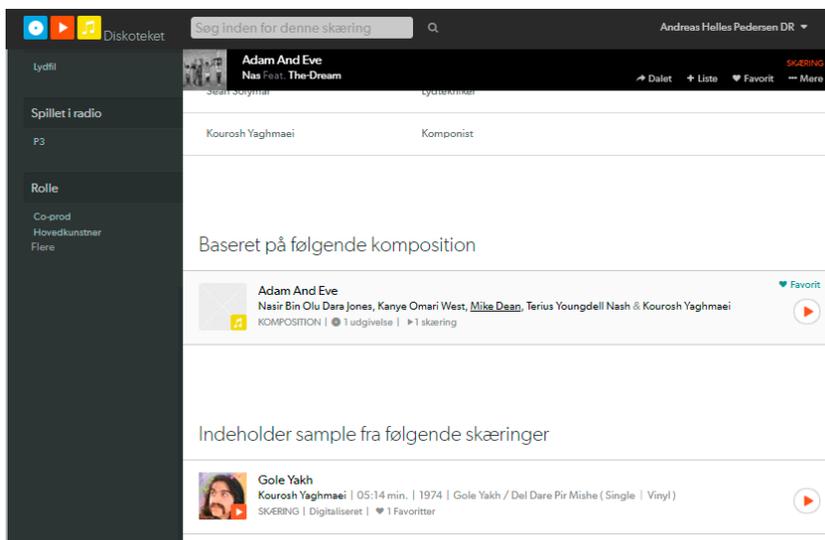


Figure 1. Segment of the track interface for Adam and Eve by Nas that shows the interrelation of metadata between this track and Kourosh Yaghmaei's track Gole Yakh. Source: DR.

An interface on /Diskoteket can link to otherwise unrelated layers of the digital music archive. I have analyzed interfaces of tracks in order to see how other tracks can be actualized and set in motion if they are inter-linked. Figure 1 shows a screenshot of the lower part of the track interface of American rapper Nas' 2018 track *Adam and Eve*. Here, a section is shown: 'containing sample from the following tracks'.³² *Adam and Eve* contains a sample from the 1974 track *Gole Yakh* by Iranian progressive rock artist Kourosh Yaghmaei.

³² My translation.

Within this interface there is a gateway to another interface.³³ When I as a user of the platform let myself be transferred from one interface to another, I cross temporal and genre-based boundaries.³⁴ By one press on a hyperlink, by one click on the mouse, I move from a context of 2018 hip-hop to 1974 progressive rock. Further, such an action also leads to a crossing of geographical and cultural space, from USA to Iran and from an African diaspora to a Middle Eastern context of pre-revolutionary Iran.³⁵

In Figure 2, the interface of *Gole Yakh* can be seen, which meets the user after following the hyperlink. In following this sort of interfacial shifts, I allow myself to be open for an aesthetic situation of practicing a historicized listening, which I account for in Chapter Four and Article One. As a listener and a user of /Diskoteket, I can engage, and act and react, in a referential listening environment that is potentiated by the operationalization of metadata. In Article One, I argue for such aesthetic situations as processes of becoming (cf. Pedersen, 2020, p. 108; see also Deleuze, 2014; Deleuze & Guattari, 1987). These aesthetic situations occur because DR's digital music archive presents the history of recorded music as a many-sided association of releases.

33 My readings of interfaces are generally informed by Galloway's understanding of computers as an ethic, as machines that take "our execution of the world as the condition of the world's expression" (2012, p. 23).

34 Galloway speaks of interfaces internal to an interface as *intrafaces* (2012, p. 40). He sees the interface that is not yet there as an aesthetic quality of the interface, as a "zone of indecision" (ibid.): "The intraface may thus be defined as an internal interface between the edge and the center but one that is now entirely subsumed and contained within the image. This is what constitutes the zone of indecision" (pp. 40-41).

35 Benjamin Bratton (2016, pp. 219-250) speaks of a similar logic within the *interface layer* of his complex concept of *the Stack*. The Stack denotes the planetary-scale computation of our contemporary times that effects our geopolitical realities. The Stack is an accidental megastructure. Within this structure, interfaces let the actions of users affect the infrastructures or let the infrastructures affect and guide the users. Interfaces translate and simplify possibilities, and they mediate between people, things, and technologies.

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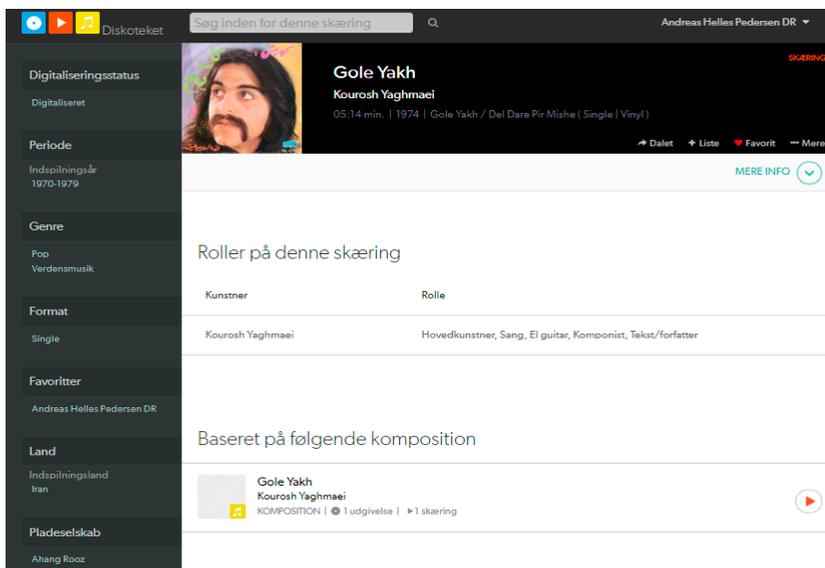


Figure 2. Segment of the track interface for Gole Yakh by Kourosh Yaghmaei. Source: DR.

Reading interfaces, following linked information, and rereading interfaces of /Diskoteket has been integral to my method of usage. Such an approach has led to a new way of seeing and listening, that is, to a new way of perceiving the digital music archive. And this new way of perceiving the digital music archive grows out of /Diskoteket's functionality and conducts of navigation. As interfaces, /Diskoteket is an intersection between two intelligences: the intentional user and the complex infrastructure of the MUSA database (cf. Bratton, 2014). This manner of reading and assessing the interfaces has revealed that the appearance of the platform is deeply dependent on the archive's sensibilities of metadata. The interfaces come from the MUSA database, and as such they are reliant on the infrastructure of the digital music archive.

Uncovering Infrastructure

For me to unfold a qualified understanding of the interrelated interfaces of, for example, *Adam and Eve* and *Gole Yakh* that I described above, I had

to move beneath the interfaces. I had to understand the digital infrastructure of DR's digital music archive. This infrastructure is complex and capable of telling concurrent histories of recorded music. Yet, the infrastructure is not opaque and working in the shadows by way of self-sufficient algorithmic processes (cf. e.g. Bratton, 2016). The design of the digital infrastructure of DR's digital music archive is organized in the MUSA database, and it is within this infrastructure that metadata are operationalized and made to hint at diverse cultural contexts. The digital infrastructure of DR's digital music archive echoes the archival strategies of the Department of the Music Archive, and ultimately it resonates aspects of DR's institutional lines.

I needed to acquire an understanding of how the digital infrastructure of the MUSA database worked, which I could get through continual usage of the registration software MUSA Reg. I have negotiated clearance for using MUSA Reg as part of my material, meaning that I am allowed to describe its configuration and reproduce screenshots. To go into this software, to learn its mechanisms by usage, provides access to the MUSA database, and thus such a method is to scrutinize the digital music archive from within.³⁶ Within this piece of software, I can see how tracks can be related to other tracks. I can see that the module for creating relations between tracks offer relations such as the abovementioned sample-relation that provides track-relevant information to be shown on a track's interface and, due to the module's way of operationalizing metadata, creates a mobility for the user to traverse the digital music archive by one click. I can also see that the module contains a type of relation, which is called *super-relations* in the vernacular of the music registrars. These relations create a power-structure between tracks, where a track can be deemed primary and trump other tracks that are deemed secondary (for a political view on digital infrastructures, see Manovich, 2001; see also Galloway, 2012, pp. 7-10). Secondary tracks are inferior to the primary tracks to which they are aurally identical.

³⁶ The access to the MUSA database by way of using MUSA Reg does not provide a direct access. As I am no programmer or engineer, I do not have the skills needed to read the coding of the digital infrastructure. Yet, through continual usage of MUSA Reg I can see how the interconnections of modules that create relations between metadata work, and I can experience the effects and consequences of connecting data and metadata.

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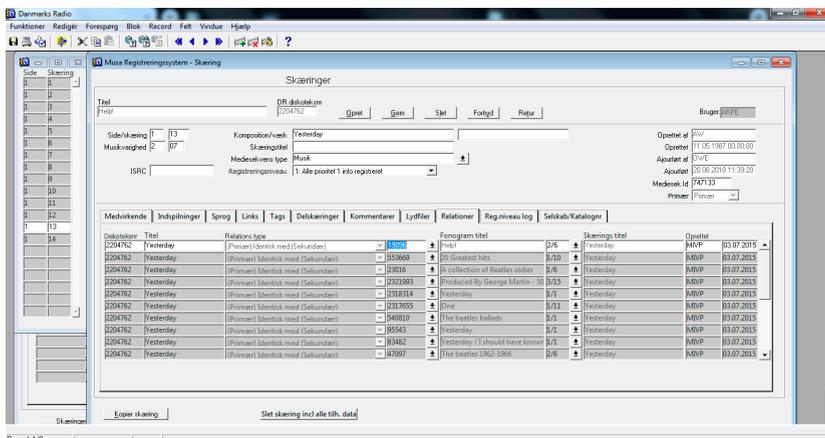


Figure 3. This screenshot shows the relation module on the track level of *Yesterday* on the album *Help!* by The Beatles in MUSA Reg. All tracks shown under ‘Relations type’ [type of relation] are from different releases, most of which are compilation releases. When it is explicated that *Yesterday* from the album *Help!* is ‘(Primær) Identisk med (Sekundær)’ [(Primary) Identical with (Secondary)], the digital coding makes sure to hide all the secondary tracks in search retrievals. Users of /Diskoteket can still enter the interfaces of all releases containing these aurally identical versions of *Yesterday*, but if they try to enter the track interface from one of these releases they will be transported to the specific track interface from *Help!*. The power-structure of making primary-secondary relations is thus unmistakable. Source: DR.

Figure 3 exemplifies how this power-structure works in practice. It shows the interface of the track *Yesterday* from the album *Help!* (1965) by The Beatles in MUSA Reg. In this screenshot a long list of aurally identical tracks can be seen that this specific registration is considered primary to. In working with this software, I can see how the option of choosing to make a super-relation is a way to structure the database, so users of /Diskoteket only get to see and access what is intended by the Department of the Music Archive. I spot a problematic issue here, which is that users are unable to see a given track in all its diverse contexts, and furthermore when searching for tracks, users are led to believe that the archive is smaller than it is. In taking on DR’s digital music archive and MUSA Reg in this way, I have been informed by Stoler’s methodological approach of doing ethnographies side by side with extractions of the archive, as I ac-

counted for in Chapter Two. I am inspired by Stoler's approach in my way of opening up DR's digital music archive, in that it helps me in viewing the music archive as an institutionalized entity representing the organization of DR. To aid my understanding of DR's digital music archive, I need to understand the institution of DR (cf. Stoler, 2002, p. 275). Even though I reveal that the Department of the Music Archive works in ways that go against the institutional lines, the archive is still a product of the institution and in fact strengthens the position of the institution. The digital music archive represents the institution, which, no matter my striving for objectivity, I also represent as an affiliate. I can see the distributions, the power in the production of DR's digital music archive, because I am working from within the archive while researching it. I take advantage of my position and deliver insights that otherwise would have been impossible to obtain. Yet, to be within the digital music archive also proves to be an impediment, which might influence my understanding and analysis as well as my way of describing appearances and functionalities of /Diskoteket. This is an ethical consideration that I address at the end of this chapter.

I look at the power-structure exemplified with *Yesterday* through the software MUSA Reg. This practice of creating a hierarchy between aurally identical tracks is to make omissions, to create silences in the archive.³⁷ It seems to be a systemic organization of the MUSA database. Yet, as mentioned, other options are available (for more on control and freedom in digital networks, see Galloway, 2004; Chun, 2006; see also Deleuze, 1995). My usage of MUSA Reg has showed that the module for creating relations contains multiple options that differ from the primary-secondary logic.³⁸

³⁷ In relation to archival silences, I am informed by Rodney Carter's conception of the archive. He sees the archive as an arena for the powerful to deny certain groups a voice. He writes: "The power to exclude is a fundamental aspect of the archive. Inevitably, there are distortions, omissions, erasures, and silences in the archive. Not every story is told" (Carter, 2006, p. 216).

³⁸ In the relation module on track level, the music registrars can make super-relations and deem a track primary or secondary to another track. But, they can also choose to make interrelations between tracks. The options for interrelations are to deem a track as: a cover version of another track; a sample used on a track; a different version of a track (e.g. with different lyrics); an edited version of a track; as part of a mash-up; as part of a mix; an instrumental version of a track; and as a remix of a track.

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This means that I as a music registrar have control of how a track will come through. If I make an error, an aurally identical version of *Yesterday* that appears on a compilation release can, as an example, be shown as a cover version instead of being occluded as a secondary track. My insider position can thus work as a way to make interventions into the digital music archive. It has not been part of my methodology to make interventions due to the fact that I am affiliated with the Department of the Music Archive and have responsibilities in that regard. Nevertheless, by having access to the innards of the digital music archive, to its control room so to speak, I can see how I can create alternative relations that would obfuscate otherwise agreed upon lines in the history of recorded music. To approach DR's digital music archive from within is a fundamental method for understanding the trajectories of recorded music. To observe the lines of the MUSA database from within and to see how metadata can be related and operationalized in decisive ways has proved to be a tactic for me that challenges what I think I already know about the history of recorded music.

My approach turned out to be a way of exposing elements of DR's digital music archive's infrastructure. This revealed how simple procedures of registering music metadata in the database might create massive reverberations for the appearance and narratives of /Diskoteket. Such direct doings with the digital music archive exhibit that "infrastructures are systems of knowledge and classification, measures and standards, storage and retrieval" (Devine & Boudreault-Fournier, 2021, p. 4). Thereby, infrastructures can never be neutral. They are many things, working underneath more or less everything. As technical and cultural systems they are what make things happen (cf. *ibid.*, p. 5; Larkin, 2013). My insider perspective of the MUSA database shows me how the infrastructure makes users of /Diskoteket experience the platform in certain ways that might test their views and convictions.

Via an uncovering of parts of the MUSA database's infrastructure, I have been able to detect a mediatic awareness internal to DR's music archive. My way of inspecting the interfaces and the modules of options in the MUSA Reg software has shown me how the physical music archive is lurking underneath the interfacial presentation of /Diskoteket. Surfaces, if relevant, are penetrated by physical formats, even though the music in

question is digitized and presented and made listenable in a digital audio format. In the case of tracks and releases that are deemed primary, it is possible to see an infrastructural relationality with tracks and releases that are deemed secondary: when I click on a secondary unit, I will be transported to the interface of the primary unit, but I can see that the secondary unit is standing out in the URL, as exemplified in Figure 4. My readings of software and interfaces tell me that the infrastructural logic of DR's digital music archive is created so as not to forget how the history of recorded music connects through time, through formats and archival methods (on mediatic awareness and formats, see Sterne, 2012).

The screenshot shows the DR Diskoteket interface for the track 'Yesterday' by The Beatles. The browser's address bar displays the URL 'diskoteket/#section=track&id=2317655-1-11', with the track ID '2317655-1-11' circled in red. The track details table includes the following information:

Type	Musik	Diskoteksnr	2204762-113
Indspillet	14.06.1965, Storbritannien	Oprettet af	AW (11.05.1987)
	EMI Studios, London	Opdateret af	OWE (20.08.2018)
Sprog	Engelsk		

Below the track details, the 'Røller på denne skæring' table lists the following roles:

Kunstner	Rolle
Paul McCartney	Sang, Akustisk guitar, Stryger-arr., Komponist
George Martin	Stryger-arr., Producer
Tony Gilbert	Violin
Sidney Sax	Violin
Kenneth Essex	Bratsch

Figure 4. This screenshot exemplifies the power-structure of the primary-secondary logic. The Diskoteksnr [Discotheque number] signifies the track Yesterday from the album Help!, but the URL signifies the same track from the compilation release 1. In this example, I have entered this track interface from the release interface of the compilation, meaning this is an example of experiencing the power of a primary relation. Source: DR.

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In a similar vein, I have looked at how search retrievals of releases acquired before the introduction of the first electronic search system, DISØ, in 1978 reveal an approach to indexical taxonomy that crosses into the later formats and systems of archiving. Let me exemplify this with Charles Mingus' piano version of Johnny Green's 1930 jazz standard composition *Body and Soul* from the 1964 album *Mingus Plays Piano*, which I use as a recurring object of analysis in Article Three. As can be seen in Figures 5-7, it is possible to carve a line from the index cards to the MUSA database to /Diskoteket.

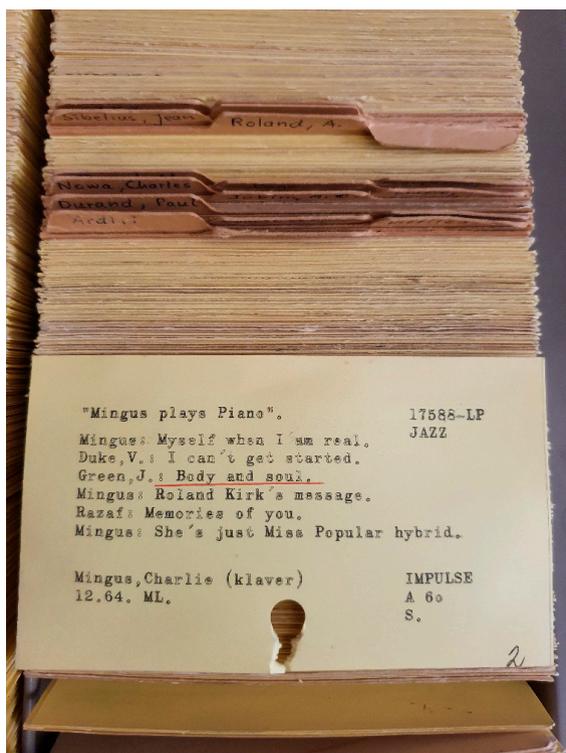


Figure 5. This picture shows the first registration on index cards of Charles Mingus' rendition of *Body and Soul* from the album *Mingus plays Piano*. This index card is retrieved from drawers allocated to searching for specific tracks. Source: DR.³⁹

³⁹ This picture appears as Figure 1 in Article Three.

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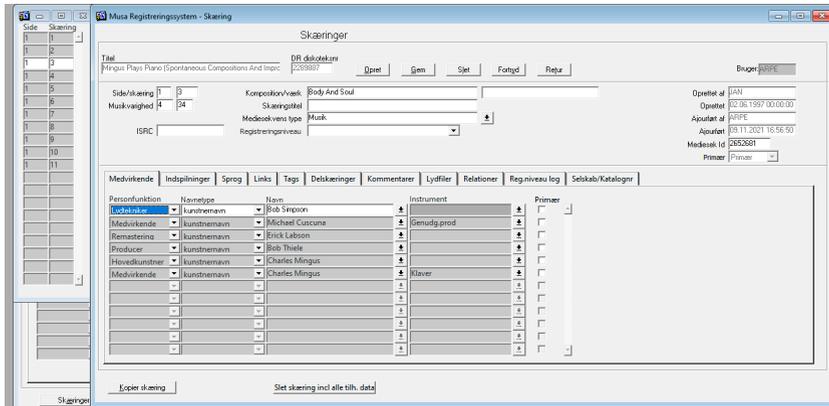


Figure 6. This screenshot is taken from the track interface of Body and Soul in MUSA Reg. It shows more complex track information, but is built on the same foundation. Yet, composer credits cannot be seen from here. In order to see those credits it is necessary to go to the composition interface by double-tapping on the composition. Source: DR.⁴⁰

⁴⁰ This screenshot appears as Figure 4 in Article Three.

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The screenshot shows the Diskoteket interface for the track 'Body And Soul' by Charles Mingus. The sidebar on the left contains filters for Digitaliseringsstatus, Periode, Genre, Kunstner/Køn, Kunstner/Rolle, Format, Land, and Pladeselskab. The main content area displays the track title, artist, duration, and release information. Below this is a table of roles and artists.

Type	Diskoteksnr	Oprettet af	Opdateret af
Musik	22898871-3	JAN (02.06.1997)	ARPE (09.11.2021)
Indspillet	30.07.1963, U.S.A. RCA Studios, New York City, NY		

Roler på denne skæring	
Kunstner	Rolle
Charles Mingus	Hovedkunstner, Klaver
Johnny Green	Komponist
Bob Thiele	Producer
Michael Cuscuna	Genudg.prod
Erick Labson	Remastering
Bob Simpson	Lydtekniker

Figure 7. This screenshot is from /Diskoteket’s track interface of the same track as shown in Figure 6. It shows even more complex track information. Composer credits can also be seen here. Further, all information is hyperlinked metadata, making for a movable and interrelated experience of the track. Source: DR.

This tells me, that the Department of the Music Archive deems it nonsensical to argue that one system of archiving is better than (and bettering) the others. In my reading of this interconnection of archival systems, the newer systems weave threads back to the older ones, but the older ones potentiate the movements of the newer ones, weaving threads toward the future.

Obtaining and Reading Historical Documents

In this brief section, I describe how I use historical methods to engage with the archival material. Presenting the historical development of DR's digital music archive is also a main concern of this thesis, and a noticeable portion of this presentation comes from documents that I have access to from DR's juridical department. This part of my material consists of 39 internal documents from DR's own archives comprising 159 pages, and they cover the years 1998 - 2002 and 2011 - 2014. The documents from the first time period concern the MUSA database. More specifically, these documents concern updates and upgrades of the database's infrastructure so as to deliver more precise metadata for (at this point in time) the reporting of credits to the organizations handling the financial rights of songwriters, performing artists, and record companies. The documents from the second time period focus on strategic gains and issues of optimization in terms of music radio production in relation to developing a digital music archive. Two issues regarding getting access to these documents are worth mentioning as they say a whole lot about the specific data and how they are evolved into being a part of the empirical material. The first issue concerns procedures in obtaining the documents, and the second issue concerns reading strategies needed to gather information from the documents.

I reached out to DR's juridical department via e-mail and requested access to documents concerning historical developments in the Department of the Music Archive. In retrospect, my request was too broad in its formulation (see Appendix 1), in that I was too unspecific and asked for "all documents concerning the development of Diskoteket [as a department] since 1985".⁴¹ My request was denied. After some negotiations I reached out once again, now with a specified request to get access to documents relating to the development of /Diskoteket and MUSA (Appendix 2). After specifying and limiting my request, DR's juridical department acceded to it.

It turned out that the access to the documents only was partly granted. All documents had been heavily redacted due to the potential interference

⁴¹ My translation.

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with economic and business related dimensions of DR's strategies of music communication. It was strongly emphasized that no editorial processes were to be revealed and therefore a great deal of the documents had to be classified as confidential. Due to the fact that all economic strategies were censored I lost the possibility to follow the dots and see who had been responsible for the many decisions in the process. And to make matters worse, the censoring was heaviest in the documents pertaining to /Diskoteket. Nonetheless, after coming to terms with the obscured ontology of these documents, I could see the hidden and omitted information as a strength. The documents tell a tale of optimization, of seeing perspectives in the digitization of the music archive as a way to improve the process of automatized music scheduling. The documents also tell a tale of indirect methods to lay off people in a continual movement of making work processes smoother. And the documents function as some sort of testaments to the fact that no one can be held responsible for making these decisions. Yet, the documents are also enlightening and provide detailed accounts of how the MUSA database is to function underneath /Diskoteket, and they amplify that the digital music archive from the very beginning was meant to be a moldable structure to be continually developed.

Assembling and Constructing the Material

My means of dealing with a composite methodology has been to cultivate a thesis structure that is at once particular and creative. I address specific issues by way of concrete methods, but I am willing to be led in unplanned directions. Case in point, in Article Three, I examine an appearing discursive formation that I call *institutionalized music history*. This discursive formation is materializing, as a surprise, due to a focus on lived experience in the interviews with DR employees, making me evolve a hypothesis about an underlying institutionalized music history at DR. This hypothesis then steers my readings of the historical documents about the digital music archive. If I am not willing to have a certain level of flexibility in my approach, such an insight will be lost. The assumption about the institutionalized music history ends up being an active component of my discussion of an interrelated metadata-structure, and it connects to my findings about how

the digital music archive's communication of recorded music in part is controlled by bureaucratic optimization processes (cf. Article Three).

The combination of interviews and participant observation put together with readings of historical documents and interfaces, and the usage of /Diskoteket and the MUSA database, empowers an accumulated understanding of DR's music archive. But, in order to get to an accumulated, and interpretive, understanding it is necessary to assemble a diverse empirical material. In this section I will describe how I have constructed my material.

Systematizing the Material

The empirical foundation for the study spreads across multiple formats. The amount of information is not insurmountable, but it is rather dense and demands careful treatment. As can be seen in Table 1, the material is not assembled after the mantra of 'the more the better', but it is multifaceted and requires a constant balancing of methodological aims, empirical expectations and theoretical prospects.

As a schematic overview of the study's empirical foundation creates clarity of the messy empirical mesh, it also shows that it is impossible to quantify qualitative data side by side with historical documents in a meaningful manner. Still, it is valuable to systematize and coordinate the empirical foundation so as to purport the research done as a unified entity, as a whole.

By assembling the material in a juxtaposed manner, I have been able to pinpoint key issues and recurrent themes that connect the streaming practices of /Diskoteket with the archival practices behind the platform. In arranging all information as a compound of coherence I have created the material. I am imagining it. "Data need to be imagined *as* data to exist and function as such, and the imagination of data entails an interpretive base [their italics]" (Gitelman & Jackson, 2013, p. 3), Lisa Gitelman and Virginia Jackson write. Data are not there to be found, as if they are natural resources; data are cultural resources that need to be generated and interpreted (cf. also Manovich, 2001, p. 224). I generate the material by imagining how it can be interpreted. In Table 2 I identify the empirical material and the analytical methods of each article.

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Table 1. Overview of data, sources and formats.

Material	Amount	Description
Hours using /Diskoteket and archival software	Approx. 1.500 hours over 4 years (approx. 8 hours weekly for 46 weeks a year)	/Diskoteket (approx. 680 hours). MUSA Reg (approx. 800 hours). Dalet (approx. 20 hours).
Archival documents	39 documents 159 pages ⁴² Variable length and style	35 documents concern the MUSA database. 4 documents concern plans and goals for developing a digital music archive at DR.
Interview transcripts	14 interviews 149 pages 1,5 line spacing, 11 points, Calibri (Body)	10 one-hour interviews with DR employees (eighty-four pages). 4 two-hour in-depth interviews with the head of the Department of the Music Archive, Thomas Dose (twenty-four pages).
Interview guides	4 guides 9 pages 1,5 line spacing, 11 points, Calibri (Body)	1 two-page guide for the interviews with DR employees. 3 two-and-a-half-page guides for the in-depth interviews with the head of the Department of the Music Archive, Thomas Dose.
Interview memos	5 documents 8 pages 1,5 line spacing, 11 points, Calibri (Body)	3 documents (of one, two and three pages) planning the interviews with DR employees. 2 one-page documents planning interviews with the head of the Department of the Music Archive, Thomas Dose.
E-mail correspondences	20 entries Variable length and style	12 correspondences with interviewees (ten of them concern doing interviews, two of them concern rejections). 8 correspondences with the head of the Department of the Music Archive, Thomas Dose, concerning interviews, archival clarifications, and provision of statistics.
Diary transcripts	17 pages 1,5 line spacing, 11 points, Calibri (Body)	Entries from the entire duration of the study. They reflect on methods used and prospective data.
Notes transcripts	55 pages 1,5 line spacing, 11 points, Calibri (Body)	Entries after participant observation (20 pages). Entries after interviews (35 pages).
Screenshots	59 screenshots	25 screenshots from /Diskoteket. 8 screenshots from Spotify. 18 screenshots from MUSA. 4 screenshots from Dalet. 4 screenshots from DR DJ.
Photos	11 photos	4 photos from the physical collection. 7 photos of index cards and drawer systems for storing index cards.

⁴² One page is calculated as 2.400 keystrokes, including spaces.

Table 2. Overview of materials and analytical approach of articles.

Article	Material	Analytical emphasis
Article One	Using /Diskoteket Screenshots	Reading interfaces Follow metadata as historical records
<i>Digital music use as ecological thinking</i>	Diary entries	Aesthetic perspective on temporalities in the archive
Article Two	Interviews with DR employees Notes	Individual sense-making Formulations and meaning in language used
<i>On Digital Music History</i>	Diary entries	Personal statements as a way to engage in historiography Construction and use of history
Article Three	Documents Interviews with the head of the Department of the Music Archive	Historical study of documents and statements Database and metadata- structure as forming experience
<i>The digital archiving of music at the Danish Broadcasting Corporation</i>	Interviews with DR employees Photos Screenshots Using /Diskoteket and archival software Notes Diary entries	The archive as mediating history – history as mediating the archive Use of history
Article Four	Documents Interviews with the head of the Department of the Music Archive Screenshots	Historical study of documents and statements Media archaeological mindset, to find what was lost
<i>Music discoveries that could have been</i>	Using /Diskoteket and archival software Notes Diary entries	Metadata as resistance

It seems that metadata are everywhere. Most of my analyses draw on the concept of metadata (except Article Two, where the epistemology of music in the online sphere, and how it impacts discourses of music history, is the main focus). This goes for my systematization as well; in order to make sense of my empirical foundation I need to operate with a metadata-structure of sorts, and as that structure becomes maneuverable it discloses the concept of metadata to be a recurring constant in interviews, notes, and documents as well as in the usage of archival software. In logging frequently used terms in relation to experiences of digital music archives and streaming practices, I carve out a thematic network of DR's music archive that shows how sensibilities of metadata are permeating most statements and sentiments. Sketching out such a network also reveals that infrastructure is regarded as a main quality to making archives and streaming work as intended.

Interviews with Employees at DR – Overview and Recruitment

The interviews with DR employees took place in December 2019 and January 2020. The participants in these interviews were all employees at DR and all of them work with music communication in one way or another. In these interviews I talked with the participants about their use of digital music platforms for work as well as for leisure and if they believe these platforms to purport a view of the history of recorded music that corresponds to their own. My goal with these interviews was to engage in a discussion about whether different design choices create different types of world-making that might lead to different imaginaries of music's historicity. For that reason, I asked the participants to consider the commercial streaming service(s) they are using to access music from in private (as well as in work) settings and relate this/these to /Diskoteket.

In order to get as wide an understanding as possible, I aimed at recruiting a sample of participants to reflect as much diversity as possible, but out of the ten participants I only managed to get two female employees to join. I reached out to fifteen people, but two declined and three never responded. Four out of these five people were female employees. As can be seen in Table 3, the participants came from different areas of the music communicative assemblage of DR. It was important for me to reflect both sides of DR's digital music archive and thus have participants being purely users of /Diskoteket as well as users maintaining and furthering /Diskoteket. Therefore, three participants are music registrars. These participants have specialized deep knowledge of how the metadata are structured and operationalized in the database, and consequently they are prone to give different answers on questions concerning interrelated data. It is important to keep in mind that these three participants are colleagues of mine, which is an ethical issue that I will return to below. The three music registrars were recruited by way of oral enquiry. The rest of the prospective participants I e-mailed with a standard query (Appendix 3) in which I briefly introduced my project and explained the overall structure of the interviews. In the e-mail I clarified that the interviews were to be anonymized in my writing.

Table 3. Overview of interviews with DR employees.

Number of employees interviewed	Department	Job positions
1	DR Concert Hall	Producer
3	DR Musiktjenester	Music registrars
2	DR P2	Radio hosts and planners
2	DR P3	Radio host / Editor
1	DR P6	Radio host and podcaster
Number of rejections	Department	Job positions
1 (lack of response)	DR P5	Radio host
4 (two declines, two lacks of response)	DR P8	Radio hosts

All interviews took between 45 and 60 minutes, and they were qualitative and semi-structured (cf. Gubrium & Holstein, 2001; Kvale, 2007). Besides planning the technical perspectives of conducting semi-structured interviews, my preparations included considerations of reflexive observation in order to understand my own presence during the interview situations (cf. Ellingson, 2017), and especially to know how to interpret my own perceptions. Three of my participants were music registrars and therefore I knew them well, which had impact on the dynamics of those specific interviews – how were I to position myself as the interviewer and researcher as well as a colleague and an insider? At the beginning of all ten interview situations I reiterated my research project and described how/why the participants' expertise, knowledge, and experiences were of scholarly relevance to the study, just as I once again made sure to explicate anonymity and potential use of citations in publications. I followed an interview guide (Appendix 4), which in most interviews was only used as a reference point. One question that I did incorporate in all interviews was the very first one. In all interviews I began by asking the participants how they define 'music history'. I took this approach in order to hear their immediate connotative reflections when caught off guard on a question such as this. The reason for this outset was twofold: to create a common ground of reference for each participant and me, and to decode the discursive traditions of music history that each participant inadvertently partakes in.

Interviews with Employees at DR

In order to prepare the ten semi-structured interviews with my participants, I relied on the part of my empirical material at hand at the time, which was a combination of knowledge of /Diskoteket (its appearance, user functionalities, options, lacks) and familiarity with the structuration behind /Diskoteket, the MUSA database. The customized interview guide (Appendix 4) allowed the participants to elaborate on issues of interest and/or wonder in relation to /Diskoteket (and in the case of the three music registrars, also the MUSA database). The template for my interview guide followed a thematic arranging of questions concerning practices, experiences, and imaginaries, but no interviews stayed on track of the guide, as is the nature of the semi-structured interview format.

I recorded the interviews and did not take any notes, so as to make the interviews fulfilling experiences of conversation. As can be gathered from Table 1, I made rather dense notes in the wake of all interviews regarding the most interesting themes brought up. Thereby, I had my immediate impressions of the interviews to compare the actual interviews with during the process of transcribing, and later analysis. In order to get familiar, and become intimate, with the interview-material, I chose to do the transcriptions in word documents. This was a slow process, but it made me aware early on of recurring themes and concepts that could be linked to other parts of the material, which helped me see the material, in all its variety, as a unity. Systematizing the transcriptions by highlighting themes, by making them into metadata, also made it easier to see the connection of the material and the conceptual framework of the thesis. I could have made this process smoother by inserting the transcribed interviews into a qualitative research software and constructed an inductive coding to make data retrieval quicker. If I had chosen to do that, I would have been able to further apply several codes to the same documents and make cross-relations between potential multiple meanings appear. Yet, I decided not to do this. First of all, the amount of interviews was not excessive, so I deemed it a doable task to produce strategic overviews for analysis; secondly, I saw a potentiality in doing this work myself in which I could begin to anticipate how, and why, I could use the transcriptions in analyses in some of

the articles (Articles Two and Three); and thirdly, I did not want to risk losing track of the human perspective so significant in the interpretation of data describing practices and experiences.

The semi-structured nature of the interviews implies being open to surprises and follow whatever comes up and seems relevant. This is the case with the discursive formation of an institutionalized music history, and it is also the case with a notion such as ‘searchability’. The question of searching in /Diskoteket differs in all interviews; people search in different ways and use the search functionalities in diverse manners, meaning that search retrievals can differ quite dramatically (cf. Haider & Sundin, 2019; Andersson, 2021). People also have different reasons for searching depending on work tasks, and the imagination of what searching is changes if /Diskoteket is used for finding music to listen to either as accompaniment or as enjoyment.

Generalizability

In regards to the interviews with DR employees, my study is not generalizable in a statistical sense. Still, research such as mine should always make efforts to be generalizable, which I for instance do by tracking common themes in the interviews. My work unfolds elements of a local specificity in time and place, which describes a certain culture and political climate, and such qualitative research provides a way for sense-making in terms of particular practices, specific experiences, and explicit imaginaries.

As accounted for above, the unity of my empirical material is dense and provides detailed insight into ways of situating /Diskoteket in the everyday work of DR employees. It is impossible to assess my participants’ experiences in a shared metrics, but explanations and descriptions are possible to relate to readings of the inner workings of the MUSA database. This makes it possible to trace whether or not structural logics of control play into people’s experiences.

In-depth Interviews with the Head of the Department of the Music Archive

Between February and March 2021, I planned and conducted three interviews with the head of the Department of the Music Archive, Thomas Dose, and in February 2022 he and I had a longer conversation that I will regard as an interview as well. Besides from this, he and I had some conversations and e-mail correspondences during spring 2022 to clarify the chronological timeline in developments of and updates to /Diskoteket. These freer conversations also worked as arrangements to obtain quantitative data about the composition of DR's music archive.

As I explain in Article Three, I regarded the interviews with Thomas Dose as a collaborative process. As I am an affiliate with the Department of the Music Archive, he was my boss and supervisor at the same time as he was a participant in the interviews. As one of the main contributors to the development of the digital music archive, he had processual insight that I could not find in the archival documents. I was fully aware how this made aspects of my research dependent on one man's interpretation, but I also acknowledged the necessity of following through on these interviews in order to acquire detailed insight into the everyday implementation of the functionalities of /Diskoteket (cf. Article Three; Pedersen, 2022b, pp. 42-43). He agreed to participate in the interviews because he wanted to help me for the general sake of openness toward research as well as to further research into the interconnection of DR, music radio, and digital archiving. One can wonder whether he also saw this research project as an opportunity for the Department of the Music Archive to get more recognition (in academia as well as in DR's management).

The three interviews conducted in 2021 were recorded and I did not take any notes during these, whereas the interview in February 2022 was not recorded and here I did take notes. This later interview was not initially planned as an interview but rather as a talk about my research process and findings, which I came prepared to with a list of questions concerning technical issues in /Diskoteket that I had stumbled upon in my exploration of the digital music archive, but it quickly turned into a conversation resembling a semi-structured interview. I gathered consent to use informa-

tion and cite phrases after the conversation (I cite once from this interview in Article Four). The procedure of transcription for all four interviews was the same as with the interviews with DR employees.

The three interviews done in 2021 were semi-structured, in that I had planned three dense interview guides (Appendix 5), but the interviews in fact positioned themselves between the formats of the semi-structured interview and the unstructured interview. The duration of these three interviews were about 120 minutes each, but no time schedule was agreed upon beforehand, which led to interviews moving away from the interview guide most of the time. Due to the free flow of the conversations, I regarded these interviews as a collaborative process concerned with shedding as much light as possible on DR's music archive, its functionalities, and its role as a certain part of Danish cultural heritage. A recurring theme in all interviews with Thomas Dose regarded how DR's digital music archive can present histories of recorded music.

Ethical Issues

I conclude this chapter by highlighting some of the ethical issues that have impacted this study. Ethical considerations have been present in all my decisions throughout this research project. I follow the code of conduct and meet the research ethics of my research institution's standards, which means that I have sought consent from my participants and anonymized them; I have sought consent from Thomas Dose to use the interviews in full and refer to him by name; I have further sought consent from Thomas Dose to be able to 'hang out' in the music archive and move around in the department, and to use the relevant digital platforms and software as an integral part of my investigation; and I have sought consent from DR's juridical department in order to use the historical documents for my research. I have explained the focus and prospects of my research project to all participants and relevant parties before seeking consent.

During the course of my research, I had to make various decisions relating to the types of methods that seemed suitable for answering my research question. Following these decisions, other decisions about how to implement and operationalize the methods in an appropriate and ethical

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manner had to be made. Besides the interviews with Thomas Dose, which I got consent to quote and treat in full, I decided not to share identities of participants as well as not to surveil any users of /Diskoteket by way of digital footprints and data logs. In fact, I made the decision not to gather any user information of a quantifiable character, in that such information would be unhelpful in creating understanding of the experiences and perceptions of users. Instead, I tested out the many examples of usage of /Diskoteket I got from my participants as well as from Thomas Dose and assessed what other options the system could offer in the given situations. Such ethical considerations are why I do not use so-called digital methods in this study. I believe that the integrity of the participants' statements and descriptions will shatter, and I actually believe that the sensibilities of the database will fade away if I seek information in computable ways. How the system facilitates different versions of the history of recorded music is not something that can be decoded with a calculable line of attack.

Of great ethical concern is the insider-outsider issue. I have a double-insider perspective because I know some of the people I observe and interview as well as have an intimate understanding of how /Diskoteket works and why people do as they do whilst on the platform, just as I have been an active part in evolving the metadata-structure in the MUSA database. During the entire research process since September 2018, I have been aware of the ramifications of assembling my material as an insider, and I have been extremely careful not to insert my own feelings and assumptions in the analyses of interfaces and infrastructure as well as not to assess the information in the historical documents with a personal sentiment. At the same time, I acknowledge my own special, and specialized, position as the very thing making this study possible. As an outsider I would never get to do participatory work with the MUSA database through the registration software MUSA Reg, which I have been doing continually during this research. The benefit of this careful balancing act in terms of ethics is that I am always already there, no matter the angle I am taking and the perspective I want to pursue. My central method has been to explore the music archive by usage, which means that I have had to recognize my position as a former fulltime employee, and current freelance employee,

while conducting the research. Furthermore, it means that I have had to be aware of how my insider perspective can bias my analyses and make me overlook necessary descriptions and elaborations in my written presentations.

4. Conceptual framework

In this chapter, I outline the thesis' theoretical takes and conceptual framework. The framework affixes to the importance of metadata in digital archiving of music, and thus the chapter puts focus on the first part of my research question: *In what ways do politics, ideals, and practices of digital design and the registering of metadata guide the structuring of DR's digital music archive?* First, I propose an angle on listening that historicizes recorded music by amplifying the music's referential qualities. Second, I provide a view on music history, which stresses that people actively take part in the way they perceive music's history *by way of* acting with and alongside media technologies. Third, I conceptualize the defining traits of the digital music archive and argue that data- and metadata-structures are important to think about in order to arrive at a finer-grained level of understanding of recorded music. Fourth, I suggest that the dialectic of metadata and music histories in DR's digital music archive is dependent on sensibilities toward the production *and* perception of metadata. Finally, I emphasize that the infrastructure of DR's digital music archive can communicate the history of recorded music as a many-sided association of tracks and releases.

Historicized Listening

I approach listening⁴³ to recorded music as a contextualized action that brings forth singular situated perspectives.⁴⁴ By taking infrastructural or-

43 When it comes to listening as a concept, I acknowledge the undertakings in sound studies, musicology, and practice-based research during the past decades. Let me credit a selection of research here that all create epistemologies through listening. Pauline Oliveros (2005, 2022) has developed a *sound practice* that she terms *deep listening*, which is to be aware of and explore the difference between the voluntary nature of listening and the involuntary nature of hearing. Deep listening is an approach to both meditation and music. Electronic music histories have made an effort to understand historical imagination by listening to noise and silences (e.g. Kahn, 1999), and this issue has been implemented into a feminist perspective of thinking difference, disturbance, and productive potential, of listening to *pink noises* as Tara Rodgers (2010) puts it. Recently, Dylan Robinson (2020) has coined the term *hungry listening* as a concept of critical awareness of listening positionality that attunes us to understand how “filters of race, class, gender and ability” (p. 11) frame the way we listen to musical encounters. In a cultural history of communications technology, Sterne (2003) has developed a genealogy of *audile techniques*, of listening techniques by providing a “history of “regimes” of listening practices” (p. 91) in order to describe techniques of listening in modernity. In relation to this, R. Murray Schafer (1994) understands the *soundscape* of any recording as technologically mediated, by which he argues that we ought to consider the role of technology in listening, and think about what it means to listen to something through technology. Barry Blesser and Linda-Ruth Salter (2007) have described how we experience space by attentive listening, by an *auditory spatial awareness*. Nina Sun Eidsheim (2015) speaks of *sensing sound* as a way to study “voice, sound, and music from the point of view of materiality” (p. 164) in order to re-actualize the renaissance understanding of sound and music as *intermaterial vibrational states*, which listening can be understood as an organology of.

44 Listening to recorded music is to listen to sound reproductions. As accounted for in Chapter Two, Benjamin (2015a) sees the mechanical reproduction of art, including music, as a democratizing feature. Pierre Schaeffer (2004), in conceptualizing *musique concrète*, speaks of *acousmatic* sounds, which are sounds we hear without seeing their source (see also Michel Chion (1994) on acousmatic sounds in film). Sterne (2003), in reference to the phenomenology of Maurice Merleau-Ponty (1964), points out that the experience of sound ought to be included in “the purview of historical analysis” (Sterne, 2003, p. 14), which is especially imperative in terms of technologically reproduced sound. John Garas (2000) speaks of *virtual spatial hearing* and explains that it is to listen to auditory spaces that are not ‘real’, which, as Mads Walther-Hansen (2012) points out, the listening to recorded sounds is an example of. In relation to this, Rick Altman (2006) describes the *heterogeneity of sound* in music recordings and argues that aural complexity is made stronger with recording technologies. Similarly, Serge Lacasse (2000) theorizes what it means to

dering and interfacial presentation into consideration, Article One proposes a definition of listening that is coined *historicized listening*. This is a concept that denotes a situation in which the act of listening done by a user of a digital music platform is inspired by wrapping and informed by underlying structures of metadata. It is a referential listening, which has as its main purpose to understand recorded music in relation to other recorded music. Historicized listening is a contextualizing approach to listening that nurtures a potential for continual renegotiation of a piece of recorded music's historical position. Historicized listening grounds on the assumption that metadata can change the way a track is listened to. It is a take on listening that puts weight on reception, in that it is a listening that is influenced by information related to the music. Further, it is a listening that is permeated by sensibility, in that it makes active use of metadata and let these have continual impact. Historicized listening is a continual and unstable activity that repeatedly creates new listening situations. Article One digs into /Diskoteket's interfacial logic of presenting tracks that are related to a given track on said track's interface, and it exemplifies this with the sample relation between Drake's *Hotline Bling* (2015) and Timmy Thomas' *Why Can't We Live Together* (1972). The consideration is that the act of being made aware of this connection potentially can change one's way of listening to both tracks, and thus this connection can put historical depth into the ways the tracks are perceived. The concern is further that, DR's digital music archive is designed in such a manner that it deflates logics of linearity and chronology by giving its users the option to cross the archive by way of a hyperlinked metadata-structure. In my conceptualization, listening is thus dependent on infrastructural circumstances.

Historicized listening forms an assemblage that includes recorded music, the history of recorded music, the infrastructure of a digital music archive as well as the affordances of a digital music archive. Affordance (cf. Gibson, 1966) is an interesting term in this connection, because the affordances of a digital music archive are made possible due to networks, infrastructures,

listen to stereo recordings, and he stresses that a *standard listening situation* is constituted by certain necessary features in a playback system, the attentiveness of a listener, and the social background of a listener.

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and metadata, and because the affordances of such an archive offer the singular user paths into the history of recorded music. Article One grapples with such a way of affording a historicized listening on /Diskoteket, and it does so by redirecting Born's concept of a musical assemblage (Born, 2005b) to the definition proposed by Deleuze and Guattari (1987). Deleuze and Guattari conceive of the assemblage as a structuration composed of heterogeneous elements and/or objects that enter into relations with each other. These elements and objects can be of differing types, such as physical objects and actions, but they can also be signs or utterances. The concept of the assemblage is thus used to describe and understand the ontological diversity of agency that makes up the socio-material networks of people, things, and narratives.⁴⁵ When regarding the practices and experiences of music streaming as a musical assemblage, the recorded music in a digital music archive can be considered to be in a continual state of becoming. Music, media, and user/listener form an assemblage, upholding each other by affecting each other. With such a mindset, DR's digital music archive is a milieu where new imaginaries continually can be made of how the trajectories of the history of recorded music move. These are imaginaries of listening that can make one rewrite the music, and make one compose by listening contextually (cf. Attali, 1985).

In my reading of the musical assemblage, the recorded music in DR's digital music archive is in a continual state of becoming, due to a convergence of social, cultural, and technological bodies that affect each other because of their materiality. The music continually repositions and is reconstituted by way of the mobility of the digital music archive's infrastructure. For such a mobility to function, the infrastructure is dependent on an interaction between a human user and layers of technological communication.

⁴⁵ According to philosopher Manuel DeLanda, Deleuze and Guattari define the assemblage as "a multiplicity which is made up of many heterogeneous terms and which establishes liaisons, relations between them, across ages, sexes and reigns – different natures" (2016, p. 1). DeLanda furthers the concept as a materialist philosophy and theorizes the assemblage as a way to create dynamic interrelationships between history and all sorts of components as well as the totality emerging from them. Political theorist Jane Bennett (2010) endows the concept of the assemblage with a material rooting as well. For her, the concept is a certain structuration that describes a space of events (ibid., pp. 23-24).

This infrastructure creates meaning via an expanded temporality that must be understood as made up of nonlinear dynamics. When recorded music is perceived because of nonlinearity it can, in theory, be experienced in limitless ways. I find inspiration for this understanding in Deleuze's concept of *difference* (2014), wherein every singular moment in time is an expression of the present that contains both past and future. According to Deleuze, the future is the present's coming present, meaning that the future of the present contains a relation to its own past. That past is the present *now*. Deleuze speaks of this as an ontological paradox of coexistence, in which the past is something prior to the present as well as contemporaneous with the present that it was. The past is only marked as past when it is actualized and stretched into the present now (cf. Pedersen, 2020, p. 104). The past is thus a *non-actualized event*, or a *virtual* potentiality of the present.

Deleuze evolves this complex idea of reality from Henri Bergson's investigation of the metaphysics of time. Bergson defines the virtual in a manner that can understand time as being contemporaneous with the experiencing subject. Everything actual contains something non-actual. It contains virtual states. To speak of virtual states of something is to speak of 'images' of the nature of something. According to Bergson, images are existences placed 'halfway between the "thing" and the "representation"' (2005, p. 9), by which he means that all matter exists in any given *now* and is discerned in a perception. In the perception, the images display inherent pure recollections, meaning that Bergson's proposition is that a contemporaneity exists between perception and recollection. Bergson argues that the past in effect is in a virtual state that peeps into the actual state, into the present. He writes:

[...] our recollection still remains virtual; we simply prepare ourselves to receive it by adopting the appropriate attitude. Little by little it comes into view like a condensing cloud; from the virtual state it passes into the actual; and as its outlines become more distinct and its surface takes on color, it tends to imitate perception (ibid., p. 134).

It is an ontological conceptualization, insisting that all images contain time. The past is written into the present, or to be more precise, the virtu-

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al state steps into the actual state. The past *now* can only be cognized as past when it is actualized and expanded into the present *now*. Time is movement, and in the light of Bergson's concept of *duration* we need to regard consciousness as temporal, thus making it redundant to differentiate between events. Duration is a qualitative multiplicity, confronting the idea of progress as causal. Reality or the material world is in a state of becoming because it has another, past, reality folded into it. Therefore, Bergson argues that our perceptions are both actual and virtual. Perception consists of an understanding of all contemporaneous objects in space as well as of an understanding of all recollections in sequential time. These two understandings continuously collide in the intersection of our conscious present, in which the sum of both understandings is inherent. In line with this, and in exploring the concept of virtuality further, Manuel DeLanda (2013, p. 31) argues that the virtual in its actualization creates diverging lines that correspond with virtual multiplicities. The material world is thus nonlinear. When the virtual is actualized, the virtual sphere is stepping into reality.⁴⁶

With his concept of duration, mentioned above, Bergson sees time as moving, and he perceives of recollections as progressive. Thus, it makes no sense to differentiate between the actual and the virtual (or between the real and the imaginary, as I explain via Zielinski's (2006) concept of *variantology* in Article Four). Something that is not there, or has not yet happened, is as real as the actualized thing, because of its virtuality. It is completely real due to its virtuality. As Deleuze points out, the virtual is opposed to the actual, not the real: "*The virtual is fully real in so far as it is virtual* [his italics]" (Deleuze, 2014, p. 272).⁴⁷ Therefore, Deleuze specifies duration as "defined less by succession than by coexistence" (2011, p. 60), by *virtual coex-*

⁴⁶ This view somewhat corresponds with Deleuze's take on philosophy as concerning multiplicities: "Philosophy is the theory of multiplicities, each of which is composed of actual and virtual elements. Purely actual objects do not exist. Every actual surrounds itself with a cloud of virtual images" (Deleuze & Parnet, 2007, p. 148).

⁴⁷ Media scholar Ulrik Schmidt summarizes the Deleuzian notion of virtuality as pasts that are no different than the present reality: virtuality "completely corresponds with reality, but it does so as the real that *just now* has passed by as a pure past folded into the present [my translation]" (Schmidt, 2013, p. 116).

istence. Such an ontological construction is central to the musical assemblage that makes for historicized listening and lets its ensuing epistemologies be possible. The musical assemblage of a human user and the technologies of DR's digital music archive potentiates a referential listening situation, in which the user of /Diskoteket is listening with, and by way of, metadata. This sort of listening has as its potential to cause a becoming that opens toward new historicized connections (cf. Article One).

Historicized listening is to attune one's ears and be open for the not-yet-discovered or the forgotten or the marginal lines in the history of recorded music. Historicized listening is to let the virtual states of recorded music peep into the actual state of a given track on a given interface. In this multiple definition, to listen is to realize and to accept that chronologies can be many. To listen is to decenter chronology. Time, understood as chronological time, is eroded by historicized listening, and listening as streaming is a sort of digital remembering that goes in all directions (cf. e.g. Ricœur, 2004; Ernst, 2013a). That is an interesting fact of digital life. As Tanaka points out, the common take on history as a practice is to "order and control a world of expanded information" and make "taxonomies and hierarchies that unify diversity into a predictable system" (Tanaka, 2019, p. 148), which is only manageable due to the metrics of chronology. The MUSA database makes its information crystallize on /Diskoteket in a manner that questions the order and control of chronology. Yet, as a digital system it is a potent example of a causal logic too. Listening via DR's digital music archive provides a space of opportunity as well as zooms in on new schemes for the structuring of time.

Digital Music History

The notion of historicized listening, as accounted for above, entails an unstable understanding of the history of recorded music. It is a history defined by the many-sided association of tracks and releases. With the introduction of the Internet, file-sharing practices, and on-demand subscription services, this history is now defined by the metastability of digital technologies. In the last two decades, no term has probably been as widespread and of impact in cultural and media studies as 'the digital'. We

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have been speaking of a digital turn and as living in a late-capitalist digital age, in which all hitherto known practices of daily life are mutating into digital media practices. Kittler's (1990, 1999) materialist approach to media makes way for cultural and political critique of contemporary media culture, which Manovich (2001) verbalizes when he describes contemporary culture as being defined by a database logic (ibid., pp. 218-221). Everything is everywhere, as an infinite unstructured collection of information, in need of ethical and aesthetic interpretation necessary for creating meaningful discourses (see also Galloway, 2004). The rise of social media and the potentiality for political misuses and abuses (Chun, 2017) of course challenges that, and thus the notion of organization, and interpretation, is perhaps more relevant than ever. And in terms of cultural histories, including the history of recorded music, this is a pressing issue. As the notion of historicized listening points to, the epistemologies of recorded music are changing and negotiable *because of* the digital systems that give way to contemporary engagements with music. Our understanding and thinking of music are challenged, and so is our way of writing, and writing about, music histories.

This thesis mainly focuses on the formal and categorical changes to storing and retrieving of music information in terms of digital archiving. Yet, this thesis also acknowledges how events and data-distributions outside a digital milieu for music streaming can impact the experience and understanding of the information in a digital music archive. Article Two proposes the term *digital music history* in order to fathom the multiplicity of interconnections and interoperability that makes up our digital practices and experiences in relation to our use and consumption of music. The goal of this term is to develop an argumentation for the singular digital (and/or online) experience with music as being of historiographical value. The term is evolved alongside the ten interviews with employees at DR. In these interviews, the participants reveal that they all create epistemologies of the history of recorded music whenever, and however, they engage with music. Such epistemologies ought to be taken seriously. Digital music history requires a destabilized notion of history, which it can find inspiration from in the media archaeological canon (cf. Gitelman, 2006; Zielinski, 2006; Huhtamo & Parikka, 2011; Parikka, 2012) as well as in the view

on history as the study of change (e.g. Hartog, 2016; Tanaka, 2019).⁴⁸ On /Diskoteket, meaning arises from the circuits of information surrounding the music, and it arises in the communication between actions of the user and machinic reactions of the digital system.⁴⁹ Thus, meaning arises from the infrastructure of the digital system that stores and mediates the music. Cultural practices and media practices, including music streaming practices, happen because of infrastructures and not the other way around. Digital music history is a conceptual attempt to understand people's doings with digital music archives and on-demand subscription services as historical. In the construction of a digital music history, it is important to remember that we all are accomplices in our own situated versions of the history of recorded music and that we are unable to separate our own doings from the doings of the digital technologies.

Digital Music Archive

Chapter One made a preliminary definition of the archive that takes off in the common perception of a place for storing cultural data. This includes the construct's historicizing force as a space for interpretation and rethinking of the past. Further, the chapter subscribed to Foucault's diagnosis of the concept's structuring power as steering historical and cultural discourses and making up people's statements (cf. Foucault, 2002b, p. 146). Fou-

48 In this regard, it is important to stress that I also find inspiration in Benjamin's (2015c) view on history as being defined by circular movements. When he speaks of the collector as destroying the contexts of the things collected (2015a), he underlines how cultural objects continually are endowed with new meaning and engage in changing constellations. Hannah Arendt makes an astute diagnosis and points out how the figure of the collector is a metaphor for the break in tradition and the rejection of modernity's blind progression (Arendt, 2015, p. 49).

49 This has to do with mediality. In this context, mediality is a practical term for understanding the correlation between a user, a digital music archive, and the history of recorded music. Sterne (2012) understands mediality as a mundane term, as "simply point[ing] to a collectively embodied process of cross-reference. It implies no particular historical or ontological priority of communicative forms" (p. 10). Schmidt (2013), on the other hand, sees mediality as the totality of a medium and the unfolding processes within said medium, and in the perceptual process of the medium the user is in the middle, co-creating the totality.

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cault sees the concept of the archive as denoting a theory of history, because, in its order and control of chronological events, it makes us capable of assessing and interpreting events in a juxtaposed manner, which reveals to us that history is heterogeneous and moves along multiple lines. That is why Parikka claims that archives are the conditions of existence (cf. Parikka, 2012, p. 6): the discursive formations that we can read out of an archive are biased, even systemic, but to grapple with discourses is to understand, and ultimately to detach, the politicized systematization of the archive.

The definition above is foundational for my understanding of how the archive connects to discipline and control, and it undergirds my general understanding of DR's music archive. A contemporary notion of the archive does not just connote a regime of knowledge about the past, it also signifies a regime of future anticipation (cf. Thylstrup et al., 2021, p. 1). However, the concept of the archive also embodies other elements of a more practical and technical character. DR's music archive is a Janus head, in that it consists of a physical collection and a digital database. The physical music archive and the digital music archive might be perceived to be two material versions of the same collection, but that is just not true. Unlike other cultural heritage institutions that digitize their collections one-on-one, DR's digital music archive moves along its own lines and grows steadily in size, whereas the physical music archive is quite static and grows exponentially slower. Data in the digital music archive are also demarcated by their enduring ephemerality (Chun, 2008), whereas data in the physical music archive are solid (if stored correctly). This is an important conceptual divergence that begs the question: how can a music collection that bureaucratically and practically belongs to one place, to the Department of the Music Archive at DR, be split into two non-comparative versions of itself, and why are those two versions spoken of as one? They appear differently and are used differently, so does it even make sense to see them as versions of the same? Are they not two singular units complying under one specific managerial layer? Such questions make it clear that it is problematic to speak of the two versions as the same archive. Yet, many of the epistemologies and potential prejudices (cf. Article Four) of the physical music archive are also present in the digital music archive, and in fact, as a big data archive, the digital music archive intensifies them (cf.

Spieker, 2017; Thylstrup, 2018; Thylstrup et al., 2021). To regard DR's music archive in this way is to turn the premise around; it, in fact, is an argument for viewing the two archival types as versions of the same.

This means that the ontology of DR's music archive is complicated and faceted. The two archival types are both similar shades of the same entity, and at the same time, are singular archival constructs with dissimilar aims and strategies. In Article Three, I argue that there are some strategic affinities between the interrelational ordering of the two archival types that stem from a taxonomical approach to infrastructure. This taxonomical approach moves from the index cards and into the MUSA database. Both archives reflect the post-structural reasoning of ordering knowledge and make large amounts of data prone to a historiographic logic (cf. Foucault 2002b; Derrida, 1995; Certeau, 1988).⁵⁰ Both archives also come forth as unstable structures that undergo, and will undergo, transformation. So, one can argue that the two archival types in fact *are* versions of the same archive, and that the digital music archive is a heightened form that builds on the physical music archive by operationalizing the taxonomic metadata-structure. To view both archives in this way is to challenge the metaphorical understanding of the archive as an abstract space, and instead it is to examine their archival reasoning (cf. Caswell, 2016; Whearty, 2018). Yet, a question also posed in Article Three concerns whether or not the concept of the database in fact is more accurate than the concept of the archive when it comes to the digital music archive (cf. Manovich, 2001; on the total archive and database imaginaries, see also Richards, 1993; Nadim, 2021). Parikka (2012), again in reference to Foucault, speaks of the digital archive as a “guiding principle for the potential actions a machine might take” (p. 132), by which he understands the digital archive as a diagrammatic structure where data points always are on the move and thus experiments with the world (cf. Pedersen, 2022b, p. 68). This is a processual and

⁵⁰ Post-structural critique connects to feminist critique of the archive. Both approaches look at the archive's power to make omissions and oppress certain historical voices. An important aspect of feminist archival theory is to provide a guide for unleashing the subversive potential inherent in most archives by dismantling systemic patriarchies and heteronormative visions and narratives (e.g. Cvetkovich, 2003; Cifor, 2016; Cifor & Wood, 2017; cf. Thylstrup et al., 2021, p. 8; see also Carter, 2006).

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organizational dissimilarity between the two archival types that strengthens the argumentation for a conceptual difference between the physical music archive and the digital music archive. And it is a description of data-movements that resemble the non-hierarchical structure typically associated with the database.

I believe that we ought to follow Manovich's argument and make a distinction between the archive as a physical collection of cultural data and the digital archive as a space for interaction. The digital archive is a medial construction that invites to interaction (cf. Kirschenbaum, 2021), and in the case of DR's digital music archive it relies on interrelated functionalities that are defined by levels of interaction. I see the digital archive as an archive with extended options due to the database logic of diagrammatic ordering (cf. Parikka, 2012). Manovich has a point in focusing on the database as a model for explanation, because the database can order its data in different ways and implement new strategies and reorder its data continually. Historically, the database is a figure of both material and symbolic value; it can lead to different imaginaries "that help organize practices in certain ways (and not others)" (Nadim, 2021, p. 126). Further, the database has an inherent function as a foundation for the building of platforms and search engines, that is, it is an infrastructure for interfaces to interact with, which can "translate the underlying database into a very different user experience" (Manovich, 2001, p. 226).

The digital music archive differs from the physical music archive due to its database logic. It contains different assets in terms of searching and experiencing, and it thus leads to different epistemologies. Both archives decenter chronology by way of a sensibility toward metadata that positions eclecticism, arbitrariness, and interpretation as main qualities for how users meet and engage with them. The archival order and the language and taxonomy of metadata establish a wide landscape of interrelated information – a landscape growing out of the archival politics of the Department of the Music Archive at DR. Historically, this politics was already induced with the index cards and it has thus been lifted into the digital music archive. Even though interrelations are present in the physical music archive its archival memory is quite static, whereas the digital music archive's memory has moved into "an economy of circulation: permanent transfor-

mations and updating” (Ernst, 2013a, p. 99).⁵¹ Metadata, I will contend, are the quality of the digital archive that can make such permanent transformations sensible. Recently, Manovich has described metadata as information about objects that already exists. He opposes metadata with the term ‘features’, which is new information created via algorithmic analysis of objects (2020, pp. 125-126). To him, metadata are descriptive and static, pertaining to the archive (understood as storage), whereas features are creative, pertaining to exhibition and interaction. Where Manovich is interested in newly obtained information, I am concerned with new and interchangeable formations of existing information, which might deepen and change the perception and reception of a cultural object.

DR’s digital music archive balances two archival understandings: the archive as a space for a repeated foundational process pointing to new events, and the archive as a dynamic space that reconfigures possible historical sensibilities of its data. Article Three makes this diagnosis of DR’s digital music archive. The archive is a conceptual space that can ensure a status quo (cf. Carter, 2006; see also Gartner, 2016) as well as bring attention to marginal records and oppressed voices (cf. Stoler, 2002, 2009; Cifor, 2016). The archive can do both due to an operationalization of metadata. In DR’s digital music archive, the interrelated metadata that are activated in MUSA Reg’s module of relations might either work as a systemic disciplining or as an enlightening of diversity and inclusion (cf. Articles Three and Four). Both results reveal a complex relation to recorded music’s pasts.

The pasts within DR’s digital music archive are many and the archive’s relation to the past is heterogeneous. Tanaka stresses that realization and acceptance of the heterogeneous pasts will “destabilize change as a linear description of becoming” (Tanaka, 2019, p. 114). Objects and statements of the past need to be seen as heralding change. Inspired by Tanaka, I see

⁵¹ Wolfgang Ernst sees the contemporary digital times as a new archival regime that does not need processing by human users and/or archivists. Electronic materiality takes care of it (see also Ernst, 2010). Mark B. N. Hansen (2015) questions Ernst’s warning that the digital archives are the point in technical media’s evolution where human experience is lost. No matter the level of operationality that can only be observed by time-critical media (cf. Ernst, 2013), media have a desire to mediate human experience (cf. Hansen, 2015, p. 42 & p. 273n12).

history as change, as the study of change, and I conceptualize the archive as a vessel for theorizing change. What is important is not how things came to be, but how change happens (cf. *ibid.*, p. 116; see also Huhtamo & Parikka, 2011; Hartog, 2016).

Metadata, Sensibilities, and Music Histories

Metadata are structuring DR's digital music archive. Without metadata, there would be a lack of context and it would be difficult to make sense of the millions of sound files. DR's digital music archive cannot be understood as a storage capacity including metadata; rather, it has to be understood *because of* metadata. The metadata-structure is a key component in the digital music archive's tissue holding it together and transforming it from a static collection of data and information to a dynamic unity of collection, technology, and user. Metadata are both actual and virtual states of recorded music, making way for the musical assemblage (cf. Bergson, 2005; Deleuze 2011, 2014; see also Born, 2005b; Pedersen, 2020). Because of metadata, the 'archive' in DR's digital music archive is not a static noun referring to a place but rather a verbalization of a continuous process. To archive something, and to have archival strategies, is in this context a transitive action of storing a sound file and registering an array of annotated information to said sound file that is meant to be set in motion and function as either consumption or work-related amplification of context, just as it is meant to be set in relation to other 'archived' files (on the link between digital storage and archiving as an action, see Cook, 1994; Chun, 2008; Ernst, 2013b; Kirschenbaum, 2021). Wolfgang Ernst would argue that it is wrong to speak of such a dynamic storage as an archive, in that the medium does not give way to a permanence otherwise assumed by the concept (cf. Ernst, 2013b, p. 138). That is a valid argument, and it somewhat resembles Manovich's (2001) database logic. I will make the opposite argument: the concept of the archive, and the archive as a term, is imperative for a study of digital archives. I conceptualize DR's digital music archive *as* an archive because of its strong focus on metadata. In this digital music archive, metadata are used to interlink music and connect it to visual presentation on /Diskoteket. All such connections are made available due to archival sensi-

bilities – due to sensibilities toward metadata, toward operationalization and visualization, and toward what music histories can be.

What does sensibility toward metadata entail? Within DR's digital music archive, metadata are information artifacts of certain values that represent an agreed upon ideology of the Department of the Music Archive working under the auspices of the politics of DR as an institution. Metadata have a specific purpose of optimizing broadcasting procedures, especially the reporting of credits of aired music (cf. Article Three). Historically, the metadata are added as a safeguard for preserving and controlling the collection by providing precise search retrievals and access, but today the concept of metadata also works as curator and music historian, so to speak. Metadata are operationalized in order to tune into the dynamic interconnections of the history of recorded music, and as such metadata pose a critique of values and ideologies of earlier music communication and archival strategies.

If metadata have all these qualities, why are the concept then so underappreciated in new media studies? There is of course no simple answer to this, but the strong attention to calculable processes and algorithmic patterns and procedures reveal a tendency to examine the interdependency of hardware and software (see e.g. (Kittler, 1992; Manovich, 2013), resulting in an inclination to forget, overlook, or even ignore the power of human-made information in the digital (and computational) experience. Parikka, in verbalizing essential points of Ernst's thinking in relation to interpretations of media-archival processes, argues that the "audiovisual archive can [...] be organized not just by metadata but according to proper media-inherent criteria – a sonic and visual memory in its own medium" (2013, p. 29). That is an astute analysis, but it is also trivializing and deflating the concept of metadata. Nanna Bonde Thylstrup argues that digital collections are made to be read by machines, and thus metadata have become "a question of machine analysis rather than of human contextualization" (2018, p. 21), which means that metadata are turned into administrative conduits for computational processes. Thylstrup further speaks of metadata as today's marginalia (p. 106), missing the point of metadata's many faces (as administrative, technical, and descriptive information).

It is imperative to make the concept of metadata more complex. As an example, metadata can also act as gateways that can influence everything

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that can (or cannot) be named (cf. Acker, 2021, p. 322). For instance, metadata can highlight hidden or never thought-of lines between compositions and tracks in the MUSA database, such as I describe through a speculative scenario in Article Four. “Investigating the hidden origins of metadata structures and the motivations behind their enactment”, Amelia Acker says, “brings to light the accumulated power of established systems and cultural practices” (ibid.). I also tend to this perspective in my discussion of metadata in DR’s music archive, though my main concern focuses on how metadata can be connected in a structure resembling a distributed network (cf. Galloway, 2004) and, metaphorically, work on their own and produce new knowledge of recorded music. Metadata can do good things, such as producing and contextualizing knowledge and widen our historical awareness (Mayernik & Acker, 2018). But, metadata can also do bad things, such as occlude voices and reinforce biases that effectively remove historical awareness and create disadvantages for certain users (Jensen, Stoner & Castillo-Speed, 2019; Acker, 2021). Throughout the thesis, I show both perspectives of metadata: in Articles One and Four, I stress how a historical awareness can be nurtured and widened by a sophisticated operationalization of metadata in the digital infrastructure of the MUSA database; and in Articles Three and Four, I also emphasize the problematic backside of making furthered interconnections possible that may have epistemological and political consequences for the users of /Diskoteket.

Metadata’s production and governance aside, it is information that impacts perceptions and knowledge production. On /Diskoteket, metadata further have influence on how users construct the history of recorded music. Metadata spawn music histories. Metadata can be restrictive and help a linear chronology to come forth, or metadata can be co-operative and work to decenter chronology. Metadata are not neutral; either they occlude and simplify things, or they shed light on the alternative histories and make things more complex (see e.g. Gartner, 2016; Gilliland, 2017). Therefore, discussions within *information architecture* have long circled around what metadata do, and can do, to the user experience.⁵² In the case

⁵² For several decades, information architecture as a modality for structural design has underlined that metadata are key to the online experience, that metadata are what users

of DR's digital music archive, metadata have been furthered chimerically to both restrict and control as well as to encourage complexity and diversity. Metadata co-construct and retell music histories based on factual historical information that is set in motion, interrelated, and operationalized. The Department of the Music Archive does all this (cf. Olson, 2013) and makes it possible by constantly balancing a nonlinear and non-chronological mindset with a quest for a singular truth rooted in causality (cf. the coexistence of multiple times, see Tanaka, 2019; see also Bergson, 2005; Deleuze, 2011, 2014; cf. also Benjamin, 2015c; Ricœur, 2004; Hartog, 2016). Such a balance is only functional due to a careful politics of metadata that sees metadata as the main attribute to the digital music archive.

That is why this thesis speaks of sensibilities to metadata as well as sensibilities to historical constructions. These go hand in hand in the MUSA database and they are welded together on the interfaces of /Diskoteket. In my understanding, it is necessary to speak of sensibilities and include an aesthetic dimension in order to try to get a grip on the affectual qualities of metadata. Metadata are embodiments of the history of recorded music and of technology, and metadata embody our understanding of them – they lead to what we decide to do, and we become with them (cf. the assemblage, see Deleuze & Guattari, 1987; Bennett, 2010; DeLanda, 2016). Users and metadata hold bodily capacities of affecting and being affected (cf. Deleuze, 1988, pp. 123-132). Sensibilities to metadata make them mean something to us as users of /Diskoteket. We can do something with them and because of them, and we can get aware of the many concurrent lines in the history of recorded music. In DR's digital music archive, metadata lead to use of history, and to communication. Is our aim to reinforce status quo and uphold chronological logic, or is our aim to disrupt and challenge the chronological logic?

The different possibilities for music communication made available by DR's digital music archive create different music histories and have different reasons for using music histories. All this is due to sensibilities of

can use for something. Peter Morville has contemplated on users' behavioral patterns and argued for designing digital structures that are hierarchical, because metadata can make the technologies guide us through the information (see Morville, 2005; see also Acker, 2021).

metadata that move, and can be moveable, in infrastructures. I will round the chapter off by discussing the conceptual impact of the infrastructure underneath DR's digital music archive, which weaves a thread back to Chapter Three where I described how infrastructures lay out an entrance point for gaining knowledge about DR's music archive.

Infrastructural Time

The historical documents from DR and my conversations with Thomas Dose, the head of DR's Department of the Music Archive, are evident of the music archive being a circumscribed system within the frame of DR as a public service media organization. The music archive grows steadily in size, it has its own logics of sorting and storing, and it facilitates its imaginaries of the history of recorded music in and by itself. However, the music archive is dependent on DR as an organization, and it is reliant on the materiality of digital data exchanges and power sources. The servers of the digital music archive, making the streaming experience cloud-like, are kept in temperature-controlled rooms. The same goes for the physical collection of releases. It is a harsh necessity to keep all elements under strict control, and the slightest errors might lead to erased or inaccessible information.⁵³ An archive today is about more than sorting and storing; it is also about making copies of copies, resisting that the ephemerality of digital data (cf. Chun, 2008) will obliterate the archive from within. And as such, the infrastructures of an archive such as DR's digital music archive are essential to understand; they need to be kept running, and they need to be critically examined in order to assess who, and what, they are supporting.

Infrastructures give way to communication. In DR's digital music archive, music is an aural expression getting communicated by servers and a database, by the structuring of data and metadata. That music needs to be discussed and thought about in such grounded terms is this thesis' definition of infrastructure. In the context of DR's digital music archive,

⁵³ In case information in the digital music archive is lost, it is important to keep the bridge between the physical and the digital archives open at all costs. Such an effort can help to maintain the archive, but it will of course not save the growing part of DR's music archive that consists of born-digital materials, if these were to be mishandled.

registering practices and file locations are the realities of experiencing music. The reason for imagining and cultivating an infrastructure is due to the imaginaries of its communications. By critically thinking about infrastructures, I acknowledge the political entanglements of recorded music that can be followed far and wide, breaking out of the buildings of DR and moving all the way to the record companies' rooting in the consequential actions of foresting and petrochemical industries (cf. Devine, 2019b; Bronfman, 2021; Devine and Boudreault-Fournier, 2021). I am informed by this political ecology of music and keep it in mind while I concretize my scope on the inner workings of DR's digital music archive, because I see an infrastructural investigation as an invitation to refocus the imaginaries of music and history. In my view, a contemporary study of music begs for a widened understanding of the digital outlets of music that are dependent on infrastructural circumstances.⁵⁴ By honing in on DR's digital music archive it gets possible to see how an infrastructural strategy determines the presentation and contextualization of music.

Following the lines of DR's digital music archive's infrastructure is a methodological take that can both amplify and complicate the epistemologies of the archive. It is an approach providing insight into the inner workings of the archival system, but it is also an approach that connects the archive to the frame of DR, thus obscuring the beginning and end of analysis. Drawing on Kittler's media analytical frame of *discourse networks* (1990), Devine outlines the mediatic networks of music as processes of translation, and he states that "every system of inscription is tied to a system of extraction. Every discourse network is a resource network" (2019b, p. 24). Today's musical cultures are deeply entrenched in materiality, and the networks making music possible (the circulations of aesthetics and culture as well as economy and goods) are spun into a layered political ecology (cf. *ibid.*). Even though I focus on the micro-scale level of DR's music archive and how it constitutes itself within DR, I take the larger structures seriously and recognize their formative impact on the archive.

⁵⁴ This relates to a recent theorization within new media studies that expands media in terms of temporality and spatiality, in terms of geological deep times that combine nature and technology (e.g. Kahn, 2013; Parikka, 2015; Peters, 2015).

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Devine's point about the dialectic of inscription and extraction is well put in terms of how the materiality of DR's digital music archive equals communication. I will go further and say that the materiality of communication and infrastructures are to be regarded as similar, if not the same.⁵⁵ I find inspiration in Kittler's statement about there being no software (Kittler, 1992), meaning that all computation in the end only has to do with differences in electrical voltage, which Devine also alludes to in his analysis of the materialities of communication and infrastructures (cf. Devine, 2019b, p. 204n50). At the same time, I also see a potentiality in Manovich's counter-statement about there being only software (Manovich, 2013), meaning that processes of hardware are redundant if not powering exchanges of information. Both views speak to the consideration that it is all about levels of (possible) communication.

To apply Kittler's outspokenness of hardwired functioning and electrical circuitry is a way to approach an *infrastructural time* of the digital music archive. Kittler is very hands-on and thereby his thinking has a certain sensibility to it. By insisting on seeing beyond, or indeed beneath, software he underscores that the materialities of computers come forth at the exact time they provide functionality to their users. To take out software from the equation is to look at computers as non-programmable machines ready to calculate, ready to compute. Computational processes are temporal processes that generate sensibility. The sensibilities of these processes make medial experiences possible due to an amalgamation of human and nonhuman systems. For Kittler (1999), it is redundant to see these systems as opposite bodies; they *are* the body. Recording technologies (of which a digital archive is one) provide the opportunity to expand sensory experience beyond a phenomenological time-consciousness (cf. Stiegler, 2010) because they constantly work with inscription, storage, and transmission. These technologies

⁵⁵ It is important to emphasize that this thesis does not mirror a blind faith in the so-called material turn in music and media studies. Musical cultures are more than material cultures, understanding physical objects to have agency (cf. Devine & Boudreault-Fournier, 2021). When I speak of the materiality of communication and infrastructures, I allude to the medial configurations of digital music archives that potentiate exchanges of information. Thus, I regard infrastructure as a cartographic facilitator of communication. An example of this can be found in MUSA Reg's module of relations.

are felt by the human body before being heard or seen by functions of the human body (cf. Hansen, 2014, p. 221), and therefore they are a part of the body. The transmission of signals from the recording technologies steer the responses of the human body, and by that the infrastructures of the technologies make communication that can have different, concurrent expressions. By being processual, such infrastructures are time-dependent, meaning that they communicate time. Therefore, the recording technologies do more than store time; they tweak time, queer time, expand time, and historicize time. This is what I see as an infrastructural time.

How can DR's digital music archive be grasped by infrastructural time and in what way does a loose conceptualization of temporality (cf. Tanaka, 2019) change the actual listening situation? To approach this question, I will once again take the module of relations in MUSA Reg into consideration. Operationalizing metadata to make tracks point at other tracks, as I, in Articles One and Three, exemplify with Drake's sample of *Why Can't We Live Together*, is a way of creating interrelations across the archival field (cf. Ernst, 2013a). *Hotline Bling* points to *Why Can't We Live Together*, and *Why Can't We Live Together* points to *Hotline Bling*, and they both open up for pointing toward (the contents of) an array of other primary entities (artists, releases, tracks, and compositions) of the database. This is interrelated metadata. Yet, such relations are not only made between metadata, that is, between cultural data. The process of operationalizing metadata also creates relations between culture and technology. Stored information in a certain flash memory location on a server's solid-state drive links up to other stored information, making the cultural data connect. With inspiration from Foucault's definition of discourses (1995, 2002b), Kittler (1999) hints at how discontinuities in timekeeping are conflated by media technologies. This is also at stake in DR's digital music archive: cultural time and autonomous time-based media go together, and this process makes the discontinuities between different times into the epistemological foundation of the digital music archive. The digital music archive's meshwork of times constitutes an infrastructural time that accounts for what is at hand, at the same time as it makes the non-actualized prone to take on form. The infrastructure makes interrelations across bodies, merging technology with organic bodies, thereby reimagining archival life.

Conceptual Framework as Methodology

This thesis' conceptual framework proves important for understanding DR's digital music archive. The trajectories of the framework orbit the digital music archive's conceptualization of metadata, which impacts how histories of recorded music can be constructed, experienced, and discoursed. The metadata-structure of DR's digital music archive has the capacity to tell different histories of recorded music, and that potentiates different epistemologies.

The trajectories of the framework point to metadata as the quality of DR's digital music archive that can lead to a widened knowledge production and a historical awareness of recorded music. The trajectories further point to a positioning of metadata within the infrastructure of DR's digital music archive, which is based on a fluid temporal understanding. Different histories of recorded music can be communicated concurrently.

To follow the trajectories of the conceptual framework is a first step toward a contemporary theorizing of the history of recorded music that takes off in DR's digital music archive. Additionally, this tactic can also function as an expansion of music historiographical methodology. Therefore, the thesis' hierarchy of theory is closely connected to its methodology. The conceptual framework outlines an interdisciplinary approach that can critically assess the logic of ordering in DR's digital music archive as well as be a strategy for digging out hidden structures and forgotten connections.

5. Conclusion

This thesis has examined the development and structuration of DR's music archive through an interdisciplinary framework grounded in musicology and new media studies. Furthermore, it has been informed by ethnographic methods. The study addressed the correlation between archival strategies and the presentation of the history of recorded music. It specifically made an observation of how DR's digital music archive creates a resonance between the music that is in the archive and the metadata that are added to the music. The thesis approached this with a two-part research question. The first part was: *In what ways do politics, ideals, and practices of digital design and the registering of metadata guide the structuring of DR's digital music archive?* The second part was: *How is the communication of the history of recorded music on /Diskoteket configured by the digital music archive's infrastructure?* In order to get a reflexive understanding of the archive, the thesis maintained an ethnographic sensibility to the archive as an object of study. By moving in and out of the archive, I made it possible continually to question what I was learning, and in that way, I could tie my interdisciplinary approach together. Through my general research question and my empirical material, I developed an overall argument regarding digital music archives. This argument was that digital technologies and metadata enable coexisting historical narratives of recorded music across time, geography, musical genre, and ideology. In facilitating coexisting historical narratives, metadata give meaning and purpose to digital music archives.

One conclusion of the study is that the presentation of music on DR's digital music platform /Diskoteket can have impact on how the music is perceived. On /Diskoteket, the history of recorded music is made movable and negotiable, weaving a complex web of connections for the user to in-

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teract with and follow. From within this web emerged the contours of what I am calling *historicized listening*. This definition anchors listening as a referential action that has as its purpose to understand recorded music in relation to other recorded music. The term was developed on the assumption that metadata can change the way a track is aurally perceived. Such an assumption leads to an expansion of narratives that has a direct effect on the experiences and practices of music streaming via /Diskoteket, which, in continuation, might reach into the practices of music radio broadcasting at DR. To approach the field of music radio studies from an interest in the history of recorded music brings new perspectives into light: perspectives on archival practices, software-infrastructures, and music historical discourses. Correspondingly, to approach the field of music streaming studies from the departure point of the history of recorded music is a way of widening the insight into what data-linkage can do to the visual presentation of music via interactive functionalities. Most, if not all, on-demand subscription services use linked data to create a (feeling of a) personalized music streaming experience, and if the metadata of the music releases on such platforms are operationalized and linked as well, the history of recorded music can work as a way of opening up alternative discoveries in recorded music's canon. I have shown that imaginaries of the history of recorded music play into both music radio production and music streaming due to the fact that both types of music communication play with music consumers' preconceptions of truth and factuality in music history.

People's conceptualizations of the history of recorded music are closely connected to their imagined communities (cf. Anderson, 2006). And such relationalities are linked to their digital practices. In Article Two, I proposed the term *digital music history* in order to be able to comprehend the range of interconnections and interoperability making up our practices and experiences when using and consuming music online. By weaving a thread between music streaming, digital behavior, and music historical imaginaries, I argued for the singular digital experience with music as having historiographical value. My argumentation evolved from ten interviews with DR employees, through which I gathered insight into the way people create epistemologies of the history of recorded music by way of engaging with music. I evaluated these epistemologies to be of great im-

portance when trying to fathom how discourses of music and music history function, and thus I developed an approach to the writing of music history that embraced people's singular perceptions, experiences, actions, and reactions. The key element of the term digital music history was argued to be that we all take part in our own situated versions of the history of recorded music, and that we all need to be aware of the intertwinement of our own doings and the doings of the digital technologies.

This study has worked with three methodological trajectories that in combination have provided knowledge about the inner mechanisms of DR's digital music archive. First of all, my line of approach was informed by ethnographic methods. I conducted ten interviews with DR employees from which I gathered insight about /Diskoteket's appearance and functionality, just as I traced a correlation between the employees' statements and the digital system's configuration when it comes to the history of recorded music. The interviews revealed a tendency among DR employees to think about the history of recorded music in linear and causal terms, which I labelled *institutionalized music history*, and this logic, I found, was supported by syntax and visual presentation in the digital music archive. I further conducted four in-depth interviews with the head of the Department of the Music Archive, Thomas Dose, in which it was confirmed that the digital system, to an extent, followed the logic of linearity. Yet, from these four interviews I also learned about the department's deliberate aims to let the system reflect nonlinear narratives. This was strengthened by observations of work routines of employees in the Department of the Music Archive as well as by participatory work with music registration software. Secondly, I took advantage of my insider-position as an affiliate with the Department of the Music Archive to engage in readings of /Diskoteket's and the registration software MUSA Reg's interfaces. This approach made for a qualified analysis of the digital infrastructure of the MUSA database that showed the extent to which visual presentation and search retrievals were constituted by operationalized metadata. Via this method of usage of the digital music archive I disclosed the complexity of relations between tracks and releases that made up some of the fundamental functionalities of /Diskoteket's user experience. I could see how the operationalization of metadata was used to strengthen the logic of linear-

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ity as well as disrupt it and amplify circular and non-causal lines in the history of recorded music. Thirdly, I approached DR's digital music archive from a historical angle by obtaining and reading archival documents concerning updates to the MUSA database as well as concerning the development of /Diskoteket. This method of going behind the production of the digital music archive was formative for my understanding of how managerial strategies were implemented at the same time as they were challenged by the Department of the Music Archive. These three methodological trajectories were combined as my methodology, and by reflecting on my own position within these approaches, I acquired a widened understanding of how DR's digital music archive can facilitate different versions of the history of recorded music.

Use of history plays an important role in DR's conceptualization of music. Throughout the life span of the music archive, the acquisition of music releases has taken place due to changing national and cultural ideals. In recent years, the multiannual public service contracts negotiated between DR and the Danish Ministry of Culture have specified that the percentage of aired music with Danish artists, songwriters, and producers must increase. This can be read out of the digital music archive's additions over the last couple of years, just as it can be traced via the hyperlinked and interrelated metadata-structure in /Diskoteket. Similarly, since 2022, there has been a substantial strategic line to air more female artists across DR's radio channels, and this also stands out in the refined metadata of many contemporary (Danish) female artists. One of my findings is the fact that the Department of the Music Archive since the mid-2000s has structured the digital music archive in such a way, that it presents the history of recorded music as a many-sided association of tracks and releases. In order for such a non-causal logic to function, the general metadata-structure had to be sophisticated and follow a strict taxonomical syntax. And this work to let the archive reflect a historical heterogeneity that goes against what I call an institutionalized music history, is in fact what makes DR capable of following new communicative trajectories that focus on Danish artists, especially female artists. The metadata are already there and they are interrelated and operationalized, meaning that it will be a swift maneuver to cross the archival field and gather hidden yet interconnected information. Such new tra-

jectories can carve out new directions for what an institutionalized music history at DR might be, signifying that the music archive and the overall institutional line are deeply associated. This study has presented a history of DR's music archive with a focus on the development of the digital music archive, and it has shown how aspects of music radio production practices at DR can be formed and informed by the digital music archive. The archive supports the institutional line, but it also goes further and amplifies connections beyond the institution's strategic scope.

It has been a recurring quest of this thesis to challenge the perceptual immediacy of /Diskoteket. Most research on music streaming keeps a strict focus on either media and listening practices or algorithmic structures of recommendation and takes the music's presentation for what it is, as if the interface of a digital music platform has a fixed teleology. Through analyses of interrelated and operationalized metadata that connect interfaces on /Diskoteket, I have argued that the visual presentation and embedded functionalities on the interfaces of tracks can be disrupted and lead to other interfaces, informing the listening experience. The archival practice of connecting tracks and creating a widened functionality generates a structure in which the music can be repurposed depending on the users' choices and what they think they know about the history of recorded music. In Article One, I discussed how the platform leads to different epistemologies in the vein of Attali's concept of composition, which I exemplified with an array of potential paths from the track interface of Drake's *Hotline Bling*. In Article Four, I made this more complex by examining the module in the registration software MUSA Reg that produces relations between tracks; here, I evolved a speculative scenario of how the metadata-structure in the MUSA database can be visualized as a way to widen the epistemologies and let oppressed and unheard voices get a say. In making a variantology of the digital music archive, I accentuated how the system can be tweaked into producing a critique of itself as a way to consciously acknowledge the problematics of its Western foundation and logic of history. In this context, it is important to note that the digital music archive qua its metadata-structure already holds such capabilities, they are just not acted upon.

In trying to understand how DR's digital music archive works and how it effects the institution's communication of music history, I encountered

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thought-provoking decisions made by DR's management. After the initial establishment, the process of developing a digital music archive was executed in favor of a politics of optimization. New visions for music communication were nonexistent. I could read this from the historical documents that I obtained via DR's juridical department, and it was reiterated by the head of the Department of the Music Archive, Thomas Dose, in an interview where he elaborated on the proposal for the mobile application DR DJ, which ended up being discarded. To an extent, the metadata-structure of DR's digital music archive is open-ended and can be used for amplifying subdued and lost lines in the history of recorded music, but so far this potentiality of the database, which can be experienced on /Diskoteket, has not been taken into consideration when larger managerial and strategic decisions have been made about what sort of digital music communication DR ought to deliver. This fact strengthened my reason for speaking of an institutionalized music history. When the participants in my interviews all argued for music's history as a somewhat linear and causative movement, it occurred to me that they were building their argumentation on a conceptualization of music history that corresponded with a general idea of right and wrong – an idea aligning with the taxonomical order of registering metadata in the MUSA database, and thus also aligning with the politics of optimization. But, at the same time I also realized the extent to which the structuration of DR's digital music archive worked as an active challenge to that general idea of right and wrong. Operationalization of metadata is control, both limiting options and making them complex.

I have examined DR's digital music archive in relation to differing ideals of history that come from different concepts of time. DR's common ideal of history, which resonates with the institution's typical take on the use of history, can be found in the educational ideals of DR as a public service institution that to an extent are grounded in the Enlightenment's reckoning of chronology. As Tanaka (2019, p. 42) has argued, the temporal hierarchy of the last two hundred years assimilated the relational conditions of things and events and moved them into fixed temporal positions that everyone could understand and that fitted into larger (national and cultural) narratives. This concept of time was not predominant prior to the turn of the nineteenth century, but in a Western context it easily caught

on due to the simplicity and unassailability of ‘historical facts’. Through interviews with employees at DR (and users of /Diskoteket) as well as through the reading of archival documents, I traced a commonality in DR’s discourse of music history, especially concerning the history of recorded music: first of all, that some (versions of) tracks had more historical validity than others, and second, that a track’s relations across time and geographical space were not of great importance to the institution’s tactic of communication. The first point was backed up by the Department of the Music Archive when they implemented super-relations that could silence and hide specific (versions of) tracks, making sure that the intended narrative would come through to the users of the platform. The latter point, on the other hand, was countered by the Department of the Music Archive due to an insistent effort of interrelating tracks, making sure all known elements of a track’s history (aligning with the department’s ideal of taxonomical syntax) were told. In Chapter Three and Article Three, I exemplified the first with The Beatles’ *Yesterday* that had undergone a heavy interconnection in terms of primary-secondary relations, making sure to create an overview in /Diskoteket that would contain one unique version of the track (from the album *Help!*). In Chapter Three and Articles One, Three, and Four, I exemplified the latter with Drake’s *Hotline Bling* and Nas’ *Adam and Eve*, which showed how a simple functionality based on a non-hierarchical database-structure could present a track as dissolving genre-boundaries, crossing geographical space, challenging cultural anchoring, and displacing temporal fixation.

The sample relations of *Hotline Bling* and *Adam and Eve* might be regarded by some as deviations from the music at hand. I instead saw this practice of the Department of the Music Archive as an effort to underscore the “differentials of time” (Benjamin, 1999, p. 456). This formulation by Benjamin was originally used to describe how knowledge will assemble in flashes that change from every instant in time to the next. I saw a qualitative value in combining tracks in the MUSA database that resembled such an epistemology; we can learn more about music and about the world by being open to starting our investigative experiences in the middle instead of from a predetermined position. Through Article Four’s speculative scenario of a public entrance to the digital music archive via the application

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DR DJ, I exhibited how the foundation of /Diskoteket can work to shed light on music's multiple times and geographies. This, I argued, must be done actively if we want to make a better world of music than the existing one. Music communication can be an agent of democratization, but it can only be so if lines of history, hitherto hidden, are accentuated.

I have shown that the music releases in DR's digital music archive are presented and made navigable due to two concurrent historical convictions. I read this out of the interfaces of /Diskoteket as well as the inner lines of the MUSA database by way of Tanaka's methodological tactic of approaching an object of study with a dehistoricized view, inverting time (Tanaka, 2019, p. 19 and pp. 90-91). I needed to understand the digital system as built up by and containing heterogeneous times. In that way, I could paint a picture of the digital music archive that consisted of human activity and relationality, leading to differing experiences. Theoretically, I described the experience of encountering music in a digital environment as a musical assemblage consisting of an actual event with virtual capacities, or non-actualized events (cf. Article One and Chapter Four), just as I defined the experiences of music streaming as unique versions of the same event (cf. Article Two; Pedersen, 2022a, p. 141). To stream music is to expose the multiple times of a digital music archive. And with DR's digital music archive as a case study, this proved to be very clear to see: the many different options in the relation module in MUSA Reg drew attention to a conviction of historical relationality, and the super-relations deeming tracks either primary or secondary exposed a conviction of linearity and consensual factuality (cf. Pedersen, 2022b, p. 70). This stimulated me to label the digital music archive as a system that contained converging histories that only could be disentangled by a mindset of decentering chronology (cf. Chapter Two and Article Three; see also Tanaka, 2019).

The history of recorded music is made available and being communicated by the digital infrastructure of the MUSA database. This makes for certain aesthetic experiences, at certain aesthetic situations. I have discussed how the technologies of the digital music archive generate a system entwined with the human body (cf. Kittler, 1999), creating relations between culture and technology. Such an interrelation is steered by the time-dependent infrastructure of the digital music archive that, by being

processual, communicates different and concurrent expressions of time. I have categorized this as the *infrastructural time* of the digital music archive. Moreover, I have analyzed DR's digital music archive as constituting an aesthetic situation that imbues the act of listening and searching with historical awareness. I have argued that it will be nonsensical to try to understand DR's music archive without focusing on the Department of the Music Archive's sensibilities toward metadata, and I have shown that the structure and operationalization of metadata can be traced back to the inauguration of archival order on index cards. Diachronically, metadata have not only given the archive structure, they have also given it meaning and purpose. When it comes to the digital music archive, metadata function as the constitutive elements that can make the archive facilitate different versions of the history of recorded music, because the metadata-structure is the very thing that potentiates different readings and opens for different approaches to use of history. Thus, DR's digital music archive is an archive that is constructed by metadata and that constructs metadata as historical records. This archive has a sensibility toward metadata, and it demands a certain sensibility from its users as well.

I have contributed to music and media studies by showing that formations of metadata can deepen and change our perception and reception of music releases and music history. In fact, based on my understanding of metadata as a determinant for how cultural objects appear, the analysis contributes to software and archival studies as well. I have argued that metadata can support many different narratives, and I have provided examples of how metadata give the digital music archive the capability to deliver multiple concurrent histories of recorded music. In a methodological vein, I have also explained that the continual development of the archive can tell us something about the institution in which it functions. First, the metadata are produced by music registrars employed by DR, and then the metadata produce the archive and its options according to the will of the music registrars. I have read the archive along its grain and thereby understood how the metadata-structure echoed managerial strategies and the politics of optimization. Yet, this reading also made me aware of unrequested functionalities implemented in the MUSA database as a potential critique of the politics of optimization. Approaching the digital

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music archive in such a manner has been to question the bureaucratic lines and the institutional strategies of DR.

Looking Forward

During the final stages of writing this thesis, two far-reaching events at DR happened that would have impacted aspects of the analysis. The first event was internal to the Department of the Music Archive, and the second event was an overall strategic line for DR as a public service institution. In 2022, the Department of the Music Archive initiated the development of a new browser-based piece of software for registering music in the MUSA database. This new registering software took over from MUSA Reg on 1 January 2023, and even though the database's integration with /Diskoteket remains unchanged, the internal functionalities of registration have changed. This has as a consequence that future research into DR and music communication will not be able to convert analytical points from this thesis one-on-one. New understanding of new software will be needed. And this, I believe, is worth keeping in mind when speculating on the possible trajectories for future research into digital archiving of music at DR, into DR's music communication, and into DR's public service obligations. In October 2021, a comprehensive plan for how to implement a new digital strategy, called *Sammen om det vigtige* [Unified by what's important],⁵⁶ was launched. The main goal of this strategy is to rethink DR's role in a fluctuating media landscape that is digitized all the way through. This is an institutional strategy that impacts DR's entire organization in an attempt to erase boundaries between media formats and technological logics. It is a digital development plan that has dire consequences for the institution's internal structure, because it is decided that DR's apps for streaming (DRTV and DR LYD [DR Sound]) will be financially strengthened at the expense of certain parts of the content-producing staff. The digital entry-points need to be more appealing and attractive, leading to personalized experiences.⁵⁷ It is a restructuring of the institution's finances,

⁵⁶ My translation.

⁵⁷ This is a paraphrasing of a statement by DR's Director-General and CEO, Maria

leading to lay-offs in the director-areas of News as well as Culture, Children and Youth. Such a planned decision also impacts the Department of the Music Archive, shifting its acquisition strategies and general workload, as more externally produced content will be brought into the broadcasting scheme in the format of podcasts. At the same time, the Department of the Music Archive will not be strengthened. This overall institutional strategy will change the day-to-day work routines and it might also be challenging to the actual archival practices. Any future research into DR's music archive and the institution's ideals of music communication will have to create an understanding of the digital music archive's infrastructure and see it in relation to this overall strategy. Especially when it comes to methodology, as these new lines will make it more obscure to obtain a widened knowledge of how things used to be.

I have alluded to possible ramifications of liquidating parts of the welfare-state. As Burkart and Leijonhufvud (2019) warn us, a common understanding and knowledge of music history and music cultures is lost when scaling down on archives that are relevant for public service and cultural heritage. As they show with Swedish Radio (SR), it has consequences to substitute the inherited archives with cloud-based streaming services. To make cutbacks on a public service media institution's music archive will result in a gradual removal of the archival memory that makes for a fruitful institutional culture, which can be expanded and directed into public culture by way of intricate takes on music communication. Such a discussion is relevant to bring up in relation to all European Broadcasting Media as well, including DR. What does it mean to the institutional integrity that elements of the practices of music archiving are delegated to commercial actors? What does it mean to cancel parts of a physical music archive and instead focus on easily integrated digital solutions mirroring a music collection selected by the record labels? What does it mean to let a digital music archive rely on imported metadata-structures from commercial actors focusing on market share instead of a heightening of information and

Rørbye Rønn made in an internal interview published on DR's news pages on 30 August 2022. See "Digital omstilling betyder afskedigelser i DR", <https://www.dr.dk/om-dr/nyheder/digital-omstilling-betyder-afskedigelser-i-dr>, article accessed on 26 December 2022.

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a highlighting of different narratives? What does it mean not to know how and why catalog contents are put together in the ways they are? And what are the implications of black boxing the foundation for a public service media institution's music communication?

Questions such as the ones above are natural prolongations of the present study. By describing the development of DR's digital music archive and how it is rooted in earlier practices of archiving physical releases, I have prepared a legitimate basis for investigating and speculating on the complications of pairing DR as a national state media with private industries. Head of the Department of the Music Archive, Thomas Dose (2021a), states that the music archive to an extent competes with Spotify, and he underlines that the department most likely would be replaced with Spotify if it were possible. But as it is, this will not happen. When it comes to SR, the ties to Spotify are different and related to the publicly funded Royal Technological University (KTH), as Leijonhufvud has explained (2018), and this makes the Spotifiation process simpler. Spotify's colonization of the Swedish public service media almost seems as a natural evolvement, even though, as I point out in Article Four, it does not harmonize with the ideals of Swedish public service. In a Danish public service media context, such an intertwinement can be hard to picture, but it goes without saying that today's digital music communication at DR is heavily impacted by movements within on-demand subscription services, such as Spotify. And with the new overall strategy, the future functionalities of DR's apps for streaming are difficult to foresee. Considering the focus on optimization that I revealed via the archival documents about /Diskoteket, it is not far-fetched to imagine a scenario where DR operates with some sort of collaborative integration from a commercial actor. This would support nearly three decades of refined music scheduling and automatized playlist-logic, and it would also align with the new strategy's focus on technology.

Today's media landscape is in constant flux, and for DR to rely on the processes of algorithms, is a way forward filled with many uncertainties. It is unknown whether a company such as Spotify will exist in five years from now, and if it does it is unclear how it will be structured and driven at that point in time. A public service media institution might be able to capitalize greatly on new functionalities and opportunities, but as Burkart and

Leijonhufvud rightly point out, this will happen “at the expense of a social democratic model of cultural policy” (2019, p. 181). It seems a fairly insecure path to tread, considering the ever-evolving progress of a company working to find ways to monetize its stakeholders’ investments. It appears to be impossible for a public service media institution to uphold the detail and precision in the communication of recorded music if an unstable and opaque transfer of data is constituting the institution’s common music archive. It is unthinkable to disentangle the political and the financial aspects from the cultural implications, and even if the cultural effects are separated from monetary logics, it would still be unfeasible.

The infrastructure of DR’s digital music archive is complex and has the capability to tell many concurrent histories of recorded music. Yet, it is a clear and honest infrastructure in that it is not relying on self-sufficient algorithmic processes. As I have made clear with this thesis, it is important to approach DR’s digital music archive as an object of critique because *it is* ingrained in a political institution. But, if DR were to be amalgamated with Spotify in one way or another, it would be the algorithmic processes of the cloud-based system and not the digital music archive of DR that would be the possible objects of critique. Yet, this would lead to difficulties. Spotify’s Application Programming Interface (API) is easy to apply and free to use, but as recent research (Morris, 2015a; Drott, 2018a; Prey 2018; Eriksson et al., 2019) has shown, the algorithmic structuration of Spotify’s recommendation model and data harvesting schemes is a well-kept secret.

In the wake of a year defined by geopolitical crises and economic unrest, it seems appropriate to reflect on whether or not the contemporary scenery of music streaming is in fact sustainable. Spotify has yet to create revenue through its current subscription-based model providing free access through advertisements, and with a global economy defined by inflation and increasing interest rates the coming years might see people scaling down on their total amounts of subscriptions to streaming services, including Spotify. In such a scenario, it will only be a matter of time before the company’s stakeholders will demand proceeds for their investments. It is an unviable business model that cannot withstand a continuous fiscal pressure. Through 2022 and the first months of 2023, there has been a tendency in the tech industry to develop new business strategies aimed at cutting down

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on expenses. This has resulted in the lay-off of thousands of employees.⁵⁸ If such efforts to stop economic losses continue throughout the tech industry, on-demand subscription services of music will inevitably go through similar measurements. What will happen to a company such as Spotify if these tendencies carry on? And what will happen to the subscribers that, as users, rely on the platform as their personal music collection? Younger generations do not necessarily own any music releases (not even as digital files), but only engage with recorded music as a streaming practice. What will the history of recorded music (and music history in general) be to these generations, if the on-demand subscription services go bankrupt? There are no simple answers to these questions, and the consequences of such a situation are impossible to comprehend.

DR's digital music archive has the capability to endure a future where the media landscape is pervaded by uncertainty, because this archive functions according to public service obligations. Unless priorities of future cultural policies lead to a liquidation of DR's music archive, the Department of the Music Archive will continue to support the production of music radio, podcasts, and web-based content. The question is whether or not this is enough for justifying a continuous maintenance of the archive. As a public service media organization, DR needs to take a decision regarding the future of music communication that shows a path for a sustainable music media landscape. If the commercial streaming services begin to break under the current economic pressure, DR ought to be ready to offer an alternative solution to the Danish public. In order to do that, DR is in need of courage and visions, and DR must be capable of providing music content that exceeds the radio format and frames the streaming experience differently than Spotify and similar services do.

⁵⁸ During the fall of 2022, Twitter fired more than 3,000 employees due to Elon Musk's chaotic \$44 billion purchase of the social media platform in October 2022. Meta, the company owning Facebook, Instagram and WhatsApp, cut 11,000 jobs in November 2022 in an effort to stop a downward trend in the company's share price. And in February 2023, Disney announced plans to cut 7,000 jobs due to media industry turmoil as well as a loss in Disney+ subscribers. A common struggle for all three tech giants is found in the fact that advertising companies have cut their budgets in the face of current economic uncertainty. As of February 2023, Twitter is not profitable; Meta is profitable but struggles to grow; and Disney is profitable, but Disney+ is not.

Thesis summary

This study examines how digital music archives can facilitate different versions of the history of recorded music. It argues that digital technologies and metadata enable coexisting historical narratives of recorded music that move across time and musical genre, and that can cross geographical and cultural space. The study sees a correlation between archival strategies and the presentation of recorded music. It exemplifies this by examining the development and structuration of the digital music archive of the Danish Broadcasting Corporation (DR). The study amplifies that the presentation of recorded music on DR's digital music platform */Diskoteket* can impact how the music is perceived. It is asserted that music streaming experiences are directed by imaginaries of the history of recorded music, which can be guided by metadata. As this study is the first to have an explicit focus on DR's music archive, it offers a historical perspective alongside its more practical and technological analyses.

The study combines the historical and ethnographic sensibilities of music radio studies with theory on music streaming practices and the critical thinking of media archaeology and new media studies. In this way, the study develops a descriptive and interpretational approach that fuels both its methodology and conceptual framework. It seeks to trace the inner workings of DR's digital music archive and assess how its structuration can constitute concurrent histories of recorded music.

In this research, I follow three methodological trajectories that all play a part in providing knowledge about DR's digital music archive. First of all, I was informed by ethnographic methods and engaged in participant observation and conducted interviews with the head of the Department of the Music Archive at DR as well as ten DR employees that use */Diskoteket* in their daily work routines. Secondly, I examined the digital music archive by

way of usage of music registration software and the digital music platform. Thirdly, I read archival documents pertaining to the development of the digital music archive. These three trajectories are combined as the study's methodology, and by continuously reflecting on my own position within the approaches I achieve a widened understanding of how DR's digital music archive enables coexisting historical narratives of recorded music.

I cultivate my theoretical argument through a discussion of the concept of the digital music archive. Specifically, I stress that the digital music archive leads to a historical perception that creates epistemologies of recorded music, which can be variable and change from situation to situation. This is a modality that I describe as *historicized listening*. With this term I define listening as a referential action that has as its purpose to understand recorded music in relation to other recorded music. I emphasize that metadata nurture such a referential action. The premise of historicized listening is described as building on interconnections in music that are closely related to practices of music streaming, to digital behavior, and to music historical imaginaries. I argue that recorded music is perceived and experienced through an interdependency of our own doings and the doings of the digital communications technologies that provide us with music. I propose the term *digital music history* as an attempt to comprehend the multiplicity of interconnections that makes us all create epistemologies of the history of recorded music.

The thesis' overall structure is divided in two. The first part is a cover paper that reviews the research project as a whole, and the second part consists of four research articles written over the course of the project.

The first article, *Digital Music Use as Ecological Thinking: Metadata and Historicized Listening*, argues that the act of using a digital music platform is a process of becoming. In the article, I analyze the engagements of making search retrievals and listening to music via a digital music platform as forming an ecology, in which the history of recorded music is variable. To exemplify such an aesthetic situation, I make use of /Diskoteket and show aspects of the strategic programming of metadata in DR's digital music archive.

In the second article, *On Digital Music History: A Contemplation on Digital Archives and Musical Experience*, I discuss the premise for conceptualizing music history in contemporary digital times. I have conducted a series of qualitative interviews with employees at DR about music history

and digital media, from which I conclude that we are in need of a conceptual frame that can embrace singular situated versions of music history constructed alongside digital technologies. I go through two formative takes on music history (specifically Carl Dahlhaus' dialectic history (1983) and Lydia Goehr's analysis of the work-concept (2007)), which I relate to recent theoretical takes in cultural and material theory. I argue for a principle of inclusivity in contemporary music historiography that takes perceptions and experiences of users of digital music platforms seriously.

In the third article, *The Digital Archiving of Music at the Danish Broadcasting Corporation – History, Ideals, Taxonomy*, I provide a historical perspective of the study's topic. In the article, I account for the development of DR's digital music archive and the platform /Diskoteket. I read archival documents alongside interviews and analyses of interfaces, and I propose that there is an institutionalized music history at DR. I examine the practices of constructing and operationalizing metadata in DR's digital music archive, and I argue that the metadata reflect coexisting historical narratives of recorded music.

The fourth article, *Music Discoveries that could have been: a Variantology of the Danish Broadcasting Corporation's Music Archive*, reads DR's digital music archive through a frame of imaginary media. In the article, I provide a diagnosis of the political climate surrounding DR's music archive and conclude that rejected ideas and unfulfilled visions for music communication play a role in the structuring of metadata in the digital music archive. I develop a speculative scenario, in which I imagine the kind of options that a discarded proposal for a mobile application, called DR DJ, would entail. Building on this scenario, I argue that the metadata-structure makes the digital music archive open for non-linear lines in the history of recorded music.

I conclude that formations of metadata can deepen and change the perception and reception of music releases. Via my analyses of DR's digital music archive, I argue that metadata can support many different narratives that are delivered concurrently. Metadata give structure to DR's digital music archive while also giving it meaning and purpose. I suggest, furthermore, that this applies to all types of digital music archives. With DR's digital music archive as a case study, I highlight that the history of recorded music is circular and can point in multiple directions.

Sammanfattning av avhandlingen

Denna avhandling undersöker hur digitala musikarkiv möjliggör flera samexisterande historiska versioner av inspelad musik. Det argumenteras för att digital teknik och metadata möjliggör olika narrativ, som rör sig över tid och genrer, och som kan korsa geografiska och kulturella rum i den inspelade musikens historia. Studien ser ett samband mellan arkiveringsstrategier och presentation av den inspelade musiken. Detta exemplifieras genom en undersökning av utvecklingen och uppbyggnaden av Danmarks Radios (DR) musikarkiv. Studien visar att sättet på vilket den inspelade musiken presenteras på DR:s digitala musikplattform, */Diskoteket*, har betydelse för hur den uppfattas. I avhandlingen betonas att upplevelser av musikströmning styrs av föreställningar av den inspelade musikens historia och det lyfts fram hur metadata påverkar och kan fungera vägledande för sådana föreställningar. Eftersom det här är den första studien som har ett uttalat fokus på DR:s musikarkiv, inrymmer den ett historiskt perspektiv parallellt med praktiska och tekniska analyser.

Avhandlingen tar avstamp i den historiska och etnografiska sensibilitet som generellt kännetecknar forskningen om musikradio, och kombinerar denna med teorier om musikströmningspraktiker samt kritiska infallsvinklar från mediearkeologi och forskning om nya medier. På så sätt utvecklas ett deskriptivt och tolkande förhållningssätt baserat på avhandlingens metod och teoretiska ramar. Studien siktar mot att klarlägga de inre mekanismerna i DR:s digitala musikarkiv och ta reda på hur arkivets struktur kan bidra till att upprätta överlappande musikhistorier.

I studien följer jag tre metodologiska förlopp, som alla bidrar till kunskap om DR:s digitala musikarkiv. För det första har jag inhämtat information

genom etnografiska metoder. Jag har använt mig av deltagande observation samt även genomfört intervjuer med föreståndaren för DR:s musikarkiv och med tio DR-anställda som alla använder /Diskoteket i sitt dagliga arbete. Jag undersöker även det digitala musikarkivet genom att aktivt använda den digitala musikplattformen och musikregistreringsmjukvaran. Slutligen har jag studerat arkivhandlingar som rör utvecklandet av det digitala musikarkivet. De här tre spåren utgör studiens metodik. Jag reflekterar genomgående över min egen roll i förhållande till studien och får därigenom en bredare förståelse för hur DR:s digitala musikarkiv skapar möjligheter för en samexistens mellan olika musikhistoriska berättelser.

Min teoretiska argumentation förs genom en diskussion om det digitala musikarkivet som koncept. Mer specifikt hävdar jag att det digitala musikarkivet bidrar till en historisk förståelse som skapar epistemologier av inspelad musik, vilka kan variera och förändras från situation till situation. Denna modalitet benämner jag *historiserat lyssnande*. Utifrån detta begrepp definierar jag lyssnande som en refererande handling som syftar till att förstå inspelad musik genom annan inspelad musik. Jag framhåller att metadata ger näring till sådana refererande handlingar, och att utgångspunkten för historiserat lyssnande är de sammankopplingar i musik som är nära relaterade till metoder för musikströmning, till digitalt beteende och till musikhistoriska föreställningar. Jag argumenterar för att inspelad musik uppfattas och upplevs genom en ömsesidig relation mellan våra egna handlingar och hur de digitala teknikerna agerar. I ett försök att bringa reda i de många kulturella sammankopplingar som bidrar till olika epistemologier av inspelad musiks historia, föreslår jag begreppet *digital musikhistoria*.

Avhandlingen har en övergripande struktur uppbyggd på två huvudsakliga delar. Den första delen består av en inledande text som beskriver forskningsprojektet som helhet. Den andra delen består av fyra forskningsartiklar skrivna inom projektets fyraåriga tidsram.

I den första artikeln, *Digital Music Use as Ecological Thinking: Metadata and Historicised Listening*, argumenterar jag för att användande av en digital musikplattform är en tillblivelseprocess. I artikeln diskuterar jag olika sätt att söka och lyssna på musik via en digital musikplattform som handlingar som formar en ekologi, innehållande en mångskiftande historik av

inspelad musik. Jag ger exempel på detta estetiska förhållande genom att använda mig av /Diskoteket, och jag påvisar aspekter av hur metadata är strategiskt programmerad i DR:s digitala musikarkiv.

I den andra artikeln, *On Digital Music History: A Contemplation on Digital Archives and Musical Experience*, diskuterar jag hur musikhistoria konceptualiseras i samtidens digitala verklighet. Jag inleder genom att analysera ett antal kvalitativa intervjuer med DR-anställda som rör vid ämnenas musikhistoria och digitala medier. Utifrån dessa intervjuer drar jag slutsatsen att vi behöver ett konceptuellt ramverk som kan inkludera alla de enskilt situerade versioner av musikhistorien som uppstår i samband med användande av digital teknik. Jag går därefter igenom två formativa förhållningssätt till musikhistoriskt tänkande (närmare bestämt Carl Dahlhaus dialektiska historia (1983) och Lydia Goehrs analys av verkbegreppet (2007)), som jag sätter i relation till senare tiders avvikelser i det kulturteoretiska tänkandet. Jag hävdar att vi behöver en inklusivitetsprincip i musikhistorien som tar användarperspektivet och digitala musikplattformar på allvar.

I den tredje artikeln, *The digital archiving of music at the Danish Broadcasting Corporation – history, ideals, taxonomy*, anlägger jag ett historiskt perspektiv på studiens huvudämne. I artikeln diskuterar jag framväxten av DR:s digitala musikarkiv och plattformen /Diskoteket. Jag närläser arkivhandlingar parallellt med intervjuer och gränssnittsanalyser, och jag argumenterar för att en institutionaliserad förståelse för musikhistorien dominerar inom DR. Jag undersöker praktiken bakom konstruktion och operationalisering av metadata i DR:s digitala musikarkiv, och jag framhåller att denna metadata speglar samexisterande historiska berättelser av inspelad musik.

I den fjärde artikeln, *Music Discoveries that could have been: a Variantology of the Danish Broadcasting Corporation's Music Archive*, tolkar jag DR:s musikarkiv genom ett mediearkeologiskt ramverk av imaginära medier. I artikeln skärskådar jag det politiska klimat som omger DR:s musikarkiv och drar slutsatsen att förkastade idéer och ouppfyllda visioner för musikförmedling inverkar på hur metadata struktureras i det digitala musikarkivet. Jag lägger fram ett spekulativt scenario där en mobilapplikation för musikutforskande som aldrig blev implementerad, benämnd DR DJ,

skulle gett andra alternativ. Utifrån detta scenario argumenterar jag för att metadatastrukturen gör det digitala musikarkivet öppet för icke-linjära linjer i inspelad musiks historia.

Jag drar slutsatsen att metadatastrukturering kan fördjupa och förändra synen på musikutgivning. Genom analyser av DR:s digitala musikarkiv påvisar jag att metadata kan stödja många olika narrativ som kommuniceras parallellt. Metadata ger struktur åt DR:s digitala musikarkiv samt gör det begripligt och ger det ett syfte. Detta, hävdar jag, gäller alla typer av digitala musikarkiv. Genom DR:s digitala musikarkiv som fallstudie gör jag konklusionen att inspelad musiks historia är öppen och iterativ och kan peka i åtskilliga riktningar.

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DR's music archives

The physical music archive (consisting of shellacs, vinyl, cassette tapes, CD's).

Index cards for navigating the physical music archive.

MUSA – the database of the digital music archive.

/Diskoteket – the digital music platform of the digital music archive.

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Correspondences

Four e-mail correspondences with Thomas Dose, between January 17 and April 5, 2022.
Two conversations with Thomas Dose. DR, Copenhagen, February 11 and March 7, 2022.

Appendix 1

E-mail requesting access to documents pertaining DR's music archive

Kære ...

Jeg skriver til dig, da jeg i forbindelse med mit forskningsprojekt har brug for aktindsigt i visse forhold omkring DRs musiksamling. Jeg er blevet henvist til dig, da du har aktindsigt som juridisk arbejdsområde.

Mit forskningsprojekt undersøger, hvordan forståelsen af musikhistorie i vor samtid påvirkes af digitale infrastrukturer og digitale handlemønstre. Som en modvægt til de kommercielle musikstreamingtjenester ligger en vigtig del af mit projekt i at analysere og vurdere DRs interne digitale musikplatform, /Diskoteket.

I denne forbindelse vil jeg gerne beskrive historien om DRs musikarkiv samt rationalet bag dets digitalisering, og herunder beslutningen om at etablere en digital musikplatform for DR-ansatte.

Derfor skal jeg gerne have aktindsigt i de beslutningsprocesser (møde-referater, pitch af projekter, økonomiske rammer mv.) og interne rapporter, som ligger forud for arbejdet med at digitalisere samlingen såvel som forud for den senere godkendelse af Diskoteket som digital platform.

Derfor vil jeg gerne anmode om aktindsigt i alle dokumenter, som vedrører udviklingen i Diskoteket (senere DR Musiktjenester) fra 1985 og frem til i dag.

Jeg ser frem til at høre fra dig.

APPENDIX 1

Med venlig hilsen,

Andreas Helles Pedersen
PhD Fellow
Division of Musicology
Department of Arts and Cultural Sciences
Lund University
Box 192, SE-221 00 Lund, Sweden
Phone: +45 26393884
andreas_helles.pedersen@kultur.lu.se

Appendix 2

E-mail specifying the request of access to documents

Kære ...

Jeg vil gerne præcisere min anmodning til at omhandle de dokumenter/sagsakter, der relaterer sig til udviklingen af /Diskoteket (oprindeligt projektnavn: DMA = Digitalt MusikArkiv) samt MUSA databasen.

Med venlig hilsen,

Andreas Helles Pedersen

PhD Fellow

Division of Musicology

Department of Arts and Cultural Sciences

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Appendix 3

E-mail query for recruiting participants for sample group interviews

Subject: Projekt om digitale musikplatforme, lytning og musikhistorie

Kære ...

Jeg er ph.d. studerende og arbejder på et forskningsprojekt, der undersøger og diskuterer, hvordan opfattelse af musikhistorisk viden bliver formet af brugen af digitale musikplatforme. Det overordnede mål med min undersøgelse er at vurdere, om musikhistorieskrivning som disciplin bør gentænke sig selv sammen med den digitale udvikling. For at kunne se på helheden af denne problemstilling undersøger jeg forskelligartede digitale musikplatforme, som politisk og socialt distribuerer sin musik på forskellige måder. Med min sideløbende ansættelse i DR Musiktjenester har jeg et særligt indblik i Diskotekets opbygning, hvilket har ansporet mig til at inddrage denne platform som objekt for analyse.

Som led i mit projekt skal jeg se nærmere på et udvalg af DR brugeres oplevelser af Diskoteket sat over for deres oplevelser af kommercielle musikstreamingtjenester. Dette kommer jeg til at gøre gennem kvalitative interviews af 30-45 minutters varighed, hvor samtalen vil kredse sig om opfattelsen og benyttelsen af digitale musikplatforme og disses indflydelse på hvordan, vi taler om musik, musikhistorie og viden om musik.

Jeg vil gerne høre, om du kunne tænke dig at deltage som informant i mit projekt? Alle oplysninger vil være underlagt fuld anonymitet. Har du spørgsmål til projektet kan du altid kontakte mig på mail eller telefonisk,

APPENDIX 3

og da jeg ofte befinder mig i DR Byen kommer jeg med glæde forbi dit bord og uddyber projektet.

Med venlig hilsen,

Andreas Helles Pedersen
PhD Fellow
Division of Musicology
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Appendix 4

Interview guide for sample group interviews

Du er indforstået med og giver samtykke til, at dette interview vil blive benyttet i mit forskningsprojekt og derfor potentielt kan blive citeret i større eller mindre grad i præsentationer på konferencer og i akademiske publikationer?

Som udgangspunkt vil interviewet ved publikation være anonymiseret. Men, vil du give samtykke til, at din rolle og jobfunktion kan oplyses i forbindelse med citering?

Hvad er din alder, og giver du samtykke til, at denne oplyses i forbindelse med citering?

Indledende spørgsmål (5-10 min)

- Hvordan definerer du musikhistorie? (Hvad dækker begrebet over?)
- Hvis man kan tale om en musikhistorie, kan man så tale om en digital musikhistorie?
- Hvor findes musikhistorien henne? Hvem fortæller den, og for hvem fortælles den?
- Hvad er dit forhold til digitale musikplatforme, både privat og i arbejdsregi?

- Spiller din måde at definere/forstå musikhistorien på ind på din måde at benytte digitale musikplatforme?
- Hvilke kvaliteter ved de digitale musikplatforme, som du benytter, har mest betydning for dig?

Om Diskoteket (5 min)

- Hvordan benytter du Diskoteket i daligdagen? (Søger du musik med et mål, eller er du åben for input?)
- Oplever du, at Diskoteket giver dig oplysninger, som ændrer din planlagte arbejdsgang? Hvis ja, hvordan?
- Føler du, at Diskoteket kan være mere end blot et afspilningsmedie? Hvis ja, kan du uddybe med eksempler?

Formidling af viden i Diskoteket (7-8 min)

- Hvad er din oplevelse af Diskotekets måde at opstille information om et stykke optaget musik på?
- Hvordan spiller Diskoteket ind i den fortælling om musik og musikhistorie, som du har? (medvirker platformen til at reproducere dine forestillinger, eller kan den genforhandle fortællingen?)
- Opfatter du Diskoteket som en visual repræsentation af DRs pladesamling, eller er der mere på spil?

Diskoteket versus kommercielle tjenester (5 min)

- Hvilke overordnede forskelle ser du mellem Diskotekets fremstillinger af kunstnere, udgivelser og skæringer og kommercielle musikstreamingtjenesters fremstillinger af samme?

- Hvordan adskiller Diskoteket sig fra streamingtjenester i forhold til design og brugerflade, og hvad, tænker du, kan være årsagerne til platformernes forskellige valg?
- Hvad er din oplevelse af validiteten af den information, som du finder på Diskoteket versus de kommercielle platforme, som du også benytter?

Musikhistoriske konstruktioner (7-8 min)

- På hvilken facon har din musikhistoriske opfattelse indflydelse på de måder, som du lytter til musik på?
- Hvordan oplever du, at digitale musikplatforme kan spille en rolle for dine forestillinger om musikhistoriske sammenhænge?
- Hvad er de væsentligste faktorer for, at du kontekstualiserer musik historisk?
- Hvordan spiller muligheden for umiddelbar gentagelse (musik på repeat) ind i din måde at forstå den digital musikhistorie? Hvad er betydningen af altid at kunne lytte til et bestemt stykke optaget musik?

Metadata (5 min)

- Hvad tænker du om indlejret information på digitale musikplatforme tilknyttet musik og kunstnere?
- På hvilke måder betyder denne form for information noget for din måde at søge og/eller lytte på?
- Hvorledes opfatter du, at digitale musikplatforme kan have skabt relationelle forhold mellem skæringer, udgivelser og kompositioner? Føler du, at du i disse situationer præsenteres for et verificeret narrativ?

- Benytter du dig af interrelationelle metadata på Diskoteket? Hvis ja, hvad bibringer disse dig?
- Hvordan influerer indlejret information på din måde at sætte forskellige stykker optaget musik i kontekst?
- Oplever du, at Diskoteket såvel som kommercielle tjenester strukturerer dine valg i forhold til søgninger? (Og giver denne strukturering sig udslag i, hvordan du lytter til musikken og opfatter den historiske position?)

Afrunding (5 min)

- Hvad mener du overordnet om digitale musikplatforme? (Hvad gør de for vores måde at lytte til musik på, tale om musik på og forstå musik på (både historisk, socialt, politisk, og som en æstetisk udtryksform))?
- Giver Diskoteket dig noget andet end de kommercielle tjenester, eller er det blot et redskab for forvaltning?
- Har adgangen til de enorme mængder musik på digitale musikplatforme en indvirkning på, hvordan du forholder dig til musikkens historiske position?
- Føler du dig som bruger af en digital musikplatform tættere på musikhistorien, eller gør disse platforme forholdet mere distanceret og abstrakt?
- Er produktionen af musikhistoriske viden op til forhandling qua faktorer som anbefalinger og playlistekuratering? (af både menneskelig og algoritmisk karakter)

Appendix 5

Interview guides for three interviews with Thomas Dose

Interviewguide – 1. interview med Thomas Dose: arkivet
som både fysisk og digitalt (9/2-2021)

Du er indforstået med og giver samtykke til, at dette interview vil blive benyttet i mit forskningsprojekt og derfor potentielt kan blive citeret i større eller mindre grad i præsentationer på konferencer og i akademiske publikationer?

Indledende spørgsmål (5-10 minutter)

- Hvis du skal sætte nogle ord på DRs musikarkiv, hvad er det så for en størrelse? Hvorfor har man det, og hvad har dets funktion været gennem tiden?
- Hvad skal musikarkivets funktion være fremadrettet?
- Hvad ser du som de væsentligste forskelle på at arkivere musikudgivelser fysisk og digitalt?
- Ser du Diskoteket som en digital repræsentation af en musiksamling, eller er DRs musiksamling nærmere en motor for Diskoteket og dets udvikling? De lever selvfølgelig i et gensidigt afhængighedsforhold,

men ligger fokus mere på brugeroplevelse og samspil mellem digitale tjenester end på udvidelse samt fyldestgørende arkivering af samlingen? Eller er det omvendt?

Arkivets betydning for musikken (15-20 minutter)

- Hvordan tænker du, at musikkens status ændrer sig i bevægelsen fra det analoge arkiv til det digitale?
- Oplever du, at der sker en ændring for DRs musikformidling sideløbende med de ændrede eksistensgrundlag for musikken?
- Det analoge arkiv er i sin essens et rum for opbevaring og præservering af DRs igennem tiden akkumulerede pladesamling. I sit skift fra hylde-meter til serverplads så viderefører det digitale arkiv denne funktion, men samtidig indtager det også en ny rolle som dynamisk afsender for transmission – især med Diskoteket som platform bygget oven på arkivet. Gør du dig nogle overvejelser omkring, at det at musiksamlingen potentielt kan aktiveres betyder noget for de måder, som man kan opfatte musikken på, når man benytter arkivet?
- Ud over den taktile oplevelse, mister man så noget ved musikken i overgangen fra analogt til digitalt arkiv?

Arkivets betydning for musikkens historie (15-20 minutter)

- Hvilken betydning har et musikarkiv for historien og for historiens rolle? Er det vigtigt, at institutioner såsom DR samler og skaber en fælles forståelse for musikkens historie, eller er det problematisk at man udlægger et særligt narrativ i den forbindelse? Kritikere vil mene, at man på denne måde kan skabe en institutionaliseret fortælling, som er svær at rykke ved, og som favoriserer noget over noget andet. Hvad tænker du om det?

- Jeg synes, at det er interessant at gøre sig tanker om en musikudgivelses væren i verden i de forskellige situationer, som den kan befinde sig i. Når vi fx arkiverer den, så gør vi musikken til et objekt, der er trukket ud ad sin intenderede kontekst som både forbrugsvarer og æstetisk genstand. Men, med arkivering tillægger vi den alligevel historisk betydning, og måske endda mere betydning. Vil du mene, at det især er som et arkivobjekt, eller som en del af en samling, at en musikudgivelse får mulighed for at indskrives i en musikhistorisk narrativ?
- Historie er groft sagt en forståelse og fortolkning af kontekster, og en historie skrives langt henad vejen gennem kontekstualisering af data. Hvis vi kigger på musikhistorien, hvad er så de to arkivtypers måder at lade os tegne musikhistorien på? Stiller vi DRs analoge musikarkiv op over for Diskoteket, så ser jeg forskelle i potentialet for at kontekstualisere musikken. Hvad mener du om dette? Har det været en underliggende pointe med udviklingen af Diskoteket, at det skal kunne skabe forbindelser på bestemte måder?

Diskotekets udtryk og musikkens historie (10-15 minutter)

- Jeg kunne godt tænke mig at høre, hvad du tænker omkring den historiske udvikling i metoderne for organisering og søgning i DRs musikarkiv – fra kartotekskort over elektroniske systemer til digital platform. Er der en gennemgående rød tråd fra 1949 og til i dag?
- (Har der været overvejelser om at gå andre veje – om at ændre organiseringsmodellen?)
- Diskoteket er selvfølgelig skabt som et arbejdsredskab for research, programlægning og musikstyring, hvilket er ensbetydende med en tvungen søgemodel, som måske kan virke rigid, hvis man sammenligner platformen med kommercielle streamingtjenester. Dog opnår man, qua datamodel og design, muligheden for nogle meget mere præcise søgninger (især når det kommer til udgivelser af klassisk musik). Man kan sige, at vi her har et møde mellem bibliotekets søgefunktion og streamingtjenestens lyttfunktion. Hvilken betydning tænker du,

at det har, at Diskoteket så at sige abbonnerer på to arkivstrategier – at det både har et søgefokus og et lyttefokus?

Foregribe næste interview (5 minutter)

- Hvad er rationale bag den måde, som Diskoteket opstiller sin information på? Bunder det helt basalt i, at informationen på simpel vis skal kunne overføres direkte i DRs musikformidling? Eller drejer det sig om at udtrykke nogle bestemte forestillinger om musikhistorie og musikalske sammenhænge? Og ønsker man, at disse forestillinger danner fundamentet for de fortællinger, som DR formidler?

Interviewguide – 2. interview med Thomas Dose: Diskoteket – målsætning og perspektiv (10/3-2021)

Indledende spørgsmål (5-10 minutter)

- Indledningsvist kunne jeg godt tænke mig at høre lidt om hvilke tanker, der førte til Diskoteket. Handlede det især om at medvirke til at tegne retningen for DRs relevans i det frembrusende musikmedielandskab, eller bundede det i et ønske om at beholde musiksamlingen og beholde afdelingen og dens medarbejdere ved at stille et produktionsværktøj til rådighed?
- Da I laver foranalysen i 2011, der leder til hovedprojektet Digitalt MusikArkiv, som ender ud i Diskoteket i 2014, er der så indtænkt langsigtede perspektiver for, hvad denne tjeneste kan bruges til? Eller handler det mest om at få digitaliseret så meget musik som muligt og få forbindelsen mellem Diskoteket og Dalet, og rapporteringen, til at glide?
- Jeg stifter bekendtskab med Diskoteket i sommeren 2015 og bliver straks fascineret af tjenestens muligheder set fra et brugerperspektiv. Var det planen allerede i de indledende undersøgelser, at få operation-

aliseret den metadata, som ligger i MUSA-databasen, og som knæsætter Diskoteket som en tjeneste med andre muligheder end fx Spotify?

Databasen og eksterne services (15 minutter)

- Jeg vil gerne lige gå uden for Diskoteket et øjeblik og fokusere på de services, som drives på dr.dk. Man kan vel sige, at /musik fungerer pga. nogle aggregeringspraksisser, hvor data om kunstnere og tracks understøtter playlister og kunstnersider. Har der fra start af med digitaliseringen af samlingen været et faciliteringsprincip om at samle og kontekstualisere metadata fra databasen som indhold på DRs online tjenester?
- Når man læser en artikel på /musik, så ser man, at der ofte er inkorporeret en afspiller-boks, hvor man kan lytte til et relevant track. Derudover er der så et hyperlink med titlen ”hør nummeret i din streamingtjeneste her”. Hvordan fungerer disse afspilninger? Trækker det på lydfiler i databasen, eller er det en skyggeløsning, der involverer andre parter?
- Sveriges Radio har skubbet public service-aftalen til det yderste og inkorporerer eller henviser til Spotify direkte i alle sine online-services. Dette kalder nogle forskere for *Spotification* af public service medier. For Sveriges Radio har denne virkelighed den effekt, at deres musikarkiv og afdeling for musikregistrering lider betydeligt, både i forhold til afskedigelser, afvikling af dele af samlingen og mangelfuld og ukorrekt metadatering. Jeg mindes, at der en overgang også var en forbindelse mellem Spotify og DRs online-services; har du været med i nogle beslutningsprocesser angående, hvordan DR udtrykker sig til sine brugere af online-services mhp. at DR Musiktjenester som minimum skal beholde sin nuværende position i huset?

Designproces (10-15 minutter)

- Da udviklingen af Diskoteket påbegynder, må du have haft nogle tanker om interfacet og om, hvordan streamingoplevelsen skulle infrastruktureres, så at sige. Hvis vi ser på Diskoteket anno marts 2021 med en

forside og en visualisering af de fire niveauer (kunstner, udgivelse, skæring og komposition), som man opererer ud fra i MUSA-reg, stemmer designet så overens med de indledende planer?

- Jeg kan huske, at du har talt om, at man kan finde et 'personligt udtryk' i designet af Diskoteket, som er opstået i den iterative proces, når en udvikler igen og igen efterprøver et punkt i designet. Er der tale om, at udviklere og programmører har indføjet nogle definerende elementer i designet af Diskoteket, som ikke var indtænkt i kravspecifikationen?

Målsætning for metadata (10-15 minutter)

- Spillede den store akkumulering af metadata i MUSA-databasen en betydelig rolle for designprocessen af Diskoteket? Jeg går ud fra, at migrationen fra MUSA til Diskoteket var kendt fra start; så, var designprocessen bygget op omkring at aktualisere det komplekse system af felter og søgemuligheder, som MUSA indeholdt?
- Jeg tænker godt, at man kan kalde Diskoteket for et massedigitaliseringsprojekt, der skal samle allerede eksisterende og systematiseret metadata med digitaliseret musik fra en fysisk samling. Hovedfokus har umiddelbart ikke ligget på at få gjort det digitale musikarkiv så stort og så korrekt som muligt, men det har nærmere haft udtryk af en supporterende rolle til den daglige drift i et travlt mediehus. Hvordan navigerer du som leder i den virkelighed, hvor man gerne vil opretholde sin relevans og understøtter brugerne, men samtidig også vil forfølge visse visioner om musiksamlingen som fælles kulturel erinding og kulturarvsprodukt?
- På Diskoteket undgår man som hovedregel ikke-standardiseret syntaks, så tjenesten er så nem og overskuelig at betjene som muligt. At det er sådan, det bunder i en enighed blandt medarbejdere om at registrere musikmetadata på bestemte måder. Alligevel har det været planen at indføre en proces, hvor man trækker på opmærkningsprog fra pdf-filer og word-dokumenter samt udvalgte hjemmesider, som Musicbrainz og Discogs. Hvad er årsagen til, at dette ikke er ført ud i livet endnu?

Skyldes det logistiske og økonomiske udfordringer, eller skyldes det for mange usikkerheder og en risiko for, at dårligere metadata kommer til at udtrykke sig på Diskoteket?

Musikhistorie og digitalt design (5-10 minutter)

- Jeg fristes til at spørge ind til, hvad musikhistorie som et begreb betyder for dig, og i den forbindelse videre spørge, om du opfatter, at musikhistorien udtrykker sig på samme måde, som digitale miljøer udtrykker sig? Medfører det at forholde sig til musikhistorie en produktion af viden, der ikke bevæger sig lineært, men som lægger op til, at alle forhold kan forbindes med hinanden, på kryds og tværs?
- Hele internettets netværksstruktur bevæger sig som et organisk rodnet, og dette skaber labyrintiske infrastrukturelle forestillinger – i Diskotekets tilfælde forestillinger om musik. Ligger der i designet bag Diskoteket en særlig musikhistorisk opfattelse, som tjenesten prøver at videreforme til sine brugere, eller er pointen netop at være en platform, der giver brugerne muligheden for at bevæge sig ind i labyrinten af musikviden og aktiverbare lydfile?

Interviewguide – 3. interview med Thomas Dose: Diskoteket – metadata og validitet (30/3-2021)

Indledende spørgsmål (5-10 minutter)

- Som et indledende spørgsmål vil jeg gerne høre, hvad du overordnet tænker om organisering af digital musik. Er der en taksonomisk inddeling, der er vigtigere end andre, eller mener du, at der er flere ligesillede måder at gøre det på?
- Er det muligt at operationalisere forskellige genrespecifikke metadata ligeværdigt i én og samme datamodel? Eller må man stræbe efter den

bedste løsning, som vil favorisere nogle typer musik og disses lytsegmenter over andre?

- Mener du, som et modstykke til de store kommercielle spillere, at fremtiden taler for udviklingen af flere partikulære og specialiserede streamingtjenester? Eller, er Diskotekets model, der forsøger at beskrive musikken både som skæring og udgivelse og også som et forhold mellem udgivelse og komposition, en vej for fremtidens musikstreaming?

Datamodellen (15 minutter)

- Vil du beskrive datamodellen bag Diskoteket? Hvilke muligheder har man med en struktur, hvor skæringer og udgivelser og kompositioner er separerede?
- Er DRs datamodel til stadighed anderledes end de forskellige mindre streamingplatforme, der er begyndt at dukke frem, som tager den separerede struktur op? Jeg tænker på eksempelvis IDAGIO inden for den klassiske musik.
- Bunder den udslagsgivende faktor for DRs datamodel i en optimeringsproces i forhold til rapportering, eller vil du mene, at datamodellen handler om de bedste søge- og opdagelsesmuligheder?

Visning af data (10 minutter)

- Nogle af de interviews, som jeg sidste vinter lavede med Diskoteket-brugere, pegede på et afsavn i forhold til vilkårlighed og opdagelse af det uventede – en mulighed, som ligger i det fysiske bibliotek eller en fysisk samling. Diskoteket lægger op til en browser-praksis, hvor man fremsøger det, som man skal bruge, uden at støde ind i det omkringliggende (som man ville ude i den fysiske samling). Er denne følelse af tilfældigt at støde ind i noget uventet musik noget, som I har overvejet at sætte i system?

- Det virker til, at der med den kommercielle devaluering af musik de sidste årtier er kommet et nyt ønske efter det uventede og det overraskende, såvel som efter det præcise og det uddybende. Derfor ser vi også pladeselskaber og open source teknologivirksomheder og -databaser operere sideløbende for at kunne sælge den bedste metadata. På den måde kan man sige, at Diskoteket har overhalet de andre inden om ved at fastholde de gamle dyder. Har der ligget en latent tro på, at sofistikeret metadata igen ville blive vejen frem, og har man derfor fastholdt de strenge registreringspraksisser, eller er disse praksisser bundet til rapporteringskrav samt et kulturarvsaspekt?

Metadata og musik som politik (15 minutter)

- Jeg er meget interesseret i det her med, hvad det er, man vælger at vise – og hvad man vælger at skjule. På Diskoteket er der et fokus på første albumudgivelse, og der gøres et stort arbejde for at skjule skæringer fra singler og compilations. Hvad er argumentet for at bestemme den kontekst, som både musik og metadata skal forstås ud fra?
- Der er mange ligegyldige compilations, men der er også en del med noget på hjerte. Hvis en compilation fx fortæller en narrativ om punkmusikkens udvikling, er det så ikke problematisk, at man på skæringsniveau altid vil blive ledt ind på en originaludgivelses forståelsesramme (hvis vi forudsætter at alle primær/sekundærrelationer er lavet)?
- Hvis man skal tage de kritiske briller på, så kan man beskyldte platformen for at udøve en form for magt omkring, hvilken fortælling der har mest værdi. Er dette noget, som man har overvejet ved implementeringen af relationsmodulet, og i særdeleshed hvad angår primær/sekundær relationerne?
- På tværs af redaktioner og DR Musiktjenester virker der til nogenlunde at være en konsensus om, hvordan metadata skal udtrykke sig for at have mest troværdighed. Affødes dette helt og holdent via Diskotekets datamodel og afdelingens registreringspraksis, eller er registrering-

spraksisserne influeret af ønsker og/eller holdninger fra de forskellige redaktioner?

- Alle arkiver implementerer en magtstruktur, hvor man som bruger af arkivet har mulighed for at forstå og fortolke noget ud fra de muligheder og det råderum, som man er blevet givet. Derved udstikker arkivet også rammen for den viden, som man kan producere i sin brug af arkivet. Ergo kan en platform som Diskoteket via sin infrastruktur være udslagsgivende for, hvordan en bruger opfatter den indspillede musiks historie (og måske også musikhistorien som sådan). Bliver der i den daglige drift og udvikling af Diskoteket gjort nogle tanker omkring musikhistoriske narrativer og relationen mellem arkivet og brugeren af arkivet (og lytteren i den danske befolkning)?

Article Three

Setting the Scene

We need to get the facts straight. DR's digital music archive is the result of a gradual evolution of a state funded collection of music releases. DR has broadcasted music for nearly a century, but the institution's first decades were marked by a non-centralized and arbitrary music communication. After the establishment of the central music archive in 1949, this began to change.

Article Three tells a history of DR's digital music archive that reveals how a politics of optimization leads to a dynamic database that does more than store music. As the article clarifies, it has never been the goal of this politics to develop a digital music platform that can relate music across releases, tracks, and compositions. Yet, the Department of the Music Archive has carried on the taxonomical logic of archival order originating from index cards in the 1950s. This is a logic that has been refined in the digital music archive. The department has decided to further the metadata-structure in order to build an interactive, interfacial user experience that transforms the archive from being about storing and retrieving to being about searching, listening, and contextualizing.

This is an article that weaves a thread through all three of the thesis' methodological approaches. The history of DR's digital music archive is told via meticulous readings of archival documents, through in-depth interviews with the Head of the Department of the Music Archive, and by interfacial analyses of /Diskoteket and its relations to the MUSA database. It is a history that could have been told in different ways. Emphasis could have been put on other issues, spurring different readings and leading to different results.

Besides describing how and why DR's digital music archive adds a digital music platform to its database, this article considers the ways in which metadata are operationalized in the database in order to present the history of recorded music as a many-sided association of releases. Due to this discussion, the article reveals that DR's digital music archive is configured so as to tell several music histories. That it mirrors concurrent historical convictions. Causality and linearity exist side by side with heterogeneity and nonlinearity. DR's digital music archive comprises multiple times and

it shows that recorded music has many pasts, and this non-fixed temporality proves to be the digital music archive's motor, thinking times and pasts anew. Rethinking and creating alternative lines in recorded music's canon.

The metadata-structure works to open up possibilities, just as it works to limit search retrievals.

Use of history shines through in practices of music scheduling and standardization. In optimization. As an institution, DR has a modernist principle of the use of history. A striving for factuality and a certain idea of how music history ought to be comprehended. The article has a term for this: institutionalized music history.

Use of history, though, is also the driving factor behind the Department of the Music Archive's reason for producing a digital system reflecting several chronologies. The department strives for creating a system of possibility, of manifold understandings. Use of history as openness, as diversity.

The Department of the Music Archive abides by the strategic demands and the politics of optimization. The process of searching for music is improved by relations between tracks making unwanted noise disappear. However, the Department of the Music Archive also makes relations between tracks that expand release-relevant information, amplifying hidden and forgotten storylines. All pasts are singular, yet they can merge and bind unrelated elements together, making all pasts a part of what is experienced.

/Diskoteket mirrors a digital music archive with attention to historical relationality and an institutional strive for consensual factuality. This duality is determining for the history of recorded music.

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History, ideals, taxonomy

Andreas Helles Pedersen

In this article I offer a history of the digital music archive at the Danish Broadcasting Corporation (DR). Within the last decade, DR has complemented their music archive with an in-house digital music platform called */Diskoteket*,¹ on which I see not only a lively and educational space for making contextualized searches in regard to recorded and commercially released music, but also a determinative discourse on music information. As a conceptual point of departure I investigate the supposition that DR has an institutionalized understanding of music history, and building on this supposition I aim to throw light on the following question: how can an institutionalized music history at DR be traced in online music presentations?

The article's definition of music history pertains to the history of recorded music, in that DR's communication of music history is to a large extent rooted in how music history is reflected in historical recordings. When it comes to music history, the institutional discourse at DR is entrenched in a conventional idea of linear progress at the same time as the digital music archive echoes non-chronological ordering and heterogeneous narratives. Where the institutional discourse trickles down into the communication to the public, the non-causal rendering is only accessible to DR employees. The digital music archive is riddled with potentiality, but in terms of production ends it is only functional internally within DR. Like the physical music archive, the digital music archive is reserved for the few and inaccessible to the public. It makes you wonder: what, then, is the difference between the digital music archive and the physical music archive?²

¹ Throughout the article I will juggle with two almost identical names: *Diskoteket* and */Diskoteket*. *Diskoteket* is the name of the central music archive at DR in the years 1952–2017, whereas */Diskoteket* is the name of DR's in-house digital music platform. Confusion might arise due to the fact that the central music archive as a department is responsible for the launch of the digital music platform, and thus *Diskoteket* manages */Diskoteket*. This coexistence of almost identical names took place during three years, 2014–2017 (in 2017 the central music archive's name was changed to *DR Musiktjenester*).

² DR's music archive consists of a physical collection of CDs, LPs, shellacs and other formats as well as a digital collection of music directly acquired as sound files or digitized from the physical formats. Today, the majority of the CD collection is digitized, whereas the LPs and shellacs are digitized sporadically. Daily, CDs are ripped and entered into the database by student employees with the overall goal of getting everything digitized. When it comes to the other formats, single tracks are only digitized when requested by a user for production and broadcasting purposes. This dispersal of digitization is taking place because of the time-consuming task of re-reading records, gramophones and recording software for a digitization process in real-time. As of February 1, 2022, the collection consists of 447,725 unique

Until now, research into music on the platforms of DR has not explored the nexus of archiving, music history and cultural policies and viewed this inter-connection in the light of DR's historical commitment to public education.³ I do not deceive myself, pretending to unearth a direct connection welding shifting political climates and strategies of music archiving together, but I believe that it is valuable to consider the correlation between a contemporary understanding of music history at DR and the original ideals of education and public service.

The sources for this article are mainly based on 39 internal documents from DR's own archives, covering the years 1998–2002 and 2011–2014 and comprising 159 pages. The documents concern the database underlying /Diskoteket, which is called *MUSA*, and the plans and goals for the development of a digital music platform. I have been granted access to these documents by DR's juridical department. It is important to note that access is only partly granted since some information in the documents is deemed to concern economic and business-related dimensions and thus might interfere with DR's strategic planning and editorial processes if revealed. Therefore, large portions of the text in the documents are censored, crossed out, and classified as confidential. These redacted documents have provided me with exclusive knowledge of the sequential development of DR's digital music archive.

In addition, I have obtained unique insights into the ideas and visions as well as the processes of strategic decision-making behind the digital music archive from Thomas Dose, who is currently responsible for DR's music archive. In early spring 2021 I conducted three comprehensive interviews with him about developments, aims and thoughts concerning the music archive and /Diskoteket, and this article is greatly indebted to his benevolence. He is one of the main contributors to the development of the digital music archive, so our talks have had significant impact on the comprehension I have gained.⁴

While treating the interviews critically, I also regard them as a sort of collaborative process. In order to obtain an inside perspective on the digital music

records distributed between 24,192 shellac records, 152,792 LP records, 180,868 CD records, 52,435 sound file records, and 37,438 other formats. Additionally, many records have been acquired with duplicates, making the actual physical collection comprise between 700,000 and 800,000 records. The collection includes 3.5 million tracks of which 1.3 million have been digitized, there are thus still 2.2 million non-digitized tracks in the collection.

³ In the current public service contract for the years 2019–2023 it is stated that a clear communication of Danish culture and Danish cultural heritage is an overall goal for DR's work. This is in keeping with Radio- og fjernsynsloven §10 [Radio and TV Act, §10] stating that the collective public service enterprises must secure that the Danish population gets a 'wide offering of programs and services comprising news broadcasting, public information, education, art and entertainment'. Since the 1980s, this balancing of information and entertainment has been referred to as the public service commitment, which historically plays into an ideal of underpinning the national democratic processes. In this logic, mass media are to take part in a general education of the population that follows the mandatory school attendance.

⁴ Quotes and references from documents and interviews are in my translation.

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archive I had to follow through on these interviews, and I am fully aware how that makes the article dependent on one man's interpretation, but I also acknowledge the necessity of taking this path for the sake of acquiring any detailed insight into the everyday implementation of the functionalities of /Diskoteket.

Another important note is that I used to be employed as a *musikregistrator* [music registrar] in the music archive at DR, from 2015 until 2018, and I am still affiliated to the department on a freelance basis. Therefore, I have been granted full access to the music archive, both physically and digitally, meaning that I know how /Diskoteket functions and also have insight into the process of registering music in the database beneath the platform. It is primarily on these accounts that my conclusions are grounded: interpretations of information from the archival documents; the interviews with Dose; and firsthand experience with DR's music archive and the different software platforms used.

I open with a short overview of recent music radio research, highlighting some non-illuminated areas within studies concerning music on Danish radio that have been published over the last five years. I then describe the development of the music archive at DR with a focus on the years leading to digital registering and archiving of music. This leads me to do a thick description of some of the functionalities in /Diskoteket in order to demonstrate how these make for different experiences due to the setting in motion of metadata. Via this analysis I accentuate the supposition of DR having an institutionalized understanding of music history in its contemporary approach to music archiving and communication. As a concluding perspective, I relate my analyses to the intimate connection between archives and history with the aim of problematizing how different concepts of time make for different ideals of history. It becomes evident that the digital music archive implies a chimerical understanding of music history that does not necessarily correspond to the institutional discourse of music history. This final perspective problematizes the concept of history as a relational means of communication, and it accentuates how DR's use of music history balances between causality and nonlinearity.

Music-related radio research

Research into music and radio can take many guises and be part of a wide array of agendas. Interestingly, most of the seminal publications have not been issued until the 1980s, even though the valve technology underlying radio broadcasting is more than a hundred years old. There is, of course, the pioneering work of thinkers from the Frankfurt School who turned to new technologies and tried to create understanding of their direct impact on media cultures and practices, leading to critical readings of the radio's influence on music in the 1930s and 1940s. Most likely due to the advent of television and the position of this medium in people's lives, we do not see a serious academic interest in radio until around 1980, when a renewed attention to the medium, from both media studies and musicology at large, takes off, rooted in social and cultural historiography. To take

a few examples, Paddy Scannell (1981) looks into music policies in the early years of the BBC, whereas Jody Berland (1990) discusses how the relationship of radio and music industry can broaden the musical worldview of local listeners. In a Scandinavian context, Per Drud Nielsen (1981) takes an early sociological approach and argues for the impact of popular music radio on the formation of peoples' everyday.

In the late 1990s Alf Björnberg provides a seminal study of music genre and radio programming at the Swedish Radio (SR; until 1957 Radiotjänst) from 1925 to 1995. His study oscillates between musicology and media studies and he operates with the premise that music is never 'just music' (Björnberg, 1998, p. 15). Björnberg describes his methodological approach as 'institutional ethnography' (p. 18), which shows clear affinities with Georgina Born's work at IRCAM (Born, 1995) – an attitude towards ethnographic research that Born further refines in her work at the BBC, in which she applies an insistent methodology to find openings in the impenetrable structure of the BBC by outlining and analyzing institutional and personal dynamics (Born, 2005a).

In recent years, Patrick Burkart and Susanna Leijonhufvud have made the critically infused claim that SR due to policy making and media laws in Sweden merges with Spotify's business model in what they call a 'Spotifyfication of public service media' (Burkart and Leijonhufvud, 2019). They analyze how governmental strings are pulled so that Spotify is instated as a 'digital librarian for all public media' (ibid., p. 178). This development coincides with a downscaling of employees at SR's gramophone archive, lessening the archival memory of this archive and, in fact, lessening the archive itself; the process of creating, and maintaining, distinctive metadata is reduced (ibid., pp. 179–180; Leijonhufvud, 2018, p. 156) and the material collection is dwindling.⁵

Over the last ten years two extensive research projects on Danish radio history have been conducted: the *LARM Audio Research Archive* (2010–2014, funded by *The National Programme for Research Infrastructure* under the Ministry of Higher Education and Science), and *A Century of Radio and Music in Denmark: Music Genres, Radio Genres, and Mediatisation* (RAMUND) (2013–2018, funded by the Danish Council for Independent Research). The first project resulted in a research infrastructure for digitization and archiving of broadcasted radio, meaning that researchers now have the opportunity to make qualified

⁵ When comparing official statements from an extensive report on media by the Swedish Department of Education issued in 1987 with statements January 2013 by the program director of SR, Björn Löfdahl, in defence of harsh strategies of digitization, we see an interesting contradiction: in the official report from 1987 it is assessed that SR's Gramophone archive contains about 600,000 records, which must be understood to include all types of vinyl, CDs and 78 rpm records (Andersson, 1987, pp. 114–115), and in 2013 Löfdahl states that SR's gramophone archive contains 220,000 CDs, 145,000 LPs, 75,000 EPs and 65,000 78 rpm records, totalling 505,000 records (Löfdahl, 2013). The contradiction lies in Löfdahl's attempt to ensure that the digitization process does not influence the physical collection; surely, the 'missing' 100,000 records might have been lost or discarded at an earlier point in time, but it is not a comforting incongruity.

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searches and open new perspectives for Danish radio research. This archive is called *LARM.fm*, and the initial idea for this project can be argued to grow out of Ib Poulsen's groundbreaking work on the Danish radio montage as a genre-specific format for radio documentaries, which also tells a history of Danish radio (Poulsen, 2006). The LARM project bodes well for interesting radio research to come that can take a lot of different cultural historical guises (Jensen et al., 2015, p. 10), and the project in fact spawned a number of exciting doctoral theses (e.g. Abildgaard, 2014; Lawaetz, 2014; Mortensen, 2014; for a widened introduction to the project, see the printed matter published by the research group: Andersen et al., 2013).

Whereas the LARM project is directed towards a concrete material outcome, a digital infrastructure, the RAMUND project seeks to understand the convergence of music (as an aesthetic category) and radio (as a medium and a specific format for listening to music). Broadly speaking, the RAMUND project is conceptual, in that it aims at detaching and analyzing the assemblage of music radio, that is, the different agents and practices of a complex mediation of genre cultures and social structures. But the project tells a specific national media history as well. In that regard the project creates valuable insight into the workings of the Danish state radio and it further makes comprehensive analyses of the ways in which DR has influenced, and still influences, Danish musical life as well as Danish musical cultures and listeners (for an introductory overview, see the website of the project: <https://cc.au.dk/ramund/>).

Much of the recent research concerning music radio production at DR analyzes DR's organization by investigating programming and related undertakings as parts of a complex assemblage of human-nonhuman agency. A common feature of this research is a scrutiny of production practices ranging from the implementation of radio formats, over the performance of control and hierarchy in music scheduling, to the discursive framings of the aural products reaching the public's ears (Krogh, 2018; Michelsen, 2018b; Wallevik, 2018; Have, 2018). Although the research takes its point of departure in either cultural analysis or new materialism, it tends not to highlight all levels of complexity of the assemblage of music radio mentioned in the paragraph above.

An example can be found in then doctoral student Katrine Wallevik's ethnography of music scheduling and the work processes of the Head of Music at DR's radio channel P3, in which she emphasizes the need for better understanding of how technologies exercise agency and how algorithms are entwined in culture production (such as radio production) without herself trying to understand said technologies and algorithms (Wallevik, 2018, p. 119). Wallevik delivers a thorough description of how the Head of Music at P3 utilizes a piece of music scheduling software called Selector (see Table 2 below) in order to centralize the selection and encoding of tracks, of music as digital files, which automatizes the configuration of the daily playlists to be broadcasted. Unfortunately, she avoids looking into the technological, and digital, parts of the

networks she is analyzing, which could have led her to do further research into Diskoteket's [the Discotheque] work processes, showing the entanglements of this department's work with the production of music metadata and Selector's and the editing and broadcasting software Dalet's functionalities. In this context, the concept of metadata is understood as all annotated information in relation to a track, an artist, a release or a composition.⁶ Further, the description of Diskoteket as having 'mainly one man keeping the digital database in order' could have been avoided (ibid., p. 105); in 2015, when Wallevik's ethnography was conducted, the department had seven full-time employees (myself included) and the same amount of student workers, handling the digitization process but also, and more crucially, executing the production of new metadata for the database - as this is a premise for understanding the meshwork, or assemblage, of radio production at P3, the ethnography ought to have opened the door to Diskoteket due to the fact that /Diskoteket was launched the year before, meaning that the Head of Music at P3 had to go through this platform in order to get his desired music on to the Dalet server and thereafter into Selector.

The influence of new materialist thinking also manifests itself in inspiration from assemblage theory. As stated above, the RAMUND project aims at analyzing music radio as different agents and practices of a complex mediation of genre cultures and social structures; the project thus wants to analyze music radio as an assemblage. I applaud this idea, but the fact that a lot of the research is deeply ingrained in sociologically informed (cultural) analysis leads to overlooking some of the nuances of the assemblage as a concept. For instance, when Mads Krogh briefly discusses the concept with reference to Georgina Born's definition (Born, 2011, p. 377; Krogh, 2018, pp. 78-79) the philosophical weight of Gilles Deleuze's and Félix Guattari's ontological framework developed in *A Thousand Plateaus* (1980) is not specifically addressed. In my reading, Born's and Krogh's definition of the assemblage focuses on how a combination of things, of mediations, provides a certain ontological presentation. Deleuze and Guattari agree on this, but they discuss the assemblage as having yet another dimension, which is to be a force field keeping very heterogeneous elements together. They

⁶ For this research, the concept of metadata covers annotated information in several categories: information about songwriters, musicians, technicians and similar roles on any given track; information about the relations between different tracks in the history of recorded music; information about the aliases and pseudonyms of artists; information about artist constellations and affiliations; information about recording dates and recording locations of any given track; and information about relations between releases. This sort of metadata is deployed and operationalized in the MUSA database, meaning that the user of /Diskoteket can move around in the digital music archive via hyperlinked interrelations. Besides this type of metadata, a wide array of meta-tagging on track level is installed. These meta-tags explicate a sorting in terms of categories such as genres (e.g. rock) and styles (e.g. shoegaze), periods (e.g. the baroque), ensemble sizes (e.g. quartet), types (e.g. only instrumental), and a multitude of keywords (amongst others, a country, a year, a political context, an event, gender, sexual orientations). The meta-tagging has not yet been operationalized (even though specialized searches on /Diskoteket reveal some of meta-tags).

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speak of plateaus as an assemblatic continuity between otherwise inconsistent elements. Taking this approach can help problematizing how the digital realm, from computing to infrastructural logic, forms and informs the contemporary production of music radio. Born's and Krogh's approach stems from Born's idea of a 'musical assemblage', which she defines as a 'particular combination of mediations [...] characteristic of a certain musical culture and historical period' (Born, 2005b, p. 8) and as bound together in four planes of social mediation irreducible to one another (Born, 2011). Understandably, there is a social focus in the research when describing DR and music radio as an assemblage, but this concentration entails, with Wallevik's research as an example, a less refined understanding of the digital functioning in the production of music radio today.

Informed by the LARM and RAMUND projects I want to make an incision into a modest yet structural and formative part of the assemblage of radio and broadcasting practices at DR: the music archive, and specifically the digital music archive.⁷ When I speak of the user perspective of DR's music archive in all its historical guises I refer to the staff at DR; employees have always been able to use the music archive for programme planning, production ends and broadcasting, whereas the public do not have any access to the music archive at all. This must be explicated in order to avoid a misreading of the article's scope.

With this article I contribute to the fields of research dealing with archives and music radio by providing a nuanced perspective into the practices and strategies behind the archiving of music at DR. This gives insight into an under-illuminated part of the history of DR as a public service institution, shedding light on the intimate connection between practices of registering music on one side, and programming and principles of rotation on the other. Further, this insight can be broadened beyond a Danish public service context, in that it highlights the determinative power of archival processes on digital music searching and listening, and connects these processes to institutional music communication.

From shellac to server

It is a widely known story that *Statsradiofonien*⁸ [State Radio Broadcasting] was in conflict with the record industry in the first decades of its lifetime. During the

⁷ To clarify, when I speak of the music archive of DR I exclusively refer to the archive of commercially released music. DR also has an archive of live music produced in-house as well as a number of externally recorded concerts (that DR has been granted the rights to broadcast and/or archive). This archive is integrated in the digital music archive, /Diskoteket, as an enclave called /Diskoteket/ep (with 'ep' standing for *Egenproduktion*, which loosely can be translated 'in-house production'), but even though both archives are built on the same infrastructure within the same database, they are separated and do not refer or lead to each other. As a user you need to be approved and granted access to /Diskoteket/ep, whereas all employees at DR have access to /Diskoteket.

⁸ During its lifetime DR has had several names. As a media company owned by the state, DR started on a trial basis in 1925 under the name *Radioordningen* [the radio arrangement]. In 1926 this arrangement for broadcasting of radio was made permanent due to *Lov nr. 45 af 13.3.1926 om Radiospredning* (Act No. 45 on Radio Dissemination), and from 1926 to 1959 the public service company was called

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1930s it was unclear how Statsradiofonien should reimburse the record industry for the replay of music. The laws and rules were not yet defined, so it was decided that Statsradiofonien had to compensate for each replay *unless* they already owned the records they were broadcasting from. Due to this dispute it was decided that Statsradiofonien was not to institute a music archive; instead the institution had to rent the records from the record companies (Michelsen et al., 2018, p. 147). The law of rights for authors and artists of 26 April 1933 granted the manufacturer of records the same rights as the author of a literary work (Anon., 1965, pp. 2-3), which put the then administrator of mechanical music, Gramo, in a decisive position. In 1946 the arrangement with Gramo was renegotiated, and from this point Statsradiofonien was allowed to build a collection of commercially released music – to build up a music archive.

Nascent collection and index cards as systematization

Inspired by SR and the BBC, DR launched their central music archive in 1949, *Grammofonarkivet* [the Gramophone Archive]. Prior to this, DR employees had to privately acquire the music themselves if they wanted to air something outside the limited collection owned by DR (cf. the abovementioned settlement between DR and the record industry), which led to an unstructured storing of shellac discs in people's offices and, more arbitrarily, on windowsills around the Radio House in Rosenørns Allé, Copenhagen (where DR was located from 1941 until 2007, when DR relocated to DR Byen in the Ørestad area of Copenhagen). After a few formative years, the legendary radio and TV host, Otto Leisner, was appointed general manager of Grammofonarkivet in March 1952.

Name	Description
Grammofonarkivet	DR's central music archive 1949-1952
Diskoteket	DR's central music archive 1952-2017
DR Musiktjenester	DR's central music archive since 2017

Table 1. Historical overview of the organizations of DR's central music archive. Descriptions are based on Dose (2021a) and Michelsen et al. (2018).

Shortly after his appointment he changed the department's name to Diskoteket (cf. Table 1) and a more systematized acquisition of music was established. Over the next handful of years the collection of phonograms more than doubled.⁹ One of Leisner's most important marks on the collection was the gradual expansion of genre specificities; a browsing through the shelves of music acquired during the 1950s will reveal that the music profile changes from being focused on (so-called)

Statsradiofonien. In 1959 the Act on Radio Dissemination was reassessed, and DR was from then established as an independent public institution. At this point the name was changed to *Danmarks Radio* [Danish Broadcasting Corporation]. In 1996 the name was abbreviated *DR*, which coincided with the launch of DR's first version of the website *dr.dk*.

⁹ In 1952 the collection consisted of around 16,000 records and in 1959 the collection had grown to around 40,000 records (Michelsen et al., 2018, p. 148).

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classical music to embracing entertainment music as well.¹⁰ The fact that the constellation is rather problematic, due to Leisner's dual interests in both Statsradiofonien and the record industry, of course plays a role in this development (for more on this, see Michelsen et al., 2018, pp. 147–149), but the impact that this change had on Danish musical cultures still has to be acknowledged. Leisner's expansion of Diskoteket's music profile paved the way for a new aesthetics of radio that differed from the usual flow radio; programmes with hosts speaking in between the aired music became more common, and in 1963 DR launched the channel P3,¹¹ which was, and still is, directed at younger listeners and therefore airs popular music.



Figure 1. Index card for Johnny Green's composition *Body and Soul* from Charlie Mingus' 1964 LP *Mingus Plays Piano*. Source: DR.

Leisner did not only transfigure the music profile, and contents, of the music archive. He also designed the first steps of the archive's infrastructure and instituted the ways in which music was to be registered and archived. He took an approach to taxonomy that we know from Carl Linnaeus' botanical and zoological writings from the 18th century, and from this he developed a complex index card system not only including the physical releases but also tracks, artists and

¹⁰ It should be noted that DR despite its politically ordained educational ideal actually not only broadcasted classical music in the first decades. An early finding by the RAMUND project, via the larm.fm infrastructure, is that DR from the very beginning gave a dominating amount of airtime to popular music genres (Michelsen, 2013, p. 23).

¹¹ In spring 2022, P3 was rebranded as a cross-medial product in order to ensure a stronger offer for the youth segment.

compositions, so that every single release was described on up to eight different cross-referencing index cards (Michelsen et al., 2018, p. 148; Dose, 2021a).

Figure 1 displays an index card showing side one of Charlie Mingus' 1964 album *Mingus Plays Piano* as retrieved through the compositional index. The index card specifies that the composition *Body and Soul* is to be found as a track on this album, and similar index cards are present in the compositional index for the other compositions used for tracks on this album. The music archive operates with four primary entities (compositions, tracks, releases, artists) that in terms of taxonomy can be regarded as overarching species described in a strict syntax, which makes it possible to navigate the collection and see connections between tracks and releases via a compositional layer. This was the frail beginnings of the taxonomic arrangement of interrelated music metadata that today is systematized in a digital database and manifested on /Diskoteket, embodying Leisner's archival visions.

Electronic search systems as the path to digitization

This sophisticated search system was a necessity in order for users of the archive not to get lost in the ever-growing amassment of music releases that quickly occupied shelf after shelf. It is a dizzying and awe-infusing experience to set foot in a music archive the size of DR's; it is by no means possible to get an intelligible experience by reading titles on the spines of the records, so to navigate in a collection that is structured after acquirement and not after genre, artist or year would be hopeless without a system of strict syntax and cross-reference. The index card system functioned well and was used for 26 years, until 1978 when the first electronic search system, DISØ, was developed.

Name	Description
DISØ	DR's first electronic search system for the music archive. Launched in 1978.
MUSA	DR's second electronic search system for the music archive and the name of the digital database. Launched in 2000.
MUSA Søg	The search system for the MUSA database. It closed down in late 2021.
MUSA Reg	Software for registering music in the MUSA database. It is set to close down in late 2022.
/Diskoteket	DR's in-house digital music platform for searching the music archive. Launched in 2014.
Dalet	Software system for editing and live-broadcasting sound.
MusicMaster	A 1983 music scheduling software in use from 1996 to 2003.
Selector	A 1979 music scheduling software in use since 2003.

Table 2. Overview of music search systems and software for registering music, editing music and scheduling music. Descriptions are based on Dose (2021a) and Krogh (2018).

DISØ was an electronic database for searching in DR's music archive, which built on the same attributes as the index cards. But it also added a lot, such as keywords and genres and styles (cf. footnote 6 on meta-tagging) (Dose, 2021b). Besides the obvious advantage of enabling a quicker finding of releases, DISØ also

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implemented, and actualized, the opportunities for in-depth research for, and planning of, programs. On top of that, a certain level of integration between DISØ and the music reporting system matured and this of course broadened the user purposes of the archive.¹² Until that point, the reporting of credits came from liner notes and was done solely by hand, but DISØ's infrastructure introduced the first important steps in an automatized reporting process (see Table 3 for organizations reported to). Still, there was a setback in moving to the electronic search system: the launch of this system signified a cut-off date, meaning that not all metadata from the vast amount of index cards were migrated to the electronic system. All releases have a unique ID called a Diskotek number,¹³ and the numbers created prior to DISØ would come up without any information if one searched for them in the electronic system. This clear cut occurred as a result of an early round of rationalization and optimization of work processes in the music department, and today it still has ramifications due to the fact that /Diskoteket on a basic level operates from the same baseline as DISØ did (Dose, 2021b). The ramifications are critical, in that a release acquired before the inauguration of DISØ will appear empty in /Diskoteket if no music registrar has added and verified the metadata since the migration of search systems.

Name	Description
Gramo	A Danish organization administered by KODA handling payments in relation to 'the Gramophone industry'. Established in 1935 and disbanded at the creation of Gramex.
Gramex	A Danish non-profit organization handling payments for performing artists and record companies and labels. Established in 1963.
KODA	A Danish organization handling payments for composers and songwriters. Established in 1926.

Table 3. Overview of external organizations handling payments and rights. Descriptions are based on the websites of Gramex and KODA (www.gramex.dk and www.koda.dk).

At the turn of the millennium, in 2000, an upgraded electronic search system was launched – the MUSA database (cf. Table 2). The search system for this database, MUSA Søg [MUSA search], improved the opportunities for making specialized searches, and it did so because of the ways the database's registering system, MUSA Reg (see Figure 2), can operationalize its metadata. The specialized searches could start from an artist but also from a release, a track or a composition and these entities could be combined, meaning that it was possible to contextualize searches, e.g. based on a composition in order to see how many tracks, spanning time and genres, were registered in the database and

¹² DR is tax funded and pays a fixed sum to the organizations handling the financial rights of songwriters, performing artists and record companies, who apportion the payments to the holders of the rights based on DR's music reporting.

¹³ Colloquially, most DR employees due to DISØ's successor MUSA call this a MUSA number.

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But this did not happen. Instead the profile of Diskoteket changed from solely supporting DR employees in planning and broadcasting to having strategic ambitions in the online sphere. Within the archive lay a slumbering force: the sophisticated potential in its metadata, which throughout the years had been refined in practices of registering. MUSA was intended to improve the experience of searching, broadcasting and reporting, but it revealed a general logic for how to approach music in the future as well, and, due to chance progressions in the department, people ‘who believed in digitization and online possibilities’ (Dose, 2021a) were hired during the 2000s, which made for a strategic conversion towards ever-improved metadata that, on the one side, should be embedded in services made for the public and, on the other side, could create more advanced editorial solutions internally in DR (ibid.; Dose, 2021c).

It is important to note that a small-scale digitization was taking place already in the mid-1990s. As Krogh points out, several of the radio channels driven by popular music genres were subject to automatized music scheduling practices and a standardized approach to music selection; with the introduction of the music scheduling software *MusicMaster* in 1996 (see Table 2 above) predetermined playlists could run more or less by themselves, thus reforming broadcasting as a case of linearity (Krogh, 2018, p. 71). Another music scheduling software, *Selector*, mentioned above, was later introduced as a more advanced control management of music at, especially, P3. With this piece of software a thorough centralization of music was deployed due to rigid categorizations, and *Selector* was (and still is) coupled directly to *Dalet*, which, as mentioned, is the software for editing and live-broadcasting sound. In *Dalet* the digitized, and edited, music is stored on large servers. When this process was introduced, music was ‘ripped’ and uploaded without taking advantage of MUSA’s metadata – instead radio hosts and other employees had to manually type in information as metadata on each music file in *Dalet*, sometimes resulting in duplicates of the same tracks with deviating, and conflicting, information. On top of that, this practice put radio hosts in a position where they manually had to report most aired music.

After the implementation of MUSA, the employees at Diskoteket (most of whom work under the job title music registrar) had a lot to do because the migration from *DISØ* had several flaws. For example, all registered tracks in *DISØ* had been carefully catalogued with recording dates, but this information was arbitrarily deleted in the migration process; instead, in the new database all tracks on a given phonogram were annotated with the phonogram’s release date as their recording dates, resulting in a shattering display of imprecise data (especially appalling was the case of compilations). The practices of registering new releases directly in MUSA was, and is, more precise and nuanced than in *DISØ*, but the merger of databases brought with it problematic situations, such as that mentioned above. Besides these challenging situations, the opportunities in the new systems were manifold; two internal documents about the implementation of MUSA Søg show priorities for ways to improve search results

as well as the reporting of music to the organizations handling rights when compared to DISØ, which reveal an early focus on, and insight into, user-friendliness and user experience.¹⁴ It is interesting to see the attention to details in terms of functionality at this early point. The strategic ambitions clearly contained thoughts on how to make the music archive more than an archive. At this point, around 2000, no one had envisioned /Diskoteket yet, but the insistence found in the early internal software development can be seen as the harbinger of a digital search system and portal for listening made for DR employees that brings annotated information into play.

Database and opportunity for new experiences

MUSA is placed on a server called UNIX 11 and evolves in a digital environment building on Oracle, an American management system for databases. This sort of server makes it possible to ‘associate’ the different music scheduling software that DR uses, as it says in a status report on MUSA from September 1999 (MUSA status 14/9 -99). The significance for DR of this association is noticeable, as the possibility of a streamlined communication of music with less contradictory information being broadcasted among the different radio channels becomes manifest, which further emphasizes the improvement of metadata as a necessity. And since Diskoteket’s conversion towards a dedicated improvement of metadata in the first half of the 2000s, as mentioned earlier, the department has rebranded itself towards a future to come in which operationalization and experience of music information would be of great importance. According to Dose, the department has been devoted to metadata in the last 15 years (Dose, 2021a).¹⁵ As I read this, this devotion was first of all introduced as an effort to make the department an indispensable element in the assemblage of DR’s radio production, in a media landscape otherwise moving into the digital sphere, but, as time has passed, the work has further been a continuous effort in readying DR for playing an active role in Danish music cultures even though commercial music streaming giants such as Spotify and Apple Music have come to dominate the

¹⁴ In the two documents simply entitled ‘MUSA SØG’ and ‘MUSA søgesystemet’ [MUSA search system] we find a rather large overview of priorities meant for the improvement of the user experience in the new search system. An example can be found in the latter of the two documents. Here we see that priority 9 (out of 54) is assessed to be a category A (on a scale from A to C), meaning it is imperative to look at right away. It states: ‘All phonograms that have been converted from DISØ have obtained the status of an original album, even if they are not. As an example, any compilation or soundtrack registered in DISØ [will now figure with this status]. Defined rules of programming for segregating phonograms that *should not* be marked as original albums are needed. In the case of soundtracks, all releases have the genre-keyword “soundtrack”, which can be used for [developing a code for] sorting’.

¹⁵ ‘What we started to focus on in the 2000s was the potentials in our metadata. Big steps were taken in the usage of MUSA for reporting, but for us the headline centered on how to get the data out and be alive in the public space as well as to develop more advanced editorial solutions internally [in DR]. The promise that we, in the department, made was that we could build digital products for the license payers’ (Dose, 2021a).

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field. By diving into specificities surrounding each track and artist and making that information interrelated, the department has been able to uphold a prominent position within DR's music communication by living up to the overall educational ideals of the institution, as well as highlighting the importance of a music archive as a part of common cultural heritage for a public service institution (and convinced DR's administration that it is so). Today, much of the information found on DR's music pages on the website www.dr.dk (notably playlist pages and artist pages) draws on the information in the MUSA database. Though much of DR Musiktjenester's work supports functions internally in DR, this is what meets the public eye. The many years of believing in a future for metadata, for annotated information, is, I will argue, the very thing that has made DR avoid a Spotifyfication model, such as Burkart and Leijonhufvud uncover in relation to SR (Burkart and Leijonhufvud, 2019).

The visions of a digital music platform crystallize and gain speed due to the continuing furtherance and sophistication of metadata in the data model. The infrastructure of MUSA reveals a potentiality of interconnected music experiences that resemble a general network aesthetics of online life worlds, and with an anchorage in the MUSA database ideas about how to open up a participatory space for music searching and listening begin to flicker. Patrick Jagoda speaks of a contemporary logic of networks as mediating constructions that have both affective and sensual implications (Jagoda, 2016), and, I will say, /Diskoteket lives up to that as a space not just to be known but also sensed and inhabited.

In May 2010, an analysis of the possibilities of implementing a digital music archive in DR is ordered, and in February 2012 a comprehensive project description¹⁶ is handed in to DR's administration, in which it is concluded that an activation of the MUSA database as the foundation for an in-house digital music platform not only is the cheapest solution, but also safeguards the future of the music archive. The project description clearly states that an operationalization of the metadata in the database is an advantageous resource utilization not only in regard to music reporting but also to research, discovery and programme planning (Anon., 2012). For this to be effected it must be possible to get into dialogue with the information in the database, hence my alluding to a network aesthetics – a digital music platform that lets metadata highlight release-related interconnections in the database, thus making a participatory space with affective dimensions

¹⁶ The background of the project description is formulated in its introduction: 'There are several strategic arguments for a digital music archive in DR (DMA in DR). For instance, the record and CD collection is the only part of the processes for programme production that is not supported by digital workflows. Moreover, the use of external digital services, such as iTunes, Spotify, Wikipedia and YouTube, is, when it comes to listening, research and information seeking, still getting more central to the employees working with music in DR today. On top of that, the record industry is to an ever-larger degree releasing phonograms as singular sound files instead of CD's.' (Projektbeskrivelse: Digitalt Musikarkiv i DR 2012, 4).

appear, is needed. And so it is decided to develop *Digitalt musikarkiv i DR* (DMA).

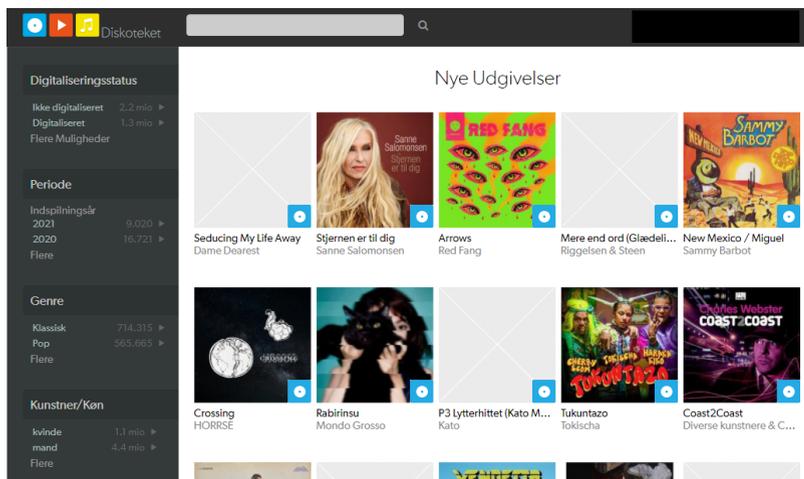


Figure 3. The front page of /Diskoteket (screenshot is taken in the afternoon of November 9, 2021). The front page is in sync with the database and changes every time a new release is added. Source: DR.

DMA (cf. Table 4) is the working title for what ends up being launched as /Diskoteket in the fall of 2014 (the front page of the platform can be seen in Figure 3). The main wish for pursuing this project can quite simply be found in a rationalization of programme production. The very essence is that users should be able to navigate in the collection and access music virtually, thereby saving time and costs. Prior to the initiation of DMA, Diskoteket's employees act as superusers handling the music's road to the Dalet servers. At this point Diskoteket is a gatekeeper for all music that a radio host needs to be in contact with in order to make new music appear on the Dalet servers. The goal is to blur Diskoteket's role as gatekeeper and make users of DMA experience and handle the music and its road to a server themselves – as Dose recalls the time before DMA: 'we were a Dalet resource for the entire house [DR-Byen] as well as we were the ones registering and digitizing the music to be transferred to the Dalet servers in the first place' (Dose, 2021b).

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Name	Description
DMA (Digital Musikarkiv i DR)	The working title for the project of creating a digital music archive at DR. The project was launched in 2012 and finished with /Diskoteket in 2014.
LARM	An external research project (2010–2014) aiming at developing a research infrastructure for the digitization and archiving of broadcasted radio in Denmark.
RAMUND	An external research project (2013–2018) aiming at understanding the convergence of music and radio in a Danish context.

Table 4. Overview of DR projects and research projects. The description of DMA is based on Anon. (2012).

For this to change, as much music as possible should be digitized and made ready to be transferred from a DMA server to the Dalet servers, and, for this to work, that same music should be registered correctly according to taxonomical ideals with a strict syntax for annotated information (ibid.). From around 2007 the department funnels its resources towards digitizing music (mainly CDs) and obtaining new music as digital sound files as well as making sure that the level of metadata on this music lives up to standards agreed upon (ibid.). Interestingly, this coalesces with the move to DR-Byen; an architectural project that infamously exceeded its budget by 34% (1.7 billion Danish kroner more than estimated). /Diskoteket, then, can be said to be a necessary evil due to substantial efficiency improvements and mass-layoffs in the wake of a scandalous situation heavily covered by the media. But, instead of crafting a rigid construction with a bare minimum of functionality, DMA's steering group and software developers decide to operationalize the metadata in the MUSA database and create a high level of mobility on the platform that works because of interrelations. This platform, /Diskoteket, is moreover intended to be open for further development. As is stated as a goal in the project description of 2012:

[A criterion for success is] that DMA is open for further development. For example that the system can support the use of new means of production as well as external music services, if juridical or business relations allow so. Or that DMA in an expansion can make external users (license payers and record labels) capable of delivering music to DR for the purpose of an efficiency improvement of music acquisition as well as the establishing of the possibility for user-generated music content. (Anon., 2012, p. 8)

A thought-provoking addendum to the story of the development of a digital music archive in DR lies in the fact that the inspiration for cultivating a digital system for searching and streaming came in part from the outside. In 2008 DR's music department, some digital developers and Diskoteket were contacted by the

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Norwegian Broadcasting Corporation (NRK), who reached out concerning a common Nordic solution for the digital archiving of music (Anon., 2012, p. 4). After a couple of months of writing back and forth, a team from DR travelled to Oslo and discussed this prospect in depth for days. It was NRK's wish that DR become the co-sponsor of a digital music archive building primarily on their archive, and in turn DR were to be able to access this digital infrastructure and thus save resources and capacity. The premise for this discussion was the so-called 'Madonna argument': both public service institutions spend time and money on registering the same record by Madonna, so why not have a shared system and distribute the resources to registering more music (Dose, 2021b)? But, after doing some quantitative analyses of NRK's and DR's registering patterns, respectively, it became clear that they were actually only sharing around 25% of their acquisitions. All major label¹⁷ releases, such as Madonna's music, are of course procured and registered by both NRK and DR, but the remaining 75% acquisitions are not the same. As Thomas Dose recalls:

The Norwegians had a lot of folk music that we would never acquire, just as we had a lot of Danish music and music from small indie-labels and the like. So, there was a very large part on each end that we [DR and NRK] did not have in common. (Dose, 2021b)¹⁸

Besides this discrepancy, NRK's plans for how to build a technical solution were not convincing to DR's developers, so the idea of a common digital music archive was not pursued for both practical and technical reasons. This is not, however, the place for pondering why only DR was contacted by NRK; it is indeed an interesting fact when considering SR's present ties to Spotify. As Burkart and Leijonhufvud point out, the consequence of this political shift by SR is that the gramophone archive stagnates due to fewer hands creating and maintaining a useful level of music metadata, meaning that archival memory is gradually reduced (Burkart and Leijonhufvud, 2019). It might be that SR has a seemingly smoother basis for user experiences due to Spotifification, but due to this fact they connect to the market forces and, accordingly, they renounce their singular status as a public service archive, which is lessened and losing value in terms of public heritage, and, on top of that, they have no immediate prospects for developing different digital solutions for music experience in the future. The model of SR appears to be an open access digital archive, but the fact that it relies on Spotify makes it an uncertain archive (Thylstrup et al., 2021). The digital music archive of DR might be in a continual struggle in terms of up-to-dateness, but it does have

¹⁷ Since 2012 it has been commonly agreed that there are three major labels: Sony Music, Universal Music Group and Warner Music Group. When NRK and DR were discussing the prospects of a shared digital music archive there still was a fourth label, EMI, that was referred to as a major label, but during 2012 and 2013 it went through a distributed merging with the other three labels. As of 2020, the three major labels are estimated to have a collective global market share of more than 65%.

¹⁸ This reflection aligns with the latest IFPI report concerning global markets and local scenes (IFPI Global Music Report 2021).

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the possibilities for getting at new digital solutions that they own the rights to themselves.

/Diskoteket differs from the commercial streaming services that it is up against. And it *is* up against actors such as Spotify, not commercially, of course, but in terms of production ends. I touched upon this earlier; /Diskoteket, and DR Musiktjenester, would very likely be cancelled if it becomes possible to replace the services with Spotify.¹⁹ But, this, or similar scenarios, is not imminent due to, mainly, three things: first, the integration of sound files and metadata from /Diskoteket to Dalet; second, the automatized reporting system for royalties building on metadata in the MUSA database; and third, the swift manner of obtaining information connected to tracks, releases and artists without leaving the platform. This last point can easily be underestimated, but the reality is that the fact that the metadata are interrelated and can be interacted with potentiates the platform as a space for producing new knowledge. According to Dose, the model for metadata is developed in this way partly due to an eagerness to ‘know how everything is connected’, and partly due to a business intelligence logic that tries to foresee the necessities in future radio production and develop digital solutions for that (Dose, 2021b). With /Diskoteket, Diskoteket goes further than the initial aim ordered by the administration, which, to me, shows a rigorous belief in operationalized metadata as the future battleground for music communication:

Not everything we did was necessary. I will say that we went quite a bit further than we were asked. It would have been possible to create a digital music archive capable of doing what we were asked to do without orchestrating all the metadata in the way we did (Dose, 2021b).

In the following section I will give two examples of how metadata are set in motion on /Diskoteket, and woven into these analyses I discuss how the MUSA database presents options for understanding music history that might be determinative for the user’s experience.

Operationalization of metadata: implying an institutionalized music history?

With the launch of /Diskoteket, Diskoteket has managed to put the taxonomical order of Leisner’s far-sighted organization in motion, and for DR Musiktjenester it is a work of pride to create new opportunities for searching, contextualizing and listening at the same time as making the user experience as smooth as possible (Dose, 2021c).

¹⁹ ‘We are, to a small extent, competing with Spotify – a small extent, because it is not a prospect to replace us with Spotify, but if it *were possible* [my italics] to do so, it most definitely would be an option. There is some sort of struggle for survival going on and we need to, banally, move with the times and try to service the users where they are and all that...’ (Dose, 2021a).

Two compositions to rule them all

Already the index card system was structured to enable searching via compositions, meaning that one could find releases of interest based on songwriter credits. This feature is also incorporated in /Diskoteket, and its prospects are quite remarkable. First of all, when the music registrars have made sure that a certain composition, let us say Johnny Green's 1930 jazz standard *Body and Soul*, appears as foundation for a track on a release, they fixate said track to the composition in the database (see example in Figure 4). They do this with all instances of tracks using this composition, and this makes for a precise and correct reporting to KODA²⁰ every time a track with a recorded version of *Body and Soul* is aired. Second, this practice of registering tracks on top of a single composition makes it possible to visualize how the life of a composition has evolved throughout the history of recorded music, at least ideally. Due to changing and very differing registering practices, compositions have not gone through strict care until recent years. After the implementation of DISØ, music registrars created new examples of the same composition more or less every time they created new tracks on a new release using said composition. Because of this, some compositions exist in a lot of examples in the MUSA database. In the case of jazz standards, such as *Body and Soul*, it can be dozens, even hundreds (see Figure 5).

Besides the problem with duplicates, the issue with incorrect recording dates, which I alluded to earlier, can also hinder the overview of a composition's whereabouts in the history of recorded music that the platform might be capable of presenting. In many instances the recording year of a track using a composition corresponds with the release year of the release it appears on, but the opposite scenario is equally common, meaning that a faultily executed registration might disrupt the strain of events for the composition in question.

If a track that uses a certain composition is registered as recorded several years later than it actually was, the composition's journey gets opaque when one tries to create an overview, especially if one wants to create a visual overview in list form, which is possible in /Diskoteket. Let me exemplify with Charlie Mingus' piano version of *Body and Soul* from his 1964 *Mingus Plays Piano*; this release contains tracks that were all recorded on July 30, 1963, but these could easily be registered as recorded in 1964 (interestingly, if one looks at Spotify one can see that they have made an error the other way around – in their system the record seems to have been released in 1963²¹).

²⁰ KODA is the organization in Denmark that works for the rights of composers/songwriters. KODA's main task is to make sure that composers/songwriters are paid when their music is played in public spaces. For more, see KODA's website www.koda.dk.

²¹ I have made this observation twice: on 8 September 2021 and on 11 April 2022.

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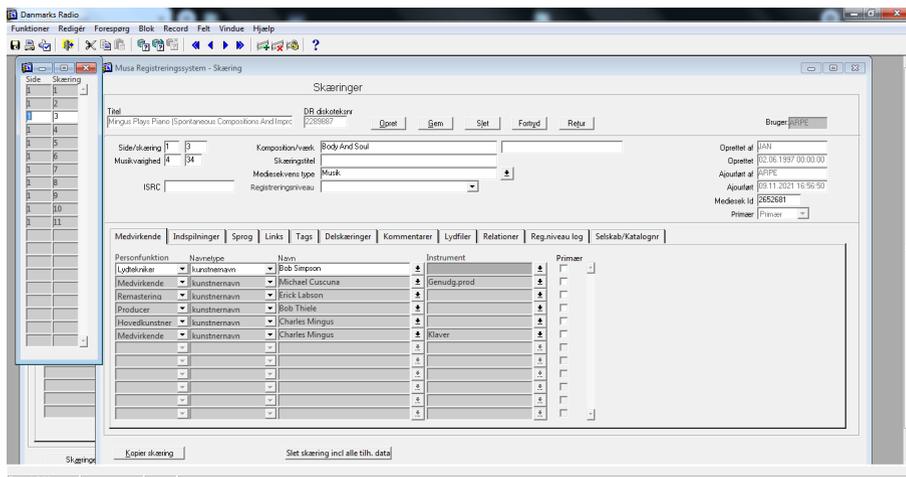


Figure 4. This screenshot from MUSA Reg shows the track level of Charlie Mingus' *Body and Soul* from the album *Mingus Plays Piano*. As can be seen in the line *Komposition/værk* [Composition/work], *Body and Soul* is fixated on track 3. Source: DR.

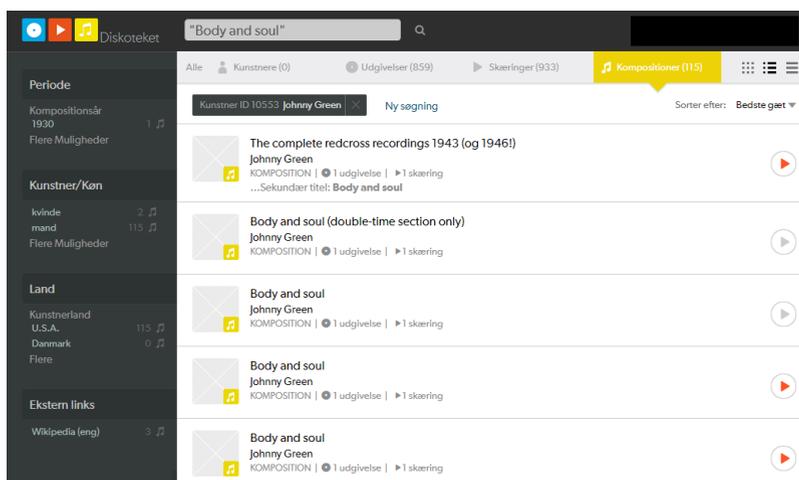


Figure 5. Here one gets a small peak into the search for Johnny Green's composition *Body and Soul*. /Diskoteket tells the user that there are 115 *Body and Soul* compositions in the database, meaning that a 'cleaning up' of this composition has not been done. This makes it difficult for the user to navigate in the system and get a clear overview. Source: DR.

Further, the track could be registered even more wrongly, say, as having been recorded decades later. In 2006, a compilation telling the history of Mingus' years with record label Impulse named *The Impulse Story* is released, and here the

piano version of *Body and Soul* is featured. If a music registrar is sloppy, the piano version, on this release, could very easily end up appearing as having been recorded 43 years later than it actually was (which is the case with commercial platforms such as Spotify that do not work with recording dates, confusing users who do not already possess the information themselves). In an oeuvre such as Mingus', recording dates are crucial; Mingus has recorded several different versions of *Body and Soul* and, again, if one wants to create an overview, the recording dates are the very thing that makes distinctions.

Imprecision with compositions can have a further level. Sometimes several versions of a composition might exist. Let me go on with the case of *Body and Soul*. It was originally written as a song with lyrics by Edward Heyman, Robert Sour and Frank Eyton, but it has been very common to record instrumental versions of it. So, in order to make clear registrations in the database two different compositions are needed, which do not get mixed up with each other. Then, if a proper 'cleaning up' in the compositions has been done, it is possible to get two distinct overviews based on the *instrumental version* and the *vocal version*. This means, of course, that it is not possible to see all tracks, both vocal and instrumental, at the same time. Still, /Diskoteket offers a long and winding road to it all: one starts by accessing the Johnny Green artist interface; here, it is possible to choose to make a search related to Johnny Green that only shows tracks, and after choosing the track tab one should search for *Body and Soul*, placing the song title within quotation marks. Then, every track with the two versions of the composition should be shown. To make this search, it is of course required that the music registrars have been narrowing down the amount of *Body and Soul* compositions to two examples and that they have made sure that the correct songwriters appear on these. Further, to distinguish between instrumental and vocal versions, all tracks using one of the two compositions need to have been annotated with the keywords 'kun instrumental' [only instrumental] or 'vokal og instrumental' [vocal and instrumental] as meta-tags.²² If all these requirements are fulfilled, it then will be possible to make a concise overview showing all tracks from recording dates (there are numerous tag-categories, though many are not operationalized so far, cf. footnote 6 on meta-tagging).

The relationship of relations

In the MUSA database, one can find another remarkable example of how a strict taxonomy for metadata subordinated to the four primary entities of the database can create instantaneous opportunities for experiencing music. In 2015, when I first got acquainted with the department, Diskoteket implemented a model for

²² It should be noted that the contemporary registering practice allows for not annotating versions that are both vocal and instrumental. When it comes to so-called rhythmical music this omission signals that a given track is both vocal and instrumental; here, the music registrar is asked just to annotate an only instrumental or an only vocal track. The registering practice is different when it comes to so-called classical music; here, annotations are always expected.

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relations on track level that we all are familiar with and typically use when discoursing about popular music releases; over the years this model has become more complex and today it holds a plenitude of functionalities. In the vernacular of the music registrars this model is known as *super-relations*. The super-relations connect different verified data by two variations, each leading in its own direction. This module for relations in MUSA is put to use in cases of cover versions, remixes and instrumental versions, just as it can be used in situations where a track is part of a mix or a mashup. Further, super-relations can show when a track is a ‘*versioning*’ (a different version, a rewrite) of another track, e.g. when a track implements new lyrics, just as they can show when a track is either using *samples* or is being used as a sample. Concerning the super-relations, Dose explains that the addition of the module in the data model is quite simple, unlike the conceptual ramifications of being able to relate between tracks (Dose, 2021c). In the MUSA database there are, as stated earlier, four primary entities (composition, track, release, artist) and within each category it is possible to create relations – both to expand knowledge as well as to minimize noise. Common to all relations on track level is an ability for interaction with the digital music archive as a space of knowledge production and sensuality. With super-relations, /Diskoteket goes together with the users of the platform and establishes a mediating network of instant experience and historical dimensionality that accentuates how the history of recorded music was always nonlinear and prone to be participatory, which I see as an intersection of the participatory and the improvisational types of network aesthetics in Jagoda’s analytical framework (Jagoda, 2016). This kind of aesthetics allows listening across multiple spheres of the digital music archive, leading to a historicized listening (Pedersen, 2020). In the following I will demonstrate how a sampling of super-relations is manifested in /Diskoteket, using Drake’s 2015 *Hotline Bling* (single version) as illustration.

On the track interface of *Hotline Bling* from the 2016 album *Views* in /Diskoteket, three different super-relations are at play (see Figure 6). First of all, one sees that the track contains a sample of Timmy Thomas’s 1972 *Why Can’t We Live Together*, whose unmistakable beat consisting of a drum machine bossa nova groove and a Lowrey organ is sped up and creates the fabric of Drake’s track. In addition, one can see that there is a cover version by Judith Owen and that Erykah Badu has made a rewrite on her track *Cel U Lar Device*.

All this information to be found on the track interface is more than just information. On /Diskoteket it is a mantra to operationalize, more or less, all metadata, which means that all three tracks alluded to can be accessed directly from here due to (the network aesthetics of) hyperlink qualities.

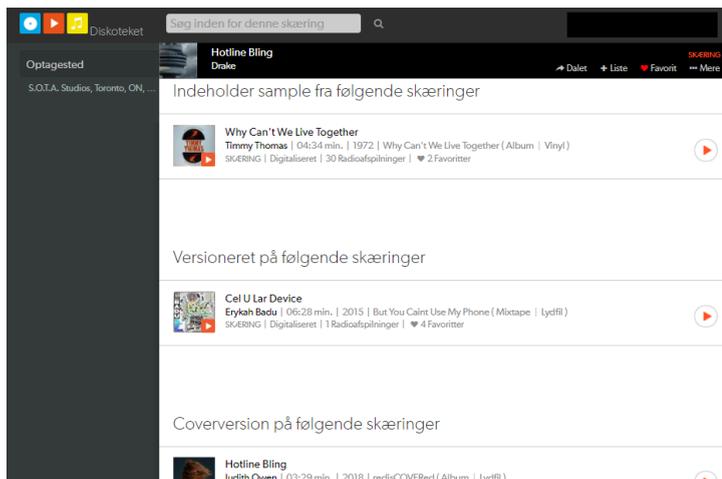


Figure 6. A segment of the track interface of Drake’s *Hotline Bling*, in which one sees three types of super-relations. All metadata are operationalized and open for other interfaces and music to listen to. Source: DR.

But one can do more than go to the interfaces of the tracks in question. If we take Erykah Badu’s rewrite, one can click on the track title *Cel U Lar Device* and go to the track interface of this track (from the 2015 mixtape album *But You Caint Use My Phone*), but one can also click on the album title *But You Caint Use My Phone* and get to this album’s interface as well as one can click on Erykah Badu’s name and be transported to her artist interface. On top of that, one can press ‘play’ on the orange play button on the right side and listen to *Cel U Lar Device* from here, from the interface of *Hotline Bling*. In this way the platform creates the illusion that one can discover all and everything related to this track, across time and space, across history. For instance, if one moves to the track interface of *Why Can’t We Live Together* one sees the super-relation to *Hotline Bling*, three different tracks by Erykah Badu from the aforementioned mixtape album, and a cover version by Sade.

It is very easy to get impressed by the fact that /Diskoteket works in this way, as some sort of mixture of Spotify on one side and Musicbrainz, Discogs, Wikipedia and WhoSampled on the other side. But it is important to remember that /Diskoteket only shows information registered in the database. Like all other digital music platforms, /Diskoteket only showcases a sampling of the history of recorded music, just as it is in full control of how the users might get at that sampling. /Diskoteket very cleverly induces the feeling of both vastness and exactitude, but the fact that there is only one cover version of *Hotline Bling* present discloses the limited size of the archive. In order to reflect completeness there should be numerous cover versions.

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tracks that are registered as secondary to *Yesterday* from the 1965 album *Help!* are shown. Users are made aware of the fact that these ‘other versions’ exist in the database, but if one clicks on, for example, the version from the compilation *The Beatles 1962–1966* one is led onto the same interface, onto *Yesterday* from *Help!* (the only thing that is different is the URL, in which the Diskoteks number is changed to the one designating the compilation). A rather problematic issue in this case is the fact that the different master recordings and remastered versions in existence in the archive are hidden and very difficult to retrieve. The different options for super-relations were added to the database shortly after the launch of /Diskoteket, based on the argument that a reduction in visible duplicates would improve the editorial processes (Dose, 2021c). Dose recalls this to be the argument that gave a green light to implementing the module:

I remember that I argued for them [the super-relations] in connection with the launch of /Diskoteket by explaining that search results, editorially speaking, would be more efficient if the noise of duplicates were minimized. But it was obviously on the official face of DR, in utilizing metadata on www.dr.dk and in apps that I saw the biggest opportunities, because I believed and thought that it is self-evident that we have some interesting metadata that no one else has – but the issue of duplicates was too big a hurdle to even begin to operationalize anything. So, if we were to take advantage of our metadata in order to enrich the digital music experiences, we had to approach this issue radically (ibid.).

Next, I will round off by bringing a few perspectives concerning the steering of data and music history.

Music history and data directing

As part of the preparations for the research done for this article I did an ethnography of DR employees working in radio production, which targeted music history in a digital age and how /Diskoteket suggests certain narratives over others. During winter 2019/2020 I conducted ten qualitative interviews that revealed (thoughts about) an institutional discourse of certain ways to understand and disseminate music history. I will not analyze these interviews here, but in order to widen the responses to the hypothesis of this article, let me just pick out a couple of statements. The interviews were semi-structured, thus they covered a range of topics. While talking about how classical movement-based compositions ought to be presented on digital music platforms, one informant suddenly interrupts himself and states that ‘there is a DR consensus about a lot of things’. We are discussing the experience of validity in music metadata, and this spurs him to underline to me how important it is that employees at DR refer to a given musical work in the same way every time: ‘We say things in certain ways ... This sort of verified information [that comes from strict syntax] is a way of me and my way of thinking [about music history]’.

The statements of this informant concern the taxonomical order of registering in the MUSA database, which can mean two things: either the taxonomy of the music archive has always been subject to a limiting discourse of right and wrong,

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of music history as equalling a catalogue of facts that tells narratives as universalist chains of events; or, the archival taxonomy has, over the years, seeped into the editorial and broadcasting discourse as a common ground of reference that all may not agree on but comply to anyway. Both explanations are probably equally 'correct'. Nowhere is it written that music history must be communicated in a specific way, it just is so and this mechanism can most likely be traced back to the original ideals of education and public service, meaning that noble intentions perhaps result in uncritical approaches to how unilateral narratives might influence the public.

Another informant speaks of the problematic act of tracks being hidden, which I accounted for in my analysis of super-relations above. She says:

A track can, for instance, be put into a compilation context focusing on the evolution of punk music, but the identical relations [primary-secondary relations] make you see the so-called primary release of a track, always. Hereby, the context of punk history is hidden to the user. ... Your options of discovery are limited. In the punk music example you are limited in discovering other music of relevance, or in discovering music that at least has been curated as relevant to the given track. The same logic limits you in finding and listening to edited versions of the track and this restricts the [experience of the] breadth of the system.

This illustrates the same DR consensus of right and wrong as the aforementioned example, but this time it unmistakably comes from within the digital music archive. Most people will probably agree that the implementation of primary-secondary relations is a helping hand for the user of the platform, and, as I have accounted for in the preceding paragraph, it is a strategic and necessary tool for being in a position to create digital music experiences for the future. Still, one should be aware that this functionality inscribes itself into a history of standardization at DR – a standardization of radio production as well as a standardization of music historical narratives.

No matter the perspective, the digital music archive of DR ordains, as all other archives, a certain power structure, and with the case of primary-secondary relations implemented in order to 'clean up' in the archive we are witnessing a somewhat heavy example of omitting what is viewed as redundant. The user is given opportunities to understand and interpret tracks within a certain scope, and by this the archive establishes the framework that the user can produce knowledge from. Read through a critical lens one should be aware that the infrastructure behind /Diskoteket, the MUSA database, might determine how one perceives the history of recorded music. The question is whether or not it makes sense to view the infrastructure solely as the representation of control; is it not as much a representation of potentiality?

The possibilities of new contextualizations, of new knowledge, of new ways of attuning one's ears, ought to mean something more than just to be examples of governmentality. Jussi Parikka, speaking through the voice of Michel Foucault, speaks of the archive as a 'guiding principle for the potential actions a machine

might take' (Parikka, 2012, p. 132), which is a concurrent reading of Foucault's concepts of the archive and the diagram, a reading for the present time. And this concomitant approach seems fitting to me. Infrastructures are closer to diagrams than to apparatuses; the diagram is in its essence nomadic – it does not map out, but experiments, with the world.

Actually, the database as a concept might make more sense than the archive; the coding of MUSA manifests itself in interfaces on /Diskoteket as representations of ideas and world views in a flat structure, or what Lev Manovich would call a non-hierarchical network of hyperlinks (Manovich, 2001, p. 16). Looking at /Diskoteket I tend to agree with Manovich that we behold a different order of archiving; the MUSA database is a collection that does not in itself tell a story, that does not have a beginning or an end. The logic of the database tells us how to see things. The more we clean up data, organize data, index data and describe data via different logics of metadata, the more data beyond the pre-existing data we create. And the fact that the database behind the archive is open to editions and changes begs the question: what actually *is* a digital music collection, a digital music archive? In the final section I will discuss how different concepts of time lead to differing ideals of history, and I will emphasize the use of history as the mechanism of DR's simultaneous, and opposing, approaches to music history.

Communication is music history is communication

In navigating an archive of any sort one will inevitably ponder on history: how did the archive in question come about; what does it preserve; and what narratives does it aim to tell? These questions are not weakened or getting less important with digital archives. The prospects of reading an archive are widened with the addition of a digital counterpart. The question of an archive's ontological status in the move from physical assortment to digital storage is intimately connected to the concept of history carried by the perceiver, the user, of the archive: is the intention to use the archive found in a reinforcing of a repeated foundational process pointing towards 'new ideas' (the belief in linearity, in modernization), or is the purpose rather to reconfigure the possible historical sensibilities of the archived material by engaging the archive with a disinterest in historicity (that is, reading the archive non-chronologically, as a heterogeneous entity)? In this final section I will relate the understanding(s) of music history in DR's digital music archive to a relational perspective on the concept of history. To scrutinize this archive is to realize that it is not just asserting a taxonomical knowledge system of musical facts; to scrutinize this archive is to realize that music history is not necessarily about being but always about relations and communication.

In considering book collecting, Walter Benjamin reflects on the meaning of ownership of objects, arguing that objects can let one come alive within them and not vice versa (Benjamin, 2015 [1931], pp. 68–69); consequently, he believes a public collection to be pointless (*ibid.*). Without a personal relationship between

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collection and collector, the collection gets void of meaning. Benjamin finds the very essence of collecting to be a physical portal to 'the spring tide of memories' that lies in acquiring and endless sorting (ibid., p. 61). The public collection is per definition an archive and therefore it is bound to eradicate confusion and chaos. The meeting with an archive, or a library, is one of immediate disorder, but its instantaneous pleasure of chance is negated by the 'dialectical tension' between the archive and the order of its catalogue (ibid., p. 62).

As I read Benjamin's text, part of his mission is to shed light on modernity's quest for installing a homogenous time, or, a framework of chronological time: the institutionalized amassment of objects robs the objects of the potential for being anything else than points in a grid that chains things together in succession.

If one reads /Diskoteket in this way, one sees a digital music archive whose entire epistemology is sculpted around years and dates, omission and noise-cancelling, uniqueness and factuality. When 'there is a DR consensus' about how things must come through to the perceiver (of both the archive and the swinging airwaves of information), there is also a DR consensus about right and wrong, about the original and the authentic, that places works over experiences. Music history is reduced to narratives in chronological time that, probably, can be argued to stem from an institutionalized lust for rationalization and optimization of work processes; to ensure progress in radio production, music history has to be viewed as progress as well. To use another famous metaphor from Benjamin, music history is caught in the institutional storm of progress that keeps open the angel of history's wings and 'propels him into the future to which his back is turned' (Benjamin, 2015 [1940], p. 249).

Music history in a chronological frame does not account for the oddities, potentialities and reiterations that a nonlinear frame might illuminate. To understand music history in terms of progress is, as Benjamin states, to meet its future with one's back turned against it. Interestingly, one can just as easily read /Diskoteket as going against the grain of a common concept of history, that is, going against linear or homogenous, chronological time. As my analysis of super-relations shows, the digital music archive wants to unveil and include connections as much as it wants to hide and occlude, thus /Diskoteket purports a heterogeneous narrative that 'destabilize[s] change as a linear description of becoming' (Tanaka, 2019, p. 114).

Recently, historian Stefan Tanaka has made a convincing contribution to historical methodology, in which he advocates a concept of history that displays how multiple units of time relate and make historical change an immeasurable movement in chronological time (ibid., p. 146). In /Diskoteket, sound files and related metadata are flung into a participatory space due to a taxonomy initiated with the system of index cards, which has a built-in potential for non-chronological ordering. The *Hotline Bling* example, with its manifold relations cutting through different spheres of the digital music archive, casts light on how a digital music platform might represent several pasts of a track. All pasts *are there*, but they

cannot be experienced simultaneously, making them subdued to an interdependence of memory and forgetting, to speak with the hermeneutic phenomenology of Paul Ricoeur (Ricoeur, 2004).

Deleuze and Guattari, on the other hand, will state that the pasts of a track take part in an assemblage of searching and listening via /Diskoteket, in which the pasts are singular plateaus that bind otherwise heterogeneous elements of the digital music archive together, thus all pasts *are a part* of what is experienced. For Benjamin, /Diskoteket will exhibit the nonlinearity of the history of recorded music by enabling all pasts of a track as the ‘differentials of time’ (Benjamin, 1999, p. 456). The user of the platform, looking at all the relations on the track interface, sees a dehistoricized view, or a ‘contemporary configuration’ (Tanaka, 2019, p. 19). Methodologically, Tanaka will call the user’s dehistoricized view to use ‘the situatedness of things’ (ibid.) in order to unfold layered interactions ‘that help us see the myriad influences on people, ideas, and things as they interact and transform’ (ibid.), and in the continual insistence on operationalizing its metadata, DR Musiktjenester, I will argue, inoculates /Diskoteket with an attention to historical relationality and emergence side by side with the institutional strive for consensual factuality.

Music history, according to the institutional discourse at DR, seems to be ingrained with a conventional idea of linear progress and of right and wrong. This is of course not DR’s own invention, but a logical result of the chronological reckoning of the Enlightenment and the institutionalization of history in the 19th century. A consistent array of statements from the briefly mentioned qualitative interviews circles around concepts such as musical works and canonized releases (within genres), ascribing a rationale of historical common sense to the institutional narratives of music. There might be ‘a DR consensus about a lot of things’, but this consensus in many ways affirms the institutionalized music history as an imaginary museum of musical works, as Lydia Goehr has theorized (Goehr, 2007 [1992]). Read alongside Tanaka’s historiographical diagnosis, music history at DR falls under the schism of modernity that ‘turns relational conditions into fixed temporal positions’ (Tanaka, 2019, p. 42), which feeds, and fits perfectly, into the overall educational ideals of DR as a public service institution. Thus, the communication of music history at DR might be claimed to have as its task to reaffirm (the development of) a national ideal for, and understanding of, *Bildung*, which functions in close proximity to the constructed, and historical, space of the Danish nation-state.²³

But the digital music archive at DR, and especially its embodiment in /Diskoteket, shows that the picture is more complex and that music history institutionally is encouraged to be understood as a framework for knowledge production that is always already changing as well. The digital music archive works

²³ Here, I am inspired by Henri Lefebvre’s analysis of how historical time is creating the space of a nation-state, while time, dialectically, is being ‘solidified and fixed within the rationality immanent to space’ (Lefebvre, 1991, p. 21).

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under the condition of feedback memories making its storage processes subject to a dynamic memory (Ernst, 2013, pp. 95-101) of music historical 'facts'. The digital music archive *is* the MUSA database, and by understanding the archive as a database music history can be perceived (visualized, interpreted and understood) as Manovich's non-hierarchical network - of hyperlinks, yes, and also of non-causal events merging in the eyes of the beholder (and in the ears of the listener).

The only real difference between the two opposing understandings of music history is that the former is defining of DR's communication to the public, whereas the latter lives a life confined to laptops with singular ID's ascribed to DR employees. And that is a significant difference which tells us something about institutional power birthed in the idealism of modernity, with ties back to a post-Enlightenment frame of national history. The digital music archive reflects, of course, an incomplete picture of the history of recorded music, created due to changing politics of acquisition, and it carves out the user's options for engagement as well. Still, it shows the first steps towards a promise of an institutional rethinking, or thinking anew, of recorded music's pasts.

As a digital music platform, /Diskoteket drives a wedge between the algorithmically infused variability of Spotify's model and the variability-as-premise models of Discogs and WhoSampled (and also YouTube), thus creating (at least the preconditions for) a communication of music history focused on relations and experiences. If DR wishes to play an active part in sketching out the field of music communication in Denmark in the future, the process of operationalizing music metadata ought to be strengthened just as the participatory space of super-relations has to be widened and made public in one way or other.

Inspired by Tanaka, I subscribe to the idea that our music historical consciousness is shaped by levels of communication merging in a nonlinear use of music historical culture available to us. Thus, I see the use of history as the reason for several (and/or opposing) chronologies that provide possibilities for manifold understandings. Each understanding depends on the willingness to follow a relational perspective. As I have accounted for with this article, DR does not operate with *one* understanding of music history across all platforms and communicative outlets, but they do tend to lay out a straightforward and causal (or should I say chronological and almost universalist) approach to how music history ought to be comprehended. There seems to be a consensual understanding as well as a striving for factuality, which probably can be traced diachronically as the result of a modernist principle of the use of history. As a public service institution, DR has followed a trail of public education in its conceptualization of music history, because this trail makes it clear what they can do with music history. This use of history makes for what I in this article have called an institutionalized music history, which, I will claim, can be seen in DR's practices of music scheduling, standardization and archiving. Therefore, it is striking to see how /Diskoteket, as the embodiment of the MUSA database, produces this sort of music history alongside nonlinear chronologies.

Concluding remarks

With this article I have provided a history of the digital music archive of DR. This history is by no means exhaustive and it could have been approached differently. A central aim of the article has been to shed light on the fact that the history of a public service institution such as DR is multifarious and complex, and that such an institution might tell many different, and opposing, histories of all sorts of matters. I have looked into the strategies and politics of archiving commercial music at DR, and from this I see a gradually evolving focus on possibilities for searching and experiencing music and music history that builds on the operationalization of annotated data. At the same time, I also see a digital music archive that is somewhat restricting in how it shows tracks and releases, which might be emblematic of a standardized attitude towards what music information and music history ought to be.

The modern-day media landscape is ever-shifting, often in unpredictable ways. This can be observed in commercial streaming services such as Spotify, but it goes for DR's approach to music archiving as well. The platforms of Spotify are constantly changing and more than once a year the defining traits of their interfaces are altered. When it comes to /Diskoteket, progress is considerably slower, but, nonetheless, progress is a defining factor of the platform, too. It is difficult to see where either Spotify or DR's music archive are in five years; perhaps a different financial situation will have forced Spotify into a narrower field of genres, or, if the three major labels see new opportunities on other sorts of platforms, it might be gone altogether, and similarly DR's music archive might end up as redundant if some sort of Spotification model proves to be feasible to implement. /Diskoteket and the MUSA database provide a clear example of what a digital music archive is and what it can be, just as they showcase the intricate conditions that digital music archives work under. At DR, the digital music archive has to balance a fulfilment of certain ideals at the same time as it must gratify the contemporary political directions, and, furthermore, it must convert to the digital spheres and continually gain actuality as an alternative to commercial streaming services.

When prophesizing about the future for DR's digital music archive (and also Spotify's platforms), Benjamin's angel of history becomes ever more relevant. Technology and economy decree options for searching, listening and experiencing, thus dictating the tales to be told about music history, and if one wants to grasp histories beyond the storm of progress one has to read the digital music archive against the grain. It is a difficult process to do research into these matters because of the levels of politics involved – politics of archiving, politics of standardization, politics of production, politics of broadcasting, and politics of applicable legislation. For this article I chose to read archival documents and do analyses of the database and the interface of the digital music archive alongside conducting an ethnography of the archive encompassing interviews and observations inspired by auto-ethnography, all of which I viewed through an

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aesthetic and cultural theoretical lens. This I did in order to examine the role and the conceptualizations of music history at DR from within the digital music archive. Other routes could have been taken and different narratives could have been told, that goes without saying. Still, in order to put forth a qualified analysis of DR's digital music archive, and in order to offer a history of it, a multi-method research design ought to be, at least, contemplated.

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Abstract

This article offers a history of the digital music archive at the Danish Broadcasting Corporation (DR). By looking into archival documents, reviewing interviews and analyzing interfaces, the article examines visions and strategies behind the digital music archive and its in-house platform, */Diskoteket*, and based on this the article assesses whether or not DR's archival strategies play an active role in creating an institutionalized understanding of music history. The article considers how music metadata are operationalized in the digital music archive's database, and from this it casts light on the ways that */Diskoteket* balances several, and somewhat opposing, music histories. The processes of music archiving at DR are viewed as a continuous production of a causal history side by side with non-linear chronologies that follow a relational perspective, and it is argued that the digital music archive hints at a promise of thinking anew of recorded music's pasts. In conclusion, the article speculates on DR's options for carving out a position of relevance in the field of music communication in the future that relies on a strengthening of the operationalized metadata, which ought to be made available to the public.

Keywords: Digital music archives, The Danish Broadcasting Corporation, music history, metadata, taxonomy, music platforms, chronologies, public service

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Article Two

Setting the Scene

Writing music history. The title of a 1992 article by Lydia Goehr, in which she debates “criteria of relevance for determining what is and what is not to be included in the writing of music history”.¹ Anchored in a critique of historical paradigms, Goehr has a different agenda than I do. Yet, we agree on the problematics of the romantic ideology of institutionalizing music that, to an extent, still reigns in the Western historical consciousness. Perhaps, we would align even more, had she written her article today? Goehr’s errand is to underline how the writing of music history is methodologically limited by being “bound to the formation of hypotheses that are produced from the perspective of our present and the history embodied in this present”.² Such limitations, in a musicological sense, are necessary and lead to openness. But they also highlight a failure in multidisciplinary approaches, of not erasing the divide between the so-called musical and the so-called extra-musical.

Article Two has as its primary aim to discuss the premises for conceptualizing, and ultimately writing, music history today. Our times of uncertainty and a rapidly changing media landscape call for an understanding that takes heed of how digital practices and unstable ontologies connect to the ways we think about music, discourse about music, and identify with music. And such social and cultural deliberations have effect on the ways we perceive of music’s history.

In balancing a twofold methodology of doing interviews with employees at DR who have expert knowledge of musical genres, culture, and history, and discussing music historical conceptualizations as well as outlets for writing cultural histories, this article pairs empirical data with theoretical considerations and proposes a term called digital music history. This term seeks to expand the methodological scope of music historiography and regards users’/listeners’ actual musical experiences in online settings as defining for their understandings of music history.

1 Lydia Goehr: Writing Music History. In *History and Theory*, 31 (2), 1992, 182-199.

2 *Ibid.*, 198.

This is an article that wants to avoid hierarchical logics in the argumentation of how music's history can be perceived and used (and abused). By having a contemplative discussion of the concept of history, side by side with interviews about practices of music streaming and ideas of pieces of music's historical positioning, the article shows how singular situated perspectives need to be taken seriously. We all have imaginaries of music, which, to an extent, are formed by the media outlets that inform us about music. Our perceptions of music history emerge in accordance with the technologies that mediate music to us. In fact, this article argues that these perceptions emerge within the technologies, in that the technologies (especially if they are digital) configure the perceptions.

Digital(ized) world-making and meaning-making is paradoxical and impossible to explain and/or interpret with grander narratives and methods for embracing linear lines. Life and music is structured differently, non-rigidly. Bodies are intertwined. Technology is in us. A different sensibility is needed to make sense of the world, and such a sensibility constitutes our music histories.

To experience music via digital technologies is an event of becoming that is continuously moulting. The article defines such experiences as unique versions of the same event. And therefore, it is argued that music historiographies ought to be about disruptive shifts and their perceptual impact. They should be about discontinuities and technological exchanges of information, about the singular musical experiences of people and should follow a principle of inclusivity.

ON DIGITAL MUSIC HISTORY: A CONTEMPLATION ON DIGITAL ARCHIVES AND MUSICAL EXPERIENCE

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IT IS INDISPUTABLE THAT MUSIC LISTENERS, be they enthusiasts or consumers, are partaking in their own musical experiences to a new degree due to computational logic and streaming practices. The question is whether or not we are facing a paradigmatic shift in musical meaning-making. If we are, is this shift then shaking the accustomed historiographies of music? Not necessarily, but it seems that we are in need of rethinking, renegotiating and reframing what music history is and can be. We need to listen to the experiences of the listeners using streaming services and accessing digital music archives. Musical meaning is as much to be found in the noises circling in and around the structured sounds we denote as ‘music’; therefore histories of music are as much to be found in communities different from departments of musicology. To think about music history in this way is an attempt to take everyday voices seriously and realize that music in the disruptive era ignites an aesthetic and epistemological process within a larger ecology. This is what music history after the digital turn should be: to hone in on an awareness of different stories to be told and to go on quests for potential new ways of telling them.

My aim in this article is twofold. The intention is, first of all, to discuss what delineates music history in 2020; this implies reassessing a limited number of considerations on history, some of which stem from music studies and others from historical studies and cultural theory. Secondly, I wish to propose a term, *digital music history*, which takes the position of the *user-listener* as its focus. I speak of the user-listener in order to capture the specific aesthetic configuration of accessing and listening to music via digital music platforms. By proposing digital music history as a term to do music historiographies with, I seek to verbalize the user-listeners’ everyday relations to recorded music’s history. The way people use and are (trans)

formed by digital media and streaming services does not only tell us something about cultural issues and media trends but might also be a gateway to understanding the possible historical position of a piece of recorded music.

In the article I discuss how Carl Dahlhaus and Lydia Goehr, two seminal thinkers within the philosophy of music history in the late twentieth century, still can provide us with theoretical insight and methodological ballast. Specifically, I turn my attention to two books: Dahlhaus' *Foundations of Music History* and Goehr's *The Imaginary Museum of Musical Works*. It is my claim that Dahlhaus' systematic outlining of music history as an ongoing reciprocity of tradition and progression, as well as Goehr's analysis of musical works as hidden discursive predispositions defined by cultural practices, to this day can be helpful in navigating writings on music history. Both provide astute analyses and cultivate theoretical insight for understanding the history of Western music, and both are detecting foundational changes happening in the aesthetics and philosophy of music in the nineteenth century that still influence discourse and research. I suggest that music's ontological whereabouts in the contemporary media landscape can be described only partially with these theories; but rather than discarding them, I argue that they hold a historiographical germ worth reconsidering. Allotting myself a destabilized notion of history, I argue for digital music history as a term capable of describing *digital music use* as a motor for musico-historical conceptualization and the writing of music history¹. To stimulate the term empirically I begin the article by engaging it in an ethnographic examination; specifically, I have conducted qualitative interviews with a dozen employees at the Danish Broadcast Corporation (DR), who in one way or another work with music communication². In these interviews the participants and I discuss the issues of music history today and I confront them with the term digital music history. Then, after the aforementioned discussion of musico-historical conceptualizations, and consistent with some of my findings, I round the article off by advocating for a shift in sensibility towards music historiography and meaning-making in music history.

IS THERE A DIGITAL MUSIC HISTORY? A QUALITATIVE CASE STUDY AT DR

In December 2019 and January 2020 I conducted a dozen qualitative interviews with employees at DR. All participants work with music communication, either as radio hosts,

¹. Elsewhere, I have defined digital music use «as the experience of encountering music in a digital setting both aurally, visually and reflexively»; an experience that impacts one's imaginaries of listening due to metadata interwoven in digital music archives, which makes actual listening situations «capable of historical re-contextualisation» and thus co-determine one's perception of musical narratives. See PEDERSEN 2020, p. 98.

². The interviews were conducted in Danish, thus all quotes are my translations.

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editors, program researchers or music registrars. The latter category covers the people overseeing, implementing and cleaning the metadata connected to music data files in the digital music archive of DR. Music registrars function as mediators between artists, record labels and commercial actors on one side and public service agreements concerning broadcasting and archiving on the other. The interviews are semi-structured in that different issues are discussed; common to all interviews, though, is a focus on music's history and how continuous digital disruptions impact the historical formations of music. I have chosen this specific sampling in order to be able to paint a broader picture, in that all participants have knowledge of at least two types of digital music platforms — *Diskoteket*, which is DRs internal digital music platform built on top of their digital music archive, and commercial services, e.g. Spotify and Apple Music. I talk with the participants about their use of digital music platforms for work as well as for leisure, and if they believe these platforms support a view of recorded music history that corresponds to their own. I ask all participants to consider the commercial streaming service(s) they are using to access music in private (as well as in work-related) settings, and relate this/these to *Diskoteket* in order to detect whether or not design choices and infrastructural logic create different types of world-making that might lead to different images of music's historicity.

All interviews begin with the same question: 'What does music history mean to you?' It might seem daring, even reckless, to begin this type of conversation with this question but I wanted to hear the participants' immediate connotative reflections when caught off guard with a question such as this. I believe this approach has a double effect: first, to create a common ground of reference for each participant and me, and second, to decode the discursive traditions of music history and musical knowledge that each participant inadvertently partakes in. All participants have a rather clear conceptualization of music history, but they differ strongly in what elements they regard as constituting the concept. One defines it as «all the music that has ever been written down and performed», which clearly is inscribed in the logic of Western music history; another goes further in the same vein and describes music history as «the earliest testimonials, being it cave paintings and Greek amphora»; one sees the conception as chimeric, either covering the diachronic grand narrative of the Western logic or, alternatively, stories being (re)discovered in an archaeological manner, which includes music that «perhaps didn't have an impact at its inception but that was pretty innovative, which today contributes to communicating the history differently». Yet another regards music history based on personal interests, as a conglomerate of narratives starting with the popularization of electric instruments, thus deeming music history as «equaling a very near past». Interestingly, they all agree on one thing, probably due to the fact that they work at a broadcasting institution: the importance of communicating, and creating interest in, the histories of music. This might be an obvious viewpoint with this sampling. Still, it emphasizes a crucial issue with most historiographies of music: a lack in public appeal and in relevance outside academic circles. As one participant holding a Master's degree in musicology puts it:

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The way that most histories of music are written, that I have seen, clearly address other academics, and to me this makes music history turn in on itself. I don't think it's the purpose of music historiographies to turn music history in on itself, but most people outside academia with some sort of interest in the complex field of music history, I believe, get discouraged because of the often strange and difficult topics of books on music history. As the starting point for histories of music, I think it's necessary also to take in something an everyday listener, and user of music products, finds interesting and exciting, and from this the dots can be connected to some of the larger discussions within historical musicology that might strike the everyday user as thought-provoking. [...] I think, opposite to a linear history, that most people construct their perception of music history around experiences leading to other experiences, which paints a non-temporal [discontinuous] picture of where pieces, people and places belong in music history.

One conclusion to draw from this is that the participants hint at the importance in communicating a Foucauldian view on music history; that a genetic history intertwines with a genealogical history. But, more significantly, this should be done from a layman's point of view, otherwise the historiographies will function as nothing more than pseudo-relevant echo chambers. I will return to this problem in the concluding remarks.

Based on the reflections on what music history is, I asked another question that recurs in all interviews: 'Can we today talk about a digital music history, and if so, how does it differ from your definition of music history?' Contrary to the differing conceptualizations of music history the participants stand more united on this issue; in general they point out that streaming services, social media, blogs and online encyclopedias all are democratizing music consumption as well as encouraging a shared and inclusive meaning-making in terms of musical knowledge and musico-historical matters. People are themselves taking charge of music's history, for good or bad. Everything that is written down in an online milieu obtains veracity as experiences and reflections of historical, and historiographical, value; as one participant puts it, «the idea about the profession of music historian as being for the few is gradually dissolving». The participants focus on a variety of issues within this democratizing aspect: one describes digital music history as mainly concerning how something new can happen here and now in the online meeting between users/fans/followers, artists and record labels, wherein phenomena can spark spontaneously and set the agenda overnight, which the participant exemplifies with the online linkage between Lil Nas X's country-rap song *Old Town Road* and the video game *Red Dead Redemption 2*³; another participant underlines the impact of geeky music blogs from around the

³. Lil Nas X released *Old Town Road* independently in December 2018, and in the of Spring 2019 the track was rereleased by Columbia Records due to huge popularity on the social media platform TikTok, where Lil Nas X himself produced memes to promote the track. This led to fans producing an abundance of memes spreading the track all over the place within a few weeks. When Lil Nas X then produced the track's first music video solely out

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turn of the millennium where people were crate digging in their own record collections as some sort of vinyl archaeology and writing elaborate analyses about selected records online, which now are getting rereleased together with (both digital and analog) rereleases of the records, and these online blogs «create a narrative, e.g. about Japanese minimal synth music, that all of a sudden means a whole lot to a particular group of people that, small as it may be, is larger than it would have been otherwise, which can affect music communities today, and this would not take place if this specific music only existed in Japan in the early eighties»; and yet another highlights the physical-material aspect of the development of music formats over the last four decades and defines digital music history as «distribution and the freeing of storage space [...] giving rise to heightened mobility and availability of music».

Throughout the interviews I connected the reflections on digital music history with the everydayness of streaming music by asking the participants whether they feel closer to music's history when clicking and swiping and searching on digital music platforms. This causes some more reticent responses. They all ponder on whether this active digital music engagement opens doors to more than a digital music archive of sorts — whether they in fact get immersed in recorded music's history or whether they perceive the relationship to be more abstract due to the technological incomprehensibility ordering the music. The reactions point in several directions, revealing manifold qualities of digital music use when it comes to constructions of music history. Still, they all agree that wrapping, presentation and design choices are impacting factors in the act of listening to music via digital music platforms and that these factors further might influence how they connect the historical dots. Without exception all participants hint at *availability* as a keyword for this disposition. The availability of almost all recorded music is the great opportunity with digital music platforms as well their Achilles' heel. Regarding one's relationship with music history one participant states that «it concerns this thing about you creating history yourself in the way you ascribe music to new contexts at the same time as you are not relating to the narrative you are creating. Back in the day you might have been viewing the music in the context of an album whereas nowadays it is more about picking out a track from an album; in that way you are removing the track from a context that you perhaps never have seen it in, or at least not perceived it being in». This participant is verbal about some of the issues with availability. What should be a blessing is at the same time a curse. When choices due to algorithmic programming are made for you, you very easily end up accepting the listening experience as consumption on autopilot. Another participant stresses that it is necessary to be knowledgeable about musical connections, or at least to have the ability to create

of in-game footage from *Red Dead Redemption 2*, the dissemination of the track skyrocketed by also activating the gaming community (as of June 2020 the game has sold more than 32 million copies). This led to a whole new array of memes as well as an official remix of the track featuring country music star Billy Ray Cyrus and an official music video featuring guest appearances by several celebrities.

such connections, because availability desensitizes one's capability to contextualize the music and (co-)create qualified narratives of recorded music. The center of criticism lies in the feeling that digital music use on the surface is taking away the opportunity to reflect and to discover the historicities of music. Still, as the same participant points out, we do create histories for, or should I say images of, music in arbitrary and cheeky ways.

If I am to give a diagnosis of the factors pointed out by the participants, it is that we should be open to thinking of the construction of music histories alongside digital music use — or that we perhaps even have to. Shaping one's thinking in this fashion might possibly nurture a methodology of historical knowledge creation that incorporates aspects of both theory and practice by paving new ways of thinking about the past and conceptualizing history as well as continually renegotiating how to write critically about these concepts. In the following, I account for some formative trends in music historiography in the late twentieth century that are anchored in Western logic and have universalist tendencies, but which still might provide a contemporary way of thinking about music history within fruitful methodological frameworks.

(RE)THINKING MUSIC HISTORIES THROUGH THE NINETEENTH CENTURY

Something happens in and around the nineteenth century that has led music historians and philosophers of music to continually revisit this specific point in chronological time. For Lydia Goehr the time around 1800 signifies an epistemological shift in focus on the meaning of music as something residing in the concept of a musical work, which turns into a denominator governing even the music from before the concept's inception. The work-concept seeps through the general music historical discourse across time and takes a universal position. Goehr's concern is to question the impact of the Anglophone analytical tradition and highlight that there are other ways to think; because of this, she includes remarkable readings of critical theory, immanent critique and dialectical reasoning as, amongst others, Carl Dahlhaus has proposed.

To begin with, I turn the attention to Dahlhaus' theoretical considerations and return to Goehr afterwards. Dahlhaus' *Foundations of Music History* is not a particularly coherent book. In the foreword Dahlhaus repeatedly states that it crystallized as the philosophical reflections on music history «of someone directly involved in the field»⁴ that he produced while working on his later history of nineteenth century music⁵. One of the book's overarching aims is to develop clear-cut distinctions as regards terminology and definitions, which are reflected in an insistence on viewing the concept of music history as a reflective field in dialogue with philosophy and, especially, the history of ideas. Dahlhaus is not specific about

⁴. DAHLHAUS 1983, p. 2.

⁵. DAHLHAUS 1989.

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the contemporary poststructuralist thinking so typical of the time, but he seems to be partly informed by this line of thought because he discusses the concept of music history as a chimeric entity closely tied to conceptual premises as well as socio-historical circumstances. Dahlhaus subscribes to a notion of history as an active force and not as something fixed that can be studied as such; there is no subject (besides the music historian) to be found within the histories of music. To him, the function of history is to relate the past to the present. This is, to put it another way, a pairing of structuralism and reception history that I read as going beyond his otherwise structuralist standpoint; music(al works) belong as much to the present as to the past — ontologically, becoming trumps being. We see this in the fact that «we can describe the coincidence and interplay of structures such as institutions, ideas and behavioral norms as an historical ‘circumstance’», which Dahlhaus argues «is a clear indication that we also stand some chance of understanding them as a circumstance with an underlying order, i.e. to a certain extent as a structure of structures»⁶. Dahlhaus is arguing for a history of mutability, in that mutability equals tradition. The continual presence of the past creates a dialectical movement of tradition and progression. I read Dahlhaus as advocating the notion that tradition reveals itself as progression in the ongoing renegotiation of practices, of canonical works, of aesthetic beliefs and of discourses (and means of discourses). Dahlhaus observes that musical works have a double nature as historical documents and as objects of current aesthetic experiences, as both past and present⁷. In the interconnection of past and present Dahlhaus sculpts his view of music history on Hegelian dialectics, in that he views the different positions of musical works and aesthetic beliefs as autonomous systems that change gradually due to dialogues between the self-same positions⁸. Dahlhaus sees the pedigree of the scientific method that came to influence compositional practices from the nineteenth century and forward as exerting a discourse on the musical work that ultimately leads to a decontextualized view in which the future point of the work governs, disregarding any aesthetic contemplation of a given present moment⁹. He believes that we, as historians, always should look into the hermeneutics that engulf a music-related area of interest, otherwise understanding will be devoid of meaning.

This type of dialectical reasoning functions as a springboard for Lydia Goehr’s project in *The Imaginary Museum of Musical Works*. Her aim is to move away from the Anglo-American analytic approach and her main critique of analytical reasoning is based on a reluctance to accept essentialist and positivist positions when it comes to art and cultural products. The positions in question bear a quest for methodology that follows the scientific logic of a pre-set theory, which

⁶. DAHLHAUS 1983, p. 144.

⁷. *Ibidem*, pp. 129-150.

⁸. Later, we see this line of thought elaborated by Leo Treitler when he expounds the writing of music history as ongoing interpretations of contexts. See TREITLER 2001.

⁹. DAHLHAUS 1983, p. 85.

treats concepts of art in an ahistorical manner. In this connection, Goehr mentions Jerrold Levinson's criteria for a musical work that rationalize its ontological distinctness irrespective of practical, aesthetic and historical relations, and she challenges the influence from Nelson Goodman's thinking on aesthetics that drove a wedge between theory and practice¹⁰. As I see it, Goehr's claim that the philosophy of music requires history in order to be methodologically valid makes for an indispensable contribution to the contemporary understanding of music history and, more importantly, to the mindset of possible music historiographies. Put another way, if we want to theorize solely based on logic — to only speak of an ontological character of music — we kill off any real possibility of looking into certain empirical materials¹¹.

Goehr is interested in finding out what lies behind the fact that the theorizing about musical works has focused on certain canonized pieces of music by certain canonized composers from a certain time period, and further why the focus is on classical music in the Western tradition. Theorists cannot show «a special connection [...] between the idea of classical music and the work-concept»¹², wherefore Goehr sees a substantial deficiency in analytic reasoning. The critique becomes clear when considering the fact that the work-concept has been widely deployed, crossing both periods, genres and styles. The hypothesis of the book is that something happened around 1800 that not only changed views on contemporary composition and reception, but also influenced the general discourse across time. This leads her to formulate a new and more complex way of defining the concept of a musical work. She argues that it is an open concept, in that the work-concept functions as a larger category in which we reflect «our beliefs, ideals, assumptions, expectations, and actions»¹³. This property of the open concept is what makes the work-concept capable of moving into other properties, and thus what makes it adaptable to all types of music from all periods¹⁴. Goehr speaks of this as «conceptual imperialism»¹⁵, by which she means that the work-concept since its inception has expanded into all levels of musical discourse. The idea of thinking about compositional practices, performance practices and listening practices as autonomous processes, and not as functional means for extra-musical events, grows out of a repositioned musical economy in the late eighteenth century. According to Goehr, at this point thinking on music runs parallel to that of the plastic arts, understanding it as a productive art that inculcates the production of musical works. This marks

¹⁰. Here, Goehr is in line with Theodor W. Adorno who argues for this kind anti-dialectical reasoning as something bringing 'false clarity'. See GOEHR 2007, pp. 73-78.

¹¹. *Ibidem*, p. 86.

¹². *Ibidem*, p. 80.

¹³. *Ibidem*, p. 253.

¹⁴. Goehr systematizes the work-concept as relying on five properties: «(i) that it is an *open* concept with *original* and *derivative* employment; (ii) that it is correlated to the *ideals* of a practice; (iii) that it is a *regulative* concept; (iv) that it is *projective*; and (v) that it is an *emergent* concept». *Ibidem*, pp. 89-90.

¹⁵. *Ibidem*, p. 245.

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a shift in paradigm; it is a way of thinking and communicating of and about music that defined norms and behaviors for the centuries to come, and that also rebranded music from before 1800 as 'early music', with certain traits interpreted through the ideal of the work-concept. The question of authenticity grows out from this issue of productions and has been omnipresent ever since, invisibly steering modernists and avant-gardists, critics and historians, listeners and musicians, crossing genres and borders, as an infectious apparition lecturing us about the worth and values of music.

To speak of musical works, Goehr believes, is a discursive practice that has hidden itself in both philosophical, aesthetic, and historical approaches to music, and this is why her goal is to connect these three fields' methodologies. There are some cultural practices that we need to understand in order to make adequate philosophical arguments about a musical work, and these we have to decode via an historical approach¹⁶. In following this approach, Goehr argues, we can take political and social issues into account while also making theoretical claims about concepts.

ONE SHIFT AFTER ANOTHER: TOWARD A CULTURAL-MATERIAL MODEL FOR MUSIC HISTORIOGRAPHY

In moving from Dahlhaus' book to Goehr's the historical argument relocates from a base in the history of ideas to a base in the philosophy of music. Still, both arguments rest on the ubiquitous sensibility of their contemporary time defined by the cultural model. Dahlhaus builds his reflections around the dispute between idealism and materialism found in Hegel's and Marx's writings, whereas Goehr discusses in detail the philosophical-aesthetic conflict between the musical and the extra-musical¹⁷ that she decodes as a question of embodied practices. The paradigms of the cultural model sneak into the arena of music history in an unnoticeable fashion facilitated by radical breakthroughs in historical and anthropological methodologies, which neither Dahlhaus nor Goehr explicitly mention but allude to in their arguments. In this section I discuss a small selection of pivotal ideas within the human sciences that have had influential impact on many research areas in the last three to four decades; the ideas in question have been part of larger theoretical movements, constituting the cultural model and the material model, which over the years have trickled down into the sub-disciplines of musicology and necessarily lead us (once again) to be asking the question: 'what is music history?'

Hayden White explores the power of language and argues that the writing of history is no different from the writing of fiction; discursive styles are viewed as 'metahistorical tropes'

¹⁶. *Ibidem*, p. 285.

¹⁷. See also GOEHR 1992.

underlying both the argumentation and reasoning of any historian, therefore the stylistic fabric of an historiographic account is as close to the ‘truth’ as the affairs and circumstances described. Engaging in historiography means deploying an «explanatory affect»¹⁸, which can be formulated via an array of combinations of modes of articulation that form the style of the historian, and thus must be understood as a performance of a certain poetic act that reveals underlying agendas and acts of agency that expose the ‘historical consciousness’ of the text. White speaks of analyzing the «deep structure of the historical imagination»¹⁹ when reading histories because he identifies interpretation as representation. I find that White leaves the concept of metahistory hanging as a theoretical tool for creating understanding of the work of historians, whereas it could have been repurposed as a methodology for producing historical meaning and reflexive comprehension as well. To be fair, White states that «[t]he same basic modalities of conceptualization appear in both philosophy of history and historiography, though they appear in a different sequence in their fully articulated forms»²⁰, which suggests an active engagement with the deep structures of historical writing. However, he conveniently leaves it there.

In White’s view historiographic texts do not refer to reality, meaning one cannot make a distinction between truth and fiction. We are faced with a historiography with an ahistorical core. While White understands this core to mean that the writing of history follows literary criteria, it is also possible to understand this core as a semiotic approach to cultural history. Cultural anthropologist Clifford Geertz analyzes social discourses as part of a culture, and this culture he analyzes as a ‘web of significance’. Not being an historian, Geertz is not interested in history per se, but rather in creating ‘thick descriptions’, which is an alternative method that he uses to describe a culture as being semiotic²¹. As Georg Iggers has summed Geertz’s method up: «[f]rom this perspective, a culture possesses the characteristics of a language and, like a language, constitutes a “system”»²². All expressions and every action have symbolic value reflecting the culture in an undistorted way.

The linguistic model and the cultural model both potentiated the material model as a reaction, strongly sparked by the digital age. Here, focus lies on objects and embodiments and on how infrastructures manifest as ecologies, questioning hitherto accepted modes of existence. Downplaying the importance of discourses, this line of thought seeks to understand the way the movement of things triggers, and upholds, their own existence²³. Going hand in hand with the so-called affective mode, the analysis of embodiments and material substances

¹⁸. WHITE 2014, p. xxix.

¹⁹. *Ibidem*, p. 2.

²⁰. *Ibidem*, p. 41.

²¹. GEERTZ 2017.

²². IGGERS 2005, p. 124.

²³. LATOUR 2007.

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implies viewing affects as potentialities, as bodily capacities of affecting and being affected²⁴. Musicologists, informed by the cultural model, have incorporated many trends of thinking materially and/or affectively, and this general fascination with the material histories of music has been a benefactor for new and eye-opening perspectives since the millennium. But, as Emily Dolan points out, musicology as a discipline is actually not doing anything new; it is simply refashioning the original visions of this scholarly endeavor²⁵. Dolan argues that Guido Adler already in 1885 extended his systematic analysis of music with a «loving protection and cultivation of musical culture»²⁶, wherein the future role of music could be fostered alongside the storytelling of music's historical structures. She believes the material model in musicology to be a pathway (back) to a similar logic. But, as Kyle Devine recently has noted about Dolan's viewpoints, this approach implies «personal phenomenologies» and «particular definitions of music and particular forms of aesthetic experience»²⁷.

In order to be as true to the musical subject under examination as possible it is essential to look at the technological mediation of music, regardless of period; to do otherwise «represents an ideologically problematic and historically inaccurate understanding of the relationship between music and technology — as well as between culture and nature, humans and nonhumans»²⁸. Devine calls for a *musicology without music*; if we are not willing to focus on the external conditions for music being there in the first place, for music being experienced, we will not be able to expand those very grounds of musical meaning we hold so dear. We must grasp the exteriorities *as* music — a point more pressing than ever. And when it comes to music history we indeed need to go beyond it, in a Nietzschean manner²⁹, and accept that history resists definition. When we do that we can further accept that all and everything partakes in music-making³⁰. It all comes down to formulating plausible historical narratives.

Immersed in these diverse conceptualizations of what music history, and history more generally, can be, I lay out my reasoning for digital music history as a term. My claim is that today we are faced with an onto-historical mishmash of music consisting of unstable listening modalities, fluid social practices, neoliberal capitalist logic, discontinuous archival strategies

²⁴. An influential strain of contemporary affect theory builds on Gilles Deleuze's readings of Baruch de Spinoza, where he teaches us that a body is a dynamic modality of intensifications of a 'single, infinite substance' mapped out on a common 'immanence plan'. Deleuze's view on affects is intimately connected to his temporal understanding as both ideas think of the body as a situated dynamic. See DELEUZE 1988, pp. 123-132.

²⁵. See DOLAN 2015.

²⁶. *Ibidem*, p. 88.

²⁷. DEVINE 2019, pp. 178-179.

²⁸. *Ibidem*, p. 185.

²⁹. In *On the Genealogy of Morality* Friedrich Nietzsche famously stated that only that which is without history can be defined. See NIETZSCHE 2007.

³⁰. TOMLINSON 2015, p. 289.

and a technological optimization process of unfathomable proportions, which requires a fresh outlook in order both to construct historiographies and also to grasp user-listeners' ways of historicizing music. Is it not alongside people's perceptions of music history, as well as from within the technological means structuring these perceptions, that we should base our contemporary considerations on music history? This is not just a variety of reception history, I will argue, but a fundamental shift in what constitutes the historicizing of music in a digital era. In a world of streaming, the ontologies of music are continually putting on new guises that cannot be satisfactorily explained via structural reasoning or dialectical logic; neither an ever-evolving character of music's materials nor a work-concept can tell us how music creates meaning for the user-listener. But, solely to turn to cultural history or to seek answers through new materialism or similar theoretical trends will also tell unconvincing stories. The formations of identities and communities as well as the material insights of our actual connections to music (and the possibilities of its technological reproduction) ought to be paired with the philosophy of music history and historiographic methods. This is not a groundbreaking position, but it is a constitutive foundation from which we can emphasize that no theoretical choice must be seen as a truth about any investigation's empirical material. It is a start from which to begin dialogues.

It is important for me to make it clear that the history of music always is *situated* and that we all situate our knowledge of music history in any given situation of digital music use. Inspired by Donna Haraway, my argument for a rethinking of the common conceptualizations of music history rests within a feminist knowledge paradigm, in that I too perceive the overarching frames of history, science and knowledge as systemic epistemologies steering the general understanding through formalist power³¹. An unmasking of the «doctrines of objectivity»³², and an acceptance of the fact that our historical truths are embodied accounts, ratifies singular situated knowledges against theories of enclosed systems of meaning-making and, in turn, calls for a critical inclusivity that (from within) cultivates awareness of the inner workings of meaning-making. Music history as situated knowledge engages in world-makings going against the grain of essentialism, and thus potentiates a non-hierarchical and non-universalist diagram of history and meaning. Next, I relate the data from the interviews to the different conceptualizations of (music) history and from that I argue for, and sow the seed of, the term digital music history. I see a repurposing of Lydia Goehr's approach of combining philosophy of music and aesthetics with history as especially advantageous. The endpoint of this article is an attempt to loosen the temporal foundation of Goehr's approach somewhat and set the scene for an understanding of digital music history as consisting of events of becoming breaking through into music history³³.

³¹. See HARAWAY 1988.

³². *Ibidem*, p. 578.

³³. Here, I am inspired by Gilles Deleuze's view on history as consisting of events that can be actualized in discontinuous ways as instances of «becoming breaking through into history». See DELEUZE 2013.

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These events are inseparable from the singularities that constitute them, thus I propose to call these singularities *musical singularities*.

MUSICAL SINGULARITIES OF DIGITAL MUSIC HISTORY

At this point it is clear that neither any theory of history nor any process of writing about history can articulate the issues about digital music history in a satisfactory way. It appears that a mixture of the postmodern sensibilities we found in Hayden White's theory and Clifford Geertz's methodology comes somewhat close to capturing the diversity of positions sparked by digital music use. Still, within White's framework the question about who is writing digital music histories will remain unattainable, and in Geertz's framework it is not possible to create relations between the disparate temporalities of digital music use that determine user-listeners' experiences and perceptions. Interestingly, the dialectical reasoning between tradition and progression that we find in Carl Dahlhaus' conceptual considerations seems more suitable to single out the matters of digital music history. When this dialectic is projected into the scope of digital music use we can begin to fathom the multitude of matters concerning reception history today.

Already Dahlhaus proclaims that any response to an expression of music is a response to a «moment in history»³⁴ and that this expression of music only carries meaning in its responses. This claim seems suitable for my purposes, but its strong embeddedness in an undynamic work-concept is problematic because it resists accounting for the impact of historical formations from the wider issues of digital music use, from technological infrastructures to digital socialities. Dahlhaus ends up with an inflexible conception of music history mirroring a new universalism that I under no circumstances can condone or defend. Lydia Goehr's theory does not, of course, consider the issues of digital music use either, but her notion of the work-concept is more nuanced, and thus might provide us with a path to conceptualizing a meaningful idea of digital music history. Due to the conceptual imperialism of the work-concept instigated by the Romantic aesthetic, which engages us in discourses and enters thought-structures that frenziedly put the present into the past, we are in many ways still firmly rooted in the nineteenth century. The use of the work-concept is derivative and with that we can argue that a «dynamic and diachronic relationality»³⁵ guides, and guards, the conversations, both academic and casual, keeping them within the perimeter of works. We of course must acknowledge that during acts of musical production other categories might prevail, but the sheer convenience of the work-concept fortifies its position in musical discourses regardless of period, genre or national identity.

³⁴. DAHLHAUS 1983, p. 151.

³⁵. GOEHR 2007, p. 257.

When it comes to the experiences provided by digital music use, the positions of the work-concept and the ideal of authenticity are blurrier. On digital music platforms the presentation of the music apparently decides whether or not something is perceived as work-like. In the interviews several participants pointed out that (when it comes to popular music) today it is all about tracks and not albums, which they contest as a logic interfering with the apparent work-character of the album; if a track is isolated and decontextualized, or if it is registered in the system in the ‘wrong way’, the unity is broken. One can ask oneself what is gained from insisting on exhibiting an album in the imaginary museum of musical works, when listening has become ubiquitous³⁶ and the attention span has decreased. But, it is a fact that people tend to navigate within this conceptual category, which needs to be accounted for when formulating a digital music history. One solution could be to impose a postmodernist sentiment, but Goehr herself rejects this as leading to, at best, meaningless historiographies that, at worst, contain the risk of rewriting history based on misleading claims³⁷. I will grant Goehr that postmodernism is dangerous ground to tread because music history is *not* ending and the fact that some music is/has been regarded as works will *not* disappear. Our present is not circumscribed by an overarching sensibility of ends; rather, our present is characterized by doubt and continuous repositioning. Digital music history is an attempt to verbalize this structuring sensibility: digital music history is about levels of creativity in digital music use.

Georgina Born can help us in formulating this theory. She argues for music as existing «in and through its complex and shifting mediations»³⁸ obliging us to understand music’s ontology and mediations as historical. Necessitated by digital music use, digital music history assembles the historicizing aspect of contextualization with the representational materiality of mediation and the micro-socialities of people’s everyday life into a coherent musical structure³⁹. Digital music history challenges how we are to perceive recorded music’s history. In his history of music’s role in the political economy, Jacques Attali speaks of a future point for music (our here and now), in which ‘composing’ is an act of listening that rewrites music⁴⁰. I believe this idea to be fruitful and, prophetically, to condense the engagements with music in our time of repositioning. It is a matter of creativity.

Digital music history makes sense if the creative acts of listening and sharing are not temporally inscribed in history understood as chronological time. With this idea, I draw on

³⁶. KASSABIAN 2013.

³⁷. GOEHR 2007, p. 284.

³⁸. BORN 2005, p. 33.

³⁹. Born speaks of musical assemblages as a multitude of mediations in terms of an ontological proposition, whereas I in a critique of Born’s notion describe musical assemblages as epistemological sensibilities that make meaning of musical experiences through their material tangibility. See PEDERSEN 2020, pp. 103-106.

⁴⁰. ATTALI 1985, p. 135.

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French philosopher Gilles Deleuze's argument for sense-making and deem every act in digital music use as *events* that occur in historical time. Following Greek mythology's division of time, Deleuze points out the difficulty in locating the exact moment in time of an event, which is due to the event's belonging to a different order of time. The events of digital music use belong as much to *Aion* as they do to *Chronos*, meaning that an essentially unlimited past and future, on the surface, forge the events as experiences⁴¹. When you are listening to music entrenched in a digital music archive, and this act is based on a reference from a YouTube clip alluded to in a TikTok video, you contextualize the music in numerous ways. But you will not necessarily contextualize it in the same ways the next time you listen to the same music. Still, all listening experiences concerning this music resemble each other. This is the labyrinthine crux of digital music use — the feeling of an eternal reoccurrence of the same. The events are the same; or more precisely, they are unique versions of the same event. The timeframe of digital music use belongs to *Aion*, dissolving the present; the present that you experience is always already dissolved into an elongated past and future, making you incapable of orienting in the totality. The here and now of digital music use only makes sense if you accept it as making no sense. This is exactly the point about the feeling of a fluid temporality that one of the interview participants referred to by stating that «I think, opposite to a linear history, that most people construct their perception of music history around experiences leading to other experiences». Whenever an event takes place, it happens as a resonance within a structure that can activate any other event, classifying events as singular points or, as Deleuze puts it, «emissions of *singularities*»⁴². Actively tapping into a digital music archive lets history and event merge, making them inseparable from singularities.

I propose to describe any type of agency in relation to a digital music archive as a musical singularity. The events are «neither individual nor personal»⁴³, but they crop up in all types of digital music use, always on the verge of disrupting the immediate experience. A digital music history has to be understood relative to musical singularity; we should depart from our own singular situated knowledges that manifest as dynamic instances of meaning-making to be understood across all of space-time, otherwise it is redundant for us to talk about conceptions of music history as something that can be impacted by whatever we encounter online. If we are not willing to make this departure we find ourselves back in dialectical reasoning, agitating for one truth over another. If our historiographies are not focusing on interconnections, discontinuity and disruptive shifts, and if they are not written from without as well as from within the mesh of people's actual musical experiences, we are not closing in on what music history is and might mean in the twenty-first century. We encounter a similar argument when Georgina Born calls

⁴¹. DELEUZE 2013.

⁴². *Ibidem*, p. 118 (emphasis added).

⁴³. *Ibidem*.

for music's mediations as historical; to her, every movement within the musical assemblage happens *because of its* internal dynamics. Put another way, every event is a musical singularity. Therefore, the work-concept remains alluring; it comes forth as a constituent of the musical assemblage that stands outside of the experienced music's historicity, that is, the work-concept is experienced as an unchanging accumulator of historical meaning. This kind of philosophical ballast and openness toward ever-moving historical formations accepts the work-concept as an interconnected web of musical experiences that can cultivate meaningful music histories (and it rejects the work-concept as a structural act of power of canonical virtue). If we think of musical works in this way, as aesthetic experiences empowered with the force to connect and reconnect to each other, we, as Kyle Devine puts it, «tune into the superhuman scales of time and space»⁴⁴ whenever we listen to recorded music. To rephrase Lydia Goehr's project, digital music history is an erection of an imaginary museum — not of musical works but of singular musical experiences.

CONCLUDING REMARKS ON (RE)POSITIONING MUSIC HISTORIOGRAPHY

In this article I have argued for a veiled principle of indeterminacy driving the musical experiences of digital music use. The clash of computational processes (behind digital music archives) and our situated knowledges of music history birth an ever-moving relation to recorded music that twists and turns like a Möbius strip. This clash emits musical singularities. In our everyday listening via, and navigating through, digital music platforms we single-handedly create epistemologies of recorded music's history that have as much worth as theoretically well-founded (academic) histories do.

This is what I have learned from the interviews about these matters. Enmeshments in digital music use seem to be too varied and manifold to articulate precisely with a single term. All participants paint a picture of (themselves as) a user-listener with an ambiguous and fluid attitude to music history that takes a liking to subversive feminist imaginings (of recorded music's history). To be a user-listener and speak of music history is not the same as being a *musicologist*-user-listener speaking of music history, and this distinction offers a crucial lesson. The two differ in scope, but they can generate equally valid and enlightening histories that all need to be taken seriously. Therefore, my aim in this article has been to emphasize the need for a thinking *from within* the digital music archives and *alongside* the singular, situated user-listener. If we as music historiographers are willing to let other voices sit in the driver's seat determining our academic outcomes, I believe there are untapped potentialities to be freed. In other words,

⁴⁴ DEVINE 2019, p. 189.

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if we let other voices drive our investigations as well as our theoretical discussions (that is, if we stay with the trouble of not just being informed by the perspectives of others) we ought to be capable of nurturing a music history of the present that produces a genuine socio-cultural impact and shows how we all act in «response-ability»⁴⁵ to formulating music's histories.

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⁴⁵. HARAWAY 2016.

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Article One

Setting the Scene

Two things have so far been established: the first thing is how DR's digital music archive is structured, and the second thing is that contemporary conceptualizations of the history of recorded music are many. It is time to move into the digital music archive, to understand what it can do to the act of listening and to the perception of music's history.

Article One theorizes the different ways metadata can be put to use and have historical impact on the music that one is listening to via a digital music platform. It does so by regarding the act of using a digital music platform as a certain aesthetic situation that is driven by a heterogeneous temporality. Searching and listening is deemed a process of becoming. The article considers the encounter with metadata on a digital music platform as a musical assemblage that moves music around, connecting and reconnecting it to other music.

This article has a main contribution to the field of music streaming and digital archiving of music, which is to speak of historicized listening. This is a sort of listening that is defined as a referential action of juxtaposing tracks and making them inform each other, and thus inform one's listening to them. It is to understand recorded music in relation to other recorded music, and to understand the music because of its relation to other music. This article analyzes such a referentiality via interfaces on /Diskoteket that potentiates movements across the archival field.

The methodology of the article is to discuss media philosophical takes on temporality and to read interfaces of /Diskoteket by way of such theoretical deliberations.

In this article, the concept of metadata is situated as an active determinant for how music can be listened to and perceived as well as contextualized. Metadata steer the digital music platform in such a way as to create different epistemologies of the history of recorded music. Metadata make the act of listening into an act of composition, in the sense of Jacques Attali's thinking. Listening turns into a historicized action; it is a creative action.

The digital environment of the platform gets widened by metadata. It expands and reaches beyond its own boundaries. It forms an assemblage

with the user that is managed by coding and historical ideals. Thus, the article views the aesthetic situation as an ecology configured by music and expectations of music, making the history of recorded music moldable and up for negotiation.

Metadata interconnect everything.

Metadata let us glimpse what is hidden.

Metadata enhance alternative lines in recorded music's canon.

From this article it is clear that relations between metadata can be followed in all sorts of directions within DR's digital music archive. By interacting with the operationalized metadata, the user can push the boundary of the archive and the platform. It is an active involvement with recorded music that carries its history forward. It is an involvement that tells music histories, in plural. Plurality is needed for the future to be capable of change – to be historical.

History is about how change happens.

DIGITAL MUSIC USE AS ECOLOGICAL THINKING: METADATA AND HISTORICISED LISTENING

Andreas Helles Pedersen

ABSTRACT

In claiming that metadata possess the power to put historical awareness into the act of listening, this article examines digital music use as an aesthetic situation driven by potentialities of becoming. Working from a theoretical foundation amalgamating digital music archives and metadata as environments the article discusses Georgina Born's notion of musical assemblages alongside the concept of virtuality, and by letting these meet the article argues for a musical assemblage built from sensibilities of becoming rather than layers of mediation. The inner workings of digital music use constitute an ecology in which recorded music history moves and reconnects, and this makes the historicity of recorded music be fluid, thus turning listening into a historicised action. In exemplifying this, the article discusses some of the strategic programming of metadata on the digital music platform Diskoteket, and through an analysis of sampled music, the prospects of recorded music's historicity are shown as affective capacities.

KEYWORDS

Metadata, Digital Music Archives, Musical Assemblage, Virtuality, Listening, Ecology, Recorded Music History

In this article, I explore how the digital life of music impacts listening. I investigate the practices of digital music use as building on musical assemblages.¹ By taking this approach, I discuss metadata as an element that puts interpretive meaning into the actual listening situations of digital music use, and I do so by conducting an analysis of the structuring of metadata on Diskoteket, which is the digital music platform constructed on top of the digital music archive of the Danish Broadcast Corporation (DR).² I have chosen to look at Diskoteket due to its qualities as an enclosed platform and a research tool embedded in a public service organisation. Designed without commercial interests, the main purpose of metadata is here to encourage an informed

listening experience rather than to set out clever ways for indirect control. For that reason, Diskoteket exemplifies a platform letting listening and metadata enter into a dialogue. It is the hypothesis of the article that metadata have an impact on how the content of listening is being historicised by the user-listener. Historicised listening unseals dynamic traces of music histories. The article defines digital music use as the experience of encountering music in a digital setting both aurally, visually, and reflexively. To speak of digital music use is an aesthetic attempt to apprehend a specific formal and material condition that shapes the prospects of the digital music experience. Common for all digital music use is that the nexus of the music's visual presentation and aural perception is formed by the archival (infra)structures that guide the user-listener's experience. I explore digital music use as an endowed aesthetic situation that destabilises the actual listening situations by potentiating imaginaries of listening. This happens due to metadata. Metadata can sculpt the modalities of listening with a relational character that injects an affective level into the reflexive experience. Thus, the article situates metadata as a catalyst for reflexive listening in digital music use.³ The logistical role of metadata plays a huge part in how musical narratives are, and can be, perceived. Because of metadata, digital music use is built up by virtual potentials of reference that can be actualised.⁴

I examine whether the structuring of metadata on a digital music platform can act as a factor capable of historical re-contextualisation in actual listening situations. This examination happens through analytical insight into Diskoteket, which I explore through an example showcasing the platform's programmatic logic in the case of sampled music. Before getting to that, I provide an overview of recent research within the field of streaming music, most of which evade cultivating aesthetic perspectives on actual listening situations. From this overview, I fuse the concepts of digital music archives, metadata, and environment in order to develop a theoretical platform from which to conduct the analysis. Thereafter, I establish a temporal and sensual framework. I discuss Georgina Born's notion of musical assemblages, which I develop with an aesthetic dimension by widening it with the concept of virtuality. Thereby, I cultivate an assemblatic approach to digital music use wherein I maintain that metadata can reinvent the representational character of music. Believing that digital music use fruitfully can be read as a resonant ecology, I argue for the user-listener's experiences as continual amalgamations of musical sound and information that

release new imaginaries of listening.⁵ Through an analysis of some of Diskoteket's assemblatic qualities, I consider how this platform aesthetically makes sense of music as data and in what ways metadata here create a becoming of listening that opens towards dynamic historicised contexts.

TRENDS IN THINKING STREAMING MUSIC

In the last two decades, illuminating academic scholarship that examines streaming music has seen the light of day, and much great work has been done in regards to the impact of technological achievements on musical cultures and listening practices. Much of this research stands on the shoulders of studies that shed light on the transitions in the commodified forms of music since the turn of the millennium. Especially pertinent is the transition from CDs to MP3s. In reflecting on the effects of networking technologies for the actual listening situations, Mark Katz argues that the online accessibility brings radical changes to our relationship with music;⁶ Jonathan Sterne debates the social effects of digitally induced organisation of music and stresses that the MP3 format has strengthened the thingness of music;⁷ and the term "digital music commodity" is used by Jeremy Wade Morris to signify the shift from CDs rooted in familiar packaging to the intangible flimsiness of digital music files as ones and zeroes.⁸ Morris' argument is about remediation, but he also claims that it might work in this way due to infomediaries that present musical narratives through "algorithmic effects."⁹

On music streaming platforms, listeners are, according to Robert Prey, constructed through a dialectical movement of recommendation systems growing out of listening behaviour and a shattering of fixed identity markers.¹⁰ Prey hinges his analysis on Gilles Deleuze's seminal essay *Postscript on the Societies of Control* (1992), stating that "individuals are seen as ... endlessly subdividable 'dividuals'."¹¹ The Society of Control is Deleuze's diagnosis of a system consisting of digital machines. When subjected to control one has no solid core, no stable position; one is everywhere and nowhere. Control is a process of subjectivation that disbands the individual identity, making one a part of the information stream.¹² Likewise, Eric Drott takes advantage of Deleuze's insightful analysis in his critical view on how recommendations and curated playlists feature in giving out subject positions to users through constellations of music. He describes it as follows:

By using the accumulated data from activity logs, combining this with user information collected during the registration process, contextual data picked up by various sensors, and the plethora of music data that platforms derive by means of machine listening or data mining, recommendations can be pitched not just at the individual level, but at what Deleuzians call the *dividual* level.¹³

According to Drott, personalised recommendation leads to a feeling of musical scarcity, giving the user-listener the impression that there is only ever one song that will work for each consecutive instant in time. Opposite to Prey's analysis, Drott sees this as a different dynamic in which "the streaming service apparently interpellates us as ourselves and as nothing else. We are not hailed as members of some abstract category, but as a concrete particular."¹⁴ Given that Deleuze sees the notion of the *dividual* as a potential for regaining singularity, I think Drott is on to something. The entwinement of a digital music platform and a user-listener makes for a self-organisation of numerous processes that Deleuze would label *individuation*, which, as a principle, let all virtual points in a recommendation system be open for actualisation.¹⁵ I will return to the interplay between the virtual and the actual below. As we will see later, *Diskoteket* is a platform that bypasses the sort of algorithmic control emphasised by Prey and Drott; here, metadata act as a dissemination of relational information rather than as a mutating vessel of information about user-choices that can strengthen a personalised recommendation and thus surveil a user-listener.

In a methodical qualitative study, Raphaël Nowak traces many of the structural elements of music consumption in the digital age by analysing how music works and affects young people's everyday life.¹⁶ In similar fashion, Sofia Johansson points out how metadata on digital music platforms can give users the power of deep discoveries that they can share through social media, thus giving them the feeling of being knowledgeable disseminators of music.¹⁷ Working from an outset in actor-network theory, Susanna Leijonhufvud argues that music streaming as an epistemological process creates us with the technologies as musical cyborgs.¹⁸ The actual listening situations have changed and are arranged by technological means; today's listening practices are characterised by a move from Theodor W. Adorno's notion of an "expert-listener" to a world of "ubiquitous listening" as argued by Anahid Kassabian.¹⁹

The aim of the present article is to provide the theoretical landscape of studying streaming music with an aesthetic consideration of the phenomenon. The actual listening situations afforded by digital music platforms might be continuously re-contextualised due to metadata, and this has consequences for all levels of perception and understanding of recorded music. The article's key contribution is a proposal implying that metadata can set listening as a vibrant potentiality that go together with the formal and material constituents of the mediating technologies as well as with the perceiving human body. Metadata purport to be additions between the music and the user-listener, but in fact, metadata transform the connections within digital music use. Furthermore, the article will contribute with insight into Diskoteket—a digital music platform hitherto not subjected to academic analysis. As a platform Diskoteket is structured as a mixture of a pulsating database and a visualisation of a physical archive of recorded music, and it works along the lines of metadata in a way that no commercial streaming services (to my knowledge) do. Before getting to that, the next section seeks to provide some conceptual clarification vital to the coming theoretical discussion.

DIGITAL MUSIC ARCHIVES, METADATA, AND ENVIRONMENT

To discuss the ramifications of digital music use requires a clear vocabulary regarding digital music archives, metadata, and environment. Digital music archives continue an ongoing de-contextualisation process of music as recorded sound,²⁰ and they have to be accessed through platforms that do not show their content in an ordered manner. Digital music archives show more affinities with Lev Manovich's definition of the database than with the traditional understanding of an archive.²¹ I agree with Patrik Åker that in the case of streaming music "the database and the archive are two sides of the same coin."²² Thus, digital music archives are fluid and transitory. We have witnessed a "radical metamorphosis of the aesthetics of storage" in which the emphasis "shifts to regeneration, (co-)produced by online users for their own needs,"²³ which not just opens up for new archival understanding but forms a new base for historical understanding as well. In the words of Wolfgang Ernst, the archival order "is being replaced by the *dynamics* of the archival field."²⁴ Digital music archives designate such "fields," and they communicate recorded music history due to a dynamic memory that collapses the temporal distinctions between past and present.²⁵ On a digital music platform, user-listeners leave traces through searching and

listening that algorithms detect and reformulate as information compiled as big data, which leads the archive to generate different classifications of the music resulting in a new arrangement of the music that the user-listener can engage with and so on. What happened then and what happens now is not important. Sorting as storage is not the defining factor, but relocating selection is. Here, music is data, and as Lisa Gitelman and Virginia Jackson has noted “[d]ata need to be imagined *as* data to exist and function as such, and the imagination of data entails an interpretive base,”²⁶ which means music needs to undergo metadating to carry any meaning at all. Streaming music requires interpretation to function *as* music.

Metadata sometimes get described as today’s marginalia,²⁷ but in terms of digital music archives, they are more than that. Depending on the structuring of them, they might focus one’s listening experience in a certain direction and possibly even transfigure one’s perception overall. Like the translation of marginalia found in a book, metadata let digital music use get infinite interpretational layers. Metadata are, for example, technical, descriptive, or administrative data about other data that in terms of digital music use create findability and accessibility. Further, the use of a digital music platform entails an intricate audio-visual world-making where noise takes shape as timbres hovering autonomously as music through sound-reproduction technologies, all the while variable graphic clusters of information mediate a mutable knowledge production, thus engendering a causal loop for the music to be perceived and contextualised anew. It might be thought of as an aesthetic situation that, provoked by its own generative nature, establishes a breeding ground for continuously getting new imaginaries while listening. The interpretive meaning we put into music via metadata assumes great importance, in that we read flexible versions of our musical selves into the actual listening situations.²⁸ Metadata take charge of the narrative critique distilled in digital music archives by telling the comparable temporalities of music and digital media as histories about recorded music history. Or put another way, metadata registered on digital music platforms have the power to nurture a different manner of thinking a representational interpretation of music.

The abovementioned world-making process is the result of a perceptual erasure of the categorical distinctions between digital music archives and metadata that forces the actual listening situations through as environments. Here, I understand an environment as a prerequisite for a becoming that interconnects

with an ecological thinking, which I will return to below. The environment of digital music use is closely connected to a Deleuzian control. Actual listening situations, then, seem political, and they are in that they are affective. They let the user-listener's body get attuned to the potentials in listening to music sparked from the non-temporal dynamics of an archival field that repositions itself nonstop due to the music's referential representation. They are listening environments thriving from an "augmented relationality" that repurposes the techno-ontological relations of digital music use as well as the possible perceptions of relations within recorded music history.²⁹ The following section turns to the temporal aspect of the musical assemblage as theorised by Georgina Born, which I will inoculate with the concept of virtuality.

THE MUSICAL ASSEMBLAGE AND DIGITAL MUSIC USE

In her analysis of musical mediation, Born speaks of digital technologies that can generate "new practices of difference and interrelation in music."³⁰ She argues that creativity-with-technology is what drives many artists nowadays; creative agency is distributed in time and informing artists' oeuvres and gradually expanding the possibilities for what music ontology can entail.³¹ Essential for this is the question of time, and it is the reading of Edmund Husserl's phenomenological idea of a time-consciousness that is of interest in her argument. According to Born, for Husserl "the same event is modified when apprehended from the point of view of present, past or future. The past and future are themselves dynamic, continually altering in cognitive time."³² This time-experience occurs because the present always contains both retentions, which are "memories or traces of the past," and protentions, which are "projections or anticipations."³³ Both are constructions of the present, continuously undergoing changes as the present progresses. Born touches upon this ramified temporality by analysing music (in its mediations) as binding in assemblages that go together in musical assemblages, which underline the historical courses that music follows. In so doing, she engages in thinking difference. But, her characterisation of the assemblage is present-centred and cannot deepen the analysis of digital music use. In Born's version of the assemblage the concept fixates on different layers rather than on potentialities, which, for my purpose, misses out on the affective side of the assemblage as well as fails to see it as part of the ecology of digital music use. Gilles Deleuze and Félix Guattari describe the assemblage in terms of potentialities, delineating it as an entangled construction

that formulates an ontological framework. For them, the assemblage is constituted by a territorialising ordering of bodies, and the vigorous energy of the assemblage lies in it *not* being static but containing an omnipotent potentiality of disrupting its own articulations and putting them together again in new ways—a potentiality of re-territorialisation.³⁴ In digital music use, a digital music platform, a user-listener, and a sound-reproduction technology compose a musical assemblage of heterogeneous elements that cut across different realms of reality—across the personal, the biological, and the technological.³⁵

With a focus on potentialities, I will propose a different understanding of the musical assemblage. The interaction between a human body and levels of technology should be analysed as inseparable parts establishing a complex structure. In this configuration, the human body and technology are continuously levelled in a way of being that liquidises time. To create meaningfulness, and to comprehend digital music use aesthetically, we have to understand time as expanded and the world as made up of non-linear dynamics. Even though music per definition is bound by time as a certain timbral structuring, digital music use cultivates a boundless non-linearity due to the shapeshifting potentialities emanating from digital media. Interaction with digital media is an accentuation of virtual entities. For my purpose, the Husserlian idea of a time-consciousness should be put aside and replaced with the concept of virtuality. In anti-reductionist fashion, Henri Bergson visually conceptualises virtuality as built up by “images” that are existences “placed halfway between the ‘thing’ and the ‘representation’.”³⁶ These “images” have an inherent pure recollection that steps forward in the act of perception, which is why there is a simultaneity between recollection and perception, according to Bergson. Recollection exists in a virtual state that peeps into the actual state.³⁷ The past is only discernible as past when it is actualised and expanded into the present *now*. Here, Bergson differs from Husserl in that he explains our being as actualisation of manifolds, whereas Husserl seeks to describe the essence of acts of consciousness, roughly speaking. For Bergson, our perceptions are both actual and virtual—the present is in a state of becoming. This leads Deleuze to let virtuality as a concept leave the philosophy of existence; he argues that the virtual does not oppose the real but the actual—“*The virtual is fully real in so far as it is virtual. ... the virtual is not opposed to the real; it possesses a full reality by itself.*”³⁸ Virtuality is pasts not differing from reality understood as a

present reality, or as summarised by Ulrik Schmidt: virtuality “completely corresponds with reality, but it does so as the real that *just now* has passed by as a pure past folded into the present.”³⁹ All pasts coexist with each and every present and this coexistence of time defines virtuality. All times that are not right now in being are already present *now*. In the musical assemblage, meaningfulness can, therefore, be detected in the tension of sensations emerging from a continual coalescence of human body and levels of technology. Digital music use is an aesthetic situation that makes sense virtually—as a sensibility of becoming.

Born defines the musical assemblage as a “particular combination of mediations (sonic, discursive, visual, artefactual, technological, social, temporal) characteristic of a certain musical culture and historical period.”⁴⁰ She, therefore, argues that mediation both gives music its meaning and lets it transfigure into cumulative interrelations. Elsewhere, Born discusses the musical assemblage as characterised by four planes of social mediation that are irreducible to one another and get mobilised by the musical assemblage.⁴¹ When it comes to the qualities in digital music use, I believe this view to be inaccurate. In her analysis of the musical assemblage as a constellation of heterogeneous mediations, Born’s errand is ontological, whereas mine is mainly aesthetic. To me, the notion of the musical assemblage can crystallise a different sort of knowledge production if focus lies on music being an entangled part of a virtual entity that can be actualised as clanging sound emanating from a sound-reproduction technology. Born focuses on music as a creative act undergoing countless mediations, and she states that music indicates “that there need not be a physical artefact or a visual object or symbol at the centre of the analysis of materiality, mediation and semiosis. ... Musical sound is non-representational, non-artefactual and alogogenic.”⁴² But, for an aesthetic understanding of musical sound accessed in a digital setting music *does* in fact need a physical entry-point. This is a prerequisite for cognising the musical assemblage as a technologically initiated multiplicity of time and sensation. The virtuality of the musical assemblage is defined by interactions on a material level that are performed through actualisations. It might not be there, but it is real. It does not make sense to speak of musical sound as being non-representational, as if the idea of music solely depends on a dialectic of extra-musical connotations projected into, and experienced as deriving from, what Born calls “the musical sound object.”⁴³ That is an ontological view on music that only bears the promise of music. Music is not only a

complex aggregation of mediations. Any musical sound begins somewhere, as an actualisation of its own virtual capacities, and all music is perceived by a listener as some kind of affective statement with a given representational character. Musical sound is produced in susceptible performance, meaning that the semiotic properties used to describe music are inchoate for knowledge formation through music. Musical sound is a sensibility of human experience that steps forward by way of technical mediation: it seems non-representational, but the mediation provides a material tangibility that, from the outside, drags representational energy into the musical sound. In terms of digital music use, music is part of the assemblage, and we have to accept that to make any sense of it. Music is dissolved and reduced to code, enmeshed in a knot of high-speed cabling, but it is still right “there” for us to engage with, in an ever-changing web of infinite possibilities of new connections and histories. In the ensuing, I will vocalise the musical assemblage as constituting a referential listening that favourably can be understood as drifting within a pulsating affective ecology. It is argued that listening with metadata has the potential of inducing a becoming that opens towards new historicised connections.

HISTORICISED LISTENING

As I fleshed out above, digital music use can be understood as past(ness) fused with future(ness)—as an inseparable unity of the virtual and the actual. The aspects of digital music use that I have hinted at can seem rather flimsy, but as a matter of fact, they are in many ways very tangible. Archival strategies of mass digitised environments showcase music in certain ways—in ways that make the user-listener merge with information that reaches into various dimensions of the construct of music history. Historicised listening gives way to a continual renegotiation of the historical positions of any given piece of recorded music and this has to do with metadata (or the lack hereof). I believe that metadata have the power to convert the experience and perception of music. The question is when they do that, and what listening with metadata actually causes. To grapple with that, we first need to address the ecology of digital music use.

The user-listener can roam free, feeling as singular as ever. And she or he can do so because the intertwined structuring of technological components and datafied music, which are crucial elements of the musical assemblage, reveals digital music use as being without a telos. The virtual stature of the musical

assemblage stresses that digital music use signifies an ecology, and it must be thought ecologically to impose meaning for the user-listener. The assemblatic coexistence of music, coding, sound-reproduction technologies, and a human body sums a totality needed to give user-listeners' singularity.⁴⁴ In this view, digital music use manifests as resonances in the vitality between all its constituents. The musical assemblage of digital music use is thus formed by the relational workings of affective bodies repositioning all the time, and this impacts listening.⁴⁵ Along these lines, digital music use formulates possible narratives in a continual rewriting through and by the ears. Digital music use fosters referential listening environments, and it is so because digital music use emulates a dividualisation process. Everything is interconnected, and by this every possible user-listener becomes more united yet more different—what Félix Guattari in ecological terms deems a process of “continuous resingularization.”⁴⁶ When you are listening to a piece of recorded music on a digital music platform, your listening will inadvertently cut across the different realms of the digital music archive, potentiating every instant with virtual listening situations always already in progress. No matter the situation, this is going on. If a digital music archive is blessed with a certain level of metadata, the act of listening to a piece of recorded music can be historicised. In this way, digital music use hands out a correlational referentiality that might co-construct the user-listener's awareness of a certain piece of recorded music. Thus, if you listen with metadata digital music use might release new imaginaries of listening.

The ecology of digital music use contains an ecology of recorded music history. Jacques Attali speaks of “composing” as an act of listening that rewrites music,⁴⁷ and digital music use catalyses listening environments capable of this re-contextualising act. If you listen to a piece of recorded music on a digital music platform and actively let your listening get informed by metadata connected to this piece of recorded music, you are potentially tweaking the listening situation and changing the listening experience. You are listening with the metadata, which (as is the case with Diskoteket) in many instances connect to other metadata, and thereby to other pieces of recorded music. You are listening from within the digital music archive, or as Attali would put it, you are rewriting the music. To listen with metadata is to compose and make the music anew; it is to rearrange the imaginative values assumed by the music's past constellations; and it is to acknowledge the impact that the link between you and the recorded piece of music has

on the recorded piece of music's historicity. When listening with metadata, listening becomes a historicised action—inside itself it holds the creation of imaginaries of listening, thus, inside itself, it holds a continual rewriting of music history.

From listening over swiping, clicking, and searching to following, engaging with a digital music platform puts one's musical world picture together as a patchwork that continuously is ripped apart and recombined. Thinking digital music use as an affective ecology entails a rethinking of recorded music history. With metadata working as referential penetrators of music, the actual listening situations are aesthetic practices of becoming. As concluded above, digital music use makes sense virtually. When you listen with metadata, the musical assemblage equals a subjectivation-process through a superimposition of all virtual events of the history of a piece of recorded music. Your own personal history of music changes through listening, since time comes to you in the form of musical sound engraved in the dynamics of the archival field. Because of metadata, digital music use makes the imaginaries of listening renegotiable, and your listening gets historicised and constitutes itself as the subject of your history of music. Next, I introduce Diskoteket and analyse an example of sampled music that prompts historicised listening. I argue that metadata slash the archival logic base Diskoteket within the ecology of digital music use.

LISTENING FROM WITHIN THE DIGITAL MUSIC ARCHIVE

In 2014 Diskoteket launched as DR's first digital search system platform containing both sound and music information. It builds on its electronic search system predecessors DISØ from 1977 and MUSA from 2000. Diskoteket is managed by the unit DR Musiktjenester (DR Music services) and was established under the name Grammofonarkivet (the Gramophone archive) in 1949, which changed its name to Diskoteket (the Discotheque) in 1952 (which was then changed to DR Musiktjenester in 2017). The platform is only accessible for DR employees and is mainly used for broadcasting and research issues. As a platform Diskoteket draws on a growing digital music archive including both acquired digital releases as well as digitised releases from DR's physical collection of more than 700.000 releases (largely constituted by 78 RPM records, vinyl records, and CDs). I consider Diskoteket a visualisation of a large digital archive. Thereby, music can be regarded as both visual and aural documents that relate to the user-listener's reality indexically as well as compositionally.

On the surface, Diskoteket seems like an old-fashioned search system with an incorporated play function, and indeed the user interface is a bit clumsy and not as smooth as, for instance, Spotify's. But if we enter an album interface, some peculiar capacities emerge that differ from what we can find on commercial streaming services. Let us look at Diskoteket's view of Drake's 2016 album *Views* (Fig. 1). We find that the platform builds heavily on hyperlink qualities, making it a capacious environment for listening that interpellates the user-listener to be in a reflective state.

It functions as such due to the digital music archive underneath Diskoteket being stratified in an interpenetrating layer-structure,⁴⁸ which hinges metadata on other metadata. The intention behind this way of programming is clearly rooted in a wish for a platform that simultaneously contains the accessibility of commercial streaming services and the organising factuality and independence of public libraries. As an infrastructural logic, this gives the user-listener an array of possibilities that all can inform the listening experience. Engaging with Diskoteket effectuates an ever-evolving musical assemblage consisting of virtual potentials of reference that can be actualised. Whereas the algorithmic governmentality of commercial streaming services, as analysed by Drott, Prey, and Morris, gives you the impression of empowerment through dynamic interfaces, which at the same time muddles the capitalistic totality of the services,⁴⁹ Diskoteket gives you what you are looking for plus it suggests related data, but it is not tampering with your intellect through personalising your experience. What Diskoteket does do is the same for everyone; when you are done listening to the last track of a release, the platform either repeats the last track or (as a default setting) suggests a different track based on a nexus of the amount of airplay and such qualities as genre-tagging and mood-category. The algorithm does not command you to adjust to the system by seemingly adjusting to you, meaning the platform is not capturing you as a subject and using your musical behaviour to manufacture you; but, if you are not actively engaged in the track to come the algorithm might be disciplining you along the lines of the principle of rotation, thus along the lines of the major record labels. To which you can ask: besides not selling my data to third parties, what is the actual difference?

Let us return to *Views*, scroll down and click on the last track (Fig. 2), *Hotline Bling*, and get transported into the interface of this track (Fig. 3). The entanglements get heavier, the possibilities more

Views
Drake
Album | Lydfil | 2016 | Young Money Entertainment, Cash Money Records

Tilgængelighed: 20 skæringer

Type	Official Udgivelse	Diskoteknr	9017591
Udgivet af	Young Money Entertainment (29.04.2016 Intet nr)	Status	Færdigregistreret
	Cash Money Records (29.04.2016 Intet nr)	Oprettet af	ARPE (29.04.2016)
		Opdateret af	CBM (06.02.2017)

Nr	Titel	Kunstner	År	Varighed
1	Keep The Family Close	Drake	2016	05:28
2	9	Drake	2016	04:15
3	U With Me?	Drake	2016	04:57
4	Feel No Ways	Drake	2016	04:00
5	Hype	Drake	2016	03:29
6	Weston Road Flows	Drake	2016	04:13

16	Too Good	Drake Feat. Rihanna	2016	04:23
17	Summers Over Interlude	Drake	2016	01:46
18	Fire & Desire	Drake	2016	03:58
19	Views	Drake	2016	05:11
20	Hotline Bling	Drake	2015	04:27

Roller på denne udgivelse

Kunstner	Rolle
Drake	Hovedkunstner, Sang, Rap, Komponist
WuKid	Sang, Co-prod, Komponist
PARTYNEXTDOOR	Rap, Komponist
Murda Beatz	Alle instrumenter, Producer, Komponist
Nineteen85	Producer, Co-prod, Komponist
Noel Cadastre	Lydtekniker

Fig. 1
Diskoteket's view of the top part of the album interface of Drake's *Views*.
© DR Musiktjenester, Copenhagen 2020.

Fig. 2
Diskoteket's view of the bottom part of the album interface of Drake's *Views*.
© DR Musiktjenester, Copenhagen 2020.

specified. We get cognisant by recording information and have the opportunity to follow most of this in a hyperlinked manner, which has the power to perplex the referential representation of the track. Taking this kind of action while listening re-informs and re-contextualises the track. The architecture of Diskoteket seems to implicate user-listeners as co-functioning intermediaries of recorded music culture, continually adding new meaning to the music and passing it on to themselves in new narrative guises. But the architectural logic seems, in fact, to portray the platform more as an infomediary than as an intermediary. Unlike intermediaries, infomediaries are not presenting and representing symbolic content. Instead, they restructure and renegotiate the mediated information through content connections.

Freely interpreting Morris' definition, I will argue that in the case of digital music use the infomediary is the organisational benefactor letting musical narratives be formed, thus perceived.⁵⁰ Being open to the organisational control let us sense the relationality of the musical assemblage. You belong in this structure; affectively, you tweek yourself into a moebius strip-like autonomy, as "a set of potential connections and movements" always playing out in "an open field of relations."⁵¹

Hotline Bling has more in store for us. The metadata on the track interface potentiate the sounding of the track's representational character, making for a historicised listening. Besides the capability to follow the endless chain of information by clicking on a person affiliated with the track and trail any given occurrence in the interconnected mesh of Diskoteket, the user-listener can also scroll down the page and obtain another sort of information. In the bottom part of the track's interface we see three other tracks being highlighted: Timmy Thomas' *Why Can't We Live Together* (1972), Judith Owen's *Hotline Bling* (2018), and Erykah Badu's *Cel U Lar Device* (2015) (Fig. 4). The first appears under the headline "contains sample from the following tracks," the second appears under the headline "cover version on the following tracks," whereas the latter appears under the headline "versioning on the following tracks."

These options thrust an environmental logic upon the actual listening situations, entailing an ecological thinking. The interconnectedness is exhibited, and the re-singularisation process is manifest, demonstrating how virtual listening situations always already are at work. The scope of possibilities manufactures yet another dimension to the virtuality of the musical assemblage, in that it gives the user-listener a tool to cut

Hotline Bling
Drake
04:27 min. | 2015 | Views (Album) (lydfil)

Indspillet 2015, Multinational
S.O.T.A. Studios, Toronto, ON, Canada / The Yolo Estate, Hidden Hills, CA, U.S.A.

Diskoteksnr 9017591-1-20
Oprettet af ARPE (29.04.2016)
Opdateret af ARPE (27.10.2018)

Sprog Engelsk

Roller på denne skæring

Kunstner	Rolle
Drake	Hovedkunstner, Sang, Komponist
Nineteen85	Producer, Komponist
Chris Athens	Mastering
Noel Campbell	Mixer
Noel Cadastre	Lydtekniker

Indeholder sample fra følgende skæringer

Why Can't We Live Together
Timmy Thomas | 04:34 min. | 1972 | Why Can't We Live Together (Album | Vinyl)
SØRMO | Digitaliseret | 19 Radioafspilninger | 2 Favoritter

Coverversion på følgende skæringer

Hotline Bling
Judith Owen | 03:29 min. | 2018 | redisCOVERed (Album | lydfil)
SØRMO | Digitaliseret

Versioneret på følgende skæringer

Cel U Lar Device
Erykah Badu | 06:28 min. | 2015 | But You Can't Use My Phone (Mixtape | lydfil)
SØRMO | Digitaliseret | 4 Favoritter

Fig. 3
Diskoteket's view of the top part of the track interface of Drake's *Hotline Bling*.
© DR Musiktjenester, Copenhagen 2020.

Fig. 4
Diskoteket's view of the bottom part of the track interface of Drake's *Hotline Bling*.
Here, relations to other tracks are shown. © DR Musiktjenester, Copenhagen 2020.

across different and seemingly dissociated temporalities of the digital music archive. Here again, one can take the hyperlinked road and click on the three implicated artists, the three tracks as well as the three releases mediating these tracks, and as the orange play buttons indicate the user-listener can also hit play on the three tracks and initiate referred listening while situated in a separated section of the archive. What is not happening now is always already in the process of happening; music not yet sounding, and information not yet informing, exist here, in *Hotline Bling*, as affective capacities, sensed but not really known. If you actively engage with these options, the indexical logic of the archive gets disrupted. In Diskoteket, the programmatic idea of the metadata is threefold: first, the metadata bring your attention to relevant information; second, they let you get involved with them and lead you across the archive; and third, they complexify the actual listening situations by integrating other potential listening situations into these. Actually, there is a fourth element in play; when your experience of listening to *Hotline Bling* gets confronted with interrelated information, which potentially leads you to other strata of the archive, you are listening from within the digital music archive. Effectually, your listening is historicised. If you click on one of the tracks, this gets more conspicuous, as the bottom of the track interface of Why Can't We Live Together shows (Fig. 5). Here, you can clearly see that you can listen backwards and reconnect to *Hotline Bling* as well as other tracks from Erykah Badu's mixtape come into play, and so does a cover version from Sade's *Diamond Life* (1984).

This way of moving around is self-initiated and not subjected to opaque control and commercial interests. But, the intentionality behind Diskoteket's code is still making for an ecological experience of such latitude that cognition of the possible streams of sound and information gets unfathomable, collapsing human cognition with machinic operations. Perhaps we need to leave reflection all together to make sense of the assemblatic logic? Maybe the relationality of this large-scale human-nonhuman processing should be grasped the other way around, as processes of "nonconscious cognition," as N. Katherine Hayles recently has theorised.⁵²

In the case of *Hotline Bling*, Diskoteket gives the user-listener the satisfactory experience of knowing the connections, of knowing more, of knowing how to listen for more, of knowing how to disseminate more. But, understood as an aesthetic situation this experience accentuates a "mode of interpretative

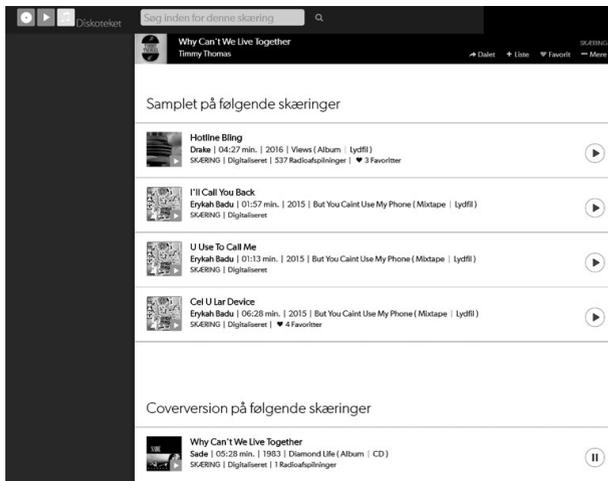


Fig. 5
Diskoteket's view of the bottom part of the track interface of Timmy Thomas' *Why Can't We Live Together*. Here, relations to other tracks are shown.
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discourse,”⁵³ in which this information as metadata creates the user-listener as involved in environmental agency. No parts in this system are given more privilege than others, and that includes the act of listening; listening is, on the surface, nothing more than one of several human activities involved in digital music use that, read through what Mark B. N. Hansen calls a “*radical environmental perspective*,”⁵⁴ melts together with all digital procedures informing digital music use. The affective listening environment cultivated by metadata traversing the digital music archive harpoons a potential historical awareness into the user-listener’s perception in a matter of micro-instances, which stresses a non-representational relationality in the very technicity of the musical assemblage. The constituents of digital music use spark relational agency in their ability to co-evolve with each other, letting the listening environment to diffuse agency and cognition on a material level. The experience experiences itself, so to speak, before the user-listener does so; or, to follow Hansen, the listening environment condenses from a “preaffective impact of technics on sensibility.”⁵⁵ Here, I am thinking of the virtual coexistence of time that, as a premise, unyieldingly resonates in the musical assemblage and collapses the sensibilities of experience, both human and nonhuman, thus configuring experiences to come. This relationality produces the virtual crisscrossing of temporal realms in Diskoteket, and it is in this non-representational ecology that music as something-to-be-perceived gains newfound agency. It is indeed this non-representational relationality of the listening environment that makes for the music’s modulatory representation. You have to cross the threshold and actively inaugurate the musical assemblage by pressing play on a track, making yourself open to the affective statement you will perceive from the music. As a disseminator of music Diskoteket counters Born’s musical assemblage, in that the referential listening in this case of digital music use makes the music meaningful because it is highlighting its connections. For listening to become historicised music has to come from somewhere. For *Why Can’t We Live Together* to interpolate the actual listening situations induced by *Hotline Bling* a concreteness must be present, letting the two tracks resonate together. The tangibility of the music’s mediation is the factor giving it representation and making it logogenic.

STAY A WHILE AND LISTEN

With this article, I try to classify the actual listening situations of digital music use as something dependent on archival connotation

and metadatified disruptions of said connotation. The digital music archive works due to the character of the apparatus, which already Michel Foucault described as the ungraspable quality of the archive,⁵⁶ and this puts the user-listener in the middle of an accumulating historicity. I define this dynamic as a musical assemblage differing from Born's notion, and I argue for digital music use as bringing an aesthetic sensibility into being that prompts singularity in the act of listening. In discussing the infrastructural logic of Diskoteket and analysing the platform's strategic choices of presentation in the case of Drake's *Hotline Bling*, I claim that Diskoteket is a digital music platform that can foster an environment of referential listening. With Diskoteket, you can listen from within the digital music archive, and the platform comes into existence as a layered field of informed matter. Diskoteket turns listening to recorded music into a historicised action—an action that “tune[s] into the superhuman scales of time and space.”⁵⁷ The ecology of digital music use puts a certain agency into the digital music archive, which informs the user-listener's imaginaries of listening. The digital music archive let you take part in the discontinuities of history, actively thinking, and feeling history. You ooze in and out of history when actively engaged with a digital music platform. While listening, you follow the interrelational metadata and push the boundary of digital music use. You are involved with history—not metaphorically, but literally. Voltage and somatic structure coalesce with music carrying history forward. This whole is a temporal and autonomous ecology that we need to learn how to address in order to invent a historical future of recorded music.

- 1 The notion of musical assemblages comes from Georgina Born. It signifies the layered ontology of music's mediations. See Georgina Born, "On Musical Mediation: Ontology, Technology and Creativity," *Twentieth-Century Music 2/1* (Cambridge University Press, 2005).
- 2 I have negotiated full access to Diskoteket as well as to the digital music archive that the platform builds on.
- 3 Throughout the article, metadata are situated as relational potentialities rather than mere information. Metadata signify that the conditions of listening in digital music use are based on a chimeric premise of infinite change, meaning that a potential future listening is as real as a present listening. As information, metadata let listening turn into a moebius strip of actualised and not yet actualised experiences that affect each other. Not only that, they also affect the user-listener sensorially and cognitively in that they put focus on the human-nonhuman relation of digital music use, making the reflexive experience a bodily experience. It is a matter of relations. See Brian Massumi, *Parables for the Virtual: Movement, Affect, Sensation* (Durham & London: Duke University Press, 2002); and Luciana Parisi, *Contagious Architecture: Computation, Aesthetics, and Space* (Cambridge, MA: The MIT Press, 2013).
- 4 I speak of the virtual as a philosophical concept along the lines of Henri Bergson and Gilles Deleuze. See Henri Bergson, *Matter and Memory*, trans. N.M. Paul & W.S. Palmer (New York: Zone Books, 2005) and Gilles Deleuze, *Bergsonism*, trans. Hugh Tomlinson & Barbara Habberjam (New York: Zone Books, 2011).
- 5 Cf. Félix Guattari, *The Three Ecologies*, trans. Ian Pindar and Paul Sutton (London & New Brunswick: The Athlone Press, 2000); and Erich Hörl, "Introduction to General Ecology: The Ecologization of Thinking," in *General Ecology: The New Ecological Paradigm*, ed. Erich Hörl (London: Bloomsbury: 2017), 1–74.
- 6 Mark Katz, *Capturing Sound. How Technology has Changed Music*, revised edition (Berkeley and Los Angeles: University of California Press, 2010), 186–189.
- 7 Jonathan Sterne, *MP3. The Meaning of a Format* (Durham and London: Duke University Press, 2012), 189 and 225.
- 8 Jeremy Wade Morris, *Selling Digital Music, Formatting Culture* (Oakland: University of California Press, 2015).
- 9 Jeremy Wade Morris, "Curation by Code: Infomediaries and the Data Mining of Taste," *European Journal of Cultural Studies*, Vol. 18, no. 4–5 (2015), 458.
- 10 Robert Prey, "Nothing Personal: Algorithmic Individuation on Music Streaming Platforms," *Media, Culture & Society*, Vol. 40, no. 7 (2018), 1086–1100.
- 11 *Ibid.*, 1092.
- 12 Gilles Deleuze, "Postscript on Control Societies," *Negotiations*, trans. Martin Joughin (New York and Chichester: Columbia University Press, 1995), 177–182.
- 13 Eric Drott, "Why the Next Song Matters: Streaming, Recommendation, Scarcity," in *Twentieth-Century Music 15/3* (Cambridge University Press, 2018), 335. doi:10.1017/S1478572218000245.
- 14 *Ibid.*, 336.
- 15 Deleuze theorises individuation as the instigator between the virtual and the actual. See Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (London and New York: Bloomsbury, 2014).
- 16 Raphaël Nowak, *Consuming Music in the Digital Age. Technologies, Roles and Everyday Life* (New York: Palgrave Macmillan, 2016).
- 17 Sofia Johansson, "Music as part of connectivity culture," *Streaming Music: Practices, Media, Cultures* (Oxfordshire and New York: Routledge, 2018), 48. In the same qualitative vein, Anja Nylund Hagen has delved into individual users' experiences of and practices with streaming technologies in their everyday lives. See Anja Nylund Hagen, *Using Music Streaming Services: Practices, Experiences and the Lifeworld of Musicking*, PhD Thesis (Oslo: The University of Oslo, 2015).
- 18 Susanna Leijonhufvud, *Liquid Streaming: The Spotify way to Music*, PhD Thesis (Luleå: Luleå University of Technology, 2018).
- 19 See Theodor W. Adorno, *Introduction to the Sociology of Music* (New York and London: Continuum, 1988) and Anahid Kassabian, *Ubiquitous Listening. Affect, Attention, and Distributed Subjectivity* (Berkeley and Los Angeles: University of California Press, 2013).
- 20 Patrik Åker, "Spotify as the soundtrack to your life: Encountering music in the customized archive," *Streaming Music: Practices, Media, Cultures* (Oxfordshire and New York: Routledge, 2018), 83.
- 21 Lev Manovich, *The Language of New Media* (Cambridge, MA: The MIT Press, 2001).
- 22 Patrik Åker, "Spotify as the soundtrack to your life," 84.
- 23 Wolfgang Ernst, "Archives in Transition: Dynamic Media Memories," *Digital Memory and the Archive*, ed. Jussi Parikka (Minneapolis: University of Minnesota Press, 2013), 95.
- 24 *Ibid.*, 99.
- 25 *Ibid.*, 95–101; see also Patrik Åker, "Spotify as the soundtrack to your life," 85.
- 26 Lisa Gitelman and Virginia Jackson, "Introduction," in "*Raw Data*" is an Oxymoron, ed. Lisa Gitelman (Cambridge, MA: The MIT Press, 2013), 3.
- 27 Nanna Bonde Thylstrup, *The Politics of Mass Digitization* (Cambridge, MA: The MIT Press, 2018), 106.
- 28 This statement is inspired by Eric Drott, "Music as a Technology of Surveillance," *Journal of the Society for American Music*, Vol. 12, no. 3 (2018), 247, doi:10.1017/S1752196318000196.
- 29 Nigel Thrift, *Non-Representational Theory: Space, Politics, Affect* (London & New York: Routledge, 2008), 165.
- 30 Georgina Born, "On Musical Mediation," 11.
- 31 *Ibid.*, 23–24.
- 32 *Ibid.*, 20.
- 33 *Ibid.*, 21.
- 34 Gilles Deleuze & Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), 3–25 and 311–350.
- 35 Manuel DeLanda, *Assemblage Theory* (Edinburgh: Edinburgh University Press, 2016), 68.
- 36 Henri Bergson, *Matter and Memory*, 9.

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- 37 Ibid., 134.
- 38 Deleuze, *Difference and Repetition*, 272 and 275.
- 39 Ulrik Schmidt, *Det ambiente. Sansning, medialisering, omgivelser* (Gylding: Aarhus Universitetsforlag, 2013), 116. My translation.
- 40 Born, "On Musical Mediation," 8.
- 41 Georgina Born, "Music and the Materialization of Identities," *Journal of Material Culture* 16(4) (2011), 378 and 385, doi:10.1177/1359183511424196.
- 42 Ibid., 377.
- 43 Ibid.
- 44 This moulds on the ecosophical ethics of Félix Guattari as well as Timothy Morton's idea of thinking big. See Guattari, *The Three Ecologies*; and Timothy Morton, *The Ecological Thought* (London and Cambridge, MA: Harvard University Press, 2010).
- 45 Jane Bennett discusses the concept of affective bodies in a reading of Deleuze's reading of Spinoza's "associative bodies." See Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham and London: Duke University Press, 2010), 21–23.
- 46 Guattari, *The Three Ecologies*, 69.
- 47 Jacques Attali, *Noise: The Political Economy of Music*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1985), 135.
- 48 The archive structures its information in four layers—artists, releases/albums, tracks and compositions. All layers hold different degrees of metadata that can inform all other metadata relevant to a specific case. Besides that, the tracklayer also holds the music as data.
- 49 Here, I am inspired by Wendy Hui Kyong Chun, *Programmed Visions: Software and Memory* (Cambridge, MA: The MIT Press, 2011), 9.
- 50 Morris, "Curation by Code," 446–463.
- 51 Brian Massumi, *Politics of Affect* (Cambridge & Malden, MA: Polity, 2015), 40.
- 52 N. Katherine Hayles, *Unthought. The Power of the Cognitive Nonconscious* (Chicago: The University of Chicago Press, 2017).
- 53 Jacques Rancière, *Aesthetics and Its Discontents*, trans. Steven Corcoran (London: Polity Press, 2009), 11.
- 54 Mark B. N. Hansen, *Feed-Forward: On the Future of Twenty-First-Century Media* (Chicago & London: The University of Chicago Press, 2015), 2–3.
- 55 Ibid., 222.
- 56 Michel Foucault, *The Archaeology of Knowledge*, trans. A. M. Sheridan Smith (Abingdon: Routledge, 2002), 142–148.
- 57 Kyle Devine, *Decomposed: The Political Ecology of Music* (Cambridge, MA: The MIT Press, 2019), 189.

Article Four

Setting the Scene

To be informed by the presentation of recorded music and to actively take use of the operationalization of metadata on a digital music platform is to listen with tweaked ears. It is to follow unarticulated trajectories and be open for different ways to tell the history of recorded music. But, does it account for the non-present music and the neglected narratives?

Article Four takes heed of the unstable conceptualizations of the history of recorded music and it views these in relation to the structuration of DR's digital music archive. It further builds its line of approach on the premise that this archive's metadata-structure constitutes the ways a user will be able to create knowledge of recorded music and its histories. But, this article goes a step further and reads DR's digital music archive through an imaginary media frame.

This article engages in a multifaceted methodology. It reads archival documents about the digital music archive next to interviews with the Head of the Department of the Music Archive. It also analyzes interfaces of tracks related by metadata. And it gathers information from all these approaches in order to take a step into the unknown by making a variantology of DR's digital music archive.

A speculative scenario is developed in order to engage in an interventional reflection, to take a subversive approach to the institutional understanding of the digital music archive.

Media archaeology seeks to tell untold stories, to draw undrawn lines in history. Alternative lines.

In 2017, DR DJ was proposed as a mobile application for music discovery and communication. It was discarded. But, notes and memories linger on.

The variantology, the idea of imaginary media, is a speculative approach for making sense of what is there by discussing what is not there. The article paints a picture of modalities for music discovery that might have been possibilities if DR DJ had been realized. The article also underlines that the digital music archive already possesses these possibilities, they are just not acted upon. However, they have a spectral presence, critiquing the managerial paths not taken at DR.

Relations between metadata can be many things. They can be flawed and one-sided, just as they can instigate reflection and interaction. On the one hand they are the foundation of DR's digital music archive's functionality, and on the other hand they make critique of the archive's bias.

The aim of this article is to speculate on alternative directions for DR's music archive, and by framing the archive with Siegfried Zielinski's variantological method of changing temporal and geographic attention, this article excavates inherent possibilities.

DR's music archive has the capability to make alternative cartographies. It is structured so as to break with the linear logic of progress as change, but it is, so far, kept under a strict institutional control. As this article makes clear, the history of recorded music is nonlinear – it is encompassed by diversity. One just needs to realize and accept that. Change is not just linear. Progress does not alone define change. History is change, and history is cyclical.

DR's music archive is aware of all that. It is even built for communicating it. Still, up until this point it has not been given *carte blanche* to provide connections to alternative futures for recorded music.

Music discoveries that could have been: a variantology of the Danish Broadcasting Corporation's music archive

This is an article that reads the digital music archive of the Danish Broadcasting Corporation (DR) through the lens of the term *imaginary media*. It looks at a digital application for mobile devices that never came to be and it assesses its impact as actualizations in the archive's current strategic developments in coding and infrastructural solutions. In this article I am inspired by media archaeologist Siegfried Zielinski's approach to imaginary media due to the fact that his specific contributions to the media archaeological canon can help me in reimagining the music historical communication emanating from DR's music archive.¹ The article will take a historical point of departure and dwell on source material regarding DR's music archive, but the mind-set of imaginary media will be a latent factor in all my findings in that I take the historical factuality as an outset for speculating on undevel-

¹ As a research field, media archaeology covers approaches for excavating our current media cultures through the pasts of media and machines. Media archaeology is closely connected to media materialism as evolved by Friedrich Kittler and it juxtaposes itself next to other recent debates of media studies, such as new materialism and software studies. Kittler complicates our concept of archival time by interrogating the hardware facilitating processes of software, which in a media archaeological context later is taken up by Wolfgang Ernst. When it comes to imaginary media, Erkki Huhtamo has pointed out that media are reducible to the ways they are used, to the cultural and social practices they partake in, and Eric Kluitenberg underlines that imaginary media hold 'impossible desires' never to be satisfied and therefore they 'articulate a highly complex field of signification and determination that tends to blur the boundaries between technological imaginaries and actual technological development'. See Eric Kluitenberg, 'On the Archaeology of Imaginary Media', in *Media Archaeology. Approaches, Applications, and Implications*, eds. Erkki Huhtamo and Jussi Parikka (Berkeley and Los Angeles: University of California Press, 2011), 48. See also Friedrich Kittler, 'There Is No Software', in *Stanford Literature Review* 9/1, 81-90; Friedrich Kittler, *Gramophone, Film, Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University Press, 1999); Wolfgang Ernst, 'Archives in Transition: Dynamic Media Memories', in *Digital Memory and the Archive*, ed. Jussi Parikka (Minneapolis: University of Minnesota Press, 2013) 95-101; and Erkki Huhtamo, 'From Kaleidoscomaniac to Cybernerd: Notes toward an Archaeology of the Media', in *Electronic Culture: Technology and Visual Representation*, ed. Timothy Druckery (New York: Aperture, 1996) 302-303.

oped potentials. The article will primarily pursue an answer to one question: how does a down-voted proposal for music discovery influence the structure and functionality of DR's digital music archive, and to what extent is it present on DR's in-house digital music platform called */Diskoteket*? To begin with I provide some historical context about DR's music archive and how it is positioned within DR as an esteemed public service institution. Then I describe the instating of DR's digital music archive by analysing archival documents concerning the strategic decisions behind, and causes for, developing a digital music archive and I put further perspective on these documents through referencing parts of four in-depth interviews with the current head of the department of the music archive that, amongst other things, circle around aims, choices, and opt-outs in the developing of digital solutions for music exploration at DR in recent years.² I then situate and give attention to the case study in question: an application for mobile devices entitled *DR DJ*. I will explain this proposal for alternative music discovery in detail, as I regard it as an effort for reimagining DR's digital music archive. Finally, I view the proposal as imaginary media and assess it through the lens of Zielinski's concept of *variantology*. In order to stimulate this reading of the proposal and make the lens of imaginary media intelligible, it is necessary first to present the strategic considerations behind developing a digital music archive at DR in length; otherwise a lucid explanation of DR DJ and why it was not developed will be unattainable. I argue that DR DJ, temporally, is present as shades of actualization on */Diskoteket* and I see this fact, that DR DJ continually enters the real, as a silent revolt by the department of the music archive. I then develop a speculative scenario of how the proposal could steer the digital music archive in alternate directions if accepted. In contemplating on the potentials of this proposal, I engage in an interventional reflection and take a subversive approach to the institutional understanding of DR's digital music archive and what the digital platform */Diskoteket* can be. The scenario I develop is speculative due to the fact that I end the article by imagining how a curated playlist in DR DJ can open up to untold stories of the music archive, and this leads me to an intervention-

² Quotes and references from documents, public service contract, and interviews are in my translation.

al reflection with subversive force because it questions DR's institutional conceptualisation of their music archive and how they are constructing music histories.

By DR's juridical department, I have been granted access to 39 internal documents from the years 1998-2002 and 2011-2014 comprising 159 pages. The access is only partly granted because some information is considered confidential in terms of economic and business related measurements, and therefore a rather large portion of information is censored. These archival documents provide insight into two matters: first, the functionalities of the database of DR's electronic search system for music acquisitions, called *MUSA*, and second, the nascent actualization of this database as a digital music archive that leads to /Diskoteket. This platform launched in fall 2014 as an in-house resource for DR employees to access the music archive with. Via /Diskoteket users can search and listen to music; users can request to get tracks digitized³; and users can transfer tracks (including attached metadata) to servers used for broadcasting. It needs to be explicated that I have in-depth knowledge of this platform as well as insight into the unapproved proposal due to the fact that I was employed as a *musikregistrator* [music registrar] at DR's music archive from 2015-18 and still have a freelance affiliation. The main function of music registrars is to

³ Today most of DR's CD collection is digitized, whereas the collection of shellacs and LP's is sparsely digitized. On a daily basis, CD's are ripped and ingested to the database with the aim of getting everything digitized. When it comes to the older physical formats, singular tracks are only digitized when requested by users. This dispersal of digitization happens due to the time-consuming work of readying records, gramophones and software for a digitization process in real-time. The digitization of shellacs and LP's is furthermore a delicate task, demanding one of the full-time employees in the department of the music archive to carry it out (CD's and digital sound files are handled by student employees). The full-time employees are actually employed as *musikregistratorer* [music registrars], whose task it is to add and correct metadata in the database, meaning the digitization of shellacs and LP's is an extremely costly work process. As of February 1, 2022, the collection consists of 447.725 unique records distributed between 24.192 shellac records, 152.792 LP records, 180.868 CD records, 52.435 sound files records, and 37.438 other formats. Additionally, many records are acquired with duplicates, totalling the actual physical collection somewhere between 700.000 and 800.000 records. The collection comprises 3,5 million tracks of which 1,3 million are digitized, meaning there still are 2,2 million non-digitized tracks in the collection today.

add music information, that is, music metadata, into the MUSA database, thus music registrars act as DR's music archivists. This means that part of my methodology lies in a somewhat auto-ethnographic approach in which I have to be aware of different interests (amongst others, my own) that need balancing and continual review for the analysis to stay critical. This is something that I care a lot about and I am fully committed to be as impartial as possible, but I also have to acknowledge that I have insight that might bias my analysis to some extent. I must balance this insider-position and I ought to recognise how I am situated within my empirical material and assess my knowledge of this archive as specialist.

On the other hand, I have not been granted access to documents concerning the proposal of DR DJ, neither about the development process nor about the managerial decisions to reject it. Here, I rely on my first-person experience with being a part of the department of the music archive while the proposal was being developed; the music registrars were not involved in the strategic development, but we were included continually as sparring partners, giving inputs and reacting on ideas. Further, I refer to the interviews with the head of the department of the music archive when it comes to the proposal as he is the only source close to the process open for sharing insights.

Why a music archive at DR?

DR saw the light of day on a trial basis on April 1, 1925, under the name *Radioordningen* [the radio arrangement], which was an arrangement for broadcasting of radio that was made permanent the following year due to an Act on Radio Dissemination.⁴ In concurrence with the trial, the state gave itself monopoly on radio dissemination in Denmark, and fittingly in 1926 the institution was named *Statsradiofonien* [State Radio Broadcasting]. In the institution's first formative years during the 1930s, it was unclear how Statsradiofonien was to reimburse the record industry for the playback of music in radio broadcasts, and it was therefore decided that

⁴ Cf. *Lov nr. 45 af 13.3.1926 om Radiospredning* [Act No. 45 on Radio Dissemination]. For more, see <https://danmarkshistorien.dk/vis/materiale/lov-om-radiospredning-13-marts-1926>

the institution had to compensate for each replay unless they already themselves owned the records they broadcasted from. An early settlement with *Gramo*, the organization that at the time handled payments in relation to the 'gramophone industry',⁵ prohibited Statsradiofonien from instituting its own music archive, de facto limiting their options for music communication to a rigid minimum. In order to air music outside of this scope, the institution had to rent the records from the record companies. As this did not correspond with the ideals of public service, it was, to say the least, an unsustainable situation. Still, the arrangement with Gramo was not renegotiated until 1946, when it was decided that Statsradiofonien was allowed to buy, store, and broadcast commercially released music. This led to the launching of DR's central music archive in 1949. The decision to initiate the building up of a music archive was not just the most practical solution; in the end, it was also the more cost-effective way to go, which at the same time was in accordance with principles of public service, educational ideals, and strategies for public heritage.

During the first three years, the music archive was called *Grammofonarkivet* [the Gramophone Archive], and in March 1952 it changed its name to *Diskoteket* [the Discotheque]. This was a turning point for the institution's self-perception in terms of music communication. The radio and TV host Otto Leisner was appointed to be the general manager of the music archive, and this arrangement led to an expansion in the acquisition of music as well as an expansion of musical genres as he established a systematised approach to the acquirement of music. This systematised approach steered him to introduce an archival ordering in a complex index card system based on the logic of taxonomy, which to this day still motors DR's music archive. Leisner's style of management not only heralded a structural centralisation of music archiving and communication that saw the singular music release as a pawn in a bureaucratic and process-oriented game; it also signified future potentials of the music archive and of what it could be.

⁵ As an organization Gramo was established in 1935. It was administered by *KODA*, which is a Danish organization, established in 1926, that handles payments for composers and songwriters. In 1963, Gramo was disbanded due to the creation of *Gramex*, which as an organization took over the handling of payments for performing artists and record companies. KODA and Gramex are still in function today.

DR is a tax funded institution and it pays a fixed sum to the organisations handling the financial rights of songwriters, performing artists, and record companies, who distribute the payments to the holders of the rights based on the music reporting of DR. The structure of tax funding logically leads to an aim of offering and distributing content that is not necessarily the most popular at the time but that is deemed important and relevant for a public service purpose. Due to this political decision, the music archive of DR is a vast collection of genres and formats that does not differentiate between musical styles or popularity or air plays. If a record goes through DR, it will be registered and stored. Some decades ago, the department of the music archive employed up to thirty fulltime music registrars and the idealistic goal was to, more or less, get all music as such in the archive. Coinciding with cutbacks and optimisation processes, the department has downscaled drastically in size and as of December 2022 employs just four fulltime music registrars and it will only acquire, and register and store, music that is editorially decided upon by the managements of the radio channels.

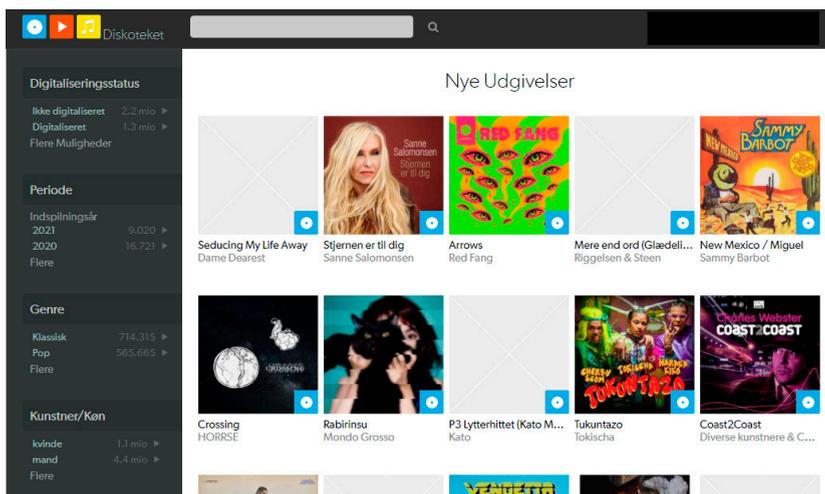


Figure 1. Screenshot of the front page of /Diskoteket from November 9 2021 that provides a general idea of the platform's architecture. The front page is in sync with the MUSA database and thus changes every time a new release is added to the system. Source: DR.

There is a direct line from Leisner's strategy of transforming the profile of the music archive to today's intuitive user-experience of /Diskoteket, which can be seen exemplified in Figure 1. Part of his approach to make the archive broader and more embracive towards genre specificities lies in a quest for creating a searchable and interrelated music archive. Leisner instituted an archival infrastructure for how to register and store music releases that potentiated the information of the releases so as to make them go into dialogue with each other. Besides each physical release, the taxonomical index card system includes the categories of tracks, artists, and compositions, meaning that every single release is described on up to eight index cards that make cross-references to each other (cf. Michelsen et al. 2018: 147-149). The MUSA database, which launched in 2000, takes heed of this interrelational logic and makes the information operational on /Diskoteket. In the data model for this database, metadata are regarded as more than annotated information informing the user about some actual release-relevant particulars. Here, metadata are put to use as a way to open up the music archive; metadata link to other metadata, which makes for an experiencing of the collection by way of the collection's own consciousness of curation, so to speak. This music archive shows a sensibility towards metadata as well as a sensibility towards the irregular compound of music historical connections that we all assemble in our singular experiences. This attention to, and understanding of, irregularities is traceable in the index card system over the electronic search system *DISØ* from 1978 to MUSA and its interactive representation in /Diskoteket. Historically, the department of the music archive has expanded its music collection and optimised practices of storing and searching continually in relation to the politics of any given managerial decision, but after making some preliminary exercises with the digitizing of selected elements of the archive in the 1990s the department has ever since operated with envisioning possible outcomes for the music archive in a digital setting. My archival sources reveal that the latter part of the 2000s shows an ongoing fascination with the possibilities of a digital music archive that often are disregarded, yet become influential for the decision-making that is carried out. The proposal that I deal with in this article is a recent example of such strategic deliberations that end up having an impact on the current state of the database. Yet, it also contains unfulfilled desires and visions that are worth pondering

on. All archives carry neglected potentials within them that might say something about said archives' current states of affair.

In this section, I have sketched out the basic lines in the history of DR's music archive in order to contextualize the digitization process of the last two decades. In the following section, I will examine the reasons for installing a digital music archive at DR and by analysing interviews and archival documents I trace a growing interest in developing alternative music exploration that lies underneath most of the department of the music archive's work. What substantial initiatives are decided upon, and how could different options for music discovery have been changing DR's music historical discourse?

DMA – lineages of a project for the future

In the mid-1990s, DR began to digitize its music collection on a small scale. At this point several of DR's radio channels dedicated to popular music genres started to have a standardized approach to music selection, which was carried out by incipient automatized music scheduling practices. To some extent, broadcasting turned into a case of linearity, as Mads Krogh (2018: 71) has disclosed, letting prearranged playlists run by themselves. In the following years, DR initiated the development of an upgraded electronic database and search system for music to take over the task from the existing one, DISØ. The upgraded version, MUSA, included more complex and contextualized search retrievals due to an operationalisation of the music metadata in the database. The standardization of music broadcasting and the automatized music scheduling demanded an encompassing subsystem within the search system, hinging it on an automatized reporting system (making sure of payments to artists) and a common standard for connecting datasets crossing the categories of artists, releases, tracks, and compositions. Metadata, understood as all annotated information in relation to a track,⁶ are the nexus of all this and the operationalisation of metadata is key

⁶ For this research, the concept of metadata covers annotated information in several categories, for example information about songwriters, musicians, technicians and similar roles on any given track; information about recording dates and recording locations of any given track; and information about the relationality between different tracks in the history

to a dynamic digital music archive that lets its users discover *with* its data. This is essential for the project *Digitalt musikarkiv i DR* (DMA) [Digital music archive in DR]. The DMA project launched in 2012 as a result of a comprehensive project description handed in in February 2012 that concluded an analysis of the possibilities of implementing a digital music archive in DR (an analysis ordered in May 2010).

When the analysis leading up to the project description is nominated as an investment in technological architecture in May 2010, the main reason for developing a digital music archive is argued to be lack of physical storage space as well as it being “a very big problem that the complete record collection in DR is not accessible” (Anon. 2010: 2). A prerequisite for initiating the analysis leading up to the project description is thus rooted in a logistic outset, which comes as no surprise. The ordering and devising of the analysis is officially done by DR Kultur [DR Culture]⁷, but the interests for this project is double-sided. The formulations of the text are very clear in that a layer of management is striving for optimisation and reduced costs; still, the rhetoric is also tactical and keeping the doors open for pursuing the development of further software solutions later on. Even though DR Kultur formally has formulated the vision behind the reason for developing a digital music archive based on several business strategic arguments concerning availability, music supply and sound quality, the project description puts a lot of freedom into the hands of the developers in imagining an end result, which points to the department of the music archive as being delegated the actualization of the digital music archive. DMA’s steering group⁸, who conducts the analysis and draws up the project description, decides to trail a construction of operationalised metadata and a high level of mobility on the platform to come. One of the goals

of recorded music. This type of metadata is arranged and operationalised in the MUSA database, meaning that the user of /Diskoteket can move around in the digital music archive by way of hyperlinked interrelations. Further, the MUSA database operates with a compositional layer, meaning that tracks are fixated to a certain composition in the database (e.g. an original recording and a cover version are both hinged upon the same composition), which creates interrelations between tracks based on the metadata of songwriter credits.

⁷ In 2019 DR Kultur was broadened as an organisational branch and is now called Kultur, Børn og Unge [Culture, Children and Youths].

⁸ Due to the redacted documents, it is unclear who exactly are a part of the steering group.

of the project stated in the project description of 2012 is to safeguard the future of DMA:

[A criteria for success is] that DMA is open for further development. For example that the system can support the use of new means of production as well as external music services, if juridical or business relations allow so. Or that DMA in an expansion can make external users (license payers and record labels) capable of delivering music to DR for the purpose of an efficiency improvement of music acquisition as well as the establishing of the possibility for user-generated music content (Anon. 2012: 8).

The strategic proposal of creating an infrastructure for a digital music archive adapted to the existing basis of data in MUSA benefits all interests. Viewed from an administrative angle, it is without comparison the cheapest solution to adjust the database, taking advantage of many years of registering music in a highly nuanced and detailed manner, and viewed from the perspective of the department of the music archive it is a success to be able to continue to work with operationalised metadata and create ever more refined search retrievals. In a chapter in the project description describing the background for the project, the strategic arguments, even necessities, for DMA lie in a positioning of DR's music archive against external and commercial services: "... the use of external digital services, such as iTunes, Spotify, Wikipedia and YouTube, is, when it comes to listening, research and information seeking, still getting more central to the employees working with music in DR today" (ibid.: 4). In the same chapter, other strategic arguments are pushed as well: first, the record and CD collection is at this point the only part of the processes of program production not supported by digital workflows, and second, the record industry has begun to deliver phonograms as sound files. These issues are rooted in practicalities and optimisation of workflows, thus they are tangible ways to reduce costs. Still, in my reading of the documents, they are not the driving forces of taking the path of developing a digital music archive at this specific point in time. As the quote alludes to, the latter part of the 2000s sees a surge in improved commercial digital music services as well as ways to obtain music information online, which are having an

impact on DR employees' workflows. Thus, an important part of the basis for DMA, besides optimisation of broadcasting practices, lies in the preservation of the music archive. If the development of music streaming is not addressed, the music archive faces the risk of turning into an excess capacity that ultimately might be discarded.

The nature of data streams seems to be one of confidence, of certainty. Once digitized and stored in vast server systems, everything is right. Ideally speaking, yes, but digitization induces an ontology of what-ifs and uncertainty. As media scholar Wendy Hui Kyong Chun (2008) has pointed out, the programmability of digital data and networked media is bound to a state of constant degeneration due to file compressions and conversions and potential breakdowns that challenge both the conceptuality and the practicality of an archive. Digitization turns the concept of the archive away from concerning knowledge about the past and into concerning knowledge about anticipations and a future we all can partake in. The digital archive is an uncertain archive (cf. Thyldstrup et al.: 2021). Side by side with the development of DMA, “[t]he project should also disclose potential opportunities and, as a result, spin-off consequences by using music sound files from external partners or services such as iTunes and Spotify” (Anon. 2012: 5). There are of course uncertainties in using external services for broadcasting purposes, and these are too big for an institution such as DR. Still, it will be naïve to think that DR will not replace its digital music archive with, for instance, Spotify if it gets to be an option. I base this assumption on two things: first, the fact that the project description explicates the role external services play in the everyday workflow as early as in 2012, and second, the fact that the current head of the department of the music archive, Thomas Dose (2021a), in spring 2021 states that “[w]e are, to a small extent, competing with Spotify – a small extent, because it is not a prospect to replace us with Spotify, but if it *was possible* [my italics] to do so it most definitely would be an option”. The idea of replacing the digital music archive with Spotify is hypothetical, yet, as Dose points to, the likelihood of taking that path would be imminent if possible. A thought-provoking perspective on this issue can be seen in the approach of Sveriges Radio (SR) [Swedish Radio]. SR has taken a different strategic approach to digital music communication and in fact merges with Spotify's business model, which recently has

been dubbed a “Spotification of public service media” by Patrick Burkart and Susanna Leijonhufvud (2019). Swedish policy making and media laws are open to a clouding of the public service obligations, and the merger of SR and Spotify, as Burkart and Leijonhufvud indicate, leads to a lessening of “analog metadata and para texts” (ibid.: 180), ultimately diminishing the archival memory of SR’s gramophone archive. As Leijonhufvud (2018: 132-133) explains, Spotify as a streaming service is unique due to unclear but close ties to Swedish public service. Such a Spotification process has not happened at DR, primarily due to the fact that Spotify is not a Danish company. Further, in § 15 of the Danish radio and TV Act it is explicated that DR is independent from economic, commercial, and political interests and must offer content on technology-neutral premises.⁹¹⁰

/Diskoteket – infrastructures and metadata

The project description of DMA does not picture the digital music platform /Diskoteket as such, but it does accentuate the importance of reimagining the MUSA database and the physical collection as an interface based on user-friendliness entwined with improved and better utilised metadata.¹¹ Further, the project description suggests a high awareness of how the infrastructure behind this digital music platform works and ought to be put together in order to satisfy all needs both practically, economically, and in terms of search retrievals. As a conclusion for the background for the project, three bullet points to develop and implement are highlighted:

9 Cf. *DR’s public service-kontrakt for 2019-2023* [DR’s Public Service Contract for 2019-2023], pp. 1 and 7.

10 It is worth noting that SR undergoes Spotification even though the institution also is subjected to similar pretensions when it comes to independency, cf. *Sändningstillstånd för Sveriges Radio AB 2020-2025* [Permission for Transmission for Swedish Radio 2020-2025], p. 3.

11 Two of seven criteria for success are “to offer easy access and a fast, intuitive and clear user-interface for use for music related production” and to both “improve and take advantage of existing metadata for use of music communication, automatized music related content generation in new media [to come], and [to make a better] general linkage of DR’s music related content”. See: Anon. 2012: 7.

- A digital music archive based on MUSA.
- Technology for digitization-stations to handle phonograms (analogue/digital) as well as scanning covers/booklets.
- Integrations to relevant production and broadcasting systems.¹²

These three bullet points show an alertness in terms of preparing the digital music archive via an infrastructural understanding. In order for the digital music archive to work as intended it is necessary to create certain structures around it beforehand, which is loosely being addressed in the three bullet points. If we look to widen our understanding of how /Diskoteket functions it is worthwhile to consider how the mechanics are ordered and how they branch out underneath the platform. From the above we can see that DMA's steering group has put thought into how the infrastructures of the digital music archive might be setting things in motion in and around the platform. Infrastructure is more than inner workings. Infrastructure goes beyond, thus it is valuable to try to conceptualise what infrastructure actually means in terms of the digital music archive of DR. 'Infrastructural investigation', Kyle Devine and Alexandrine Boudreault-Fournier (2021: 7) write, 'is an intentional invitation to reconsider and rebuild the ways that music comes to sound'. This, I believe, is an invitation to reflect upon, in that infrastructural investigation is a fruitful line of approach that can help in demystifying the digital in a digital music archive. The seemingly intangible quality of an interface to stream and search music from is in fact very material and needs cables, devices, and constructions, just as a large amount of the digital sound files themselves are embedded in physical formats and needs transferring. In fact, the digital music archive of DR keeps its physical counterpart right under the surface. For instance, a release that is digitized from a CD tells the user about this story on the release interface in /Diskoteket, explicating the format from which it came. And that same CD is further kept on its shelf as backup due to the inscribed possibility of deterioration.¹³ So, to search /

¹² Anon. 2012: 5.

¹³ That CD's, as digital media themselves, also are predisposed to degenerate over time,

Diskoteket is to search among shellacs, LP's and CD's as much as among sound files. There seems to have been an awareness of the digital music archive's morphological infrastructure from the beginning, making sure not to discard anything from the previous system of music storing. The digitization of music, as Devine (2019: 135) has pointed out, "does not remove all traces of previous musical practices or media systems. It absorbs them, reconfigures them, magnifies them, and is dependent upon them". Besides an awareness of the infrastructural ecology of the digital music archive itself, the project description of DMA further problematizes how the digital music archive is to connect to the larger infrastructures of DR's broadcasting practices. Two out of three bullet points above indicate as a goal for the entire project how the digital music archive is to branch off into other digital systems for broadcasting as well as physical spaces for scaling up digitization practices. In terms of infrastructural investigation, one can go further than this and put attention to, amongst other things, broader business strategies within DR; Danish media policy; and the entanglement of DR and the music industry. That is not what is at stake in this article, but it is worth to bear in mind that it always is important, if not necessary, to go beyond what lies in front of you in order to make critical engagement.

Dose recalls the incipient development of /Diskoteket in the years 2012-14 to be an exercise in creating a self-explaining system that largely got its inspiration from Google's search logic and Wikipedia's non-hierarchic structure and interconnection of information (cf. Dose 2021a). Based on the project description of DMA, the goal is to create a compromise that links googling with astute music research with music listening. The task was, and still is, to reimagine the physical collection and the MUSA database as an interface – as a certain technique of mediation and interaction, to say it with media philosopher Alexander Galloway's ethics of interfaces (2012) – which is an action that primarily can happen due to metadata. In 2011, the department of the music archive develops a feature so that the public can see playlists for each radio program, and in 2012 the department launches an online product, www.dr.dk/musik, which exhibits some of its metadata. This is going on simultaneously with the work on DMA and the development of

even if kept sealed and in temperature-regulated conditions, is a tough fact of the lives of music collections that no one foresaw during the 1980s and 1990s.

/Diskoteket. Dose explains: “Metadata were the significant argument, and with metadata we went all in. All our metadata had to be refined and activated in new products, both internal and external” (Dose 2021b). The operationalisation of metadata deepens the interface of /Diskoteket to be more than a surface of user-friendliness; the metadata interpenetrate levels of the music archive and let its users form a world with its data (sound files and metadata). The interface is there to interact with, but, as Galloway points out, the interface is also an effect in which immediacy and hypermediacy coexist. He describes the interface effect as “a process or active threshold mediating between two states” (Galloway 2012: 23), and stresses that it “is always a process or a translation” (ibid.: 33). On /Diskoteket, most metadata are imbued with hyperlink qualities, making the interface more than a screen to look at and get information from. There are many interfaces and they all have several options that again leads to other options. On /Diskoteket, we see an interface that is both logical and effective; but we also see interfaces internal to the interface that, if interacted with, destabilise the interface. Folded into the logic of /Diskoteket’s interface are all the potentials that aim to upset the interface. In the idiom of Galloway: the edges of the interface are brought into its centre (cf. ibid.: 39). Viewing the interface as a gateway between two states is also to view the interface as a setting where the inner and the outer have an opportunity to meet, to swap places, to turn into each other, and thereby to constitute each other. The interface thus designates a sensibility of becoming that underscores the concurrent emergence and erasure of a distinction. There is a distinction between the interface of /Diskoteket’s front page and the interface of a given release, but this distinction only exists as the threshold between the two. The distinction between interfaces gets redundant in that the interfaces cover their tracks by pointing to that something, which they lead to.

With the launch of /Diskoteket in 2014, the department of the music archive proves how a strict taxonomy and a high level of standardization creates overview and induces the feeling of flexibility and interoperability. It has been the necessary way to go in order to avoid ending up as redundant, in risk of being closed down, but the quest for flexibility has its backsides. “[L]inked data”, Nanna Bonde Thylstrup (2018: 32) stresses, “demands standards and shared protocols, meaning that flexibility is often achieved

through decomposition, modularization, and black-boxing, allowing some components to remain stable while others are changed without implications for the rest of the system”. That duality of flexibility is true for /Diskoteket, and it is a conscious choice. Dose (2021c) states that “in order to scale up possibilities, to have free options, restrictive initiatives are needed. Flexible data output demands a controlled data input”, and he describes the path of the music archive to be an ideological one that went against the program archives at DR as well as against the archive’s counterparts in the European Broadcasting Union (EBU). Today, the MUSA database, repurposed for /Diskoteket, links data and creates interrelations crossing its primary entities (artists, releases, tracks, and compositions). At the same time, the digital music archive is deeply entrenched in editorial needs at DR and agreements with external right-holders. To a large extent, /Diskoteket has fulfilled the DMA project, but it has gone further in regards to be more than just a search system with an added playback function. The final criterion for success, that “DMA is open for further development’ and directed against ‘users of DMA to come” (Anon. 2012: 8) pushes the department of the music archive forward. The department’s work with software and digital infrastructure is an iterative process that continually review the potentials of ideas and proposals, as a trial-and-error methodology. With /Diskoteket, the approach of the iterative process leads into an incremental design that takes the best features and builds them into the interface. This modality of iterations also goes to include discarded ideas and proposals. In most instances the discarded is not thrown out; instead, it continues to inform the workflow of the department and is integrated as an alternative to the ideas and proposals that are realized. One can only speculate how such proposals for wide-ranging use and operationalization of metadata might have transformed DR’s music communication; what if the Danish public has the opportunity to access the music archive via a digital platform and get introduced to unusual and marginal trajectories in the history of recorded music?

In this section, I have read into the archival documents concerning the digital music archive of DR and I have provided with a widened understanding of why the project was initiated and how it conceptually was carried out. In the following section, I will describe DR DJ as a proposal for alternative music discovery.

Reimagining the music archive through alternative curation

/Diskoteket is first and foremost an editorial tool. The main reason for developing this platform on top of the MUSA database is found in a wish for two things: first, a wish for smoother (and cheaper) music reporting, and second, a wish for an intuitive online search engine with a playback function, making shelf-searching and borrowing of records an action of the past. Coupled with the latter is a wish for a direct connection between */Diskoteket* (and thus the database) and the broadcasting servers, cutting out several middlemen in the process. All in all, */Diskoteket* is about saving money. What is not an initial aim is the incessant refining of linked data and the approach to designing the experience of music discovery. As mentioned, the future of the digital music archive is written into the project description of DMA; it is a criterion that the digital solution is open for further development. But, the recognition and green light for the project in 2012 does not have the high level of interrelated data in mind. As Dose (2021b) stresses: “Not everything we did was necessary. I will say that we went quite a bit further than we were asked. It would have been possible to create a digital music archive capable of doing what we were asked to do without orchestrating all the metadata in the way we did”. Besides working out of sheer passion, the department of the music archive always have the what-if situation of sharing the grid of music information with the public in mind in one way or another. Developing the infrastructure within a public service institution inevitably connects to questions of cultural heritage. The collection itself is of value in terms of cultural heritage, but even more so is the aspect of being capable of communicating the collection to the public. If everything one day gets digitized it can of course, at least idealistically, be communicated and aired, but the overarching logic of music scheduling and automatized playlists limits this prospect. What is needed, Dose (2021a) argues, is an editorial decision to “create content that reaches out to the public”, by which he implies a sort of inclusion or interactive solution that bridges DR’s music archive with DR’s history and makes sure to invite the public into the corners of the collection, into forgotten and unique listening experiences.

In the years 2016 and 2017, the department of the music archive proposes an unconventional approach to music curation that has as its goal to open up the door for the offbeat parts of the collection. This proposal, DR DJ, is an application for mobile devices that hinges playlists and recommendations upon DR-related personalities that have impact on Danish cultural life.



Figure 2. A possible first meeting with DR DJ. Here users are to choose the DR radio channels they prefer in order to be paired with relevant DR-related personalities as playlist curators. Source: Thomas Dose.

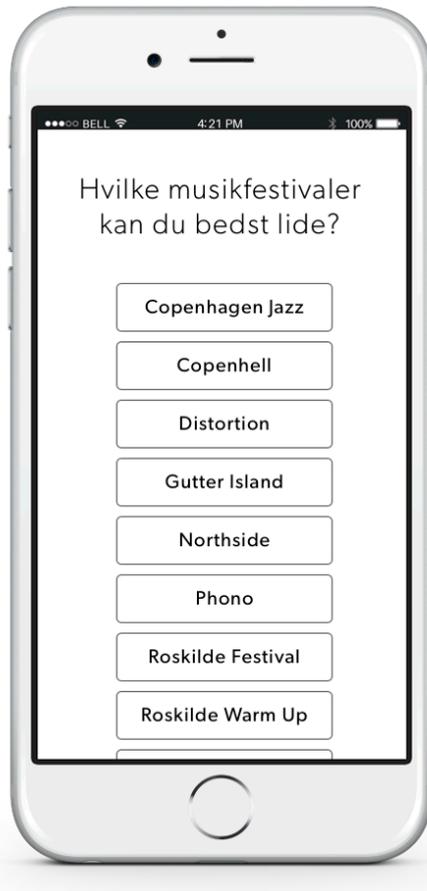


Figure 3. A possible first meeting with DR DJ. Here users are to choose the Danish music festivals they prefer in order to be paired with relevant DR-related personalities as playlist curators. Source: Thomas Dose.

Figures 2 and 3 show two imagined entrance points to the application. As a proposal it goes beyond the initial aims and criteria of the project description of DMA. The idea for DR DJ is nurtured by the department of the music archive as a possible way to regain relevance for DR as an institution when it comes to music communication in contemporary digital times. Perplexity and bewilderment have been occupying the minds of

the chief-editorial layers in DR, for how is it even possible to create anything interesting and effectual when it comes to dealing with music digitally? According to Dose (2021c), it is obvious that DR Medier¹⁴ [DR Media] is disoriented when it comes to music:

It all comes down to the editorial division of executive branches in DR Medier. There is no allocated responsibility for music. DR Medier is organized due to platforms: some are responsible for TV, others for radio. Until recently, there was a branch responsible for all things digital; that is, at least, changed today, so that the radio boss is responsible for radio's publishing on digital platforms.

In his experience, the issue lies in a lack of willingness to embrace the mediality of music today; to some extent, music is a way of artistic communication that crosses media and this needs to be approached somehow for a media institution to uphold relevance. This sort of assessment drives the department of the music archive to develop the framework for DR DJ. As Dose (2021c) explains:

DR DJ is synonymous with the fact that we believe that radio and TV as platforms cannot cover the requirements of the music domain. I mean, what is Spotify? Is it radio or what? In our end it is so obvious that if we want to create some relevant digital solutions for music to offer the public, we need to think substantially beyond radio and TV platforms. And also beyond www.dr.dk/musik as a platform, which has its focus fixed on articles. We *must* [my italics] build something that follows the conditions of contemporary music consumption and music listener behaviour. And this something will inevitably diverge from the traditional platforms, which

¹⁴ DR Medier was the organisation within DR that at the time outlined overall strategies, initiated the developing of projects, and published content. In October 2021, as a result of profound organisational changes, DR Medier was disbanded and DR is henceforth to be organised under the executive director in the following four management areas: Nyheder [News], Økonomi, Teknologi of Medieproduktion [Economy, Technology and Media Production], Bruger, Marked og Publicering [User, Market and Publishing], and Kultur, Børn og Unge [Culture, Children and Youths]. The big change lies in a future for DR that leaves the platform-mentality behind and instead thinks and develops content to be released digitally and cross-media.

more or less sees everything digital as online newspapers. Music should not mainly be embraced with articles.

The idea is not to enter the market with a singular streaming service. That is first of all an illusion, but it is also an impossibility due to battles of copyright and right holders. Public service is not in tune with streaming. As it is today, DR produces online articles with music content that incorporate a linkfire¹⁵ integration, which is too weak a solution to be effective as content creation. These articles often integrate a web player to playback a track or two from the MUSA database as well, but it is a rather clumsy functionality – too many clicks are involved. The concept of DR DJ tries to take hand of these issues by proposing an interfacial infrastructure that stages personalities related to DR as an institution, across platforms, to be the curating links to the music. Conceptually, this application wants to drive a wedge between the two poles of Spotify’s recommendation apparatus that works with mood-based playlists on the one hand and personalised, data-marker based, playlists on the other hand. DR DJ proposes to stage playlists via media personalities that have impact in Danish culture and therefore are somewhat identifiable. Basically, the concept sees an open market share in a different, public service-oriented take on music streaming in which e.g. certain popular TV and radio personalities are positioned as playlist curators with weekly or monthly substitutions of tracks. Playlists and personalities as well as singular tracks can be “favorited” by users and thus saved in one’s personal DR DJ discography, which is an action that via operationalised metadata is meant to open the doors further into the collection. In staging media personalities that already have a huge reach into (certain areas of) the public, DR can target different segments of the population across age and communities. And in order to be able to embrace all age groups, including kids, the vision is to include fictive personalities (e.g. from children’s television series) as well.

¹⁵ Linkfire is a Danish smart link platform made for music marketing that can be used to route users from websites or apps to the specific streaming platform they normally use and subscribe to.

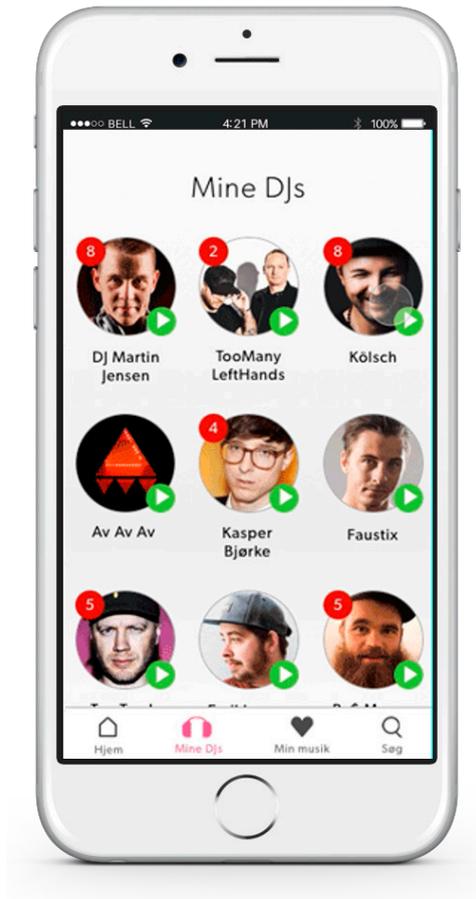


Figure 4. A possible overview of the DR-related personalities a user might have selected as playlist curators. The numbers encircled in red signify news related to the DJ, such as new tracks added to the playlist or newly added motivated descriptions of a given track. Source: Thomas Dose.

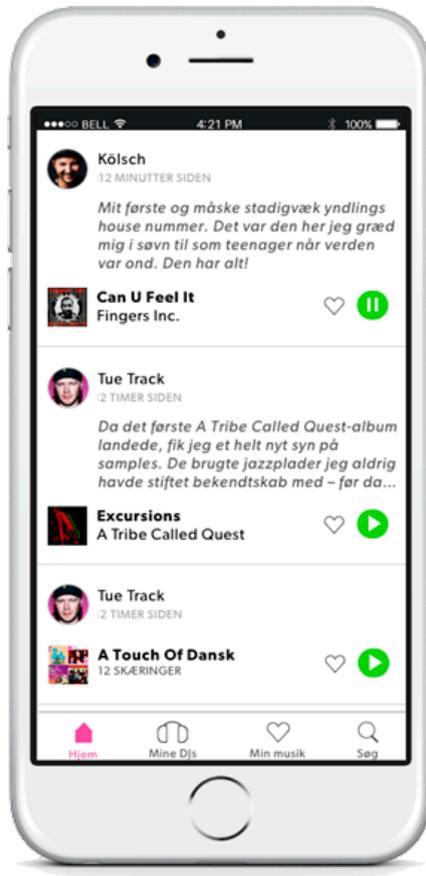


Figure 5. A possible overview of a user's feed. Here, newly added tracks occur with motivated descriptions by the DJ's. For example, Kölsch recommends Can U Feel It by Fingers Inc. and describes the track with a personal statement: "My first, and maybe still my favorite house track. This was the track I cried myself to sleep to as a teenager when the world was cruel. This track has everything!" Source: Thomas Dose.

Figures 4 and 5 imagine how an overview of selected DJ's and a user's feed could look like. By activating the advanced level of metadata and letting these personality-curated playlists be thresholds into the collection and providing users with an opportunity to excavate the history of recorded

music and DR's broadcasting history in tandem, by dynamically navigating through the digital music archive, DR DJ is a way to go against the grain of music scheduling practices as well as archival order in the practices of music communication. DR DJ creates a metaphorical space that through curation places the primary entities of the database (artists, releases, tracks, compositions) side by side and provides the user with the opportunity to experience the same music and music information in different ways through time. The experience, as time, is motion and thus becomes different from itself in time. DR DJ consists of dynamic processes in which each moment is different from the previous one and the one to come.

This proposal is a reimagining of the music archive and the narratives it can be capable of communicating. It further aims at repurposing the very reason for having a music archive at an institution such as DR. But the proposal is not realized. It is rejected with a reference to financial argumentation, in that the opposition between copyright and a public service institution as delivering interfacial access to music appears to be insolvable. For that reason it is explicated in the proposal that the application should function as a gateway to be coupled with either a linkfire integration or a similar solution, or that the application's infrastructure should make it possible to "access the database in order to play thirty seconds snippets of tracks" (Dose 2022). So far, these pitches for solving the issues of copyright have been fruitless. Interestingly, the management committee of DR Medier, based on comprehensive user surveys conducted by *DR Medieforskning* [DR Audience Research Department] in 2017,¹⁶ actually has commissioned the developing of a digital solution that exceeds DR DJ, which is simply called *Digitalt musikunivers* [Digital music universe]. But so far this commissioning has not been acted on. It is worth noting that DR Medier

¹⁶ In DR Medieforskning's yearly report on the Danish use of electronic media from 2019, these user surveys are assessed in the article *En ny generations musikopdagelse* [A new generation's music discovery], which concludes how convenience is a primary factor for people under 25. This goes together with a focus on user-friendliness in the design of streaming services. Another conclusion is that people under 25 do not necessarily regard newly released music as new; for them, everything they stumble upon in any contextualized digital setting (recommendations, social media, gaming) is new music. This means that music discoveries potentially span decades of recorded music's history. See, Niegel and Kidde 2019: 20-23.

is disbanded in October 2021 (see footnote 39), which now makes for a focus on content to cross media and be released digitally. Perhaps DR DJ would not have suffered the same fate if the proposal had been made today. Who knows? It is, at least in my estimation, a digital solution that will cross media and fulfil the public service obligations by offering many types of incisions into music cultures and music history.

In this section, I have illuminated the limited sources on DR DJ as a proposal for alternative music discovery developed by the department of the music archive in the years 2016-2017. I have described the basic ideas for the proposal's functioning and discussed how it might challenge the status quo of DR's approach to music curation and communication. In the following and final section, I will introduce Zielinski's concept of variantology in order to explore the proposal's capacities to create differences and deviations in the canon of recorded music, and I will envision a speculative scenario that pictures DR DJ as being approved and generating a modified media history of DR with consequences for the institution's music historical discourse.

Imaginary media

– to understand what is there by what is not

With his concept of variantology Zielinski (2006) develops a methodology for how to examine and conceptualise media and machines that never came into being. In exploring media that ultimately are imaginary, Zielinski is challenging the categorisation of what counts as media. He argues that analysis of impossible machines lets us dodge the danger of chronology, or of a "first" that defines how we are nearing what follows. Zielinski thus wants us to be aware of unarticulated media histories, and ultimately of alternative approaches to the writing of history. The intention of variantology as praxis is to be found in a nonlinear description of the development of media that interconnects different historical settings. Variantology of media is to look for ignored constellations in the flow of history, and it is to let one to be able to "discover individual variations" of media (ibid.: 7). With the clear mission of going against the grain of media history, Zielinski wants us to enter a condition of wondering about fantasies

of imaginary media and of speculating on the alternative deep time strata within our media culture. For him, the goal is neither to continue the Foucauldian path of doing archaeology in order to excavate conditions of existence, nor to make genealogical considerations of the developments of media. Instead, Zielinski is interested in alternative temporalities that do not necessarily see changes as improvements always striving forward. He focuses on doing an *an-archaeology* of media that should form the variantology of media. The methodology of an an-archaeology of media celebrates diversity and potentiality:

The goal is to uncover dynamic moments in the media-archaeological record that abound and revel in heterogeneity and, in this way, to enter into a relationship of tension with various present-day moments, relativize them, and render them more decisive (ibid.: 11).

One of Zielinski's aims is to widen our understanding of what media in fact are, of what counts as media. Are media necessarily defined by evolution and continuous remediation? No, he says. Instead we should discard the very idea of beginnings; why (and how) do media start? Should we always try and find the past in the present? Zielinski is more interested in doing it all the opposite way – “do not seek the old in the new, but find something new in the old” (ibid.: 3). According to Zielinski it is all about time. All media are time media (cf. ibid.: 31). He grounds this view on George Bataille's general economy and Karl Marx's analysis of wealth as disposable time. All media reproduce existing worlds and/or create new artificial ones. It is meaningless to believe that one can do studies that encompass entire processes of developments or embrace all possible directions for development. Therefore, Zielinski includes an epistemological time-understanding that he coins *deep time*. To think of deep time is to reimagine the media and keep in mind what the medium in question is, what it has been, what it will become, and what it could have been. Therefore, to think of deep time leads to the process of variantology. Zielinski believes it is a necessity to approach media with a paleontological time wherein all sorts of connections can be made and create the foundation for historical explanation. Zielinski's project is a far-ranging cultural history

of media that assesses possibilities, both realized and imaginary, and in his thinking he keeps the unrealized possibilities of imaginary media in the driver's seat in order to meditate on what time and knowledge are.

DR DJ as imaginary media

If we make a specific observation of DR DJ through the lens of imaginary media we encounter the virtual (or the not-yet-actualized) state of this application scattered around the current functionalities of /Diskoteket. Just as important, the application's alternative approach to music curation informs elements in the everyday workflow of the department of the music archive. The sophistication of interrelated metadata that makes for an accumulation of information to cross the primary entities of the database is to an extent the result of the conceptual development of DR DJ. The hyperlinked metadata create a vibrant interface that fertilises /Diskoteket with non-actualized capacities that are fully real in their potentialities. /Diskoteket accentuates infrastructural workings meant for DR DJ, both in terms of user interface and in terms of repeated actions of the music registrars. Understood as an imaginary medium, DR DJ constitutes /Diskoteket, just as /Diskoteket constitutes DR DJ, and as such DR DJ is very much a part of the material practices of /Diskoteket. The department continues to implement elements that were to be the driving forces of the deserted concept of DR DJ, which works as a critique of the visions and choices put forth by the institutional structure of DR. The digital music archive, evolving from the project of DMA, is a result of an institutional force field that strives for optimisation and standardization, but its current manifestation is as much a result of dissatisfaction with the institutional line of the chief-editorial layers. DR DJ offers a glimpse into a what-if situation of Danish music media culture, in which DR stretches its music archive into a continuum of a broadcasting-supporting role and a record collection reimagined. But, what if the what-if situation is actualized? As a service, DR DJ employs contemporary digital solutions in order to engage with alternative histories of recorded music. It stands out due to a public service purpose of accentuating alternative storylines and reimagining DR's music archive for times of convenience and user-friendliness. It finds something new in the old, it repurposes the

epistemology of the music archive. It wants to tell the lost stories hidden on dusty shelves, and it wants to shed light on marginal histories of the collection to be constructed via a metadata frame.

What if DR DJ is realized?

A DR personality releases a monthly playlist. It is quite eclectic. Still, it is dominated by Western ideas of genre. There are many hip-hop tracks on the playlist, American hip-hop from black communities. These tracks fall side by side with pop music from an array of geographies, all Western. The hip-hop tracks oppose the racial tendentiousness of the pop music, diversifying the overall impression of the curation. Even though the playlist appears racially representative in embracing diasporic communities it is still biased by a Western frame. It underrepresents other geographies in terms of song writing and production. Here, the metadata-structure kicks in by activating interrelations in the music archive that might tell the stories differently. One month, the DR personality adds a track by American rapper Nas called *Adam and Eve* (2018). This track is interesting in that its production revolves around a recurring piano sample from a track called *Gole Yakh* (1974) by Iranian progressive rock musician Kourosh Yaghmaei. Here is a different story to be told that springs from a diasporic yet Western outset. The application presents a playlist, that's it. However, the interactive functionalities are structured in such a way so the user can take off in curation and evolve the experience of discovery by cutting through the archive, make different trajectories and get a grip of how the history of recorded music to an extent is nonconforming when it comes to chronologies and cultural dispersion.

But, there is another side to the application's functionalities. In following the line from Nas to Kourosh Yaghmaei the user sees the Western anchoring of the music archive beneath the application. *Gole Yakh* is the only music in the archive by Kourosh Yaghmaei, revealing that both track and artist have been added due to the connection to Nas' track. The geographical and cultural diversity is thus forced from a Western frame and it is constrained to a minimum. The application shows two sides to the epistemology of interrelations. On the one hand, interrelations make ven-

tures in different and sometimes surprising directions and they palpably show how recorded music consists of dynamic multiplicities that resist the straightjacket of chronological ordering as being the only reasonable way of understanding its history. Furthermore, the interrelations develop different cartographies in terms of understanding from where music comes and how it moves and flows. In the production of *Adam and Eve*, Iran and the Middle East are just as defining hubs for contextualizing the music as the US and North America are. The interrelations argue that time and location are not to be perceived as fixed categories. On the other hand, interrelations make it possible to hone in on limitations and narrow presentation. Music by and information about Kouros Yaghmaei is clearly only present due to other logics, due to Nas' track and the wish for highlighting all elements of this. Diversity appears forced and untruthful and it in fact strengthens the Western bias of the music archive. The interrelations not only work to tell versatile histories of recorded music, they also tell an unattractive history of DR's music media. And the interrelations themselves are a symptom of this; ordained as an intent for openness and equality they actually end up pointing more back at the Western origins than opening up paths for new and different knowledge. That is the interrelations' backside, but it is an important and valuable backside.

The playlist by the DR personality empowers the user to take a step outside its curated confinement. To take a step into an African diaspora and further into an Iranian past of pre-revolutionary progressive rock music. The user is situated in the enlightening trajectories of the interrelations and the user experiences the music by way of these. Many paths can be taken, always. One is always centred, moving from the middle and out. And when the interrelations point out that they are reaffirming Western modalities the user can experience the music by way of that. The interrelations are flawed and they always will be, but the application, in providing direct interaction with them, offers a platform where the interrelations function as critique of the biased rootedness of the music archive. The application teaches its users that perspectives are many and that it is ok to go with one as long as the others are recognized. DR DJ epitomizes public service; if one accesses the playlist just for listening and appreciating the curation, it is pure entertainment, but if one takes the invitation to start the investigation in the middle and follow

the shoots of the interrelations, it is public education in terms of diversity and cultural awareness as well as critical thinking.

Concluding remarks

As an offer of music content DR DJ actualizes an eclectic experience by providing a platform for exhibiting and activating interrelated metadata that are curated within a frame of a DR personality but are free to be explored and put together as a user sees fit. The proposal for DR DJ should be seen as an organic movement in the digitization-process of DR's music archive, in which metadata have been set to use as operationalised meta-sources for music curation. Instead it is deemed as an unnecessary construction obfuscating the managerial strategies for keeping listeners fixed via strengthened music scheduling emulating the algorithmic playlist-logic of streaming services, YouTube, and commercial radio channels. In terms of public service, this is a dilemma; DR of course needs a certain market share in order to stay relevant and eligible to receive funding, but DR also needs to challenge the public and go in multiple, and different, directions. As stated in the existing public service contract (2018: 1):

DR must focus on content that is not offered by commercial providers. Therefore, DR is not to broadcast everything to everyone. In terms of content and distribution, DR must not compete with private actors in situations where this does not serve a clear public service purpose.

Such an explicit formulation questions the premises for the decisions of management. This is not a new critique; for nearly thirty years, with the advent of music scheduling practices, many voices within the cultural scene and across the political spectrum in Denmark have warned against standardization on the popular music radio channels P3 and P4. If actualized, DR DJ might have been an attempt to follow through on the above-mentioned aim of the public service contract at the same time as it would have placed DR's music communication within an ongoing trend globally – no one can deny that mobile music streaming platforms conduct today's music consumption.

Thus, it is of importance to engage in an ongoing reassessment of DR's conduits of music communication, and to reflect on the variations of DR's music media is such an action. To do a variantology of media is for Zielinski to defy the hegemonic forces that create a homogenous standardization in the ways media are practised and discoursed, and as such a variantology of DR's music archive challenges the inherent capitalist mechanisms of all media culture. Entertainment is important, also for DR, but entertainment does not need to be in opposition to categorical qualities such as difference and experimentation. To regard DR DJ as imaginary media, as a virtual capacity of DR's actual music communication, can help us to imagine DR's music archive differently. In fact, viewing the proposal as imaginary media will inadvertently force us to think DR's music communication as such differently. Variantology is a methodological tool that can help us in shifting focus on multiple levels, from the specific, that a track in the archive might have indirect connections to other tracks in the archive, over the ungraspable, that a track in the archive points to tracks and/or occurrences outside the archive, to the political, that a track in the archive might be present at the expense of other tracks. Zielinski wants to change our geographic attention from North to South and from West to East, and thus make us rewrite media history in order to rewrite history, and I think this cue of the variantological method is important to bear in mind when speculating on alternative directions for DR's music archive.

As I have uncovered in this article, the project description of DMA tells the story of a layer of management at DR that wishes to speed up the process of digitizing the music archive for reasons of optimisation. The formulations of the project description are quite open and underline a necessity for creating a digital solution that can be developed continuously. What I also disclose in the article is the fact that the management has an unyielding idea of the purpose of DR's music archive. The department of the music archive proposes DR DJ as an alternative proposition for music curation that directly involves the music archive in DR's communication of music. The editorial refusal of this proposal shows that there is an internal dispute about what the role of the music archive is today. The management wants to uphold the status quo and keep the digital system open to further optimisation of workflows, whereas the department of the music archive wants to create content

directly from the metadata-structure and involve the archive in music communication via new media formats. The forces of management clearly subdue the department of the music archive, but in this department's work we find indirect forces insisting that the music archive progresses heterogeneously and can be reimagined historically.

The history of recorded music is nonlinear and should be understood non-chronologically. Within an event, other non-actualized events are slumbering, and we need to remember that. Any communicative uttering about recorded music is always only one situated perspective that takes part of a wider mapping of music and media, and if we are not actively shedding light on music's multiple times and geographies we are not trying to make a better world than the existing one. Music has democratising potential, but without full and unlimited access to music's potentials of change the democratisation is impeded and might work in the opposite direction. How sad it is if music qua strategies of communicative outlets gets undemocratic. Histories of recorded music, just as histories of media, ought to avoid the linear logic and the "hegemony of the new" (Parikka 2012: 11). This is where the variantology of Zielinski is helpful. By scrutinising the alternative deep times, the paleontological times, it is possible to bring out the forgotten or the oppressed trajectories in the history of recorded music. And, to develop such speculative scenarios widens the actual music communicative outlets and infuses them with critical reflection. When I verbalise the proposal of DR DJ as imaginary media, I warn against what is actually at hand within DR's music archive and the institution's linear logic to music communicative strategies, but I also accentuate that DR's music archive possesses capabilities and willingness to carve out other paths in the archival field that can connect things differently and yet again connect things differently in infinitum. With that in mind, today's somewhat narrow approach to music communication at DR gets easier to accept. The history of recorded music is cyclical and pervaded by diversity – to think otherwise is an appropriation of both music and media technologies. Variantology potentiates the deep times and the loose geography of recorded music, which connect to alternative futures for recorded music and how it might be communicated and experienced.

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Abstract

This article reads the digital music archive of the Danish Broadcasting Corporation (DR) through an imaginary media frame. By looking into archival documents and analysing interviews, the article dissects the reasons for developing a digital music archive at DR and it juxtaposes the strategic decisions with a technological opt-out in the developing of digital solutions for music exploration. The article delves into a not-approved proposal for music discovery, which it assesses as imaginary media driving the digital music archive forward. Stating that the proposal as imaginary media possesses a full reality in itself, the article argues that this proposal acts as a body of critique aimed at DR's management. The proposal might not be there, but it does co-constitute the digital music archive and open up for alternative, non-linear, and marginal lines in the history of recorded music.

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