

Jimi Jones, Marek Jancovic, *The Future of Memory: A History of Lossless Format Standards in the Moving Image Archive*, ISBN: 978-0-252-08875-9 (softcover), University of Illinois Press, Champaign, Illinois 2025, pp. 199

In the first two pages of *The Future of Memory...*, we learn that the best way to provoke a roomful of media preservationists is to promote the use of a lesser-known file format for a large-scale digitization project. Like many professions involving highly technical skills and knowledge that members of the general public will never contemplate, annual conferences for specialists in digitization and digital preservation are opportunities to debate arcane technical questions with a fiery passion. Jimi Jones and Marek Jancovic recount just such an event: a presentation by Hermann Lewetz at the 2010 International Association of Sound and Audiovisual Archives (IASA) and Association of Sound and Moving Image Archivists (AMIA) joint conference. The presentation was titled “Video Digitization at the Austrian Mediathek” and outlined the selection of the FFV1 codec as part of a broader digitization workflow he was developing for an estimated 2,000 video recordings preserved at this European institution, which has a mandate to ensure the long-term accessibility of its collection to the public. Based on the published proceedings of the conference¹, the discussion of FFV1 constituted only a small part of the presentation. However, as recounted in *The Future of Memory...*, this seemingly minor point nevertheless provoked a hostile reaction from defenders of the JPEG 2000 standard, which at the time was considered the only appropriate preservation format for moving images and had been endorsed by powerful institutions such as the Library of Congress. There is a risk to opening an academic book with an anecdotal event like a heated response to a conference

¹ H. Lewetz, *Video Digitization at the Austrian Mediathek*, “IASA Journal” 2011, no. 36, pp. 25–33, <https://www.iasa-web.org/iasa-journal-no-36-january-2011> [access: 28.05.2026].

presentation: was this debate truly significant, or just a minor disagreement? However, Jones and Jancovic make a compelling case for the value of investigating the very human stories behind the development of two groups of paired encoding and container formats for moving image preservation: JPEG 2000 and Material Exchange Format (MXF) and FFV1 and Matroska (MKV). These pairs of formats are contrasted for their divergent origin stories and communities of practice: JPEG 2000 and MXF had the support of industry and large-scale heritage institutions and were developed within formalized standardization frameworks that took years of effort, whereas FFV1 and MKV had grassroots origins in open-source developers and archivists and seemingly gained institutional legitimacy overnight. While complex technical documents like file format standards imply a cold, hard neutrality, Jones and Jancovic reveal them to be anything but. Rather, they are shifting sites of negotiation: between the values of their developers and champions across a variety of sectors both nonprofit and for-profit; the technical affordances that manifest these values as a set of possible actions, each with real-world consequences for the materials being cared for; and the archival resources available to face the huge, almost incomprehensible demand of preserving past media for an unknowable future.

Jones and Jancovic come to their topic with considerable experience. Jones currently works as Manager, Gift Documentation at the University of Illinois Foundation and as an adjunct lecturer in the university's School of Information Sciences. *The Future of Memory...* is based on his doctoral dissertation, which was completed in 2019. He has also had a long career in archives and in the film industry, including three years working on an MXF application specification for the Library of Congress. Jancovic has previously produced several documentary films and is now Assistant Professor of Media Studies at the Vrije Universiteit Amsterdam. His 2020 doctoral dissertation was published as the book *A Media Epigraphy of Video Compression: Reading Traces of Decay* (2023)². The two met when Jones gave a lecture on his dissertation research at the Eye Film Museum in Amsterdam and they realized their mutual interests could be joined by co-writing a book.

² M. Jancovic, *A Media Epigraphy of Video Compression: Reading Traces of Decay*, Cham 2023, <https://doi.org/10.1007/978-3-031-33215-9> [access: 28.05.2026].

Chapter 1 focuses on the meaning and importance of “lossless compression” in digital preservation, especially its material and social aspects, and acts as the spot for media studies-oriented theorization in the book. “Losslessness” is a relatively new quality desired of digital audiovisual archives in a manner that was previously not expected of analogue relatives: that digital materials should be maintained into the future without decay. Furthermore, many digitization efforts now seek to capture the highest possible fidelity from analogue source media. Lossless compression is a compromise between lossless uncompressed files, which quickly become enormous, and “lossy” compressed files that permanently remove image data to enable smaller file sizes for access purposes, such as online streaming or easy file transfer. Lossless compression promises to be reversible in a similar manner as ZIP files, enabling the reperformance of files with perfect fidelity to an uncompressed original, but resulting in smaller file sizes when “at rest” for more economical, and less wasteful, data storage from both a cost and environmental standpoint. Paired container formats also offer richer metadata options to store important technical details about the files, such as checksums for each image frame in a video. But to embrace lossless compression, the archivist must trust the compression algorithm and the suitability of the codec for the materials at hand, leading to debates about the best format to achieve this balance. If archives had infinite storage and technical resources for uncompressed files (not to mention the human resources to oversee them), lossless compression would not be a matter of concern. This shift, from accepting decay as a natural part of archives, to the theoretical insistence on complete fidelity and perfect fixity established through checksums, is both new and undertheorized in archival studies. As the authors note, “the institutional notion of »loss« as something that can be verified on the level of the bitstream rather than as something within human sensory reach represents a significant epistemic break in media preservation” (p. 60). It also has resulted in new sets of skills required of archivists and deeper collaboration with technical specialists that Jones and Jancovic note are also understudied as the profession shifts towards mixing traditional analogue and relatively new digital methods of preservation and access within the same institution. Jones and Jancovic conclude that decay in the archive has not been conquered but simply transmuted to other forms: “lossless workflows [produce] many new types of loss” in the myriad ways in which technologies fail and require constant maintenance and monitoring (p. 46).

It is important to note that this book is exactly what it says on the label: this is a *history* of a decade of discussion, experimentation, and adoption in relation

to these file formats, rather than a guide or set of recommended practices. That said, the authors provide clear and readable explanations of many complex technical topics in audiovisual preservation and digital preservation generally that will be helpful for anyone looking for an introduction to the field. While they have made efforts to integrate more recent changes, such as the Library of Congress' major shift in 2023, when it embraced FFV1 and MKV as a "preferred format" in its Recommended Formats Statement (RFS), the book takes as its core a series of interviews with 32 practitioners and technical experts mainly conducted in 2017 and 2018. The interviews appear to have primarily informed Chapters 2 and 3 of the book, which review the respective development and adoption of JPEG 2000 and MXF and FFV1 and Matroska. These chapters illustrate the stark differences in their creation stories, with the former group's origins in American broadcast and cinema industries and well-established memory institutions and formalization via authorized modes for standards development like the International Organization for Standardization (ISO), and the latter's fascinating emergence from the ethos of open-source and the process of their legitimization for institutional purposes. Chapter 3 is especially interesting for its discussion of the origins of the MKV container format in both activist political critique and online video piracy, and the ways in which archivists and technical specialists have gradually embraced more open, collaborative methods for standards development through the example of CELLAR (Codec Encoding for LossLess Archiving and Realtime transmission), a working group hosted by the Internet Engineering Task Force (IETF) that has developed specifications for FFV1 and MKV for preservation purposes.

The final chapter, titled "Standards at Work", discusses some of the nuances of their research across three subtopics as both a conclusion and prompt for further study. The first section challenges the false association between the open-source and nonprofit sectors, as for-profit actors increasingly influence and contribute to open-source tool development and adoption and public institutions undertake partnerships with for-profit companies to lower their costs. It is here where they "bury the lede" that YouTube makes use of a version of the Matroska container for its massive video library. The second section discusses some of the resource constraints archives face, though the conclusions lack weight. The final section provides a brief set of observations about the underrepresentation of women in the field of standards development, and the inequities surrounding standards adoption outside of relatively well-resourced heritage institutions

in North America and Europe. Although each of these issues is significant, their combination makes this chapter less tightly focused than the others. The perspectives contributed by two practitioners from Nigeria and Ghana are particularly insightful, yet they are positioned mainly as a counterweight to the study's primary focus on practitioners in the United States and Europe. Indeed, the audiovisual preservation practices found in countries across Africa, South America, or the Middle East could themselves form the basis of a compelling and substantial set of studies.

The structure of the book, with its divided focus on the two pairs of file format standards, and the implication that interviewees belong to one camp or the other, gives the impression that institutions take an exclusive approach to choosing JPEG 2000/MXF or FFV1/MKV. Of the 32 interviewees, 17 are quoted more than once, privileging a smaller selection of individuals for their specific allegiances or opinions. It is true that the devotion to one format pair has often meant heavy personal investment for those involved in the development and adoption of these standards. JPEG 2000 in particular requires investment in high-capacity computing hardware and costly software. But the choice between them is called for when designing workflows for large-scale digitization projects of like materials, not necessarily in day-to-day practice where practitioners may end up embracing both options for different contexts and needs. For example, the material differences between born-digital files received directly from broadcasters or filmmakers and files created by digitizing videotapes or film can really be the key determiner of a target format choice, a difference which tends to be glossed over in the book. Despite the fact that each set of formats can theoretically be used for a range of origin sources or content types, practice tends to prefer lossless compression options for digitization rather than born-digital files, which can be received in a wide variety of formats and states depending on the collecting mandate and policies of the institution and the types of donors or depositors in its orbit. Similarly, institutions considering the needs of their "designated community" of users are also called by the Open Archival Information System (OAIS) standard to make format decisions based on preferred modalities for access, another giant standard in the field that is curiously not mentioned in the book at all. During my own brief experience with FFV1/MKV, I encountered a similar set of considerations. From 2016 to 2022, I served as Digital Preservation Librarian at Scholars Portal, a unit that offers shared digital services to academic libraries and archives in the province

of Ontario, Canada. With my colleagues, we supported hosted instances of the open-source digital preservation workflow application Archivematica as part of a service called Permafrost. Several participating institutions were ready with both digitized and born-digital video for ingest into Archivematica. Their born-digital source files were usually already compressed in formats like AVI, MPEG, or MOV. At the time, Archivematica's file format conversion rules transcoded a copy of these videos into FFV1 for preservation purposes, and the result was enormous files placed into preservation packages that then impacted system performance and vastly increased storage costs without adding much value. It came as a relief in 2019, when, following consultation with its user community, the staff at Artefactual Systems decided to disable the conversion rules in its next upgrade, which encouraged practitioners to decide to apply these rules in specific circumstances when transcoding would be helpful, rather than automatically relying on a single approach for all incoming files. A key part of their rationale was that files in standard codecs and wrappers like MOV and AVI were found to be less of a preservation risk than was previously assumed and could reasonably be considered safe for future conversion if required³. The discussion that surrounded this decision was yet another example of the social nature of the digital archival endeavour, as a network of practitioners came together in venues such as a regular Archivematica users' meeting and online forum to discuss the pros and cons of the change. While institutions may still prefer to narrow the scope of formats they are called to manage by transcoding their entire holdings to one codec-container pair of the two, the archival reality is likely to be much more fluid. But this is precisely the point of *The Future of Memory...*, which acts almost as a kind of ethnographic snapshot of a profession amid a remarkable transition to collaboratively tackling highly complex technical challenges in digital preservation. As Jones and Jancovic write: "Archival practice is forever a bricolage, always in a preliminary state. Many solutions to problems are permanently provisional. Yet this is, we would argue, not a flaw in the system nor a weakness. It is from this instability, from the hybridity and messiness of doing, from the interferences and errors, from the complicated politics archivists must navigate, that new things emerge" (p. 68). Despite all the work of anticipating the needs of the future, whether that

³ Github, Problem: The Default Preservation Normalization Rule for Video Files Results in Very Large Preservation Masters, <https://github.com/archivematica/Issues/issues/912> [access: 28.05.2026].

future is tomorrow's researcher or one a century away, the work of archivists is always grounded in the flesh-and-blood challenges of the present.

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