

H O W

t o

Archiving, preserving, conserving, documenting...
Knowing the difference changes everything

Will your work survive despite the
technology it was made with?

• a r C H i v e

From bit rot to obsolete formats:
how do you keep your digital files alive?

Storage is just the beginning.
Here's what comes next

• y o u r
d i G i t a l a r t
& C u l t u r e

written by
Gaby Wijers

Network archives design and digital Culture

Design archives provide insight into the social context of design, the position of designers, the development of their work, and new applications for techniques or materials. In short, archives provide access to the past and contain knowledge for the future. But in order to do so, they have to be preserved and accessible.

There are several organisations in the Netherlands that manage design heritage, and in 2021 they united as the Network Archives Design and Digital Culture (NADD). The network shares knowledge around archiving and makes visible existing design archives, with work being done on digital infrastructure to ensure scattered archives are centrally accessible. Through its *Seeking Shelter* programme, the network also draws attention to managing and preserving at-risk design archives.

NADD consists of more than 80 partners including designers, design experts, professional organisations, educational institutions, and heritage institutions of all sizes that manage archives.

AN INTRODUCTION

Archiving and preserving digital art and culture is urgent. The rapid technological developments of the past decades have made sustainable digital file management (e.g., keeping your files alive and your practice future-proof) one of the most pressing challenges for artists and institutions working with digital media today.

You're probably already aware of this. Maybe you've taken first steps, built some practices, made some choices. But how deep have you gone?

Before going further, a few words we will use throughout this guide – and why they're not interchangeable. **ARCHIVING** is about long-term storage and accessibility. It's how we know our digital history. **PRESERVATION** of media art focuses on non-invasive, long-term strategies to ensure it remains accessible and usable. It involves planning, resource allocation, and application of preservation methods and technologies. **CONSERVATION** involves active, hands-on intervention, such as migrating formats, repairing hardware, or updating code, to stabilise and ensure the artwork functions correctly despite technological obsolescence. **DOCUMENTATION** is what makes both possible. Without it, context is lost forever.

Archiving and preservation have a lot in common, starting with the need for storage. That's why this edition of *How to Archive Better* is dedicated to exactly that.

Here's the reality: most artists and institutions don't build their own storage facility. Outsourcing is far more common, and for good reason. It's more cost-effective, practical and scalable, whether you're an independent artist, a festival, a gallery or a museum.

But outsourcing only works when you know what you're asking for. This guide empowers you to set up or take control of your outsourced storage, with the vocabulary, knowledge and confidence to make informed decisions and negotiate them well.

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i v e

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Here's what comes next



u r
L a r t
t u r e



HOW MUCH WILL YOUR ARCHIVE GROW?

Estimating your storage needs five years from now starts with looking back. Answer these questions to build your growth projection:

ABOUT YOUR CURRENT PRODUCTION OR ACQUISITION PACE

- How many items, files or artworks have you made, or acquired in the past year? And the year before?
- Is that number growing, stable or shrinking?

ABOUT THE FORMATS YOU RECEIVE

- What formats do you most commonly make, or receive from artists?
- Are those formats getting larger over time (e.g. moving from SD to HD to 4K)?
- Do you digitise analogue materials? If so, at what rate?

ABOUT YOUR KNOWLEDGE AND RESOURCES

- Do you have in-house expertise on digitisation and file formats, or do you rely on external support?
- Who in your organisation is responsible for tracking collection growth?

ABOUT THE FUTURE

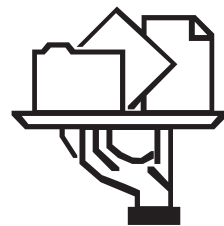
- Do you expect your production or acquisition pace to change in the next five years?
- Are there backlogs of undigitised or undocumented work that still need to be processed?

Your answers won't give you an exact number, but they will give you an honest estimate. And an honest estimate is what you need before any conversation with a storage partner.

steps

Digital art faces three real threats: technological obsolescence, file format obsolescence and digital degradation. They are already affecting works made as recently as five years ago. But they are not inevitable. With the right knowledge, you can spot them early, understand what's at stake and take steps to protect your work without needing to be a technical expert.

This guide walks you through five clear steps, explored more in depth in the chapters that follow:



1.

MAP WHAT YOU HAVE

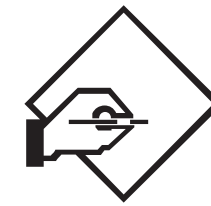
An inventory of your work is your foundation.



2.

BEFRIEND THE LANGUAGE

Understand key digital preservation standards and tools.



3.

CHOOSE YOUR STRATEGY

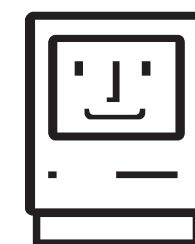
Pick from existing frameworks that fit your context.



4.

WHERE DOES IT ACTUALLY LIVE?

Cloud, server, hard drive or someone else's problem. It's time to decide.

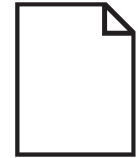


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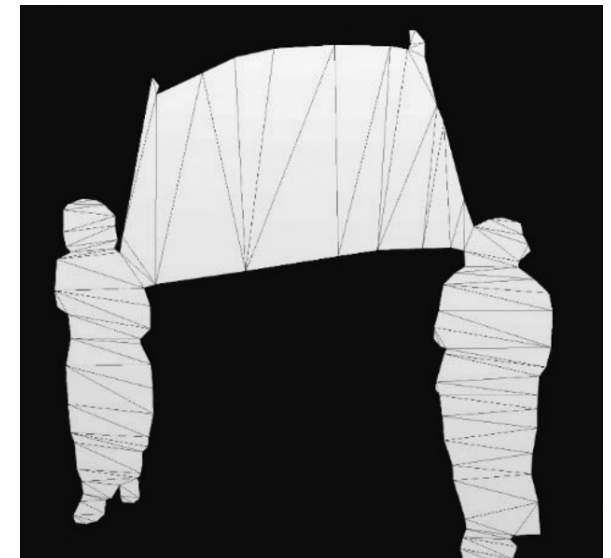
KEEP IT GOING

Decide how you'll keep your work safe and accessible, now and in the future.

case study



JUSTIN ZIJLSTRA,
100 JAAR VROUWENKIESRECHT
(2018-2019, collection ATRIA)



When LI-MA began documenting this VR artwork, the available materials were extensive: a video interview with the artist, a written artistic statement, a 360° video export, an audio transcript, archival source material, and a completed artwork documentation tool.

But documentation alone wasn't enough. The work relied on specific hardware and software that risked becoming obsolete. The recommended strategy was to migrate to open standards, creating a version independent of the original hardware, while storing both the original and migrated versions alongside all setup documentation.

This case shows that mapping what you have is only the first step. Understanding what those files depend on, and for how long, is what determines whether the work survives.

Dive deeper into the preservation strategies for VR art works and read the practical research based on Justin Zijlstra's work [here](#).



THE BITLIST: How Endangered Is Your Archive?

Published by the Digital Preservation Coalition, the Global List of Digitally Endangered Species – known as the Bitlist – maps the specific risks of storing digital content on portable media. Think of it as a red list for digital heritage: a practical tool for understanding how urgently your carriers and formats need attention.

RELEVANT CATEGORIES FOR DIGITAL ART AND CULTURE:



PRACTICALLY EXTINCT



- Adobe Flash animations and interactive applets



CRITICALLY ENDANGERED



- Community-generated content in arts and heritage
- Digital archives of community groups
- Exhibition content
- Legacy research web collections
- Media Art (legacy, deceased artists, defunct workshops)



ENDANGERED



- Oral histories
- Legacy video files
- Orphaned works

Do parts of your archive appear on this list?

Visit the [Global 'Bit List' of Endangered Digital Materials](#).



1.

MAP WHAT YOU HAVE An inventory of your work is your foundation.

Before you can make any decision about storage, you need to know what you're dealing with. An inventory of your archive is your foundation. Without it, every choice you make about capacity, workflow and outsourcing is a guess. Start by asking: how many items, files and artworks does your collection contain, and what media formats are they in? Single or multiple channel videos, software-based artworks, analogue works with digital components, online artworks, live generated works – each comes with different storage implications.

Don't stop at format. Map duration, resolution and variations too. The same artwork can exist in multiple iterations – with or without subtitles, on different carriers, in different versions across different years. Each variation is a storage decision waiting to be made. Age matters as well. Older works tend to be SD and require less space than contemporary HD artworks. Works that relied on dedicated computers may require disk images, roughly the size of the original hard drive.

Ask yourself:

- Do you have analogue materials still to be digitised?
- Does your archive include optical media like DVDs or CDs?
- Are there works with external dependencies, such as social media or internet access?
- Are there works where media playback is part of a larger physical installation?

Your answers will determine not just how much storage you need, but what kind.

The website [projecttracks.be](#) offers ready-to-use templates to help you get started.



BUILD YOUR SUSTAINABILITY PLAN

Knowing what you have is one thing. Making sure it survives is another. A sustainability plan turns good intentions into consistent action. Start with three steps:

> DRAW UP A LONG-TERM STORAGE POLICY

A policy doesn't have to be complex, but it does have to exist. It defines how you approach preservation as a maker, or who is responsible within your organisation, and what standards you follow.

> IDENTIFY YOUR DATA CARRIERS AND ISOLATE OBSOLETE MEDIA

Physical carriers – tapes, discs, hard drives, USB sticks – all have a theoretical lifespan. Identify what you have and flag anything that is ageing, damaged or no longer readable with current equipment.

> SET YOUR PRIORITIES

Not everything can be saved at once. Ask yourself: is the content on this carrier unique? Does a copy exist elsewhere? How long before this carrier becomes unreadable?

For each carrier, consider:

- What is on it and how unique is it?
- Is it the only copy?
- Can you still read it today?
- How long before you can't?

These questions will help you build a priority list – securing the most vulnerable and most valuable material first. A useful tool for this is the Bitlist, which maps the theoretical lifespan of common carriers and formats.

A sustainability plan is never finished. But starting one is the most important thing you can do today.

case study



MONIEK TOEBOSCH ARCHIVE



When UvA students began inventorying the audiovisual archive of artist Moniek Toebosch, they found over 1000 audiovisual items, such as videos, audio recordings, films and works that resisted easy classification: performances, installations, environments.

The first step was an inventory without opening a single file. Each carrier was catalogued by artwork title, year, type and role: autonomous work, installation component, documentation or interview. Only then did the selection begin: comparing content across carriers, keeping the highest quality version, and making difficult decisions about what to let go.

**SUSTAINABILITY
ISN'T JUST ABOUT
SAVING EVERYTHING.
IT'S ABOUT KNOWING
WHAT MATTERS MOST**

Read about opening up the archive of Moniek Toebosch on the [LI-MA website](#).

KEY OAIS VOCABULARY

OAIS is a widely recognised information system for digital preservation (read this section's main text to learn more). Before talking to a storage partner, know these four terms:

SIP (Submission Information Package)

The data as delivered to the repository – by an artist studio, gallery, conservator or registrar. This is what goes in.

INGEST

The process of a digital object entering the repository, during which preservation decisions are made based on policy and procedure.

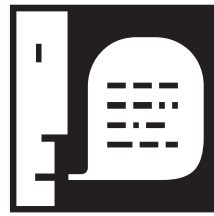
AIP (Archival Information Package)

The container built around the digital object for long-term preservation. It holds the object plus everything needed to understand and maintain it.

DIP (Dissemination Information Package)

The version optimised for access and sharing. This is what comes out when someone wants to view or use the work.

> In short: *SIP goes in, DIP comes out!*



2 .

BEFRIEND THE LANGUAGE

Understand key digital preservation standards and tools.

Digital preservation has developed a rich set of standards and tools. They are not there to overwhelm you, but to give you a common language. And when you're outsourcing your storage, that language is your most powerful asset.

Two standards are worth knowing: OAIS and ISO 16363.

OAIS – Open Archival Information System is the foundational framework for digital preservation. It maps the full lifecycle of a digital object: from the moment it enters your system (ingest), through sustainable storage and access, to long-term management. Think of it as the agreed-upon blueprint that most serious storage providers work from.

THE RIGHT QUESTION
ISN'T JUST
'HOW MUCH DOES
STORAGE COST?'
IT'S 'HOW DO
YOU ENSURE THE
INTEGRITY OF WHAT
YOU STORE?
AND HOW DO YOU
PROVE IT?'

ISO 16363 builds on OAIS. It's the international standard for certifying trustworthy digital repositories. Full certification is overkill for most institutions – but its three criteria are an excellent self-assessment tool:

- Organisational infrastructure – governance, staffing, policy, financial sustainability and legal liabilities
- Digital object management – acquisition, preservation planning, archival storage and access management
- Technologies and security – whether the right systems are in place and properly secured

Because full ISO 16363 certification is a high bar, the Levels of Digital Preservation were developed as a more accessible companion tool. It breaks preservation down into five areas – storage, file integrity, information security, metadata and file formats – each with four achievable levels, from basic to best practice.

You don't need to master all of this. But knowing what these standards are, and asking whether a potential storage partner works to them, immediately changes the quality of the conversation.

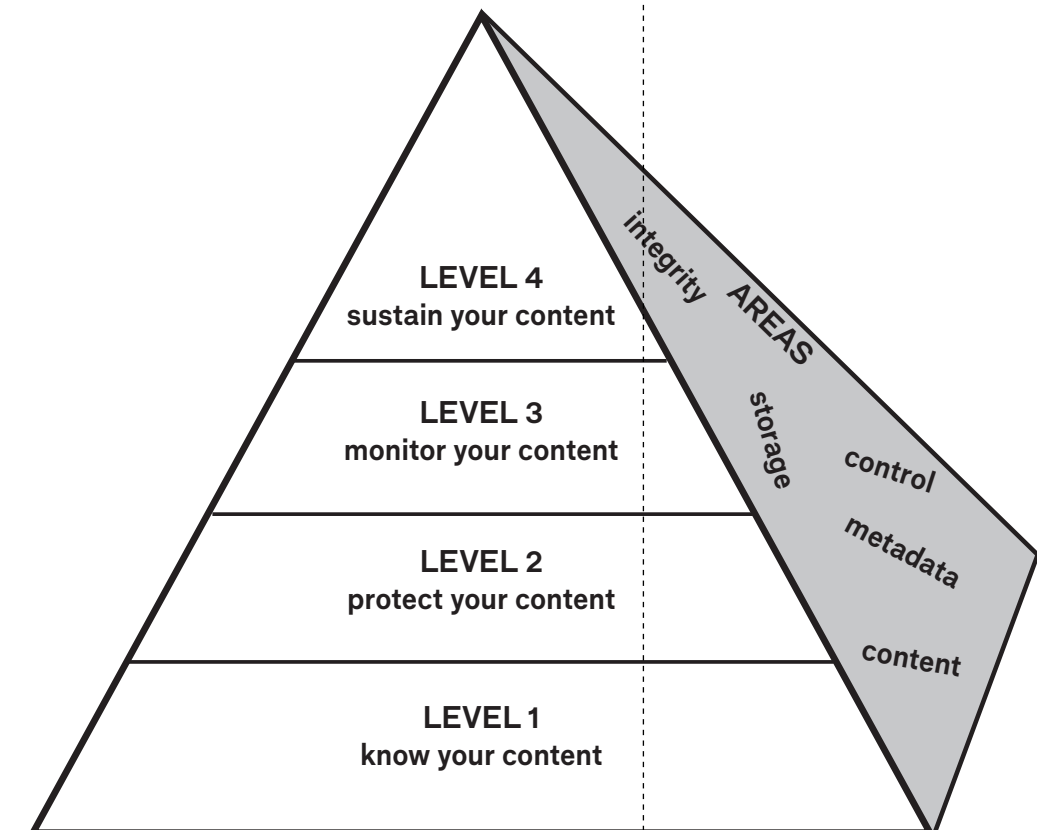
LEVELS OF DIGITAL PRESERVATION

Can't achieve full ISO 16363 certification? You're not alone. The NDSA Levels of Digital Preservation offer a more accessible path. It's a one-page tool that defines incremental steps toward best practice across five areas:

- Storage and geographic location
- File fixity and data integrity
- Information security
- Metadata
- File formats

Each area has four levels, from basic (level 1) to advanced best practice (level 4). Start where you are. Move forward from there.

Download the Levels of Digital Preservation at [ndsa.org!](https://www.ndsa.org/)





KNOW YOUR ENEMY

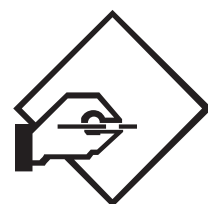
Digital art feels permanent. It isn't. Three forces are quietly working against every digital artwork ever made. Here's what they are.

TECHNOLOGICAL OBSOLESCENCE happens when the hardware, software or platforms an artwork depends on become outdated. What runs perfectly today may be unplayable sooner than you think. Technology changes faster than ever.

FILE FORMAT OBSOLESCENCE occurs when the formats used to create or store a work become unsupported or incompatible with future systems. Data isn't lost all at once – it quietly becomes unreadable.

DIGITAL DEGRADATION is the slow corruption of digital files over time. Bit rot, data errors and failing storage media can all compromise a work's integrity without any visible warning signs.

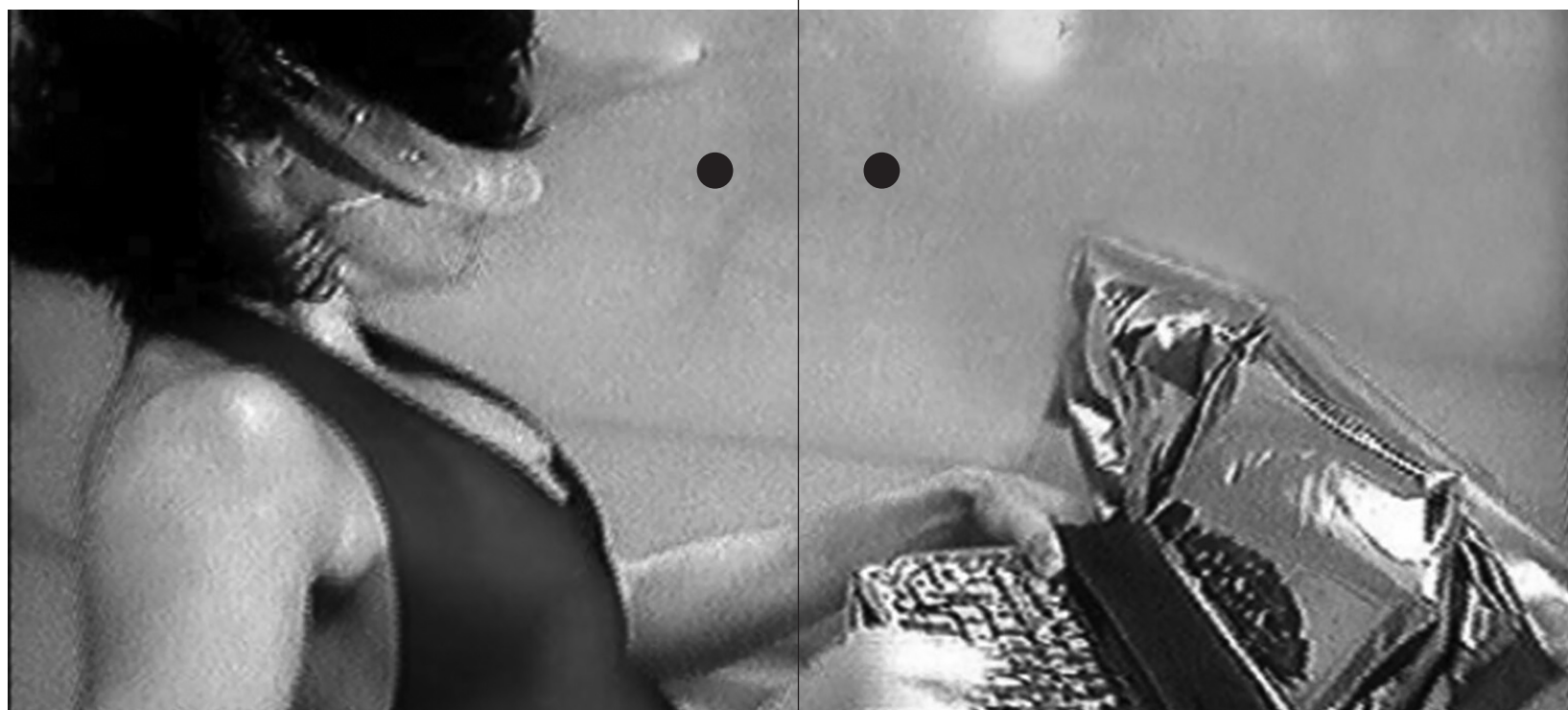
These aren't hypothetical risks. They are happening now, to works made as recently as five years ago.



3.

CHOOSE YOUR STRATEGY

Pick from existing frameworks that fit your context.



When artist Debra Solomon transferred the footage of *the_living* to LI-MA, the preservation team faced a familiar but brutal situation. The website was gone. The CU-SeeMe software was out of use. Most of the digital content – Javascript animations, GIF files, Midi audio – had gone defunct. The original technical setup could not be reconstructed.

Three strategies were on the table. **EMULATION** would recreate the original software environment to run the work as it once ran. **MIGRATION** would transfer surviving files to new formats and media. **REINTERPRETATION** would let go of the original setup entirely and ask instead: what was this work actually about?

YOU CAN ONLY
CHOOSE WELL WHEN
YOU UNDERSTAND
WHAT THE WORK IS
– TECHNICALLY, AND
CONCEPTUALLY

The artist's answer was clear. Previous exhibitions had shown *the_living* representationally, and she'd hated it. The work's power was situationist: unexpected, disruptive, live. So the preservation team placed archive footage on the monitors of a museum reception desk, spilling into public space, restoring the element of surprise. The work was reactivated, not reconstructed.

No single strategy is right for every work. But you can only choose well when you understand what the work is – technically, and conceptually. That understanding starts with the artist.

Dive deeper into the archival presentation of Debra Solomon's *the_living* in [Archives at Risk: Seeking Shelter](#) by NADD.

exercise

WHAT WOULD YOU DO?

Pick one artwork from your archive that relies on specific software, hardware or an online platform. Then work through these questions:

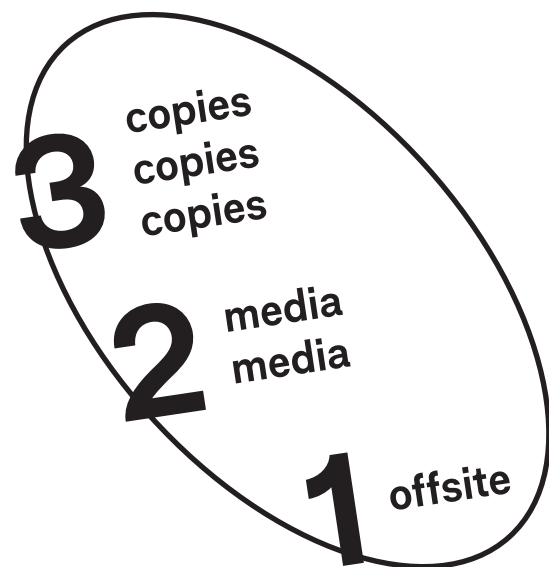
UNDERSTAND THE DEPENDENCIES What technology does this work depend on to function? Is that technology still available today? If not, when did it stop being available?

MAP YOUR OPTIONS Could the work be emulated and run in a recreated version of its original environment? Could surviving files be migrated to a new format without losing what matters? Or does the work's meaning live in something beyond its technical setup?

PERSPECTIVE FROM THE ARTIST What did you, or the artist, intend, and how fixed is that intention? Have previous presentations of the work felt right? What would be lost in each strategy? What would be gained?

MAKE A CALL Which strategy fits this work best: emulation, migration or reinterpretation? Write one sentence explaining why.

3-2-1 RULE



Whatever path you choose, three requirements are non-negotiable. You need multiple copies, in multiple geographic locations, with a system in place to monitor their integrity. The widely accepted standard is three copies in different locations – known as the 3-2-1 rule: three copies, on two different media, with one stored offsite.

But the 3-2-1 rule is a starting point, not a finish line. It's a backup strategy, a minimum condition for digital preservation, not preservation itself. True digital preservation, in the sense of OAIS and the NDSA Levels, goes further: it includes fixity checks, format migration, documentation, provenance tracking and active management over time. Redundancy keeps your files alive. Preservation keeps them meaningful.



4 .

WHERE DOES IT ACTUALLY LIVE?

Cloud, server, hard drive or someone else's problem. It's time to decide.

Most artists and institutions don't build their own storage infrastructure, and they don't need to. Outsourcing is common, practical and often the smartest choice. But outsourcing only works when you know what you're asking for.

Beyond location, your files need to be actively monitored. This is where checksums come in, a way of fingerprinting each file so you can detect if something has changed or corrupted, even invisibly. Bit rot doesn't announce itself. Checksums do.

A basic file system, carefully organised directories with restricted access, is a legitimate first step. But the real goal is a digital repository: a preservation-oriented system that actively manages your files over time, rather than just holding them. Think of it as the digital equivalent of climate-controlled art storage. Files don't just sit there. They are monitored.

Whoever you work with, internally or externally, ask how they handle integrity monitoring. If they can't answer clearly, keep looking.

THE REAL GOAL IS A
DIGITAL REPOSITORY:
A PRESERVATION-
ORIENTED SYSTEM
THAT ACTIVELY
MANAGES YOUR
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RATHER THAN JUST
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THEY ARE
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tips

HOW TO STORE INFORMATION THAT LASTS



Make someone responsible. Files without an owner get forgotten.



Map and capture what you have before you store it.



Back up regularly – and actually do it, not just plan to.



Keep multiple versions of each backup.



Store at least one copy offsite, always.



Choose your approach: cloud, local or both.



Set up automatic backups to a network drive or external hard drive kept elsewhere.



Use a central server that holds data at an external location.



Check your backups regularly – not just that they exist, but that they actually open.



Give every file a checksum: a unique fingerprint that reveals if a file has degraded or changed over time.



WHO CAN HELP?

Here's a list of organisations working in digital preservation, archiving and media art conservation. Reach out, most of them are more accessible than you think.

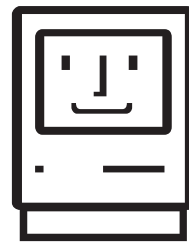
> DPC – dpconline.org

> LI-MA – li-ma.nl

> NADD – nadd.network

> NDE – netwerkdigitaalerfgoed.nl/tools

> Podiumkunst – podiumkunst.net



5.

KEEP IT GOING

Decide how you'll keep your work safe and accessible, now and in the future.

You've mapped your work, learned the standards, chosen your strategies and set up your storage. Now comes the part that determines whether any of it sticks.

Preservation isn't only about technology. It's also about people, responsibility and critical questions. Before committing to any solution, ask yourself: can I afford this in five years? Can I operate it when funding shifts or technology moves on again?

Preservation policies tend to be written for institutions, not makers. But having your own approach matters just as much, including how you think about storage, hardware waste, energy use and your carbon footprint. The goal isn't perfection. The goal is consistency. A written-down approach that doesn't depend on individual memory or goodwill to function.

Digital preservation is never finished. Formats change, carriers age, technologies evolve. But an organisation that has asked these questions, made these decisions and written them down is in an entirely different position from one that hasn't.

Start today. Even a rough policy is better than none. And if you're not sure where to begin, there are people who can help.

THE WORK YOU MAKE DESERVES TO OUTLAST THE TECHNOLOGY IT WAS MADE WITH.

Archiving isn't a task for later. It's part of the practice – as much as making the work itself. You now have the vocabulary, the tools and the first steps. What you do next is up to you.

A STRATEGY YOU CAN'T SUSTAIN ISN'T A STRATEGY. IT'S A WISH

ABOUT LI-MA

LI-MA – Living Media Art is a leading Dutch organisation for sustainable access to media art and digital culture, based in Amsterdam.

With decades of experience in conservation and collection management, LI-MA supports artists, museums, cultural institutions and scientists in keeping digital art alive. As a digital depot, LI-MA provides conservation and storage services for individuals and more than 70 collections.

LI-MA's own collection and archive spans 50 years of media art in the Netherlands. As a knowledge centre and network organisation, it connects artists with the expertise, networks and infrastructure they need – and exchanges strategies and knowledge with international partners including ZKM, Tate, and Rhizome.

If you're working on your archive and don't know where to start, LI-MA would love to hear from you.

ABOUT THE AUTHOR

Gaby Wijers is founder and director of LI-MA, a platform for digital art and media art in Amsterdam. With a background spanning information management, theatre and informatics, she has spent decades working at the intersection of art and preservation. Previously coordinator of collection, preservation and research at Montevideo/TBA/NIMk, she has since initiated, advised on and contributed to countless national and international projects dedicated to documenting, preserving and making (new) media art and performance accessible for the future.

COLOPHON

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How to archive your digital art & Culture

Archiving, conservation and documentation are three essential requirements for sustaining digital art for future use.

We archive to know our digital art and culture history. We conserve to ensure it can still be experienced, now and in the future. We document to make both possible.

Conservation goes further than regular archiving. To experience an artwork as intended, the artist's process, intent and prescribed presentation method must be understood and respected. This may require entirely new technologies and methods to ensure the integrity of the work.

Knowing the difference is where it starts.

Network Archives Design and Digital Culture
nadd.network

This guide was developed in the context of ongoing research into archiving and preservation practices for digital art and culture in the Netherlands.

ABOUT THIS GUIDE

This is a DIY guide for anyone who makes, collects or cares about digital art and culture, and wants it to survive. Part inspiration, part workbook, this is the fifth cahier in a playful series on the essence of archiving for designers and makers. Write in it. Work in it. (Digitally) dog-ear the pages. It's yours.

**“DIGITAL ART
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EXPERIMENTATION
CHALLENGES HOW
WE IMAGINE AND
BUILD THE DIGITAL
INFRASTRUCTURES
THAT KEEP CULTURE
ALIVE.”**

William Kilbride Executive Director,
The Digital Preservation Coalition

NADD'S EXPERT PARTNER

LI-MA has been a valued partner in the NADD network, bringing decades of hands-on experience preserving complex media art. They understand better than most how quickly hardware and software become obsolete, and the real challenge of keeping digital artworks accessible and true to their original experience. As pioneers in preserving immersive and experimental media, they offer practical, forward-thinking approaches that make them an ideal guide for designers learning to archive their work in a fast-moving digital landscape.