Born *digital cultural* heritage is *endangered* heritage

for born digital heritage in the domains of art, film, photography and architecture

Why this brochure?

Born digital cultural heritage is endangered heritage. It is created digitally, without an analogue equivalent. Due to rapidly evolving technology and the often individualised use of IT techniques (in the realm of digital art, for example), this type of heritage material is especially vulnerable. Hardware and software are ageing quickly and will eventually be obsolete. As a consequence, we may one day find ourselves unable to use or access our digital heritage. Every domain within the cultural sector is faced with this problem. In order to continue to guarantee the sustained accessibility of these digital objects, the necessary care for our heritage must now be extended to digital collections, too. Doing so is crucial if cultural institutions wish to maintain their value in the future.

In 2014, the Cultural Coalition for Digital Preservation (CCDD) conducted an investigation into the state of affairs regarding sustained access to born digital heritage in the cultural sector.

This investigation reviewed and tested the various methods of ensuring the long-term preservation and accessibility of born digital cultural heritage. Specific attention was paid to the domains of art, film, photography and architecture. This brochure presents a summary of the conclusions from the investigation and offers recommendations on what the next steps should be. By providing this information to the cultural sector now, we hope to contribute to our goal of forging a stronger connection to the national digital infrastructure in the future.

The investigation

In 2014, the Cultural Coalition for Digital Preservation (CCDD) investigated the state of affairs regarding sustained access to born digital heritage material in the domains of art, film, photography and architecture as well as design. The project was commissioned by the CCDD, supported financially by the Ministry of Education, Culture and Science (OCW), and carried out by Gaby Wijers (director of LIMA) and Hannah Bosma (project officer for CCDD). It aligns closely with the first phase of the CCDD's Work Programme 2013-2018, and the results are embedded in the execution of Work Package 3 (Sustainable Digital Heritage) of the OCW programme Digital Heritage Network (NDE), led by the Netherlands Coalition for Digital Preservation (NCDD).

Goals

The investigation was aimed at reviewing and testing the range of best practices, tools, standards, protocols and workflows for sustaining the preservation and accessibility of born digital cultural heritage, with the goal of making these tools publicly available and generically applicable.

The project yielded the following results:
• An inventory of best practices, tools, workflows and standards for sustained access to born digital cultural heritage material;
• A proposed research agenda, as part of a national strategy for digital preservation;
• A final report. With the conclusions of this investigation in mind, appropriate decisions can be made regarding follow-up projects, and priorities can be set in composing a research agenda for the future.

Methodology

The project consisted of three phases:
• Based on both desk and field research, an inventory was made of existing best practices, tools, standards, protocols, workflows and proposed research projects;
• The information thus gathered was analysed, and conclusions were drawn regarding the usability and applicability of these tools and practices for generic application in cultural institutions' primary work process;
• With the outcome of the previous steps in mind, an outline was made of the recommended follow-up steps, concerning, among other things, the national strategy for digital heritage and how to connect to it.

Details of the results of the investigation were included in the research report. You can download the report (in Dutch) at www.den.nl. Enter 'onderzoeksverslag CCDD' into the search bar.

The current situation

The investigation has produced a clear picture of the state of affairs regarding the preservation and management of born digital cultural heritage. The following are its most important findings:

1. The methods of collecting and sustainably storing born digital heritage material used by Dutch heritage institutions are as yet underdeveloped.

2. Heritage institutions are aware of the importance of, and the specific problems associated with, the preservation of born digital cultural heritage.

3. Preliminary research into needs and approaches has been conducted, at some time and to some extent, in each domain examined in this investigation, but has often not been followed up on.

4. The amount of digital heritage materials collected by heritage institutions and the manner in which they are managed and preserved vary greatly between domains. A uniform programme, extending to every domain, is impossible, at least for the moment. Even within domains, large differences exist between institutions in the approach taken to born digital heritage issues.

5. Generally, specialised knowledge of digital preservation and management of born digital heritage is not structurally shared or taken advantage of.

6. The workflow is marked by a difference between customised work on small amounts of diverse and complex materials and a bulk approach for large amounts of uniform materials.

7. The management and preservation of digital heritage begins with its production. When it comes to preservation and proper, efficient archival, the source is both part of the problem and part of the solution: file formats, the associated software and hardware, the quality, structure and selection of files and the

GENERIC WORKFLOW

BORN DIGITAL HERITAGE

sustained access to digital collections

digital preservation training by domain

digital art film/video photography and architecture

'When it comes to *preservation* and *archival,* the source is both part of the problem and part of the solution'
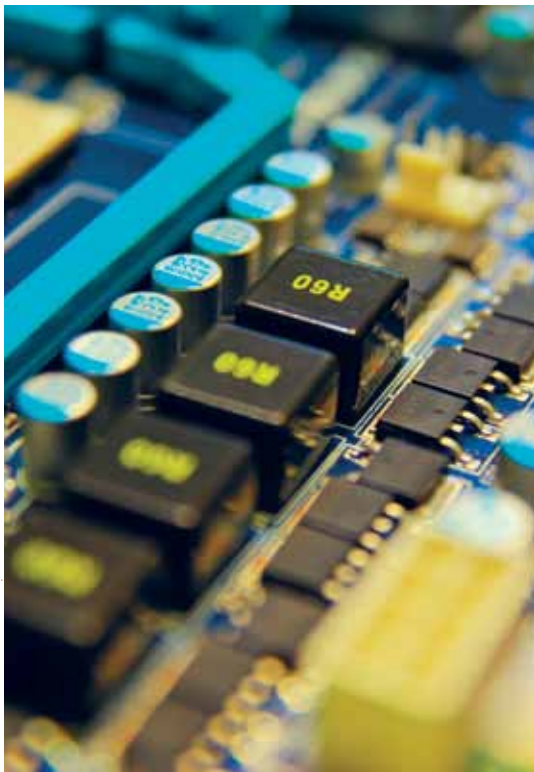
Netherlands play a leading role. An e-depot (*see box*) managed by LIMA sustainably preserves media art pieces from 22 collections. EYE has brokered an agreement with the Netherlands Institute for Sound and Vision to sustainably store large volumes of digital film at the latter organisation's e-depot.

PANORAMIC ACCELERATION
Marnix de Nijs, 1999
registration of interactive installation
collection LIMA

domains of architecture and photography, respectively, neither Het Nieuwe Instituut (HNI) nor the Nederlands Fotomuseum have started collecting born digital heritage in any structural way.

10. Rapid and unceasing technological developments demand a continuous build-up of knowledge, translation and adaptation of best practices, workflows, tools and standards.

information provided about those files are all determined at the level of the source. File storage on-site with the creators is also a point of attention.

8. In the field of born digital heritage, the pioneering facilities provided by LIMA (digital art) and EYE Film Institute

9. Heritage institutions in the Netherlands do not have a coordinated policy on the selection and long term storage of born digital heritage materials. Generally speaking, early born digital objects have not been collected. Structural archival and collection of born digital film material has been performed at EYE since

WHAT IS
AN E-DEPOT?
An e-depot is a sustainable digital repository. One definition used in the archival sphere, but applicable more broadly as well, is as follows: "The entirety of organisation, policy, processes and procedures, financial management, personnel, data management, data security and hardware and software, that enables sustained management of the digital archive material to be stored".

2010; for media art, it has been performed at LIMA since 2005. Museums are focused on their own, specific collections. The Cultural Heritage Agency (RCE) barely covers born digital art, while the Netherlands Institute for Art History (RKD) collects documentation on art, but not the works of art themselves. In the

11. Many collection managing heritage institutions are reporting a lack of options for communicating information on born digital objects in their collection management systems. Metadata schemes and exchange formats must be developed further.

Conclusions and recommendations
for further research and projects

Based on the investigation's findings, outlined above, a number of important conclusions have been formulated. Some of these conclusions relate to facilities that need to be built, others to knowledge that is still lacking. For every conclusion, a recommendation is also made for further research and other projects.

'We need a customised, step-by-step approach, tailored to an organisation's actual situation'

Conclusion 1
Facilities are needed that meet the specific needs of each domain

The investigation has concluded that it is preferable for the preservation and management of born digital cultural heritage to be performed within domains and in an international context. The facilities that make up the national infrastructure for digital preservation (under development within the NCDD and NDE programme; see

'The investigation' above) must be connected to the specific practices and circumstances within the different domains. We need a customised, step-by-step approach, tailored to an organisation's actual situation and aimed at the long-term sustained accessibility of born digital material. In order to gain insight into the level of development an organisation has attained, which steps may be taken to improve it and how to reach the desired situation in the
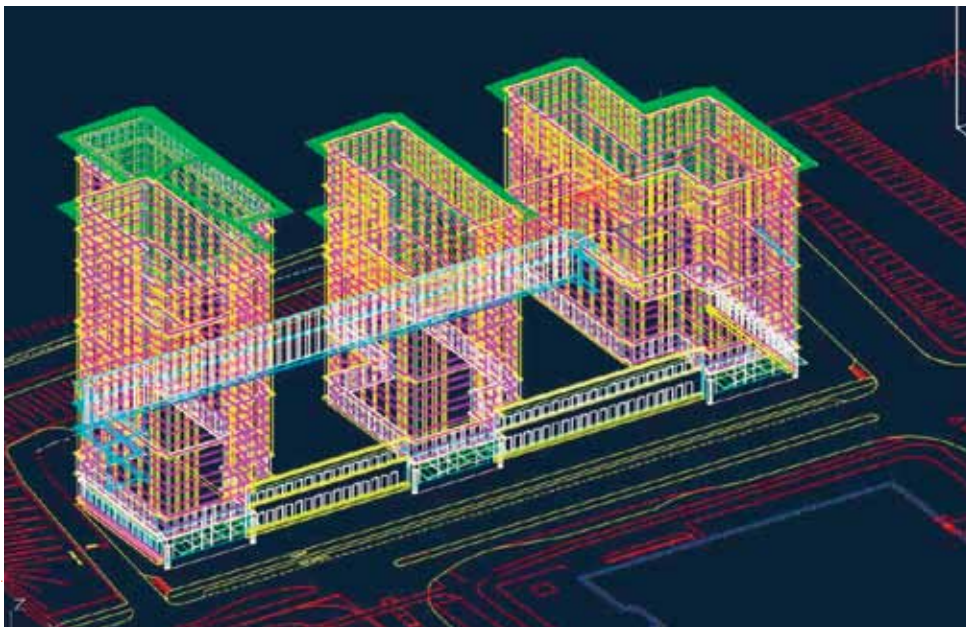
QUEENS TOWERS, AMSTERDAM
Carel Weber / de Architecten Cie.
1997-2000 tentative design
1 x screen print AutoCAD dwg
collection HNI

INSTRUMENTS FOR
A STEP-BY-STEP
APPROACH TO SUSTAINA-
BLE DIGITAL STORAGE

SCOREMODEL
The Score Model,
developed by the
DEN Foundation
and PACKED, is an
online question-
naire that supports
heritage institu-
tions in determining
policy, strategy and
implementation of
sustainable digital
storage. It can be
seen as a first step
on the way to certi-
fication of a digital
repository. The
Score Model can be
found online at www.
scoremodel.org..

long term, the use of the
following instruments is
recommended: the digital
preservation Score Model
developed by the DEN
Foundation and PACKED,
the NDSA (National Digi-
tal Stewardship Alliance)'s
Levels of Preservation
model and the OAIS model
(*see boxes*).

LEVELS OF DIGITAL
PRESERVATION
The Levels of Digital
Preservation are a
layered set of recom-
mendations, devel-
oped by the American
National Digital
Stewardship Alli-
ance [NDSA], that an
institution can use
to set priorities
among the necessary
activities surround-
ing digital pres-
ervation. For more
information, see
www.digitalpreserva-
tion.gov.

OAIS MODEL
In the context of
this report, the
acronym OAIS refers
to the Open Archival
Information System
reference model.
This model provides
a framework for the
creation of an infor-
mation system for the
long-term storage
of digital data. Go
to public.ccsds.org
and use the search
function [search for
'OAIS'] to find an ex-
tensive publication
on this subject.

Recommendations

Develop a step-by-step
plan for the creation of
specialised data and
knowledge centres for
each domain, in order
to realise both domain-
bound and cross-domain
facilities. Stages of devel-
opment differ between
the various domains, and
so should the details of
these step-by-step plans
as well as any further
research projects.

• Storage in an e-depot
has now been realised for
the EYE Film Institute's
film collection. It could
develop into a domain-
specific e-depot and
knowledge centre, tran-
scending the individual
institution. The collabo-
ration between EYE and
the Netherlands Institute
for Sound and Vision may
serve as an example for
other heritage institutions.
• In the sphere of digital
art, LIMA has already
developed into a domain-
specific e-depot and
knowledge centre, tran-

scending the individual
institution. The collabora-
tion between LIMA and
other organisations in its
domain, too, may serve
as an example for other
heritage institutions.
Support is needed to
continue, certify and in-
novate this partnership in
the short term. Further-
more, specific attention
must be paid to forging
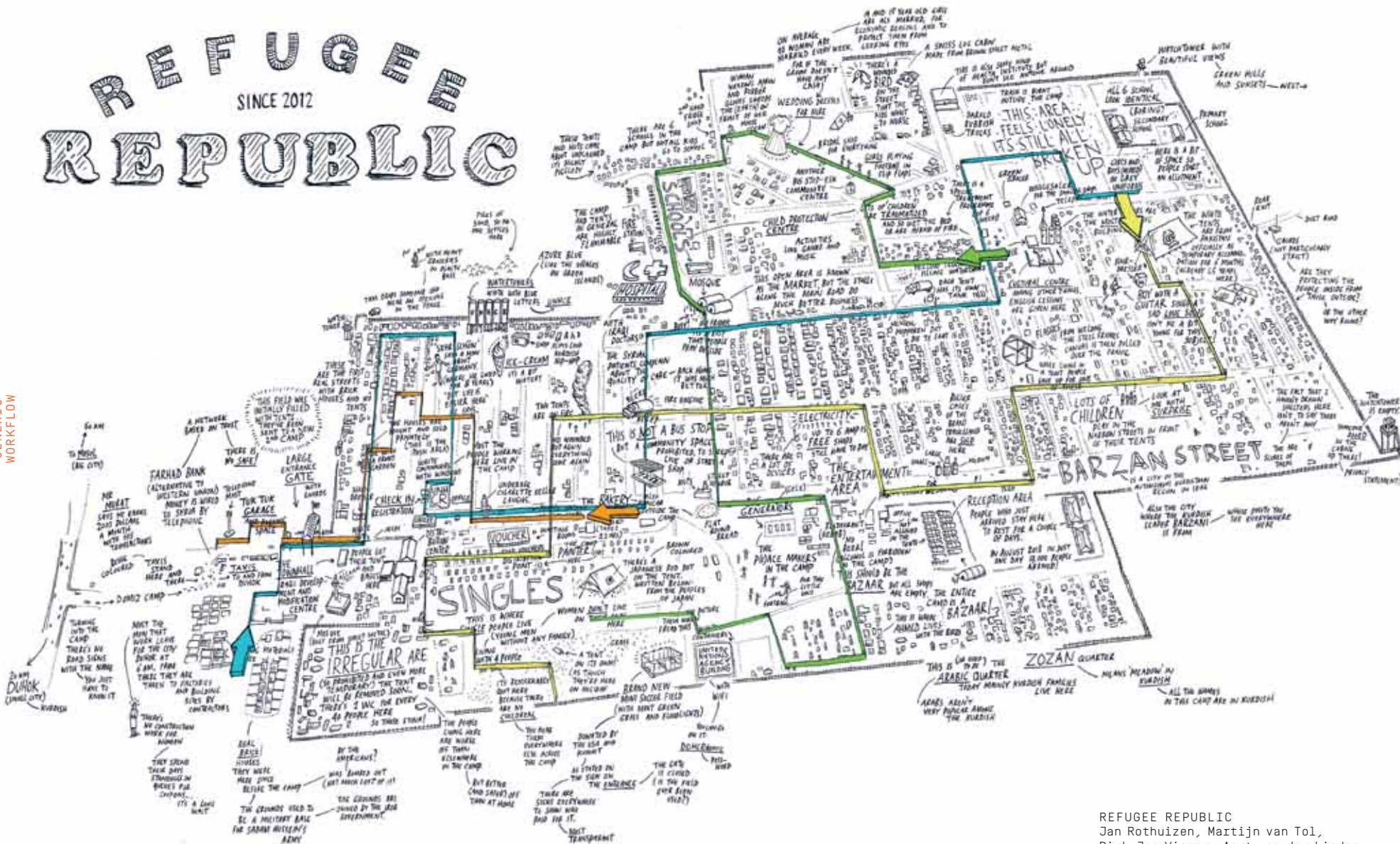a sustained connection
between LIMA and the
Digital Heritage Network,
as well as to LIMA's role in
creating national facilities.
• For architecture, HNI
can fulfil a similar role:
domain-based organisa-
tion, supported from the
field. Concrete needs
and wishes regarding the
connection to a national e-
depot may be investigated.
• For photography, the
Nederlands Fotomuseum
can begin formulating an
approach within the
domain that will, in the
long term, connect to
cross-domain facilities.
• Other domains can
follow this same route.

REFUGEE REPUBLIC
Jan Rothuizen, Martijn van Tol,
Dirk-Jan Visser, Aart van der Linden
a Submarine Channel production [2014]
www.refugee-republic.com

Conclusion 2
Specialised e-depots are needed for each domain

Within each domain, there is a need for high-standard, safe and affordable sustainable digital storage. Already we see EYE (in collaboration with the Institute for Sound and Vision) and LIMA (in collaboration with its domain) developing into national knowledge centres and e-depots for film and digital art, respectively. They are also developing training courses for colleagues within these domains. In the same way, HNI could function as a knowledge centre and e-depot for architecture. In the domain of born digital photography, knowledge centre and e-depot facilities have yet to be developed. This may be a task for the Nederlands Fotografie-museum.

Recommendations
The further expansion of a scalable and modular facility, within which cultural heritage institutions can discuss and collaborate on the provision of storage services, is to be recommended. This will also allow for the connection to domain-specific and, if possible, cross-domain and national facilities. The creation of a digital 'pre-repository' for creators may also be considered. This would allow born digital objects to be sustainably stored with an outside party, instead of having the creator store them, less safely, him- or herself.

'A domain-based solution offers a great result with relatively little effort'

Conclusion 3
Active knowledge centres and networks are needed for each domain

Heritage institutions have a need for specialised knowledge centres connected to a distributed knowledge network. Within each domain, organisations could share knowledge and experiences, create projects and determine a common policy on digital preservation. These knowledge centres and knowledge networks can facilitate the necessary contact with, training of, and provision of services to the creators of born digital heritage. Through the knowledge centres, an international exchange of knowledge can occur. They may also serve as hubs for the exchange of knowledge between the various domains.

A knowledge centre can – potentially in collaboration with the network or individual organisations – offer training, advice and services, organise information meetings and courses, and publish manuals. It is important that this exchange of knowledge is concrete and practical, so that it has a real effect on organisations' activities. The relationship with actual practice is crucial in this regard. In each domain, examples of production, purchase, maintenance and preservation of born digital heritage material must be set, and employees and creators must be trained. To this end, knowledge centres and networks should set up research and pilot projects. Hardware and software may also be shared and kept sustainably accessible through the knowledge centres.

A domain-based solution is easily implemented at this time and offers a great result with relatively little effort. Structural financial support for knowledge development will serve to stimulate this development.

Recommendations
1. Digital preservation training by domain
Training is important to every aspect of digital preservation, and the earlier it is implemented in the overall process, the more effective digital preservation becomes. Collaborative training projects in each domain should ideally focus on:
• Future creators: raising awareness of, and teaching skills for, digital archival, both within and outside of professional art education;
• Creators and producers: writing tips and tutorials for each domain, so producers and creators can learn to work appro-

priately with the material and manage born digital archives themselves.

• Employees of museums and institutions: promoting awareness of the demands and costs of preservation, developing checklists and standard contracts, and teaching the technical skills needed to determine the state of the material.

2. Shared knowledge development

New digital forms, works of art and media products like websites, photographic stories, apps, interactive works and transmedia all make unprecedented demands of management and preservation and transcend the existing, pillarised facilities. This allows for the achievement of a higher level of knowledge development and cooperation.

• **Investigate the preservation and management of complex born digital objects in their context**
Investigate ways of preserving complex born digital objects for the future together. The choices to be made in this process are influenced by the context in which these objects are created and displayed. A pilot project by EYE, LIMA and the Netherlands Institute for Sound and Vision, aimed at collaborative research into the preservation and management of complex born digital objects, enjoys the benefit of the joining of forces from different fields and points of view.

• **Investigate metadata for born digital heritage in Collection Information Systems (CIS)**
Tackle the modification of CIS together, within SIMIN (Information Services Section for Museums in the Netherlands). Based on existing knowledge and experience, and the PREMIS standard for born digital heritage metadata, an inventory can be produced of the information in question. With this done, it will be possible to see to its accommodation. In Flanders, Contemporary Art Heritage Flanders (CAHF) is running a similar project.

• **Peter Struycken archive research project**
Use digital pioneer Peter Struycken's archive as a pilot for a networked approach to long term management of born digital heritage material. RKD, HNI, NA and LIMA are formulating an approach based on this case study and are testing the existing Flemish and Dutch archive guidelines.

Conclusion 4

There are gaps in our born digital heritage collection

Gaps appear in the born digital heritage collection of the Netherlands. These include:

- Domains falling outside the fields targeted by NCDD, CCDD and the national digital infrastructure, like design, music, theatre and dance;
- New media falling outside the traditional domains altogether, like games, websites and apps;
- Complex, mixed, (partially) digital objects composed of a combination of different media and disciplines;
- Born digital objects that are extra vulnerable due to experimental, non-standard technology;
- Born digital objects dating from a period when no collection policy for such objects (yet) existed.

Recommendations

'Keeping everything' is problematic, but stimulating the development

of a conscious preservation policy combined with a minimal form of sustainable storage (*bit preservation*, see box) seems appropriate, both to justify the spending of community funds and to ensure the preservation of valuable heritage and history.

To this end, we recommend creating an inventory of digital preservation in the performing arts. Digital techniques have been playing an important role in the creation, performance and documentation of music, theatre and dance for a long time, but these disciplines are not represented in the CCDD. No overview of born digital collections and digital preservation in this field exists. The locations of born digital collections for music, theatre and dance should be mapped, as should the ways in which they are managed and maintained, and what the problems and needs in this sphere are.

WHAT IS BIT PRESERVATION?

In bit preservation, the focus is solely on perfectly preserving bits of data. Keeping formats and other digital objects readable is not taken into account.

INSIGHT
Sebastian Diaz Morales, 2012
collection LIMA

Roadmap to a
generic workflow

Based on conversations, literature review and input given at the expert meeting, an outline was created for a generic workflow for all types of born digital cultural heritage material. This generic workflow consists of a number of stages, leading from the preliminary trajectory to delivery. Special emphasis is placed on the pre-ingest (see box), with an inventory meeting, acquisition visit, quick scan or assessment, checks on the quality and complete-ness of the material, documentation and information, and the provision of feedback to the creator, archivist or provider. Stimulating and investing in a conscious preserva-tion policy in this phase will prevent potential problems from arising at a later stage. Joint research and sharing of knowledge is necessary in order to gain further insight into these instruments and their value, and to develop them for generic know-ledge and use.

WHAT IS PRE-INGEST?
Several stages are distinguished in the OAIS model. The ingest – the intake of objects – is an important example of such a stage. The pre-ingest [which is not a part of the current OAIS model] covers every action that needs to be tak-en before a digital object is stored in a depository. This in-cludes acquisition, digitalisation, description etc.

This brochure was commis-sioned by the Ministry of Education, Culture and Sci-ence and will be presented during the Digital Heritage Week, 9-12 March 2015.

About the CCDD
The Cultural Coalition for Digital Preservation (CCDD) is a knowledge network that brings together cultural heritage institutions in order to collaborate on ensuring the long-term accessibility of (information on) digital objects. The CCDD is a net-work of professional cultural institutions. For more infor-mation, visit www.ncdd.nl/culturele-coalitie/.

About the DEN Foundation (Digital Heritage Nether-lands)
DEN is the Dutch knowledge centre for digital cultural heritage. From this position, it has committed itself to the sustained accessibility of digital cultural heritage material for the benefit of the knowledge society. DEN promotes cooperation be-tween heritage institutions in digital infrastructures, focusing especially on ef-ficiency, value creation and demand responsiveness. It works towards this end by strengthening statistical knowledge about digital her-itage. For more information, visit www.den.nl.

About LIMA
LIMA preserves, distributes and researches media art. It works to promote the sus-tained accessibility of media art by facilitating a transla-tion to modern times and technologies, and bridging the gap between theory and practice. LIMA distributes its sizeable collection around the world and manages a specialised e-depot, which is actively used by museums for modern and contempo-rary art, academies, and cor-porate and private collectors. For more information, visit www.li-ma.nl.

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Kenniscentrum Digitaal Erfgoed

LIMA

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GENERIC WORKFLOW

on born digital cultural heritage