Designing and building the post-analogue audiovisual archive

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Abstract This paper addresses the challenges related to the role and function of audiovisual archive institutions as the environment in which they operate becomes increasingly digital and networked. The context is the Netherlands Institute for Sound and Vision (Sound and Vision), a leading audiovisual archive that has successfully transitioned to the digital domain. Its ever-growing collections today comprise more than a million hours of audiovisual content, ranging from film to television and radio broadcasts, music recording and web videos. For eight years now, born-digital assets from various sources have been incorporated in a state-of-the-art digital archive. Most of the analogue holdings have been digitised through a national digitisation programme that ended in 2015. Operating in such a new, post-analogue context has profound implications for institutes. The fundamental challenge is how the public mission of archives (ie, supporting a myriad of users to utilise collections to learn, experience and create) can be achieved in a digital context. 'Creative technology' plays an important role in building the audiovisual archive of the future. To manage the transition, Sound and Vision launched a process of internal review and assessment. In the course of this two-year process, it drafted a new mission statement, defined a new strategic plan and built a new organisational structure from the ground up.

KEYWORDS: broadcast archives, media archives, digitisation, digital preservation, archive innovation, trustworthy digital repository

INTRODUCTION

In the world of Dutch heritage institutions, the Netherlands Institute for Sound and Vision (Sound and Vision), is a leader in the area of conservation, management, presentation and promotion of audiovisual heritage. It plays an important role in recording and interpreting the history of Dutch society as captured by audiovisual media, as well as the history and development of these media themselves. The institution is complementary to institutions that play a similar role in the field of material heritage, such as works of art, monuments and historical artefacts, as well as the Royal Library, the EYE Film Museum and the National Archive.

Like these three institutions, Sound and Vision manages an extremely diverse range

of content in a specific form. This form (the audiovisual content and the audiovisual medium) places specialist requirements on the conservation and management of the collection. The content is partly within the scope of the broader knowledge area of cultural and social sciences, a discipline that is particularly drawn upon during the interpretation and publication of the collection and which plays an important role in collection policy with respect to determining value and providing access.

HISTORY

Sound and Vision is a Netherlands institute for the conservation, provision of access and presentation of national audiovisual heritage. This may sound simple, but it is not. The realisation that audiovisual collections are an important part of national cultural heritage only dawned on society at the end of the 20th century.

It took until 1995 for the Dutch government to finally set up a national institution specialising in this field, on the advice of a specially selected committee. In 1996, this decision resulted in the foundation of the Netherlands Institute for Sound and Vision via the merging of the company archive of NPO (the Netherlands Public Broadcasting Organisation), the film archives of the Netherlands Government Information Service, the Film and Science Foundation and the Broadcasters Museum.

The primary goal of Sound and Vision was to develop an infrastructure for the management and conservation of national audiovisual heritage and expand the reach of the collections, which was extremely limited at the time. In pursuit of these goals, Sound and Vision has grown over the years from an archive for professionals to a broad cultural institution which caters not only to professionals but also schools, universities and the general public. At the end of 2006, Sound and Vision opened a beautiful and colourful building in the Media Park, designed by the architects Willem-Jan Neutelings and Michiel Riedijk. The building stands out due to its large coloured surfaces designed by Jaap Drupsteen, which feature highly abstract and historic film and television images. As such, the building is decorated with its own archive (Figure 1).

STATUS

Sound and Vision plays a crucial role as a central connecting hub in the media centre, where the public, the business sector, the creative industry, the education sector and the world of culture can come together to learn, experience and create. In today's era of omnipresent media, there has never been a greater need for curation. The demands of the visitors and users are constantly changing. This is also the case for the application of and interaction with sound and vision in society and the development of different forms of museum presentation. All of this creates new responsibilities while simultaneously creating many new opportunities for the media, the creative industry and heritage. With the knowledge, infrastructure and services gained with regard to long-term digital access in the Netherlands, Sound and Vision will remain a driving force for collaboration and modernisation in the sector in the years to come.

The past seven years have been characterised by the transition from an analogue to a digital archive. Indeed, this period coincided with the €90m Images for the Future digitisation programme (the preservation, digitisation, metadata, copyright search/clearing and storage of 91,183 hours of video, 22,086 hours of film, 98,734 hours of audio and more than 2.5 million photos). As a result of this programme, Sound and Vision went from being a 'classic' audiovisual archive to an ultramodern media archive. The digital collection expanded to more than 25 petabytes (including backups) and has since become one of the largest digital audiovisual archives in the world. The institution

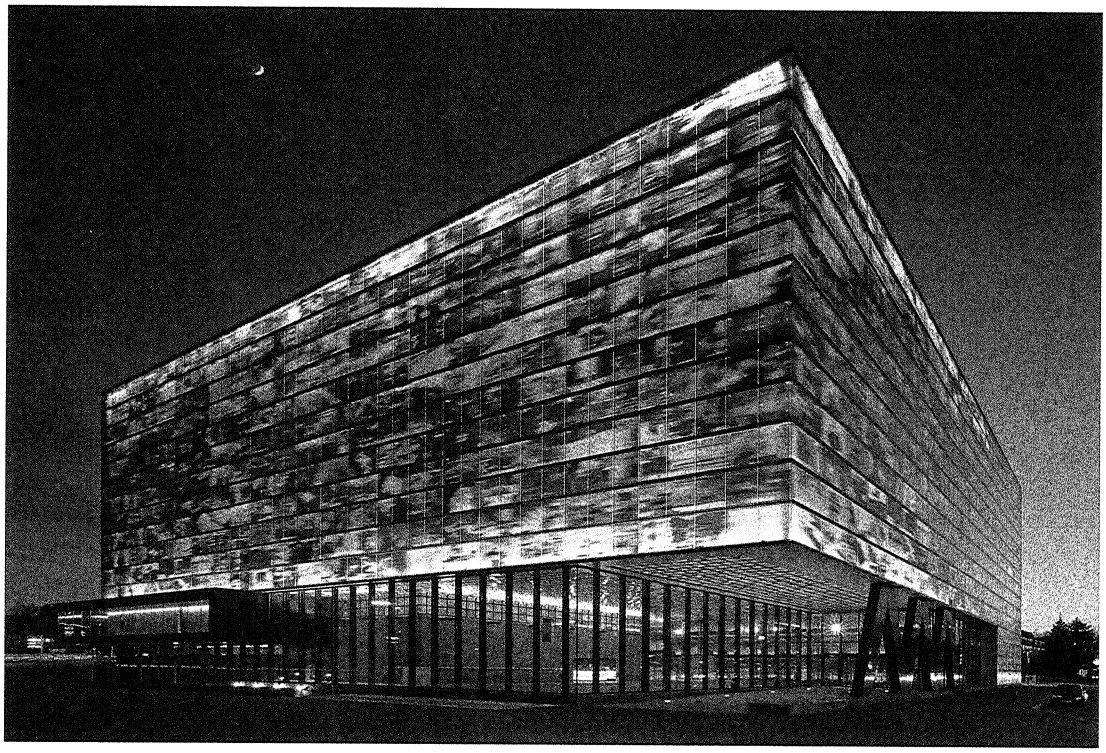

Figure 1: The building of the Netherlands Institute for Sound and Vision, at the entrance of the Dutch Media Park

makes use of the very latest technology for long-term storage and automatic metadata extraction and offers a variety of platforms to make the media collection accessible to a diverse range of target groups. The new organisational structure that was implemented in 2015 enables the institute to operate flexibly and efficiently within the ever-changing domain of digital media.

ARCHIVE, MUSEUM AND KNOWLEDGE CENTRE

The institute fulfils three important functions: archiving and services; museum presentation and provision of access; and knowledge development, innovation and collaboration. The institute collects, conserves, provides access to and presents an estimated 80 per cent of the audiovisual heritage that is of national importance from a media and/or cultural-historical perspective (Figure 2). The archive offers professional access to the collection to professionals, schoolchildren, students, researchers, cultural institutions and the general public. Furthermore, Sound and Vision develops, collects and distributes high-quality knowledge in the field of media history and audiovisual archiving, digitisation and digital preservation, provision of digital content and collections, digital presentation and public involvement. Sound and Vision's threefold function has characterised the institute from its very beginnings through to the present day and ensures collaboration with an incredibly wide range of organisations in both the public and private sectors.

Sound and Vision houses a prominent audiovisual archive and collects, stores, conserves, documents, presents, provides, studies and interprets Dutch audiovisual heritage. In total, the institute manages more than 1 million hours of audiovisual material, including radio and television programmes, educational and scientific films, privately/government-commissioned films,

Figure 2: The vaults of the institute, which hold 80 per cent of the Dutch audiovisual heritage

documentaries, web videos and music. In addition, it possesses an important auxiliary collection of non-audiovisual materials, such as photos (positives and negatives), artefacts, costumes, books, scripts, log books, memorabilia, personal archives and other documents that help to gain a greater understanding of the historical and cultural context of the audiovisual productions and their presentation. The collection paints

a unique picture of both Dutch history over the past 100 years and the history of audiovisual media, and it keeps growing every day.

The museum serves as the public's window into the archive. With an average of 225,000 visitors each year, it is a major attraction in the Netherlands. Since its opening, more than 2 million people have passed through its doors. The museum, called The Media Experience (Figure 3), is an interactive media exhibition located in the building of the Netherlands Institute for Sound and Vision. The Media Experience is the successor of the Netherlands Broadcast Museum and it makes Sound and Vision's collections available to the general public. This is done via 17 themed pavilions that reflect the development of audiovisual media and the history of the Netherlands from the 20th century onwards.

Every visitor is given a personal tour by a virtual guide via a ring containing a radio frequency ID (RFID) chip that is activated at the entrance to the Media Experience. When visitors hold the ring up to certain reader devices with a screen, information on a particular topic is displayed. The Media Experience is interactive, enabling visitors to take part in all kinds of activities, such as reading the news, presenting a television programme, scripting a radio broadcast, creating a television channel's programme schedule, filming their own soap opera, creating green-screen effects and producing sound effects for radio plays. All of these activities can be activated with the ring. Subsequently, all of the videos that the visitors make in the Media Experience are sent to the private e-mail addresses they provided when activating the ring. By the time they arrive home, the visitors will have been sent a link to the page containing their videos. In addition, visitors can choose to watch content from Dutch media and broadcasting history. There is also a large

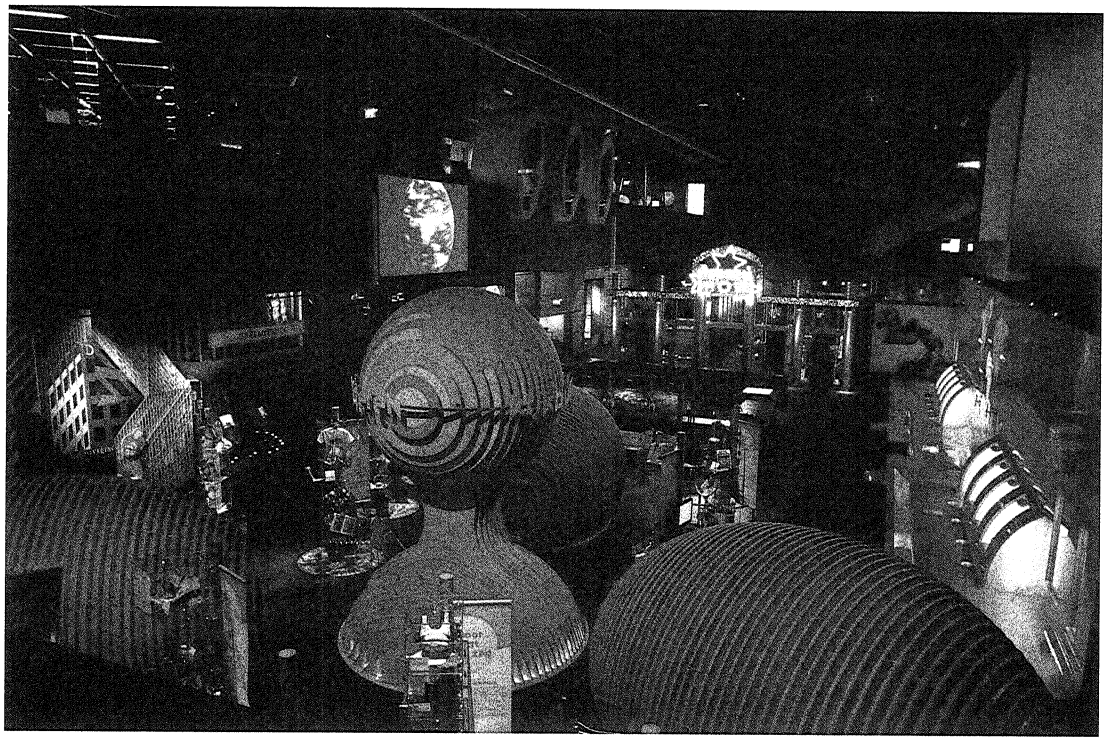

Figure 3: Part of the Media Experience at the national media museum of the Netherlands

hall where a wide variety of exhibitions are held.

In addition to an archive and a museum, Sound and Vision is also a knowledge institute. Acquiring, safeguarding and distributing knowledge has always been part of the activities that continually develop the institute. In 2016, a multi-annual innovation agenda was adopted, consisting of five research themes: (1) automatic metadata extraction and Big Data analysis; (2) exploring new access paradigms; (3) understanding users; (4) ensuring digital durability; and (5) studying the impact of media.

THE INSTITUTE'S MISSION AND VISION

The transition from analogue to digital has since been completed. Born-digital assets are incorporated in a state-of-the-art digital repository that is accessible online and in the museum.

As an integral part of the transition to the digital domain, a new mission statement, strategic plan (covering 2016–2020)[1] and organisational structure have been defined and implemented.

The mission statement reads as follows: 'As the guardian of Dutch audiovisual cultural heritage, we keep Dutch history in sound and vision alive. We make it possible for everyone to learn, experience and create with the Netherlands' audiovisual history.'

This statement summarises the task and mission of Sound and Vision: the collection, storage and provision of access to audiovisual heritage of national importance for the media industry, the creative industry, the cultural heritage sector, for education and academic research and for society as a whole. The obligation of preservation is the automatic consequence of mission, assignment and task. By preserving this heritage for the future, Sound and Vision is able to maintain the digital collections entrusted to the organisation, with a view to ensure permanent access for various user groups.

Vision: Smart, connected, open

A guiding principle was the conviction that the success of memory organisations lies in their ability to make the notions of 'smart', 'connected' and 'open' an integral part of their strategy.[2–4]

It is Sound and Vision's vision to be a smart and open multimedia archive in a connected world.

Sound and Vision envisions the future of the audiovisual archive as being smart, connected and open, using smart technologies to optimise workflows for annotation and content distribution.

Sound and Vision collaborates with third parties to design and develop new technologies so that they can act as frontrunners rather than followers.[5] The institute is connected to other sources of information (other collections, contextual sources) and to a variety of often niche user communities, researchers and the creative industries in order to embrace the use of standards defined by external agencies rather than by the cultural heritage communities themselves and to fully embrace 'open' as the default for exerting maximum impact on society: applying open licences for content delivery, using open source software and open standards wherever possible and to promote open access to publications and so on.

COLLECTION POLICY

In October 2016, the size of the digital archive — including backups — amounted to more than 25 petabytes. The collections can be divided as follows.[6]

Digital-born collections ingest of radio and television

Radio and television productions from public (and commercial) broadcasters are

preserved on assignment. To some extent, these productions have an intrinsic cultural and historical value. The material is selected for long-term preservation because of its (cultural and) historical value, its reuse value and/or its research value. This material includes:

- all of the Dutch-produced programmes broadcast by the six public broadcasting organisations — both radio and television (the ingestion of digital-born audio and video produced by the public broadcasters each year amounts to 8,000 hours of television and 54,000 hours of radio);
- 800 hours of unedited news and current affairs items each year;
- 1,000 news items from EVN material (the European news and exchange service for current affairs items) each year;
- 800 hours of music recordings from public broadcasters each year;
- unabridged recordings of two complete weeks of Dutch radio and television broadcasts, public and commercial (4,368 hours and 3,360 hours each year, respectively); and
- a selection of broadcasts from commercial stations (500 hours of radio and 1,000 hours of television each year, respectively, in high and low resolution).

Digitised legacy collections

Sound and Vision holds digitised collections of analogue film, film, video and audio material mainly consisting of productions from public broadcasters through to the year 2007 (in this case, the start of digital broadcasting production). Most of the material has been digitised in the framework of the Images for the Future project (2007–15). Now the project has come to an end, legacy materials are not being digitised on such a large scale, that is, only on request from specific customers and as part of selection work.

Websites and interactive media

Sound and Vision has started to archive websites, primarily produced by public broadcasters. This selection will be expanded over the coming years to include websites relating to the essential collection at Sound and Vision. Twice a year, approximately 55 unique sites are collected. As well as websites, between 100 and 150 internet videos are also collected each year. These are mainly videos that have appeared on YouTube (channels from 'celebrity' YouTubers and other popular videos). Finally, the ambition has been announced in the multiyear plan for 2016–20 to reassess the collection policy by broadening the remit to include interactive documentaries, games and virtual reality. In 2016, a number of research pilots were started.

Digital (media) collections from third parties

Sound and Vision archives collections from Dutch (media) organisations with a deposit agreement that make use of (a choice from) the ingestion, storage, preservation and access options within the infrastructure of the Digital Archive. At present, these include the EYE film collection, the backup for the collection of the Royal Library, material from the Dutch Premier League and the Naturalis Museum. There are well-developed plans for preserving video registrations of the Proceedings of the Dutch Lower House of Parliament. All these collections are managed subject to the individual conditions of the depositor, and may be preserved for a short period or for the long term. In cases in which an exclusive technical hosting relationship is maintained, the material is not made generally available for discovery or reuse.

DIGITAL PRESERVATION POLICY

Important definitions

Within the policy framework of Sound and Vision, the term *digital preservation* should be

taken to mean: 'The full range of activities and processes necessary for the intellectual and technical preservation of the digital collections over time, with the purpose of ensuring sustainable access for the user groups'.[7–9]

The primary goal of digital preservation is to preserve the integrity and authenticity of the digital objects. Sound and Vision operates the following definitions:

- *integrity*: the object is demonstrably unchanged at bit configuration level; and
- *authenticity*: the object is what it purports to be; it is demonstrably unaltered since its submission or it can be demonstrated that following transformation, all typical characteristics have been preserved.

Migration

Sound and Vision's central preservation strategy for the essential collection and the materials from other depositors that must be preserved, is migration. This first of all means that carriers on which the audiovisual productions are stored, are transferred to current carriers at set times, related to the state of technology. This preservation strategy arises from the fact that the Digital Archive houses a very large and rapidly growing digital collection that is intensively reused within a professional media production environment. As such, emulation is not an acceptable preservation strategy as it would not be possible to make all the material available immediately in a usable form to the largest user group — the public broadcasters. (That said, emulation will probably start to play a role with the new collection areas for games and interactive media, as the enormous variety of file formats that cannot be standardised to the regular preservation format makes migration for these matters difficult, if not impossible.)

Migration activities also include format migration. With the exception of the migration of large collections of proxy formats, this type of migration has not yet been carried out since the first ingest of digital archive formats (in 2007). The planning and implementation for the migration of the formats in the large collection of broadcasting productions is carried out in consultation with the depositor, NPO.

The third form of migration is the migration of the hardware, such as the tape robot, the servers and the systems within which the various preservation processes take place. These innovations have been a fixed element of the annual planning, budgeting and implementation of the maintenance and permanent improvement of the infrastructure since they were established in 2007.

Organisation and the preservation workflow

Sound and Vision has developed an information model that acts as reference in analysing and successively implementing the controlled preservation workflow in the processes and systems. Elements and concepts from the model are now in fact reflected in the actual ingestion, storage and access processes.

In the information model, a generic description is given of which workflows are distinguished around the functions of ingestion, storage and providing access. The model records all actions or events that can take place in relation to an object and also defines the (changing) composition of the object across all of these processes. Preservation metadata, supporting and documenting the digital preservation process, are also recorded. Predefinition is essential in order to have a reference framework to verify that all events in the life cycle of an object tie in with the preservation policy of the archive. By comparing provenance metadata and the events in the information model, it can be established that — if the workflow was completed correctly — no unexpected actions have been carried out on the object.

The life cycle of a digital object thereby develops in a controlled and verifiable manner.

To identify and manage the files and accompanying metadata within the processes at a conceptual level, clear digital objects have been created within the information model, known as *information packages*. The content (essence and metadata) of the package types may differ: a submitted file may be stored in an enriched form (eg, added to with metadata). Furthermore, what is delivered to users is often only a part of what is stored (eg, only a viewing copy of the content without the complete set of stored metadata).[4]

Guarding integrity and authenticity

Sound and Vision's digital archive is in the implementation phase of fully monitoring the integrity of its objects. The storage management system is able to calculate checksums in MD5-format, for all incoming objects. These can be verified with the checksums as delivered by the data producer. The Digital Archive strongly recommends data producers deliver checksums, along with the files. For MXF-files, checking file integrity by verifying header and footer metadata is acceptable. Further information regarding Sound and Vision's definition of integrity and the mechanisms and procedures for ensuring integrity, although beyond the scope of the present paper, is available elsewhere.[5]

Metadata integrity is detected during ingest and also after updates. In the specifications of the media asset management (MAM) system, the rejection criteria for metadata are defined as well as the workflow for mending, logging and documenting specific types of errors. The Digital Archive uses different strategies for data changes. In the event that a file needs to be replaced, a manual workflow is in place. Authorised employees may remove an existing item and create a placeholder for the replacement version of the file. Data cannot be changed after being been stored — only removed. In case mistakes are made, removal actions can be undone to a certain point.[6]

OAIS as a guiding principle for Sound and Vision's organisation

Sound and Vision's digital archive has implemented the Open Archival Information System (OAIS) as the leading functional model for structuring the organisation, the technical infrastructure and its functions. The ingest, access and storage functions are clearly identifiable within the organisational structure of the institute. Sound and Vision intends to fully implement all OAIS functions and has created guidelines based on ISO 16363 in order to make the archive fully compliant with all OAIS guidelines in the future. As per the multiyear plan for 2016–20, Sound and Vision also intends to develop the Digital Archive's infrastructure in order to become ISO 27001-compliant.[10,11]

THE NEAR FUTURE: THREE STRATEGIC THEMES FOR 2016–20

Only organisations that are able to continually reinvent themselves can retain their relevance in this technology-dominated and networked era. What these organisations have in common is their ability to involve their users in the development of their products and services and to fully integrate both offline and online channels. Being the national media archive, the national media museum and a knowledge institution in one, Sound and Vision is able to reach users in both the physical and virtual worlds. The important challenge perceived by the institute is how best to help its users to realise their goals within this media mix. The answer to this question will greatly influence the development of the archive, the museum and the institute's knowledge function in the years to come. It forces Sound and Vision and its partners to continually consider the

public function of the media archive within the value chain of digital media production and society as a whole, and determine which activities and competencies are important in order to fulfil this function successfully. Three strategic themes will determine the path that the institute is going to follow in the next years to meet the goals of its multi-annual plan 2016-20.

Reinforcing the functions of the media archive

To maintain the relevance of the media archive in the distant future, over the next few years, the institute will more clearly orient a significant proportion of its activities towards boosting the archive function within the scope of the *Mediawet* [Dutch Media Act] 2016. As a media archive, Sound and Vision can contribute to improving the efficiency of the public broadcasting system. For this purpose, the coming policy period will focus on further professionalisation and elimination of duplicate services. Work will also be done on aligning the digital archive with the collaboration between national and regional broadcasters. To ensure that a relevant and representative cross-section of the broadcasting media are represented over the years, greater collaboration will be sought with independent producers and commercial and regional broadcasters for the purposes of research into media history, within the framework of collecting, conserving and presenting media heritage. Finally, Sound and Vision will work towards fully-fledged acquisition of web videos and forms of social media relating to the activities of the public broadcasters.

Expansion into new collection areas: From media to multimedia

The media heritage of the future will certainly not be limited to traditional channels and public radio and television productions. New media channels are growing rapidly in popularity (especially among young people) and are predominantly manifest online and in interactive forms. Nowadays, everyone is a potential broadcaster and/or creator of new content. A rapidly growing number of digital platforms offer professional contact that can reach millions of people. News videos now reach viewers quicker — and often exclusively — via social media channels. This new use of media has not yet progressed naturally into Sound and Vision. Therefore, as of 2016, the institute — in its role as an archive, museum and knowledge institute and as part of its broad cultural role — will systematically gather a representative collection of multimedia productions in the Netherlands. This will encompass both physical and digital multimedia content that will be archived and presented within a media, transmedia and/or cultural-historical context. In the coming policy period, Sound and Vision will focus its efforts on expanding the infrastructure for long-term archiving and provision of internet culture and games. In November 2016, Sound and Vision started a game-archiving project and announced the establishment of a national agenda for game archiving.

Sound and Vision will further professionalise as an organisation, developing into a specialised data centre for the digitisation and storage of audiovisual collections from the government and other institutions, partly as a result of its participation in the Digital Heritage Network and its function as a hub within the National Strategy for Digital Heritage.

Expanding access to the multimedia archive and developing a guide function

Due in part to the renegotiations with copyright owners and the resulting establishment of a modernised archiving

agreement, pre-1990 material will potentially become freely available. In the coming years, the institute will significantly increase access by making smart use of new opportunities in its building, both online and onsite. Sound and Vision will bundle together all of the platforms that focus directly on the end user — including those targeting primary, secondary and higher education — as well as reinforcing its role as a guide in the areas of media wisdom, media history and media research. Sound and Vision's technical infrastructure will be adjusted in accordance with this.

In the coming policy period, the modernisation of the museum will be a predominant focus of Sound and Vision's activities. Within the new presentations, Sound and Vision will focus on the visualisation and experience of the development of both broadcasting media and new media, games and internet culture.

Furthermore, as a national institute, Sound and Vision will develop and execute sectoral tasks. These duties will focus on policy preparation and research; the management of an infrastructure for knowledge, context and services in relation to long-term audiovisual archiving; and management duties regarding — among other issues — the conservation status of digital or other audiovisual and multimedia collections in the Netherlands. Regarding the involvement of and connection with the audiovisual archiving sector, Sound and Vision considers one of its important duties to be the continued reinforcement and support of the network of audiovisual archives in the Netherlands (AVA_net).

Connecting the institute and the region will be a more central focus of policy from 2016 onwards. On the international stage, Sound and Vision will continue to work actively on benchmarking, research and knowledge exchange in the field of audiovisual digitisation, digital preservation and accessibility.

THE STRATEGIC THEMES IN GREATER DETAIL: AMBITIONS FOR 2016–20

The ambitions of the Netherlands Institute for Sound and Vision are based on its three essential functions:

- archiving and services;
- museum presentation and provision of access; and
- knowledge development, innovation and collaboration.

Archiving and services

Audiovisual materials will be as much a part of the future fabric of information as text-based materials are today.[12] As creation continues to expand, archives will be storing and managing increasingly large collections of assets. Archives operate within a dynamic and multifaceted context. They will grow to become nodes in a network of communities along with other content providers and a variety of stakeholders from various industries including education and research, creative industries (publishing, broadcasting, game industry), tourism, journalism and so on. Recent studies indicate that analogue carriers will need to have been digitised by 2025, or thereabouts. After this point it will be impossible to transfer the carriers, either due to the technical obsolescence of the playback devices or due to the state of the physical carriers.[13–15]

For many archives, managing 'born-digital' is already the norm, with analogue collections only growing through donations or acquisitions. Simply put, the future of audiovisual archives is digital. Multiple formats will need to be supported, from the highest industry standards to emerging open video formats and wrappers. Content, in various formats, will continue to be managed through specialised asset management systems. Metadata will be fine-grained, allowing access at shot or scene level. Standards will be adopted to allow

interchange between collections (RDF, SKOS, PID, schema.org, etc) and to maintain a record of provenance or metadata records as content is distributed online. Navigation across the combination of semantic data and a diverse range of media types is essential. In terms of the value chain of media consumption and production, the position of archives and roles of archive staff will evolve. Already today, the traditional role of archivists/cataloguers is transforming. The future archivist plays a role as media manager; managing assets from their inception all the way through to distribution and long-term storage.

Asset management systems will need to be able to manage various streams of metadata; (1) metadata exported from production systems; (2) expert annotations; (3) machine-generated metadata; (4) crowdsourced annotations and other sources; and (5) knowledge extracted from secondary sources related to content. In the last policy period, Sound and Vision developed its new MAM system. The implementation and roll-out of this system is taking place in 2016. Also in 2016, Sound and Vision will start a new phase in the implementation of annotation innovation. One of its greatest challenges is to monitor and maintain the reliability and consistency of metadata for the purposes of searching and presentation. To make optimal use of innovation, the emphasis here is on the deployment of automatic annotation technology by and for our partners.

With respect to ensuring long-term storage, archives need to make fundamental choices between storing content on servers they own, using cloud storage or opting for mixed models. Other choices relate to the type of storage media (tape, optical, solid state, hard drives) and adaptation of standardised working processes to ensure digital durability.

The dynamics between the creative industries (producers, broadcasters, distributors) and archives will change. Archive staff and 'creatives' will be working more closely together than ever before. This will result in ample opportunities, for instance, playing a more proactive role in the production process and suggesting topics for new programmes based on gems from the archive. This relates to the future role of archives as curators of vast materials of content. Filters need to be applied to provide meaningful access to vast collections. These files can be created by machines (recommender systems), by experts or by a smart combination of both.

With regard to new media, Sound and Vision has been archiving Dutch broadcasters' websites for several years now, as well as a small selection of web videos (eg, YouTube). So far, however, this has only been done in a format that is not suitable for professional reuse. In addition, the selection is too limited to paint a representative picture of this new media and it also focuses almost entirely on the broadcasters' web-only content, despite the increasing amount of multimedia footage and content being broadcast via diverse platforms that are not affiliated with any broadcaster. Therefore, as of the 2016–20 policy period, Sound and Vision will use its expertise as a media archive to compile a growing collection of Dutch multimedia productions. This will encompass both physical and digital content that will be archived and presented within their media, and/or the cultural historic context.

The transition from audiovisual to multimedia archiving is forcing Sound and Vision to expand its collection, with a particular focus on expanding infrastructure for and expertise in long-term archiving and provision of social media, web videos, websites, video art, interactive productions, virtual reality and games. Based on a number of pilots, the collection will gradually be expanded with new content. In this way, the collection will sustain its relevance by

representatively reflecting the ever-changing range of media and content. By seeking collaboration with partners that already have experience in archiving similar complex and interactive media, efficient working processes can be established and clear agreements made regarding responsibilities and knowledge development.

Finally, the professionalisation and optimisation of Sound and Vision's digital archive will also be a central issue in the coming policy period. In this way, it will be possible to accommodate the wishes of the most important depositors with regard to official certification, and Sound and Vision's transition into a professionally managed digital audiovisual archive will be definitively put into effect. In a world of rapidly growing digital volumes and increasingly complex processes and data structures, certification will ensure that the authenticity and integrity of the collections are safeguarded. This provides reliable guarantees to depositors and users regarding both the future-proof storage of and continual access to the collections.

Sound and Vision's digital archive is in the implementation phase of fully monitoring the integrity of its objects. The storage management system is able to calculate checksums in MD5-format, for all incoming objects.

In the coming years, the 2015 National Strategy for Digital Heritage will seek a greater focus on collaboration and standardisation. During the coming policy period, Sound and Vision will also collaborate intensively with parties in the area of heritage in order to use its mission and strength to elaborate on the national strategy. For example, this will be done by offering technology to enable smart connections between collections or by working on long-term storage services. Furthermore, Sound and Vision will be working with the most important international archives and umbrella organisations (eg, the International Federation of Television Archives (FIAT/IFTA), the Association of Moving Image Archivists (AMIA), the International Association of Sound and Audiovisual Archives (IASA), the International Federation of Film Archives (FIAF) and the Co-ordinating Council of Audiovisual Archives Associations (CCAAA)) in order to optimally support our policy preparations. In this way, Sound and Vision's role will further evolve into one of a collaborative, proactive and supporting partner to the various audiovisual archives in the Netherlands and abroad.

Museum presentation and provision of access

In an era of immense supply, an abundance of choice and far-reaching globalisation, the authority of professionals is no longer a matter of course. The public needs different types of guidance. As a result, Sound and Vision aims to serve as a crucial link between the public and the media archive. In this regard, the internet and social media have become indispensable. During the coming policy period, Sound and Vision will devote further attention to expanding its role as a guide not just in terms of its collection, but also with regard to media literacy, media history and research, both online and onsite.

The most significant section of the archive is now digitally available. In addition, the renewed archiving agreement made with the broadcasters and producers in 2015 will ensure that a sizeable proportion of their content will be made more quickly available online. For this purpose, a revamped repertoire of communication channels is required in order to anticipate the lightning-fast changes in consumer behaviour.

In addition, a technical infrastructure will be constructed for online access. This is a precondition for making the collection available via channels that meet the

expectations of user groups and requirements with regard to collection management.

Sound and Vision's museum remains the most recognisable face of the institute. It is a vital determiner of Sound and Vision's public image. It is, however, more than just a building that accommodates a collection and experts: over the years, Sound and Vision has developed into a platform — both online and offline — that enables ideas and audiences to interact with each other in a myriad of ways. Accordingly, in the years to come, Sound and Vision will work on a new perspective regarding the essence of the museum in relation to the environment and the permanently evolving media archive collection featuring new media, social media, web videos, video art and games. The users and the public expect more of a say. They want more access and also want to contribute more. Online and offline public participation will go hand-in-hand with this factor, which is why the innovative deployment of digital technologies remains of the utmost importance: curation — ie, selection, explanation and provision of context — is indispensable.

The most far-reaching ambition is the complete redesign of the Sound and Vision Media Experience — the permanent exhibition located in the Sound and Vision building. This was developed more than a decade ago with visitor numbers of 150,000 per year in mind. The institute; however, actually attracts an annual average of 225,000 visitors (267,000 in the record-breaking year of 2014) . Back in 2006, the concept of the media experience was firmly founded on a time-based vision of museological education. During the planning of the semi-permanent and permanent presentations, more deliberate use will be made of the five-year policy cycle of the state media budget, as is customary at other major museums with grants issued within the framework of the basic cultural infrastructure. During the restructuring, Sound and Vision will devote itself to realise a more fluid space that can be more easily moulded and that encompasses the entire building. This will enable the institute to adapt more quickly and flexibly to new developments in the media industry, to other user and visitor preferences and to technological innovation within archive and museum presentation.

During the period to come, the institute will also devote further attention to modernising the education services in order to safeguard Sound and Vision's role as a guide, including lifelong learning, mobile learning, the rise of massive open online courses, serious games and media literacy. Within the Images for the Future programme — partly prompted by the programme's objectives — Sound and Vision's education function has been translated with a great deal of ambition into the Education Media Platform: an online platform with target group oriented front-ends for education, research and education professionals. Finally, internal innovations such as the modernisation of the MAM system offer new perspectives and opportunities for a different approach to Sound and Vision's educational services. In the years to come, the institute will have to partially phase out its specific end-user services for education. At the same time, the institute will strengthen its role as a supplier of tools and semi-fabricated products (application programming interfaces, etc) for education and research. In addition to specific online services, this will also include supporting activities that will guarantee appropriate use of semi-finished products within an educational context. In this way, a variety of educational target groups will be able to maintain a relationship with the museum in many different ways. As a result, the education sector will be able to rely on Sound and Vision to provide high-quality and relevant access to Dutch multimedia heritage.

To test the various expectations of the online and onsite visitors during the creation of new applications, Sound and Vision is developing a 'living lab'. This will give the public the opportunity to test techniques and concepts that are not yet widely available to consumers, enabling them to contribute to the institute's innovative capacity. The methods and tools in the living lab will enable Sound and Vision to test recent innovations and to develop them quickly and iteratively. This includes everything from new educational concepts to new applications in 2020 that could not possibly be foreseen today.

Knowledge development, innovation and collaboration

Within today's society and media landscape, everything is either online or well on its way to getting online. Furthermore, demand is growing for online access to audiovisual heritage material and for new forms of supply and usage. In the years to come, together with its partners in the field of heritage and beyond, Sound and Vision will continue to elaborate on its specialist position and make its contribution to international developments in ICT. The transition from knowledge and innovation to development not only requires top-level knowledge, but also demands that this knowledge can progress both within and beyond the organisation, for example, via incubators, breeding grounds, spin-outs and collaboration with the small and medium-sized enterprise sector. In this way, Sound and Vision continues to offer added value in a highly dynamic context within a network comprising a broad and diverse range of knowledge partners, providers and user groups.

Also in the coming policy period, participation in development and in fundamental and applied research will provide Sound and Vision with solutions to issues faced by both the archive and the museum, not least within the context of new collection areas such as social media, games, media art and web videos. In addition, whenever it is desirable, Sound and Vision will develop products and services itself. Furthermore, the institute not only facilitates the proper transfer of research results to its own archive and museum, but also makes acquired knowledge and practical experience structurally accessible to knowledge institutes, sectoral peers and other stakeholders. Naturally, Sound and Vision will continue to disseminate its specialist knowledge actively via forums such as the Netherlands Coalition for Digital Preservation (NCDD), Open Culture Data and various other projects and initiatives in the Netherlands and on the international stage.

Furthermore, Sound and Vision fulfils a role as a unique national hub within the National Strategy for Digital Heritage, and in this capacity it will conduct clearer management of the status of audiovisual and multimedia collections in the Netherlands and related policy issues. In this role, Sound and Vision also wishes to serve as a catalyst for filling any important knowledge gaps and as a connector and agent between academic research and the creative industry. To make the acquired technical knowledge and expertise more understandable and accessible, and more applicable to practical issues, Sound and Vision's generic testing and demonstration environment will be expanded.

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