

Adam Andre

Professor Howard Besser

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Images for the Future: Execution, Challenges, and Results

Over a period of seven years, three cultural heritage institutions in the Netherlands came together to tackle a universal concern in the archival world. The Netherlands Institute of Sound and Vision, the EYE Film Institute, and the National Archives of the Netherlands are responsible for taking care of the memory of the Dutch and the videos, film, and photos in their collections which represent the rich past and present of the entire country. But, these resources were degrading and in serious danger of being lost forever. The physical, organic items of the archives were gradually succumbing to the natural path of all tangible things; they break, and rip, and fall apart. The mission of the aforementioned collecting institutions is to protect, preserve, and provide access to these items that hold the precious history of the Netherlands, so something had to be done to save them. With advancements in digital imaging technologies in the 21st century, the archival institutions formed a consortium and devised a plan entitled *Images for the Future* (IFTF) to digitize the most vulnerable items in the collections with the goal of preserving and providing access to the resources for future generations. Digitization at such a large scope is easier said than done. IFTF presented many financial, technical, and rights challenges, produced successes and failures, and set the precedent for digitization projects on an international level.

The Consortium

The IFTF consortium consisted of Sound and Vision, EYE, and the National Archives, three of the largest archival institutions that hold the majority the country's audiovisual cultural

memory, each one with slightly different collecting policies. Sound and Vision is a broadcast archive that manages over 70 percent of the Dutch audiovisual heritage with collections of television, radio, music, and film from 1898 to the present day.¹ Every Dutch public broadcasting program is ingested into the Sound and Vision archive daily. The EYE archive contains film reels and cinema-related objects dating back to 1895. The EYE collection focuses on Dutch film culture and includes a copy of every Dutch film released. Film ephemera and equipment, such as posters, photos, and projectors are also collected which creates a diverse, unique archival institution.² The National Archives of the Netherlands is the Dutch government's national collecting organization that is part of the Ministry of Education, Culture and Science (MECS). Not only is it the national archive for the national government, but also for certain social organizations and individuals of national importance.³ The collections contain documents, maps, and photos that represent the geographic and political history of the Netherlands.

Project Development

All three archives recognized that the bulk of their collections were steadily deteriorating and the items were losing quality to the point that information was being lost. The consortium was formed to address the preservation emergencies because the institutions realized the importance of bringing the 20th century collections into the 21st century. The plan was created in 2005, when digital archiving was in its very early stages of development. The consortium was concerned with the lack of digital infrastructure in the archives and the absence of knowledge

¹ The Sound and Vision "About" web page includes a summary of the background and mission of the institution and details the different fields of action such as education and organizations like the Sound and Vision Museum. <<http://www.beeldengeluid.nl/en/about>>

² The EYE "Collection" web page addresses the variety of collections. <<https://www.eyefilm.nl/en/collection/about-the-collection>>

³ The National Archives "Organization" web page details the objectives and policies. <<http://en.nationaalarchief.nl/organisation>>

and skills needed to implement this type of work. The institutions had to look in the mirror and execute modifications to the philosophies and facilities of the organizations themselves. They had to map out a plan to involve external suppliers to perform services and provide equipment. New employees were hired with specializations in preservation, digitization, cataloguing, and copyright. Because of the mass of the collection, volunteers were also brought in to complete descriptions of some of the materials. The scale of the project was unprecedented, but since the archives exist within the Dutch government under the Ministry of Education, Culture and Science the need for a digitization project was apparent to the people who had the power to finance it.

On the opening day of the Dutch Parliament in 2006, it was announced that *Images for the Future* would be included in the governmental budget for 2007. A budget of €173 million was set for the project, with financial backing from Dutch Economic Structure Enhancing Fund, the MECS, and the three participating archives. The initial end-goal was to restore, preserve, digitize, and set-up access services for 137,200 hours of video, 22,150 hours of film, 123,900 hours of audio, and 2.9 million photos. The original budget involved an obligation to the three archival institutions to create revenue using the newly digitized resources. Based on an interim evaluation in 2011, the budget and goals were adjusted because of unforeseen challenges in several facets of the project. The budget was changed to €121.6 million and objectives were downgraded to 91,183 hours of video, 22,086 hours of film, 98,734 hours of audio, and 2.5 million photos.

Digitizing Different Mediums

Although all of the collections are considered audiovisual, each institution contributed different moving image, still image, and sound formats. The formats have unique properties and

characteristics that require a variety of processes and equipment. The EYE and Sound and Vision supplied the film elements. Both archives contain nitrate and acetate films, with Sound and Vision's 16mm collection and the EYE's 35mm collection. These 2 institutions were faced with the challenge of analog preservation before digital preservation.

The EYE decided to use analog preservation for most of their collection, which aligns with the mission of the organization to preserve not only the content of the films but also the medium's aesthetic and cinematographic value for exhibition. After a film curator made selections, the EYE chose the Cineric film lab in New York City to perform tri-separation preservation. This process includes creating a positive print from a negative print, creating three separate strips with red, green, and blue information, and finally creating a new positive master print from the three color strips. Later, the EYE began digitizing parts of their collection through external vendors.

Sound and Vision used analog preservation at the start, but in 2011 switched exclusively to digital preservation. They faced a unique challenge in that the sound elements for the films existed on a separate medium; magnetic tape. These magnetic tapes were falling apart and shrinking, which caused the sound to be played ahead of the image. Sound and Vision worked with manufacturers to develop a laser measuring system that accounted for the synchronization problems.

Sound and Vision were tasked with preserving video and audio collections, all of which existed on various magnetic tape formats, including DigiBeta, VHS, quarter-inch tape and DAT cassettes. On the video formats, the adhesive binder layer is the first to fall apart, which causes the magnetic particles to flake off, causing the video and sound information to be lost. Once the videos that were in good enough shape were selected, Sound and Vision in conjunction with

Technicolor digitized to HighRes Material Exchange Format files (MXF) for archive masters. The quarter-inch tape was digitized at 48kHz and a 24 bit bit-depth, which is a standard for archiving with a better quality than CDs. The DAT cassettes were digitized to BWF files, which is an extension of Microsoft WAV files that are able to hold more technical metadata. The Sound and Vision audio collection also included over 25,000 gramophone records, that were cleaned and digitized at 96kHz and a bit-depth of 24 bits.

Photos were a part of all three of the collecting institutions, but the National Archive had the largest photography collection, so they lead the photo digitization efforts. The photos consisted of paper prints, acetate negatives, and glass negatives and positives all of which were scanned at 300 pixels-per-inch at an A4 size in a TIFF format, which yields a high-resolution image but a rather large file.

In the beginning, all of the digital preservation was outsourced to vendors. The pressure of the vendors to produce high quality scans in the time allotted became overwhelming, and when a certain stage of digitization was complete, vendors would detach themselves from *Images for the Future* all together. This led the consortium to rely on one another more for services. The consortium partnered with a Dutch company called Kennisland to support these new lines of communication and promote knowledge sharing. The EYE and Sound and Vision used a part of the budget to purchase a film scanner from a vendor so that they could digitize in-house in the future. The National archives were able to hire permanent positions in photo preservation. Over the course of the project, the institutions developed extensive experience and their own digitization services and workflows, making the professionals at the organizations some of the most qualified leading experts in the field.

Digital Infrastructure

A large audiovisual digitization project requires a substantial digital infrastructure including specialized hardware and software that can scan the content, maintain the digital files, store the metadata, and provide access to the collections. At the time, no organization in the Netherlands had the infrastructure necessary to manage *Images for the Future*.

The original plan was to create a joint digitization facility and one catalogue, Sound and Vision's multimedia catalogue iMMix, which was supposed to serve as the joint catalogue because it was already connected to the public broadcasting infrastructure, with the idea of facilitating a revenue. But this proved difficult because of the different nature of the institutions' collections and the lack of digitization standards. iMMix also wasn't able to ingest the large quantity of photos that the National Archives were digitizing. In effect, the National Archive chose eDepot to manage their collection. During digitization, it was difficult for the 3 institutions to keep track of all the digital copies, and sending them away to be ingested into one catalogue proved impossible. Because of the similarities in their collection, the EYE and Sound and Vision are currently still working together to develop a joint catalogue.

In 2008, the National Coalition for Digital Preservation (Dutch acronym: NCDD) was formed with four partners, of which, the three *Images for the Future* collecting institutions are involved: the National Library of the Netherlands, the National Archive of the Netherlands, Sound and Vision, and the Cultural Coalition for Digital Preservation (which is led by the EYE Film Institute).⁴ The coalition aims to create a nationwide digital network including storage facilities, expertise, manpower, and financial support for Dutch cultural heritage institutions.

⁴ The NCDD website provides links to the partners' websites and more information on their specific expertise. <<http://www.ncdd.nl/en/about-the-ncdd/partners/>>

In 2010, the EYE collaborated with IBM and Thought Equity Motion on a data storage strategy for storing 150 million Digital Picture Exchange (DPX) files using Linear Tape Open-5 (LTO) drive technology. Thought Equity Motion specializes in large scale video archive management including preservation and metadata.⁵ Sound and Vision have signed a long-term agreement for EYE's digitized collection to be stored at Sound and Vision. They have also implemented a tape robot to maintain the LTO-5 and additional hard disk storage. The LTO is great for long-term digital preservation but it takes a significant amount of time to access the content on the tapes, so the content that is accessed more often is stored on hard disk drives, which have a smaller storage capacity but output digital files far faster than LTO.

Access, Revenue, and Copyright

The end-goal of *Images for the Future* was to provide access to a much wider audience through the digitization of resources. Revenue would be created by introducing subscription-based educational platforms and video-on-demand services, and by licensing the material to digital television stations for programming. When this revenue model was developed in 2005, online video services and platforms were in their infancy, so it was unclear exactly how this money was to be made. The consortium hoped to entice copyright owners to let them use the digitized materials by offering 50 percent of the earnings. The entire access model was based on the assumption that copyright owners would allow permission in return for payment. But in many cases, copyright owners were difficult to track down or to identify at all. This prevented the consortium from making these materials available online. The archives owned the physical

⁵ EYE Film Institute/IBM/Thought Equity Motion collaboration press release <<https://www-03.ibm.com/press/us/en/pressrelease/32463.wss?title=IBM%20and%20Thought%20Equity%20Motion%20Collaborate%20on%20Film%20Archive%20Digitization%20and%20Preservation%20Project%20for%20EYE%20Film%20Institute%20Netherlands>>

items but not the copyright to use them. An online streaming service of the Dutch National Public Broadcasting called NPO also created direct competition.

Efforts were made by all partners to remedy this situation. The National Archives formed an agreement with Pictograph, a collecting society for photographs and representing photographers, which allowed a significant portion of the photo collection to be available online without violating the rights of the copyright owner. The EYE obtained the rights for online use for about 20 percent of their collection, with some registered as orphan works. Kennisland, along with other Dutch cultural heritage institutions, formed the Copyright working group. This group focused on implementing Extended Collective Licensing which makes it possible for collection management organizations to enter into agreements with cultural heritage organizations. The working group also worked to change copyright frameworks so that cultural heritage institutions could provide online access to materials that are no longer commercially available.

Several online access platforms were created for the legally eligible digital resources in order to reach a wider audience and create revenue for IFTF. Open Images was an initiative of Sound and Vision and Kennisland that provides free online access to over 3000 items from the Polygoon newsreel collection through Creative Commons licenses. This platform encouraged the “remixing” of the material, but only provided access to low-quality copies so as to not encroach on some of the other online access platforms that planned to charge consumers for use.

Two online education platforms were introduced, LES 2.0 and ED*IT. Both offered audiovisual materials from Sound and Vision, the EYE, and several other Dutch museums to the educational community to be used for teaching lessons and creating presentations. But only a limited amount of licenses were purchased and ED*IT and LES 2.0 were cancelled in 2013 and 2014 respectively.

In 2009, Sound and Vision introduced Dutch Footage, a paid online clip service geared towards directors, producers, broadcasters, and advertisers. Designed to be a fast source to moving image materials, the site contained about 600 clips but such a small amount of requests are made each year so no more clips are going to be added.

The last of the online access services was Ximon, an initiative of Netherlands Film Producers, EYE, and Sound and Vision that launched in 2011. It provided access to 4300 films, documentaries, and tv series. The growth of service was much slower than expected and most of the money that was generated by the service went to copyright owners. Ximon was not able to obtain more funding in 2013 and suspended its service in 2014.

Results and Challenges for the Future

In many ways, *Images for the Future* was a success. Digitization totals surpassed the original goals with 138,932 hours of film and video, 310,566 hours of audio, and 2.4 million photos. The project served as a dive into the deep end of the impending digital environment. The digital technologies were installed in the institutions themselves, making them self-reliant and prepared for their future digital collections. It made significant efforts for cultural heritage institutions in the copyright world, providing these national organizations some breathing room in the areas of use and access.

The biggest failure of the project was providing wider access to the collections. Obtaining the rights to post the materials online was a giant, and at most times, an insurmountable obstacle. Use was not granted by the copyright owners and the items that were placed online were not generating enough revenue to keep access platforms afloat. Extended Collective Licensing and exceptions for cultural heritage institutions are bright spots and possible future avenues to

creating access. The consortium is still working on finding ways to providing online access to the collections, although 100% of the film, video, and audio are now accessible on-site.

Sound and Vision have the most advanced digital archive infrastructure that holds nearly half of the *Images for the Future* collection. A large portion of their annual budget is now dedicated to maintaining the collection and technical equipment required to preserve it. But with such a large influx of born-digital objects being ingested every day, these digital storage facilities require constant expansion and maintenance. The Ministry of Education, Culture and Science are working on a plan to help supplement the cost of this endeavor in the future.

Images for the Future was a digitization project of unprecedented scale. When planning for something that has not been done before, unforeseen challenges are inevitable. The consortium made mistakes and, in retrospect, lost a lot of money in access initiatives but gained valuable experience. *Images for the Future* served as a case study for other institutions, who planned on executing similar projects in the future, to learn from the successes and challenges. Digitization is a daunting task with many facets to consider, but fear of the unknown didn't stop the Netherlands from taking a large step towards preserving the legacy of the nation for the 21st century.

Additional Resources

- <https://www.eyefilm.nl/en/collection/about-the-collection/services-and-activities/restoration-and-digitization>
- <http://pro.europeana.eu/blogpost/images-for-the-future-lessons-learned-from-7-years-of-digitisati>
- <http://www.beeldenvoordetoekomst.nl/en/research.html>
- <https://www.kl.nl/en/projects/beelden-voor-de-toekomst/>
- <https://picturae.com/projects/296-negatives-digitisation/741-images-for-the-future>
- <http://beeldenvoordetoekomst.nl/en/activities.html>
- <https://www.openimages.eu/>
- [https://www.eyefilm.nl/en/collection/film-history/film/all/all?f\[0\]=field_cm_media_filter%3Awith%20film%20fragment](https://www.eyefilm.nl/en/collection/film-history/film/all/all?f[0]=field_cm_media_filter%3Awith%20film%20fragment)
- <https://www.beeldengeluid.nl/en/blogs/research-amp-development/201201/national-cooperation-digital-memory-netherlands>
- <https://www.slideshare.net/everbruggen/video-migration-and-preservation-practices-at-the-netherlands-institute-for-sound-and-vision>
- <http://www.ncdd.nl/en/about-the-ncdd/policy-and-strategy/>