

Digitisation of Europe's film heritage

SUMMARY

EU film heritage covers over 120 years of cinema history and its technological evolution. The recent digital shift has resulted in significant digitisation of film production and distribution chains. Consequently, films produced on other formats (for example, 35mm film or magnetic recording) can only be accessed if appropriate screening equipment is preserved and operational, or the material is digitised.

This challenge has redefined the scope of the work and tasks performed by European film heritage institutions. These, mostly publicly funded, bodies have a mission to preserve European films and make them accessible.

The process of film heritage digitisation comprises many stages, involving both technical and legal elements. The legal issues include copyright clearance, which enables authors, producers and other rights-holders to receive payment for use or exploitation of their work. Rights management systems vary considerably between EU Member States, as do the technical solutions applied for digitising, preserving and making such digital content accessible. These technical and legal disparities lead to difficulties and higher costs in cross-border or interinstitutional access to film heritage.

As these issues are common to all Member States, solutions at EU level could allow mass digitisation of European film heritage, and improve the process, thus reducing costs. Since 2000, the European Commission and the European Parliament, together with the Council, have supported moves to foster cooperation in this field. European funding is available to co-finance such efforts.



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Background

'Film heritage' has a very broad meaning. It covers the earliest silent films produced at the end of the 19th century in Europe, up to and including present and future digital productions and documentary or feature films. All are part of European history, culture and identity, to be preserved for future generations. The material is dispersed in various personal, private and public archives in many countries, and not necessarily in the locations where the work was initially produced.

The history of film starts with black and white moving pictures on a highly flammable 35 mm nitrate support with no sound track. Colour and sound arrived over the 120 years of technological progress, which changed the width and chemical composition of films used, and after a shift to magnetic recording technology, introduced the current use of digital productions with 3D and sound effects. These varied image and sound capturing and screening technologies require different preservation and restoration technologies and equipment.

As the digital economy has grown, the film production chain in Europe has shifted significantly towards digital technology (see figure 1 for digital screening in European cinemas). Consequently, production of photographic material (16 mm and 35 mm film) is in decline, and it has become almost impossible to view films produced on a non-digital support (analogue productions, 16 mm, 35 mm films, and films on magnetic tapes), unless they too are transferred to digital or the necessary equipment for transmission has been properly preserved and is operational.

For decades, [film heritage institutions](#) (FHIs) in Europe have been busy collecting, cataloguing, storing, preserving, restoring and providing access to European films.

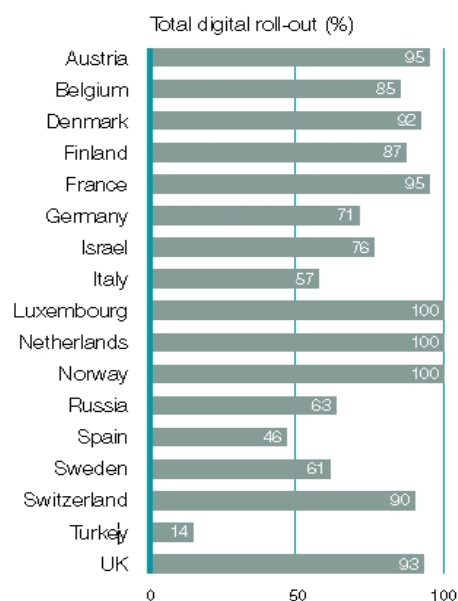
Financed mostly from public funds, FHIs have the public [mission to safeguard](#) European culture, history and identity captured on film. They also keep track of technological developments in cinema. They face the challenge of preserving their collections regardless of the format, and making them available in the digital environment for present and future generations.

Film as world heritage

The importance of film works to world cultural heritage was recognised as early as 1980, in the Unesco [Recommendation](#) for the Safeguarding and Preservation of Moving Images.

In 2006, Unesco proclaimed 27 October '[World Day for Audiovisual Heritage](#)'. The topic chosen in 2014, '[Archives at Risk: Much more to do](#)', highlighted the need for urgent action to prevent the disappearance of this fragile heritage.

Figure 1 – Digital cinema screens



Data source: [UNIC \(International Union of Cinemas\) members](#), 2012.

Definition of the process

According to a Unesco [definition](#), 'digitisation is the creation of digital objects from physical, analogue originals by means of a scanner, camera or other electronic device'. Unesco takes a broad understanding of the process in relation to cultural heritage, encompassing all kinds of cultural objects gathered, inter alia, in museums, libraries and archives.

A [European expert group](#) of specialists set up to advise the European Commission in cultural heritage digitisation states that 'digitisation is a ... set of management and technical processes and activities by which material is selected, processed, converted from analogue to digital format, described, stored, preserved and distributed. ... In the European cultural heritage sector, digitisation has come to signify the various activities through which physical (analogue) cultural content ... is ... translated into a digital form, described and made accessible through digital channels such as the Internet'.

In the context of film heritage, digitisation may therefore be understood as a process comprising many stages and consisting of technical steps and management issues that result in the conversion of an analogue or digital film to a digital file (see figure 2).

EU framework

Cultural heritage is recognised as a sphere of action for the EU in [Article 167.2](#) of the Treaty on the Functioning of the European Union (TFEU). In accordance with the principle of subsidiarity, EU actions in this domain are restricted to financial support, coordination of Member States' policies, and recommendations concerning efforts aimed at preserving cultural heritage, including film.

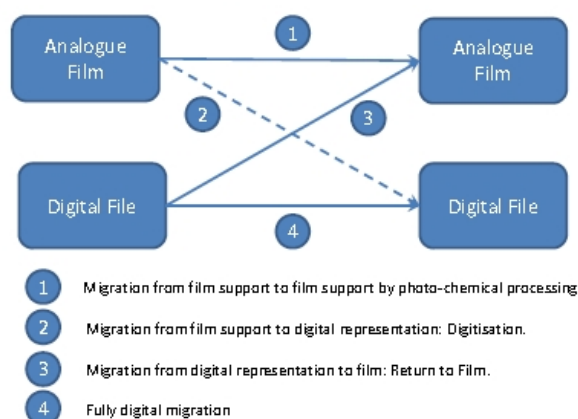
Various initiatives on protection of film heritage have been taken at EU level in recent years. In a [resolution](#)

on the conservation and enhancement of European cinema heritage in 2000, the Council appealed for cooperation among Member States in film heritage preservation and restoration, and pointed towards its possible digitisation.

Five years later, the European Parliament and the Council adopted a [recommendation](#) on film heritage and the competitiveness of related industrial activities. Financial and legal barriers to film digitisation and online access were identified, and Member States were invited to report every two years on progress towards securing film heritage; the most recent ([fourth](#)) [implementation report](#) was published in October 2014 (see 'Challenges', below).

In November 2010, the Council adopted [conclusions](#) on European film heritage and the challenges of the digital era. The Council underlined the FHIs' role in preservation and digitisation, and the business potential of related activities.

Figure 2 – Possible media migration paths



Data source: '[Challenges of the Digital Era for Film Heritage Institutions](#)', European Commission, 2011.

The European Parliament adopted a [resolution](#) on the online distribution of audiovisual works in the EU in September 2012, suggesting a comprehensive approach at EU level, involving rights-holders, online distribution platforms and internet service providers. Such an approach would facilitate user-friendly cross-border access to content and enhance the sector's competitiveness. The resolution stressed the need to establish access to material held in FHIs and to support its digitisation and preservation.

Film heritage institutions (FHIs)

Role

In every Member State there is at least one public, non-profit FHI that collects films regardless of their support or type: feature, documentary, newsreels, cartoons, short film, advertisements, experimental or amateur films. In some Member States, FHIs include national or regional film archives and film museums, some of which have public screening facilities. In total, there are some [100 national and regional FHIs](#) in the EU. They differ greatly in size, staff numbers, scope, and the legal basis of their activities, but their role is the same: they are guardians of film heritage and providers of access to it.

Scope of action

According to a 2011 study for the Commission '[Challenges of the Digital Era for Film Heritage Institutions](#)' (DAEFH study), FHIs have already collected around 1 million hours of European films. The scope of their work depends mainly on the definition of film heritage set out at national level, and varies considerably across [individual Member States](#). Some states (such as Denmark), consider that their film heritage is composed exclusively of national language works screened at home and produced by directors originating from the country. Others (like Austria), also include foreign works that influenced their culture or are of particular relevance (Croatia). Some definitions refer only to works screened in cinemas, while others (e.g. the Netherlands) also cover accompanying documents (screenplays, posters, photographs, publicity, journals and books).

Lost film heritage

According to the [European Commission](#), around a million hours of European films are locked away in archives and inaccessible to film enthusiasts. Only 10% of silent movies survive, and just 1.5% of European film heritage is commercially available to the public.

Challenges facing FHIs

To fulfil their role as guardians of film heritage, FHIs collect, preserve, and provide access to films. The advent of digital technology adds to the difficulty of these tasks, as digital support opens new exploitation windows, such as DVDs, Video on Demand, and web screening, as well as generating new questions relating to copyright issues.

According to [the DAEFH study](#), the film production chain in Europe, up to and including theatre distribution, is now almost entirely digital, and analogue film screening equipment is no longer produced. Consequently, if collections of cinematographic works produced on such supports are to remain accessible, the equipment required must be preserved, properly maintained by the FHIs and operational.

This poses a double challenge for FHIs. In its [fourth implementation report](#) (2014) on European film heritage, the Commission suggested that FHIs evolve towards hybrid archives including both analogue film and digital or digitised collections and equipment. In order to preserve these, the necessary skills need to be taught and maintained. Adding to standard operational costs are costs associated with digitisation and digital

Digital film fragility

'Born digital' films are fragile: their life-expectancy is limited to between 2 and 5 years, due to the fragility of their physical support, data instability, rapid technological progress and format changes that require format migration.

According to [specialists](#), 5 to 10 years after the end of the initial commercial exploitation phase, most born digital films will be definitively lost.

In order to avoid this loss, digital archives need to be migrated and copied for preservation on a regular basis.

Projections for the loss of new productions are calculated at 220 feature films in 2016 and 330 in 2017.

restoration of analogue works, as well as digital preservation of digitised or 'born digital' films.

The collection of 'born digital' films is central to preserving present and future productions. This can best be done by producers depositing their films. [Various legal](#) and technical approaches are possible. Member States might opt for voluntary deposit by the producer with a view to having the material well-preserved and accessible; or impose a legal obligation to deposit any cinematographic work in a FHI. A third option, [mandatory deposit](#) for state-aided works, implies that the payment of the final part of any public subsidy can be conditional on the deposit of a good quality master copy of the work. Precise formats (in some countries the deposit of an analogue copy is still an obligation) and technical standards, as well as the deadlines imposed, ranging from the release day to within seven years, are [established by each Member State](#).

Cooperation between European FHIs

In 1991, several European national film archives founded an [association](#) to collaborate on collection and preservation of film heritage. With EU funding via the [MEDIA programme](#), they rediscovered some 700 films and restored around 1 000, mostly silent, films from their archives. Several FHIs participated in a Moving Image Database for Access and Re-use of European Film Collections, ([MIDAS](#)) pilot project on [film archives online](#), co-financed by the [MEDIA Plus](#) programme. As a result, a [searchable database](#) (in eight languages: German, English, French, Italian, Czech, Greek, Lithuanian, and Norwegian) of mainly non-fiction films (currently 26 000), from all over Europe, was set up, in cooperation with 18 FHIs from 12 EU countries. This film gateway provides online access to a digitised copy of selected films.

More than 30 FHIs, together with the International Federation of Film Archives ([FIAF](#)), have also cooperated to develop a film [aggregator](#) platform: the [European Film Gateway](#) (EFG), which provides archive films and related documents to the [Europeana](#) cultural heritage platform.

Building upon this experience, a further platform, [EFG1914](#) was launched in 2013, devoted exclusively to archive material relating to the First World War.

Film heritage digitisation – the challenges

Long-term digital preservation of film heritage is a complex process comprising film collection (via deposit), cataloguing, digital restoration (if the material is damaged), digital conversion, archiving, storage and conservation. Access to material is essential for educational purposes, for researchers, film directors and the general public. The process poses various general and specific technical and legal issues, relating inter alia to cross-border accessibility and interoperability.

Copyright

Wide digital accessibility to cultural content creates [new opportunities](#) for artists to reach larger audiences. However, before a film is digitised and archived, its authors,

producers, and all copyright holders need to be identified and located. FHIs physically hold cinematographic works on various supports in their archives, but they do not necessarily have exploitation rights that allow them to show such works to the public, or to researchers, or even to copy them for archiving purposes or preservation. Only when rights-holders are identified and located can a decision be taken on a film's accessibility and re-use.

In Europe, the current copyright regulatory framework is complex. Each Member State has its own copyright management system and framework for copyright clearance. Moreover, geographical rights restrictions can limit the exploitation of a film to a specific geographical area.

In the EU, the period before which a copyrighted work is transferred to the public domain and does not require any rights to be paid is defined as 70 years after the author's death. However, films have many authors (screenplay, music, cinematography etc.). According to an expert [study](#) from 2011, one third of the EU's film heritage consists of orphan works: films still under copyright, whose authors, producers and rights-holders are difficult to identify and locate. Rights clearance is particularly costly in this case, and forms a barrier to mass digitisation, making even educational or research use impossible. The Commission addressed this issue in 2012, in its [Orphan Works Directive](#), which makes provision for recognising a film as an orphan work after a diligent search for rights-holders. Once a film is declared an orphan work in one Member State, it has the same status across the EU, and can be digitised, preserved, archived and accessed for non-profit purposes.

In its November 2013 [Communication](#) on State aid for films and other audiovisual works, the Commission also appealed to Member States to allow for specified non-commercial use of state-subsidised works for research, educational and cultural purposes, if agreed upon with rights-holders.

The [Digital Agenda for Europe \(DAE\)](#), one of seven flagship initiatives of the Europe 2020 strategy, has clearly identified an EU copyright framework among its priorities – the need for an EU-wide system of copyright clearance that would facilitate digital access to film heritage, and cross-border and pan-European licensing in the digital environment.

Accessibility

Copyright clearance is just one step towards public access to film heritage. Once this legal issue is resolved, physical access to digital content via its proper description is to be addressed. Without a [standard system](#) used by all FHIs, even film catalogues cannot be accessed from other locations or countries. In 2013, in the framework of DAE, the European Commission initiated a structured dialogue '[Licences for Europe](#)'. Participants agreed on [principles](#) and procedures concerning rights settlement and licences for exploitation, and facilitation of film heritage digitisation. They highlighted the need for common standards, and have adopted a [declaration](#) on audiovisual work identifiers, which facilitate the identification of works. According to the information

Common copyright clearance system

To facilitate copyright clearance the EU-funded [FORWARD](#) project aims at creating an EU-wide automated system to assess the copyright status of all types of audiovisual works. Its purpose is to establish a register, taking into account all national legislation deriving from the application of the Orphan Works Directive. The project will establish a network of 10 national clearance centres in Europe and be interoperable with the [ARROW](#) model platform for written works' rights.

gathered in the Commission questionnaire circulated for the fourth implementation report, a large [number of FHIs](#) have already implemented, or plan to implement, the European standards in this domain.

The [Film Heritage subgroup](#) of the Cinema Expert Group, established in the framework of the DAE project, addressed [technical issues](#) such as online accessibility, digital preservation, and exchange of best practices in film heritage activities. The group aims to determine common solutions and [standards](#) enabling interoperability of film databases. Thus common standards would facilitate access to film heritage and related information everywhere in the EU, regardless of location.

Costs and funding

According to [the DAEFH study](#) the cost of a digital master deposit in a FHI is close to zero. The cost of digital preservation of digital films corresponds to only 0.2% of public support for the industry. However, the [costs of digitisation](#) of an estimated 1 million hours of European film heritage range from €500 to €2 000 per film hour, depending on the technology. This would total between €500 million and €2 billion. The median cost of €1 billion corresponds to roughly 38% of annual state aid for the European cinema sector.

Although the funding of FHIs is stable, the additional costs of digitisation are often difficult to cover for FHIs alone and result in budgetary constraints. Consequently, the Commission recommends establishing [public-private partnerships](#), in various forms, from sponsoring or donations, to foundations tasked with the various aspects of heritage digitisation. The [Europeana film platform](#), EFG, as one of the first film heritage endeavours, benefited from input from [private partners](#) for its technical development. A further example is the Polish Audiovisual Institute, which obtained funding for digitisation from industry ([Polish Energy Group and National Bank of Poland](#)).

Some FHIs have introduced prioritisation systems. For instance, according to the 2014 fourth implementation report (see its [annex](#)), a restoration project targeted at [Oscar-nominated films](#) was launched in the Netherlands in 2011. Germany opted, as a priority, to take care of material that is in danger of disintegration and films for children, whereas Latvia cannot continue its digital restoration programme at all, due to a lack of funding.

EU funding

Given the financial and historical importance of Europe's film heritage, in 2011 the Commission [recommended](#) the use of the [Structural Funds](#) for its digitisation and digital preservation. It cited successful examples in the Baltic States and Poland, which have devoted structural funds to this purpose and achieved a high rate of digitised film heritage. [Lithuania](#), for example, has digitised 13% of its film heritage, [Latvia](#) 15%, and [Estonia](#) and [Poland](#) 20%, compared to an average of around 1.5% in the EU as a whole. [Creative Europe](#), and [Horizon 2020](#) (Reflective Societies, call 6: Innovation ecosystems of digital cultural assets) funds are available for

Public-private partnerships

An initiative developed in partnership between [FindAnyFilm](#) and UK Film Councils, whose responsibilities have now been transferred to the British Film Institute (a FHI), resulted in a catalogue of British film heritage and a platform on which films can be watched.

[Ximon](#) is a joint initiative of the Dutch Film Institute, the Netherlands Institute for Sound and Vision, and a Dutch association 'Film Producers Netherlands'. Its catalogue contains not only recent Dutch productions, but also a historical collection of films dating back to the early years of the industry.

film literacy projects aimed at [raising](#) awareness of European film heritage and educating future film audiences. The Connecting Europe Facility is available for digital infrastructure that will provide access to digitised cultural (film) heritage.

The EU faces international competition in this field, particularly from the [US and India](#) which dedicate significant financial and human resources to digitisation and long-term digital preservation projects. Efforts to achieve mass digitisation of European film heritage would create economies of scale and benefit the sector, enhancing its competitiveness.

Main references

Implementation of the 2005 European Parliament and Council Recommendation on Film Heritage, [Progress Report 2012-2013](#) and [Annex](#), European Commission, October 2014.

[Challenges of the Digital Era](#) for Film Heritage Institutions, European Commission, 2011.

[Access to film heritage in the digital era](#) – Challenges and opportunities, Jon Wengström, Swedish Film Institute, in Nordisk Kulturpolitisk Tidskrift, Vol 16, 2013, No 01.

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