

Digitization of the National Audiovisual Heritage: An Overview of Bahrain TV Experience

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Abstract

Supported by the rapid development of ICT, digitization is fundamentally changing the way policy-makers, experts and professionals treat and value information resources. It is essentially characterized by its contribution in terms of storage capacity, speed, the extent of dissemination, and management flexibility. Audiovisual archives are part of the cultural heritage and collective memory. Digitizing the archives has become essential in recent years despite its expense and complexity because of the potential threat that these archives may deteriorate. Strategies and policies regarding the issue of national heritage vary depending on the country.

In the Kingdom of Bahrain, the digitization and preservation of audiovisual fund is part of the (2011-2016) strategy implemented since 2011 by The Information Affairs Authority (IAA). The aim of the fifth pillar of the strategy is to update the technological infrastructure of the Bahrain TV. A process of digitization and preservation of a 55 years heritage of audiovisual resources has been initiated since 2008 through a corporate working in the field of media asset management (MAM)

This project has two objectives: to convert analog into digital information resources on the one hand, and to copy the native digital content on different storage media for preservation and easier management/distribution, on the other hand.

The strategy emphasizes the urgency of safeguarding the audiovisual archive, which has degraded or may degrade or be susceptible to alteration as it is preserved on traditional storage media

(magnetic tapes, on reels or cassettes). In addition, the strategy pointed out that it is also time to solve the chronic problem of aging playback devices and television broadcasting.

Four years since its launch, the project is yet to produce tangible results in building up the prerequisites for the digitization of the huge audiovisual funds. Managers seem to be reserved about the subject and the documents made available to researchers are rare and insufficient.

Keywords : Digitization, Audiovisual archives, Media Asset Management, Bahrain TV.

Introduction

The development of digital culture and the proliferation of tools for the production and dissemination of data have heightened concerns about the archiving and preservation of all forms of human creation.

The digitization of archives is experiencing a growing interest among governments. Aware of the importance of library archives, museums, audiovisual collections ..., governments integrate this issue in their development strategies. However, this awareness is not always followed by action plans. Regarding the audiovisual archives, Irina Bokova, Director-General of UNESCO, acknowledged the difficulty of preserving them:

We are witnessing a historic turning point in the impact of technology: the easier it is to capture images and sounds, edit them and disseminate them worldwide, the harder it is to safeguard these immense data streams. (World Day for Audiovisual Heritage, October 2013)ⁱ.

The UNESCO has noticed: ‘‘Despite the adoption of the UNESCO Charter on the Preservation of the Digital Heritage in 2003, there is still insufficient awareness of the risks of loss of digital heritage’’. Thus, it organized an international conference on The Memory of the World in the Digital Age: Digitization and Preservation (Vancouver, September 2012). One of the major recommendations of this conference:

For analogue documents, digitization can protect valuable documents from deterioration by reducing handling. In the case of audiovisual documents, digitization is the only means of ensuring their survivalⁱⁱⁱ.

The 2008 economic crisis has significantly slowed funds to finance major digitization projects in the USA and UK (Hughes, 2012, p.2).

Some countries, however, have resumed engagement in this process after 2008 such as the Kingdom of Bahrain.

This article covers three main points. First, it focuses on the reasons that motivate governments to invest in digitization. Secondly, it discusses the importance of digitization of audiovisual archives. Finally, it outlines the experience of the digitization project of the Bahrain TV since 2012.

1. Drivers for Digitization

1.1. Digitization : An Access Enabler

Technological development has accentuated the need for documents because it makes them more visible. Now, the opportunities for storage, distribution and management are limitless. Digitization has multiple functions, the most important of which is to provide access to an archival heritage to the greatest number of users. The *flexibility* provided by these technologies for storage, distribution and management is limitless (Dobrevá and all. 2012)

In addition, the need for archives is no longer reserved for specialists; several actors, such as researchers and broadcasters use archives for different reasons and purposes. Institutions are then required to opt for this approach and take advantage of technology by creating platforms and comprehensive solutions that meet the needs of all.

1.2. Digitization : A Preservation Strategy

Digitization as a preservation strategy has been the subject of debate among the members of the cultural heritage community for two decades. The benefits of digitization in expanding access are universally acknowledged, but the recognition of digitization as an option for long-term preservation of analogue materials is still controversial (Matusiak and Johnston, p. 1, 2009)

Without going into this controversy, we can say digital conversion does not only offer copies for immediate access and use, but also creates a new resource in the form of archival master files.

It is widely recognized that the value of the original documents is related to their fragility. Collections should be consulted on-site. Archivists argue that governments assume their responsibilities in safeguarding these documents which are part of the collective memory and the cultural heritage. Digital material is robust, easily copyable and transferable via networks.

It should be noted in this context that the digitization of duplicate documents does not mean the replacement of the originals ; they are complementary. It is certain that the digital copy preserves the original and consequently contributes to its preservation by relief consultations.

Although archive specialists do not consider digitization an effective preservation strategy, they do not deny that it has facilitated access to the originals documents.

The challenges and uncertainties of digital preservation are well established, and it is clear that the complexity required to preserve digital objects far exceeds the known requirements for the preservation of analogue materials. (Oliver, p. 52, 2012)

1.3. Digitization : A Dissemination Tool

The activities of classifying, indexing, and preserving should normally be followed by diffusion which is considered as one of the main purposes of the digitization process.

The publication of archives, mainly in the form of digital documents, broadens access to sources. The opportunity to access databases designed by archivists is a source of motivation for researchers because it helps them gain time and use less effort.

The diffusion and sharing of documents via the networks have developed due to the development of digitization and compression technologies. Storage capacity databases and websites are constantly evolving. Simultaneously, the rapidity of retrieval of documents increases. In addition, the development of social networks has increased the exchange and sharing spaces of archives.

2. The Context of Digitization

2.1. Prerequisites for Digitization

Digitization is a long, costly and complex process. It is for that reason that digitization projects are supported by governments and fit into a comprehensive strategy implemented by the State. According to the UNESCO, IFLA (International Federation of Library Associations) and ICA guides (2002), a prior strategy to any digitization project should be implemented. This strategy should define the types of resources involved in this process as well as the objectives, recipients, and the uses of the digitized product. In addition, it was mentioned in the guide of UNESCO

that the choice of resources to digitize should be based mainly on their intrinsic value, conservation status and the real need of the users.

Usability of digitized resources depends largely on the management policy. The way in which files are archived and organized (file management) and the particular attention given to the data describing these files (metadata) facilitate enormously the indexing, archiving and the use of digitized files. It should be noted that strategies differ according to the type of the digitized material. (This article focuses on the audiovisual resources). However, strategies must be established with considerable attention given to the relatively high cost of digitization.

2.2. User Involvement

It is worth mentioning that the success of a digitization project is only possible when the objectives and user needs were clearly identified. To best meet user needs, experts suggest their involvement in the digitization process. The degree and nature of this involvement differ depending on the project and the willingness of its leaders. It is obvious that user involvement can contribute to the final product for a better usability.

In addition, it is useful to specify the type of users we are dealing with before defining the nature of its involvement. Milena Dobрева, Andy O'Dzyer and Leo Konstantelos provide us with this typology in the audiovisual field.

Table 1 : Types of user involvement in digitization <i>Milena Dobрева, Andy O'Dzyer et Leo Konstantelos, in : Hugues et al., 2012, p.77</i>		
Type of involvement	what is used for ?	Relation to value and impact
Front-end involvement	Users can take part in assessment of a variety of issues in digitization (technical requirements e.g. resolution, dimensions of digital objects, preferred formats for use). At this stage users can also take part in exploratory research,	This type of user involvement aims to identify in advance what the users see as a valuable future resource. It helps to focus digitization on outputs of expected value and impact.

	e.g. needs in new resources and defining requirements, as well as rationale for selection appraisal and prioritization of material to be digitized.	A major warning that needs to be made is that the opinions of current users may not be identical to those of future users.
Normative evaluation	This type of evaluation usually takes the form of iterative circles of process and evaluation when implementing digitization of collections. Most typically, such evaluation will focus on usability, e.g. interfaces and presentation of digitized resources; coverage of identified needs for specific audiences.	This type of evaluation helps to potentially increase the value and impact of a resource in development. Iterative circles of evaluation can be really helpful to improve resource discovery tools and interfaces, and to apply corrective measures to the digitization process.
Sommativ evaluation	Here the focus is the final output and accordance to the expectations and requirements of target communities, organization structures and the wider disciplinary domain.	This type of user involvement may help to valorize the digital resource and to establish its reputation.
Direct engagement in the digital resource creation	Direct user engagement can utilize social media tools that allows users to contribute their own digital objects or to take part in the enrichment of digitized resources – e.g. supplying full texts or metadata. Typical examples are crowdsourcing, e.g. users contribute to create full text versions from images, and the use of Flickr to share digitized resources more widely and invite users to contribute metadata.	This is a specific type of contribution that potentially could increase the value of digital resources of users or communities that appreciate the wider involvement. However, it might also have the opposite effect if there is a danger of compromising the quality and trustworthiness of digital resources.

3. Digitization of Audiovisual Archives

3.1. The Mandatory Conversion to Digital

In the audiovisual field, digitization is of a particular importance both for access to the archive or the preservation of audiovisual material. Since the 1990s, the techniques of conservation and management of audiovisual documents have not ceased to develop. Institutions and broadcasters are becoming more attentive to that process.

Digital files are gradually replacing analog forms of storage and media playback. It is commonly known that, in analog forms, contents depend on the playback devices. Two problems must indeed be solved: physical media degradation and obsolescence of analog playback devices. With the development of digital technologies, traditional media are now gradually disappearing (e.g. VCRs that record, read and transfer the conventional formats are no longer appropriate).

Magnetic and chemical film tapes are very sensitive to mechanical and chemical alterations, depending on the storage conditions. These defects increase with time. Most video archives are stored on magnetic tapes on reels or cassettes of various sizes.

The only way to save the original documents is to ensure their sustainability which can be done by transferring them to modern media or by digitization. These kinds of actions have become relatively inexpensive and allow keeping programs available for any type of future use (broadcast, DVD ...). Currently, bodies that offer archiving and preservation solutions deal with all the file formats (standard and coding rate) available: conventional MPEG1 and MPEG2, H264.

Unlike other resources, the preservation of audiovisual materials is particularly complicated. The complexity stems from several factors including (i) the choice of format retention, (ii) the management of voluminous files that are not always compatible with existing equipment, (iii) the lack of standardization in the field of audiovisual archiving, (iv) the storage capacities, and (v) the challenges of copyright.

3.2. The Digital Media Asset Manager (MAM)

With reference to Albert van Niekark, Wikipedia defines DMS as the:

Management tasks and decisions surrounding the ingestion, annotation, cataloguing, storage, retrieval and distribution

of digital assets. Digital photographs, animations, videos and music exemplify the target areas of media asset managementⁱⁱⁱ.

Digital assets are any form of content or media that has been formatted in binary source, allowing it to be consultable. Organization, research, viewing, retrieval and protection of such material have become a challenge for professionals and researchers.

Such content is web-based and has a central repository that allows quick access. In addition, online digital MAM is excellent software designed to manage, organize, and distribute content. It facilitates, automates and secures confidential content in the workflow.

Several systems exist on the market. They are very similar and are considered an asset orientated solution. Below we present an example.

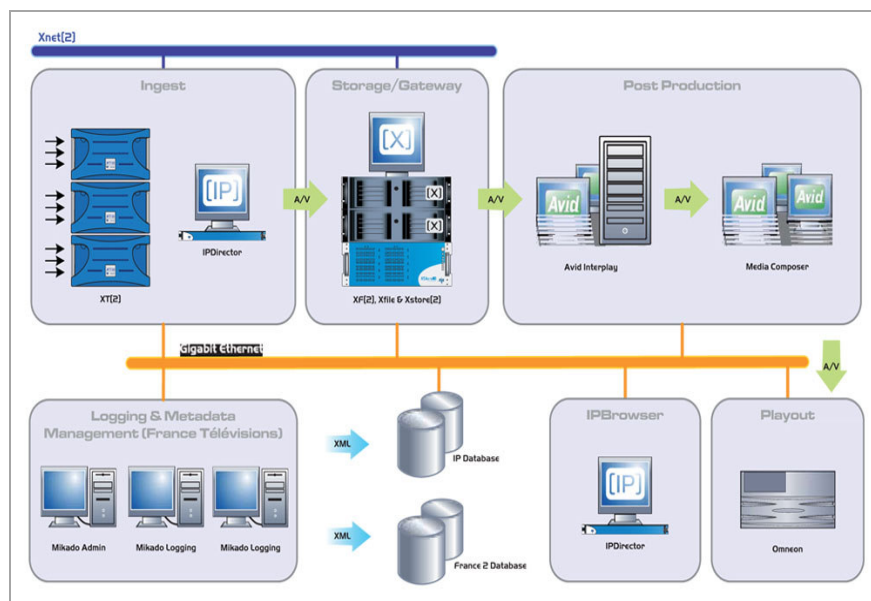


Fig. 1. Media and Asset Manager (France Télévisions)

4. Case Study : Bahrain TV^{iv}

4.1. Bahrain TV: Awareness of the Significance of Digitizing

The Kingdom of Bahrain is one of the few Arab countries to take action regarding the digitization of its audiovisual archives. In his study

The Reality of Audiovisual Archives Centers within Arab Radio and Television Organizations (2011), Wahid Gdoura concluded:

Audiovisual documents do not benefit from the fame and the privileges acquired by the sector of Arab radio and Television, despite the fact that they provide primary material for the production of programs that will attract the attention of the Arab publics of viewers or auditors. (...) Audiovisual documentation Centers are – theoretically- the scene of special care but their situation – practically- is difficult and suffers from abundant obstacles.

Before describing the new strategy of the Bahrain TV for the digitizing and archiving of its audiovisual heritage, it is important to give a brief overview of its current working method.

Whether preparing news programs or programs that require the consultation of the archive, journalists/producers are required to pursue a manual process that is not always reliable. First, they are required to identify the requested material by watching the content of video tapes stored in the library. Unfortunately, such needed archives may not exist and when they are found they are always not well organized and sometimes they are in poor condition. In addition, it is difficult to find the requested material without asking for help from the head of the library. Once found, the material should be first visualized, then copied and transferred into digital format. It goes without saying that this process is long and inefficient.

These weaknesses were repeatedly raised by professionals and deplored by the assessments undertaken by the Information Affairs Authority (IAA) in charge of regulating the media sector. From 2011, indeed, the IAA has implemented a new strategy (2011-2016) that aims to improve competitiveness of Bahraini media in a rapidly changing field. As part of its new strategy, the IAA aims to improve the performance of Bahrain TV. The improvement had to focus first on an extensive process of digitization and implementation of an action plan that identifies the mechanisms of transition to production and broadcast in high definition format. In addition, it was necessary to adopt international standards in terms of automated workflows to manage content (ingest, digitization, quality control, archive storage).

The Digitization of the Bahrain TV archives aims for^V:

- Disseminate easily and provide rapid access to archives through a server and thereby ending the traditional way in the circulation of

audiovisual documents. External requests are handled quickly and efficiently because the required equipment can be distributed via the Internet.

- Group on a single platform documents stored in a variety of content systems ;
- Build a fully searchable online database available to the producers, broadcasters and researchers.
- Develop the workflow in Bahrain TV, particularly as regards the preparation of the news and programs based on archival documents.
- Ensure the longevity and the continuity of the audiovisual archives.

4.2. The Digitization Project

In order to achieve the objectives listed above, Bahrain TV has chosen Masstech^{vi} and its well-known solution called TOPAZ + XT (version 7.5)^{vii} to initiate a wide ranging project to digitize and archive 55 years of Bahrain TV assets (approximately 15,000 hours of audiovisual material) .

We chose Masstech because they have more built-in versatility to provide us with a complete solution for digital archiving, ingest, QC and metadata management. The TOPAZ system will enhance production giving our staff instant access to archived video footage with the ability to search and view low-resolution proxies at their desktop. It is very important for us to preserve and protect our media assets as we invest in more channels and generate more content. Shaima Al Hamid, Director of technical affairs at IAA^{viii}.

The size of the material to be processed is considerable (the Project Manager puts the figure at 15,000 hours to transfer or to digitize). Available material dating back to the 1970s and 1980s is archived on composite tapes / cassettes (2 inch quadruplex, VHS, Betamax, V8, S-VHS, Hi8 ..) The audiovisual material recorded during 1990s and 2000s is primarily stored on Betacam video, Betacam SP (Sony).

Much of the backup action undertaken as part of this project is the transfer of the contents exposed to degradation (approximately 3500 hours) on new digital media. Also, 4,700 hours of recorded material in a DV technology (in digital or DVPRO 8) are not immediately affected by

digitization. However, they will be digitized compressed formats DVCProHD, HD MPEG2, H264.

At the same time, the Bahrain TV is working on updating its channels by upscaling SD (Standard Definition) content to HD format. The high-speed transcoding (HQS) is able to ensure fluidity between different platforms of content creation and design (Avid systems, Apple FCP, Adobe Premiere.) Solutions/tools offered by Masstech, therefore, cover transcoding, logging, ingestion, annotation, cataloging, storage on the retrieval and distribution of content/media assets. It provides workflow production, transmission, and storage.

Masstech's TOPAZ+XT system facilitates metadata entries in Arabic and English for program planning and coordination. At BTV's facility in Manama, the installation will comprise IBM servers, a DCS3700 150TB near line cache, a Spectra multi-frame T950 LTO-5 library, Pulsar-2 QC, 15 XT-Ingest appliances and Masstech's patented DRAC redundancy—all integrated and managed by TOPAZ^{ix}.

According to Brad Redwood, Vice President of International Sales and Marketing at Masstech, the digitization of Bahrain TV archives is:

A greenfield project for the Middle East, where adoption of digital workflows is still fairly low and there are plenty of opportunities to help broadcasters migrate from video to digital archiving and accelerate content digitization in this region^x.

We expose below the DAM system, which will be implemented in the Bahrain TV.

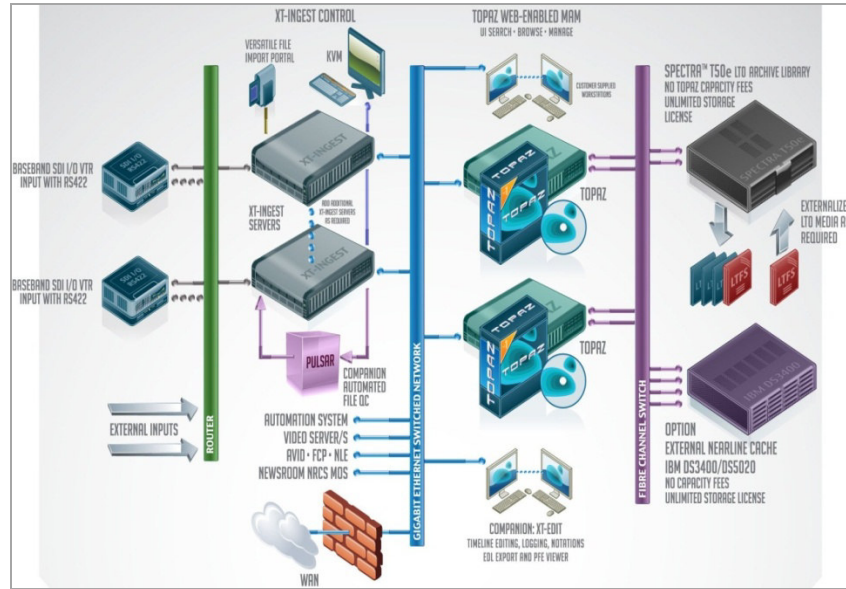


Fig. 2. Topaz digital archiving ecosystem

In this endeavor, the user should have a simple and efficient access to the archive. One of the major advantages of this type of technical solutions is the continuous tracking of the audiovisual archived assets through an accurate and clear indexation, which enables a quick and efficient retrieval.

Another component of the project monitored by Bahrain TV is to update the 6 TV channels into HD format. In the future, managing and archiving the content will be more simply simpler through XT-Ingest that is a standalone ingest server that manages VTRs (capture, archiving...). XT-Ingest is simultaneously a server and an interface. It also allows users to import audiovisual material recorded on various media and in different formats. Assets are likely to be indexed and archived according to the selected format. It is also possible to access the platform at any time to update the associated metadata.

Three main phases are mentioned in this context:

First, the company has installed its platform since May 2012. It was operational in early 2013.

This is a long-term process. We will have to transfer the analog content archived for 55 years in digital formats. Several teams and profiles are involved in this project. We

must first review all the material available in the BHTV's library. A substantial part of this archive requires rehabilitation (soundtracks adjustment, color correction ...) This operation is very expensive. The BHTV may not be able to handle it on its own. However, this does not prevent us to start digitizing the assets through 15 ingest machines. Ishtiaq Ahmed, Head of Research & development and Sr. Broadcast Project Manager at IAA^{xi}.

After ingestion, the project includes the addition of metadata-related to archived material. This phase is extremely complicated because the data associated with the material should be written in Arabic.

After the implementation of the platform for digitization and archiving, BTV will develop a quite innovative access system, which will allow the In User (journalists, researchers...) access the archive on their portable devices. Training sessions will be designed for this purpose. Finally, in order to ensure better results, a phase of quality control will follow.

Conclusion: Issues for the Digitization Process

The launch of the Bahrain TV digitization project is found to be long, complex and expensive process. Although it has the full support of the state agency (IAA), its implementation is experiencing major difficulties. Another serious problem is the general state of archives in Bahrain TV. A substantial part of material stored on damaged videotapes need to be cleaned, repaired and fixed. This might slow down the process.

The language is an additional factor that contributes to this slowdown; the metadata associated to archives are typically written in Arabic. For easier indexing and retrieval, metadata will be written in English and Arabic.

Finally, issues related to the security of data stored on the servers seem to be complicated. Who has the right to access and how? How to ensure that records are not pirated? For the moment, officials are saying nothing on this subject.

Notes

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http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/images/events/wdah2013_dg_message_en.pdf

[ⁱⁱ] http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/mow/unesco_abc_vancouver_declaration_en.pdf

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on: http://www.ciscra.org/docs/UNESCO_MOW2012_Proceedings_FINAL_ENG_Compressed.pdf

[ⁱⁱⁱ] http://en.wikipedia.org/wiki/Digital_asset_management#cite_note-1

[^{iv}] Bahrain TV, national broadcaster since 1973 has control over six television channels that offer a variety of programming, including news, documentaries, talk shows, series and movies.

[^v] Ishtiaq Ahmed, Head of Research & development/Sr.Broadcast Project Manager at IAA, Interview with the author. (December 2013).

[^{vi}] Masstech is a world leader in solutions dedicated to MMA and transcoding HD content.

[^{vii}] Topaz is designed for medium to enterprise sized broadcast operation centers and postproduction environments to perform efficient file-based archiving and content management (CMS).

[^{viii}] <http://www.digitalproductionme.com/article-5395-going-digital/1/print/#.UuOaFNLfqIW>

[^{ix}] (<http://www.tvtechnology.com/deployments/0108/bahrain-tv-taps-masstech-for-mam-project/212782>)

[^x] <http://www.digitalproductionme.com/article-5395-going-digital/1/print/#.UuOaFNLfqIW>

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