Leveraging AI for Video Appraisal

A Case Study at the World Bank Group

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**Abstract – The World Bank Group (WBG) Archives, in partnership with the WBG IT Department, has developed a tool to support the appraisal, selection and disposition of video recordings. The Archives Video Appraiser (AVA) leverages Machine Learning (ML) to make recommendations on which recordings to keep or destroy after having learnt from a trusted set of training data. Decisions are validated or corrected by an archivist so that AVA can continue to learn from its mistakes. AVA´s current predictions are 85% accurate and the use of AVA has resulted in 1.5-person-day savings per month and in the reduction of manual mistakes.**

**Keywords – Artificial intelligence, machine learning, video appraisal, digital preservation**

**Conference Topics – Innovation**

# Introduction

The World Bank Group (WBG), founded in 1945, is the oldest and largest multilateral development bank in the world.  It is one of the largest sources of funding and knowledge for developing countries; a unique global partnership of five institutions dedicated to ending extreme poverty, increasing shared prosperity, and promoting sustainable development. With 189 member countries and more than 12,000 staff worldwide, the WBG works with public and private sector partners, investing in groundbreaking projects and using data, research, and technology to develop solutions to the most urgent global challenges.

The WBG Archives provides the public with access to the archival holdings of the WBG along with engaging tools that enable the discovery of historical information. It also has fiduciary responsibilities for current records management and information governance within the WBG, made possible by policies, programs and services provided internally.

One of the responsibilities of the WBG Archives is to appraise the business, legal and research value of WBG records to identify records with permanent value and records that can be destroyed when no longer needed. The ever-expanding volume of uncategorized digital records makes the manual appraisal and selection of records increasingly labor-intensive- and prone to mistakes. In 2021, WBG archivists and their IT counterparts developed a solution to test the effectiveness of using Machine Learning (ML) technology to assist the Archives in the appraisal and selection of born-digital moving image records.

Our poster will introduce the results of this case study: the design of the so-called Archival Video Appraiser (AVA), a ML tool that generates recommendations on which video recordings should be permanently preserved or destroyed based on a set of pre-defined appraisal criteria. Furthermore, AVA also automatically transfers the records to a designated folder based on the decisions.

The poster will be structured as follows:

* The problem we were struggling with
* Goals of the project
* Results
* Technology used
* Lessons learned

# Problem Statement

The exponential growth of digital content makes it hard, if not impossible, for the WBG Archives to appraise the vast volume of unclassified records that we receive into custody. An example are video recordings, of which we receive an average of 200 per month. Many of these recordings have permanent value according to our Retention Polies, while others need to be destroyed. Some recordings are transferred to our custody with promising and descriptive titles, but contain no sound or content (e.g., a meeting scheduled to be automatically recorded via Webex is cancelled and recorded anyway).

The current process of human-driven appraisal of recordings requires the visual review of a one-minute segment of every video to ensure that there’s content and sound and to determine which retention rule applies. Archivists also use metadata, such as the title or the date of the recording, to support the decisions. Once decisions are documented, the archivist manually transfers the videos to different locations depending on whether they are eligible for ingest into the WBG’s digital preservation platform (internally named Digital Vault) or are ready to be destroyed.

The process takes about 2-person days per month and is prone to errors due to its very manual nature.

# Project Goal

Our goal was to develop a tool to support the appraisal of WBG moving image records and the automated staging of the videos after appraisal for ingestion into the Digital Vault, or their destruction when appropriate. Our objectives were to speed-up decision making and transfer, to increase the accuracy of the appraisal decisions.

# Results

AVA scans designated network folders for new videos and stores the information in a database. AVA then extracts and analyzes the filename and a generated transcript, identifies empty and soundless recordings, and provides recommendations for archival retention or destruction. AVA’s preliminary decisions are validated by an archivist. Thereafter, the videos identified for archival retention are transferred to a digital preservation staging area and those identified for destruction are destroyed. Audit reports are generated and automatically captured in the WBG’s Electronic Document and Records Management System.

AVA’s accuracy currently averages 80%. AVA is also successful in detecting empty and soundless videos. The tool requires approximately 10 minutes to make the recommendations for 200 videos. Once the recommendations are available, an archivist needs about 30 minutes to verify and take any required corrective actions.

AVA’s implementation has resulted in 1.5-person day savings per month, a reduction of manual errors, and an increase in appraisal decision accuracy.

# Technology Used

M365: PowerApps, PowerApps API and Power Automate (Flow).

AWS: API Service​, Python, Flask, Celery​, ECS Lambda​, Rekognition and RabbitMQ.

# Lessons Learnt

Identifying a representative set of training data requires a high initial time investment for the archivists. To support AVA’s learning process, the archives provided 3000 carefully verified appraisal decisions that were used to teach the tool how to differentiate between permanent and temporary content. In addition to the videos selected by AVA, it is important to ingest any available metadata about the full set of videos, such as dates, meeting titles, meeting room, participants, and others.

A human driven iterative training process is still required to continue training the tool and increase accuracy. Archivists need to plan for future developments and ensure that those plans reflect the current technology and are funded appropriately.

Our current use case is relatively simple, requiring evaluation of straightforward criteria. Scaling it to larger collections of mixed formats, etc. will likely present greater challenges, such as more AI bias because of human errors on the training data or because the training data is not representative enough.