



InterPARES 3 Project

International Research on Permanent Authentic Records in Electronic Systems

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Report of a case study

A. Outline

This case study aims to approach the preservation of the digital photographic records created within the coverage of news stories produced at the Public Relations and Press Office (acronym in Portuguese: ASCOM) of the State University of Campinas (UNICAMP), so as they remain reliable, authentic and accessible through time, given their scientific, cultural and informative relevance to the university.

B. Methodology

The case study followed the methodology proposed by the InterPARES Project. UNICAMP researchers collected data based on specific guidelines defined by the project, aiming to gather information about the context of creation and characteristics of the digital entity. This data collection was carried out through interviews that the ASCOM researchers held with the personnel in charge of the creation and maintenance of the photographic records.

After data collection, the researchers conducted the diplomatic analysis of the record, according to the template for diplomatic analysis proposed by the InterPARES Project. From that analysis, it was possible to identify some procedural problems and to propose changes and a plan for the preservation of digital records.

C. Description of Context

Provenancial context

UNICAMP is a public institution of autarchic nature under the special rule of São Paulo state's government administration, and it has ASCOM as an auxiliary unit that reports directly to the Rector's Office at the university.

Juridical-administrative context

ASCOM was installed in 1980, under the Rector's Office, as the unit that was responsible for the production of photographic records at UNICAMP, with the following mission: to moderate the relationship between UNICAMP and the media (newspapers,

magazines, radio, TV etc.), responding to external demands generated by the media and generating demand of information about the university; to disseminate scientific and technological information from all knowledge areas; and to clearly and objectively disseminate information of interest to the academic community. As an auxiliary unit to the Rector's Office, ASCOM follows the legislation that is related to it, which is defined in the university's statutes and internal rules.

Procedural context

Photographs are taken by photographers accompanying journalists in interviews or coverage of events with photographic equipment.

The production of photographic records follows these steps:

1. Photographic mission: Photographer takes pictures in the field.
2. Storage of raw material: Transfer of materials from the camera's memory card to a hard disk at ASCOM's Photography and Archives sector, where they are stored and organized in a directory with the name of the corresponding photo mission.
3. Image selection: Images without technical quality are deleted and the good-quality images are selected for publication and/or for a set called "technical reserve," aimed to potential use in external productions, or even in other journalistic editions. The photographic records are sent to the so-called Digital Archive System at ASCOM.

The digital photographic records are stored on computers at ASCOM's network, in their original format, from which representations are derived for use by editors and journalists for publication on UNICAMP's newspaper and website. The published photos and their originals are kept in a repository and referenced on the search engine developed by a team from the university's Central Archives System (SIARQ), which follows the description requirements set in the "General International Standard Archival Description – ISAD(G)" and the "Encoded Archival Description – EAD." The images that were not used are gathered in a repository of files, available for use by journalists and organized in directories named after their respective photographic missions.

Documentary context

ASCOM's digital photographic records are managed with UNICAMP's records management tools¹ and, at the Central Archives, they are organized as follows: group

“Rector’s Office,” subgroup “Public Relations and Press Office,” series “UNICAMP news – journalistic mission,” sub series “Photographic records.”

Technological context

Digital photographic records are created on 6.2-MPixel Nikon D-100 cameras, in JPEG format.

The photographic records are stored on ASCOM’s computers, in which certain strategies were adopted to maintain those documents, such as: RAID 5 data redundancy systems, transfer and back-up routines, and the storage of copies on optical media for security purposes.

To access and manage the digital photographs, we use: the SIARQ/SEARCH system, developed for Windows 2000 Server operating system; an SQL Server 2003 database; HTML and ASP languages; and an IIS server.

D. Narrative answers to the applicable set of questions for researchers

The photographic records are created as a result of the production of news pieces on research, courses, outreach projects, cooperation agreements, transfer of technology and other activities held at UNICAMP, besides the production of the university’s house journals and other institutional promotion material.

The photographer takes the photographs while covering a news story, with professional digital cameras. The images are transferred from the camera's memory card to a computer (HD) at ASCOM’s Photography and Archives, where they are stored in a directory under the name of the corresponding photo mission, still as unsorted raw material. At that time, an image processing software (Adobe Photoshop) is used for analysis of the photographic records, eliminating those disqualified due to technical problems. After that, we prepare the photographs for selection for publication. The photographic records are classified and grouped into thematic collections for other uses, and stored on optical media. At this point, the files are transferred through FTP to ASCOM’s Digital Archives System, the network server of SIARQ’s Central Archives, where they are archived in high resolution. Also, the images stored on optical media are copied for backup on AIT tapes.

After storage, the photographic records are described and indexed in the database called “SIARQ / PESQUISA” (“SIARQ / SEARCH”), according to ASCOM’s archival organization manual.

Descriptive metadata is manually entered into the database, according to the ISAD(G) standard: file name, title, reference code, level of description, class, date, extent and medium, creator/author, location, original location, location of copies, publication notes, notes, keywords/descriptor, scope and content, date of description, responsible person, address of the electronic file, biographical and administrative history, archival history, gender, origin, archivist’s notes, appraisal, accruals, system of arrangement, container list/register, conditions governing access, conditions governing reproduction, physical characteristics and technical requirements, finding aids, related units of description, rules or conventions, instruction for reference, and completion date.

The technical metadata are automatically produced at the time of creation in digital photographic equipment: identification of the photographic record (the original code of the equipment’s application software and serial number), color, size, pattern, format, date, time, width, height and resolution. They are recorded in the file properties of the JPEG file.

The survey on the context of creation revealed that the photographs are created and maintained in JPEG format (300dpi). The images posted on electronic media (e.g. the university’s website) or the “Jornal da UNICAMP” newspaper are maintained also in PDF format. The images for “Jornal da UNICAMP” are prepared in the CMYK color system for printing in grayscale.

Documents are identified by a persistent unique identifier, consisting of a reference code made up by the country code, the holder’s code and the local reference code.

To ensure accuracy, reliability and authenticity of the digital photographic records, the original file in high resolution is entirely maintained, and further changes are not permitted. Access is granted only to creators and other authorized persons, by means of the interaction with a digital repository at ASCOM’s Digital Archives System, within the Central Archives’ network managed by SIARQ – the unit in charge of records management and preservation at the university. All the technological environment and procedures for access and storage are governed by back-up and security access policies. In addition, the university keeps a policy of continuous technological upgrading.

SIARQ's Central Archives receives the photographs in digital form, through the use of an FTP (File Transfer Protocol) installed on a server with access restricted to specific equipments at ASCOM that host static IPs, i.e. only two specific ASCOM computers can hold the transfer of digital documents to the Central Archives. The granting of access to servers at the Central Archives is defined by an access policy and managed by a firewall operated by computer technicians of the Central Archives itself.

The design of a corporate repository for the transfer of digital records and its standard rules are currently in study, under the Central Archives' guidance. A Digital Records Management and Preservation Commission was established in 2007 at UNICAMP (GR 45/2007, and members were appointed in May 2008, through GR 22/2008).

E. Narrative answers to the project's applicable research questions

Which are the regulatory, auditing and policy making bodies that need to be sensitized to the importance of digital preservation, and what are the best ways of influencing them?

The organisms to be sensitized to it are those related to the strategic planning and the making of policies concerning archives, information and ICT, which are, in the context of a university, the higher deliberative bodies, such as the university council and colleges and institutes' boards. One way to influence them is to create, within the archival field, committees or groups composed of teachers, researchers, students and managers, in order to develop studies and proposals for digital preservation. Then, awareness may reach the organization's areas horizontally and vertically, depending on their participation in those committees, which should include members of academic and administrative bodies (including maintenance and supervision staff). Those groups may jointly propose, therefore, actions and procedures to the higher and decision-making bodies for the resolution of the management and preservation of records.

How and when should these archives or programs prepare themselves for digital preservation?

The institutional archives should prepare guidelines and best practices for preservation, enabling record creators to carry out, in their local archives, measures to ensure the reliability, authenticity and access of records, from the time of their creation and for as long as necessary.

What differentiates the preservation of digital records from that of any other digital entity for which the archives might be responsible?

The preservation of digital records, unlike the preservation of other digital entities, must be able to guarantee the basic characteristics of the archival document, particularly what comes to its fixed form, stable content and archival bond with the other documents that register the action.

What are the nature and the characteristics of the relationship that each of these archives or programs should establish with the creators of the records for which it is responsible?

There should be partnership between creators and archives in building solutions for digital preservation. Archives and creators must know each other and the former should provide guidance on the management and preservation of archival documents; the latter, in turn, should provide information about their operations and documents, allowing the identification of those which are archival, and be willing to incorporate archival knowledge in their work processes. That interaction is required for the joint development of solutions that enhance the creation and filing of records, in order to maintain their reliability, authenticity and access.

What action plans may be devised for the long-term preservation of these bodies of records?

In the case study of ASCOM / UNICAMP, it was verified that the digital photographs were produced and maintained permanently only in the JPEG format, in the archives of SIARQ. As they were considered as records, since they meet the five basic characteristics required in the diplomatic analysis, the following action plan was developed, aiming at the long-term preservation of the digital records.

1. Change in the digital format of the photographs produced at ASCOM

Initially, the photographs were produced in digital cameras and exported to computers (for technical processing and storage) only in JPEG format. A change in that procedure was proposed, so that, at first, the production of photographic records on the camera should be in CAMERA_RAW (proprietary format of each digital camera that varies according to the manufacturer and model), in order to keep all original characteristics of the image generated in the cameras, required for the processing on graphics editing software. Then the photographic image in RAW format will be exported to the image processing software, where they will be accessed, appraised and selected for editing and final

production of digital photographs, and finally stored in a file, in TIFF-6 format, which will consist in the matrix file.

The digital format CAMERA_RAW was not considered an appropriate format for long-term preservation and access, and will be kept only in the work environment of the creator (ASCOM), for the time it is deemed necessary for the completion of the photographic record for the initial use proposed (news coverage and media events, people, places, etc.).

As it was defined that the standard digital format for archiving photographs is the TIFF-6, all digital formats that may be necessary for use and dissemination in the organization, such as JPEG, will originate from it, and their storage may be just temporary, according to the criteria established.

The news stories published and converted to digital PDF files that contain digital images in JPEG will also be stored and preserved as a record of the action.

2. Increase of security in the storage solution

In order to implement the necessary actions for long-term preservation of digital photographs, maintaining their integrity, reliability and access, there will be an increase in the safety of the archiving solution (storage), as follows:

- a) implementation of audit trail to allow tracking of cases;
- b) definition of metadata registering agents (use and tracking);
- c) definition of security and access policy; and
- d) backup.

3. Definition of actions aimed at the preservation of the digital photographic records at ASCOM, through:

- a) development of procedural instructions for the production of digital photographs by photographers;
- b) acquisition of professional digital photography equipment;
- c) monitoring formats of digital photographs and technological environments (image processing); and
- d) training of personnel.

Can the action plan chosen for a given body of records be valid for another body of records of the same type, produced and preserved by the same kind of organization, person, or community in the same country?

Yes, it is possible, if the conditions are the same as the ones raised in this case study.

Can the action plan chosen for a certain type of record or system be valid independently of the creating or preserving organization and its context?

It is possible that other institutions that have the same characteristics can adapt it to their realities.

How can records professionals keep their knowledge of digital preservation up-to-date in the face of ongoing and increasingly fast technological change?

Records professionals can keep up by participating in open study groups (including networks), courses, conferences and meetings on the issues, or even by establishing programs and forming study groups in their own organizations, in partnership with national and international projects.

F. Diplomatic analysis

The digital photographs of ASCOM / UNICAMP were considered as records once they meet all the characteristics required in the diplomatic analysis. However some changes are needed in the creation and maintenance procedures, in order to preserve the photographs for a long period, such as:

- to monitor the file format so as to implement the necessary actions for long-term preservation;
- to study the capture format and storage of photographic records, aimed at long-term preservation – it is recommended to use the TIFF format for archiving and preservation; and
- to appraise the safety of the repository of digital records, in order to support the authenticity and to control access to documents.

Furthermore, there is the need to:

- improve ASCOM's records management program, systematizing and standardizing procedures concerning selection, disposal, indexing, retrieval, access, etc., and instruments such as the file plan and disposition schedule; and
- assess, from both logical and physical standpoints, the current human and material resources available targeting the creation, processing, organization and access to documents, and propose changes.

G. Conclusion

The case study proved to be possible to apply the body of concepts, principles and methods of the InterPARES Project at this university.

After identification of the digital record and its context (creation, archiving, technologies, etc.) as well as its diplomatic analysis, it was concluded that the photographs are digital records.

The group identified the need to plan improvements in relation to the production of photographic documentation, system security, maintenance and monitoring of the reformatting process, in order to ensure greater reliability and authenticity to the record. Thus, an action plan was defined for the implementation of the improvements so as to monitor JPEG, CAMERA_RAW and TIFF formats, when it comes to upgrades and migration procedures, and track information by means of an audit trail.

Some definitions and solutions are already being implemented:

- maintenance of descriptive metadata in the database, which should be preserved, as well as the bonds with the digital objects (photographic records) described in it;
- registration of the record's classification code, and description of all the other records related to its creation; and
- enhancement of security requirements, with the identification of agents and the implementation of audit trails.

The monitoring of file formats and the system itself will be subject to applications to be developed from the digital preservation requirements duly published by reputable institutions.

Another important element raised was the need to develop a plan for the preservation of digital records in the custody of ASCOM / UNICAMP, besides the need to form a group to continue with the study of digital preservation in partnership with the university and SIARQ, targeting the development of future joint institutional actions.