

The Management of Metadata in the Digital Photographic Collection at Celebration Ministries International in Harare.

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Abstract

Metadata plays a significant role in facilitating the authentication and retrieval of digital photographic records. The purpose of this study was to assess how the capturing of metadata and the use of a photographic management software can facilitate easy retrieval and access to digital photographic records. According to Getaneh (2014), metadata is structured information that describes, explains and locates information resources. Types of metadata such as descriptive, administrative and structural metadata are essential in managing photographs since they support the findability and retrieval of photographs. The study used a case study design, where interviews and questionnaires were employed as data collection instruments. The objectives of the study were to evaluate the types of metadata captured for retrieval purposes; understand the challenges associated with the storage and retrieval of photographs as well as establishing the extent to which metadata assist in easier management of photographic collections of the church archive. The findings of the study revealed that the system used in managing the collection has incomplete retrieval metadata fields. This was due to the fact that the system used to capture metadata traits has pre-defined metadata fields, thus creating shortfalls in the captured information. More so, the software system used at the church archive is open-source software and it lacks defined metadata standards. The study recommended the adoption of socially-constructed metadata standard. Furthermore, there is need to use proprietary client-oriented photographs management software (PCOPMS) since it allows the capturing of sufficient metadata.

Keywords: church archive; digital photographs; metadata; metadata standards

1. Introduction and background

The Celebration Ministries International (CMI) was founded in 1979 and it was known as ‘Hear the Word Church’. The church delivers its services through its main arms which are the Celebration Churches and Celebration Holdings. The Celebration Holdings is constituted of the Compassion Ministry, Kingdom Celebration Music, Celebration International School, Book Store and the Connections (restaurant). The activities of the church are captured in photographic records. Photographs are sources of information which give an insight into the business. Dashrath (2014) points out that, photographic collections are not mere pictures but they speak more than is shown on the image, they give information about the business processes and a deeper understanding of the processes it represents. Therefore, still-visual images are captured for the purpose of archiving.

The process of capturing important metadata traits of photographic collections involves the use of IPhoto computer applications and Picasa to capture technical, administrative, descriptive and structural metadata of all the scanned and born digital photographs. However, the system that captures metadata at the church archive seems to have some loopholes in capturing adequate metadata that fully describes the photographs’ detailed metadata traits. Weinberger (2007) posits that metadata is a powerful tool to help organisations find records, understand them and use them to serve multiple purposes. Metadata is needed to track, retain, protect and preserve records as well as to manage them over time.

For digital images to be acquired through archival means, and for them to have the most archival value, their function and surrounding contexts must be known and this speaks to metadata traits. Elings and Gunter (2007) point out that the meaning of a photographic document is not in the content or the form but in the context of document creation hence the need to capture descriptive metadata. Anderson (2006) is of the view that this process of creating and shaping why a photograph was taken, which may include documentation about the possible manipulation process, needs to be understood so that future users of a photograph, whether traditional or digitally created, can begin to appreciate the image before them.

Clark (2011) asserts that metadata should not only identify and describe an information object but should also document how that object behaves; its function and use; its relationship to other information objects and how it should be managed hence the need for finer metadata information. Zeng and Qin (2008: 3) state that metadata is “the invisible hand” that serves users

to find information. Without metadata, it would be impossible for the church to make its digital archives accessible for internal and external consumption hence metadata play an important role in facilitating access to photographic collections.

Metadata should be of high quality. Clark (2011) asserts that when metadata is captured, much concern should be on capturing useful rather than perfect metadata. The issue of metadata quality should be weighed in light of the relevance of metadata to support findability and discoverability. Furthermore, it is the metadata's usefulness in finding and discovering information objects rather than whether it is objectively accurate or not; or whether it is good enough rather than if it is perfect metadata that should be considered (Bennani et al, 2008).

2. Statement of the problem

The archiving of photographs is relatively a new phenomenon. It requires the capturing of metadata to facilitate easy identification of specific photographs in the collection (Anderson, 2006). Therefore, technical, administrative and descriptive metadata plays a significant role in facilitating the storage, retrieval and preservation of the information contained in photographic collections. However, the metadata captured in the current collection at Celebration Ministries International church archive seems not to be sufficient to facilitate easy retrieval. The metadata that is available and relating to the photographs is not adequate and as such there are delays in accessing and retrieving digital photographs. To make matters worse, the IPhoto which is a photographic management software used by the organisation, seems not to be offering adequate metadata fields to support the capturing of complete metadata traits of the photographs. As such, this study sought to come up with a metadata capturing system with adequate fields which promotes easy access and retrieval.

3. Purpose of the study

The purpose of the study was to assess how the capturing of metadata and the applications in place are effectively supporting the storage, retrieval, access and preservation of the photographic collection at CMI. The study sought to establish the problems that are affecting the capturing of adequate metadata which facilitates storage, access and preservation of the photographic collection and in the process, solutions were recommended to CMI Archives department.

4. Research objectives and questions

The study was guided by the following research objectives and questions as shown in *table 1* below:

Table 1: Research objectives and questions

Research Objectives	Research Questions
To establish how the digital photographic collection at the church archive is managed by those in charge of the collection.	How was the digital photographic collection at the church archive managed by the archives department?
To evaluate the types of metadata captured in managing the digital photographic collection at CMI.	Which metadata traits of the photographic collection at CMI were captured for preservation of the collection?
To bring out the challenges associated with the storage, access, retrieval and preservation of the photographic collection at CMI.	What were the challenges encountered in storing, accessing and preserving the photographic collection at CMI?
To establish the kind of metadata traits omitted in the retrieval system and the effects they had in accessing the photographic collection.	Which metadata traits were omitted in the retrieval system and what are the effects in the management of the collection?

5. Literature Review

Literature was reviewed thematically following research objectives.

5.1 Defining metadata in the context of photographs

In simpler terms metadata is data about data. Elings and Gunter (2007) argue that this definition is unhelpful and they suggested that metadata should be defined in relation to its function. Metadata describes the characteristics of photographs regarding the content, quality, accessibility, lineage and other features. Getaneh (2014) concurs by providing descriptive,

administrative and structural information hence metadata is essential in managing photographs as it supports the findability and discoverability of photographs.

When discussing metadata, the aspect of metadata schemas come in and Perce-Moses (2005) defines a metadata schema as a structured specification of the elements, values and rules that are designed to facilitate identification, discovery and utilisation of information in a consistent manner. Clark (2011) averred that metadata schemas should contain element sets that are likely to be usable, complete, accurate and accessible. When metadata schemas attain these recommendations, the retrieval of photographs will be quick and easy.

5.2 Defining photographs as records

Photographs, in an electronic environment, exist as born digital and digitised photographs. In both cases, the photographs contain machine-readable information. Weinberger (2007) postulates that born digital records are electronic records that are originally created in electronic record capturing systems, either in a networked environment or one working office. On the other hand, a digitised electronic record is a copy of a record that exists in an alternative electronic form or a physical paper-based system. Therefore, both digitised and born digital records, as electronic records, explain well the nature of digital photographs hence photographs are records as they fit in the classes of born digital and digitised records.

Perce-Moses (2005) defines records in two categories which are the exclusive and inclusive. The exclusive definition acknowledges the need for records to provide authentic, reliable and auditable evidence of activities. The exclusive interpretation describes records as written or paper-based documents. Conversely, the inclusive definition caters for modern organisations that create records in a diversity of electronic formats since the interpretation covers tangible, digitised and born digital records. The inclusive definition of records includes photographs as records hence photographs are justified to be records.

5.3 Adding metadata to a photo

It is hard to understand the meaning of the content and context of photographs without metadata, hence the need to add metadata in photographs. Metadata in photographs can be provided separately from the image or it can be embedded in a photograph. In each case, the purpose which is served by metadata is to assist information users and information professionals to search and retrieve particular photographs from the collection.

Murphy (2004) is of the conviction that embedding metadata in a photo is like turning over a snapshot to scribble your name and a note on the back of the picture. With embedded metadata, the information travels with the photo where ever it goes and as such administrative, technical and descriptive metadata is provided during viewing of photographs. Without the availability of metadata that describes the objects, it is hard to understand the context in which photographs were created. However, the extent to which metadata is captured varies and as such there is need for enriching and filtering of metadata as a way to come up with sufficient metadata that facilitates the good management of photographs.

5.4 Theory of metadata enriching and filtering

The theory of metadata enriching and filtering stipulates that metadata should be enriched by setting up a standard based approach (p priori metadata) and socially constructed approach (post-hoc metadata). Getaneh (2014) propounds that this theory cannot be optimally utilised unless the resulting metadata is contextually and semantically linked to both internal and external information sources. The theory of metadata enriching and filtering was essential to this study since the metadata created should be sufficient in facilitating identification and retrieval of photographs from the collection. It is important to note that metadata fields can be limitless and as such there is need for photographic collection managers to define boundaries of metadata fields and information to be captured hence the need to provide rich and filtered metadata that facilitates easy retrieval. The need to provide quality metadata prompted the introduction of priori and socially constructed metadata as discussed in the following sub-sections.

5.4.1 Priori metadata in photographs

Priori metadata make use of predefined metadata schemas or fields. In the process of creating metadata, it is important to note that most archival institutions that deal with photographs assumes that authors create works and archivists create metadata, while users access the photographs. In light of this, Getaneh (2014) observes that standard-based metadata is predominately generated a priori that is to say before users get access to images metadata fields are already established. With priori metadata, archivists acquire information object and describe it with metadata based on a given or established schema. Metadata captured should support retrieval in a way that archivists and remote users understand and as such priori

metadata as it uses predefined classes might not accommodate adequate useful metadata hence a socially constructed metadata can be the other option.

5.4.2 Socially constructed metadata in photographs

The need for metadata that is easy to use and best understood by users of the photographs collection propels the introduction of socially constructed metadata. The construction of metadata is highly influenced by socio-cultural constructs such as language, education, context of use and personal interests (Farkas, 2007). The diversity is spearheaded by differences in organisational cultures and how the archivists found the systems to be user friendly. O'Reilly (2005) cited that human beings are highly unlikely to agree on a singular top-down and hierarchical classification of objects thus the concept of socially-constructed metadata is proposed. The need for metadata that facilitate accessibility of photographic collection speaks to the need of metadata that is useful and not necessarily perfect. Useful rather than perfect metadata is discussed in the following section.

5.5 Theory of useful rather than perfect metadata in the management of photographs

There is need to reconceptualise the concept of metadata quality if retrieval is to be effective. Standards and organisation principles governing the operations of the archive office can be sometimes overtaken by current trends in the technological world and user perspectives hence the need to revise the metadata entries describing photographs (Spiteri, 2012). The theory suggests that metadata quality should be weighed in light of the relevance of metadata to support the findability and discoverability of information objects (Getaneh, 2014). At this juncture it can be noted that the usefulness of metadata in facilitating the finding and discovering of photographs is preferred rather than putting emphasis on metadata being objectively accurate or perfect. However, there should be metadata standards that define metadata fields and traits to be incorporated in the photographic management system. The proceeding section discussed metadata standards in photographs.

5.6 Metadata standards

The need for uniformity and consistence in the way metadata is captured in photographs open doors for the adoption of metadata standards in the management of photographs. Metadata standards are in diversity due to the fact that various countries and institutions are coming up with their own standards that support their organisational needs. Timothy et al (2007) averred that the used metadata approaches are based upon agreed principles. The subsequent subsection

explores on metadata principles that are to be observed when institutions are intending to design and implement metadata standards.

5.6.1 The principle of sufficiency and necessity

IFLA (2009) postulate that the principle of sufficiency and necessity states that only those data elements that facilitate the description of objects and their controlled forms of names for access that helps users in performing their search queries are to be captured. Elements essential to identify unique photographs are to be included in the capturing of metadata be it in Encoded Archival Description schemas or Dublin Core element set. Metadata should be kept minimal and simple by recording only the metadata pertinent to find information objects.

5.6.2 The principle of user convenience

The principle states that metadata should be designed in a manner that is user friendly and as such metadata systems should be designed with users in mind. Spiteri (2012) alludes that decision on the choice of controlled vocabularies to be used should reflect user needs. User convenience necessarily implies that metadata in standards-based systems reflect the metadata needs of each user, including the terminologies used for describing information objects. It becomes of no use to capture metadata in digital photographs that archivists and users does not understand.

5.6.3 The principle of representation

According to Bennani et al (2008) the principle of representation stipulates that metadata should objectively and accurately represent an information object. Descriptions and controlled forms of names should be based on the way photographs are captured and presented in the collection pool or database and as such metadata should represent or correspond to what is being shown on the image as this ensures integrity and authenticity of the collection.

5.6.4 The principle of standardisation

Description of access points should be standardised hence the relevance of the Dublin Core metadata standard as it guides on essential metadata elements to be captured. IFLA (2009) asserts that standardisation contributes to consistence which leads to easy sharing of metadata. Controlled vocabularies, which include taxonomies, thesauri and ontologies, are useful in the metadata as they are mechanisms to enforce standardisation in metadata values (Basil, 2015). To achieve interoperability there is need to establish standards that will be followed. All the

mentioned above metadata standards principles are to be observed in any metadata standard set by an organisation. Metadata entries may vary depending on the organisation's needs but the metadata principles should be employed as a means of ensuring useful and rich metadata that facilitate accessibility and retrieval of photographs.

6. Research methodology

The study adopted the qualitative research methodology. The research methodology was used to facilitate the gathering of data that informs the management of metadata in photographic collections. The case study research design was used to investigate metadata issues in photographic collections as a contemporary phenomenon within its real-time life context.

The study focused on the CMI personnel who work in areas such as the Archives Department, CMedia Department, Worldwide Department, Senior Pastor's Office, Celebration Schools, Conferencing Department and Connections Department. A total of fifteen respondents constituted the research population. Seven head of departments were selected from the seven departments. A population of four records and archives staff were also part of the targeted population. The Chief Executive Officer, Finance Manager, Human Resource Manager and the Records Manager were also part of the target population. The targeted population work in offices that create or use photographs in the conduct of their business and as such they had the capacity to provide information that speaks to metadata issues in photographs. Data was gathered from the population that was carefully selected basing on their knowledge of management of photographs.

The study employed semi-structured interviews and standard questionnaires as data collection instruments. The study sought to collect exploratory information to assist in better understanding of management of metadata in the photographic collection and as such qualitative information was collected through questionnaires. Open and closed questionnaires were used because they allowed the respondents to complete the questionnaire on their own free time and that contributed to the gathering of information that contributed to the drawing of conclusions and recommendations. The interviews were directed to members of the organisation who held managerial positions as they are the ones who are at the apex of decision making and policy frameworks that affect the management of photographs in the organisation.

7. Findings of the study

The findings are presented in line with the research objectives of the study.

7.1. Management of photographic collection

The first research objective of the study sought to establish how photographs are being managed at CMI. Management of photographs involves various aspects and the research sought to outline some of the significant components that constitute the management of photographs.

7.1.1. Formats in which photographs are captured and preserved

The respondents indicated that the organisation is adopting image formats such as the Joint Photographic Experts Group (JPEG), Graphics Interchange Format (GIF), Portable Network Graphics (PNG) and Tagged Image File Format (TIFF). The respondents explained that in most cases these formats were generated automatically by the camera especially with born digital photographs. The results obtained shows that JPEG, GIF and PNG were adopted as they allowed file compression while TIFF was used as the organisation considered it to be an archival format. *Table 2* presents the photographic formats that were being used and the reason behind their approval as formats used at the church archive.

Table 2: Image formats used at the church archive

Image Format	JPEG	GIF	PNG	TIFF
Advantage	Allows file compression without showing signs of visible distorted artefacts	Stores multiple bitmap images in a single file for exchange between platforms and systems	Allows separate capturing and storage of metadata from the image since it does support means of embedding Exif metadata	Offers different fields or tags for metadata. Archival recommended. It incorporates different compression algorithms

The findings of the study revealed that some formats allow file compression which might degrade the visual quality and fail to animate the image especially on scanned images. This will compromise the authenticity and integrity of images and as a result their archival value will be questionable. TIFF has been adopted as it proves to suit archival needs. Clark (2011) averred that TIFF is a standard format for storing digitised and born digital photographs.

Printed photographs which are scanned to become digital photographs can be managed effectively for long term preservation if they are stored in TIFF format.

7.2. Types of metadata captured for the photographic collection

The second research objective sought to establish the metadata types that were captured in photographs to facilitate the storage, preservation and retrieval of photographs. Managers of the photographic collection provided the information and the users of the photographic collections were asked to indicate the information they provide in order to facilitate searching for the photographs. The following were responses obtained under the following sub-headings:

7.2.1. Photographic metadata captured at the church archive

The findings revealed that technical, administrative and descriptive metadata are the common types of metadata that were captured. However, the respondents failed to deduce the class of metadata captured. The findings revealed that the organisation was aware that photographs, as non-textual records, require metadata to describe the collection.

7.2.2. Metadata standards for photographic management

Metadata standards set a benchmark on the metadata traits that can be captured to describe photographs within a collection. Respondents were requested to provide information that explains the metadata standards which the organisation was using. The study findings indicated that there are no metadata standards in use. Archivists were capturing metadata which they thought was sufficient to describe the photographs while on the other hand users were providing information which they thought would assist archivists in identifying photographic records which they were requesting.

The findings revealed that there were no specific metadata schemas and elements that were officially recommended at the church archive. Without metadata standards the information centre may fail to meet its obligation in providing timely access to its photographic collections. In support to this observation Elings and Gunter (2007) concur that metadata can be lengthy to an extent of having more than fifty metadata elements or traits but what is more important is to provide useful metadata rather than lengthy metadata which might not be effective in assisting in the identification of a suitable storage folder and retrieval.

7.3 Challenges associated with the storage, preservation, access and retrieval of photographs at the church archive

The third objective of the study intended to ascertain the challenges emanating from metadata issues that affect the storage, preservation and retrieval of photographs from the collection.

7.3.1 Policy used in the management of photographic collection

The respondents indicated that the church archive had a draft policy that is temporarily used to govern the operations of the records and archives department. There was a records and archives management policy which generally addresses management of records and archives materials. The policy did not specifically speak to the management of photographs and this presented a challenge in establishing good preservation methods to photographic collections.

7.3.2 Metadata Standards for the management of photographs

The respondents interviewed availed that the organisation does not have any metadata standard in place. In relation to standards, the organisation is making efforts to get the records and archives department ISO certified. However, the certification is not specifically on ISO standards that speaks to metadata standards rather the standard is the general records management standard. The findings of the study revealed that the absence of photographic metadata standards have led to a long search time when retrieving materials. The study showed that deciding the appropriate storage folder for the newly accessioned photographs is becoming difficult since one archivist can capture different descriptive information which might not be understood by the other archivist.

7.4 Metadata traits omitted in the management of photographic collection at the church archive

The fourth research objective of the study sought to establish metadata traits that are being omitted by the current system and the effects they present in the overall management of the photographic collection at CMI.

7.4.1 Metadata software applications and their fields

The findings obtained revealed that the IPhoto application allowed the capturing of geographical location information, date, name of people featuring on the image, colour of

clothes and the record group. Respondents indicated that the software applications have fixed record group classes which include family, work and wedding. From the metadata fields offered by the IPhoto, it can be noted that much of the essential elements of the Dublin core were not being incorporated. Administrative metadata appears not to be captured and this compromised the determination of access rights to the collections.

7.4.2 Classification system for photographs

The classification system used to group records assist in resource discovery. The respondents indicated that the photographs are bundled together according to the authoring dates and event title. For example, all photographs created in the month of January 2018 are stored in one folder and in that folder, a subfolder is also created and it will be according to the subject or event name.

The findings revealed that the classification system is only constituted of technical metadata and presentation metadata which does not fully describe the content and context of photographic collections. The respondents indicated that users of photographs usually send their request with search terms such as the name of person and the subject. The omission of such important metadata traits leads to a failure in locating the photographs that are being requested by users. The current classification system is omitting metadata that is vital in bundling photographs into collections that can facilitate easy identification of requested photographs.

8. Conclusions

Conclusions were made based on the findings that were obtained by the study. Conclusions were drawn for each research objective.

8.1 Management of photographic collection at the church archive

The findings of the study revealed that the digital photographic collection in the church archive was managed by archivists. However, the records and archives staff did not have formal training in the management of digital photographs and this was affecting the capturing of metadata. The management of photographs by the archives department and CMedia, in the absence of metadata standards, make the effectiveness of managing photographs to be consistently compromised.

8.2 Types of metadata captured

This study concluded that technical, administrative, presentation and descriptive metadata types were being captured. Records and archives managers appreciated the importance of capturing metadata in photographs as a way of defining and explaining the non-textual still image records. Despite their appreciation of the importance of capturing metadata, records staff at CMI did not have metadata standards at their disposal to guide them on metadata types and elements to capture. Ultimately, the capturing of metadata types and elements was being done based on the records and archives staffs' understanding of the collection at hand.

8.3 Challenges associated with the storage, preservation and retrieval of photographs

The findings obtained revealed that there were challenges faced by the organisation in the storage, preservation and retrieval of photographs. The challenges emanated from the absence of metadata standards which can be useful in determining the metadata schemas and elements to be captured when describing photographic collections. In addition, the study concludes that the lack of archivists and user training on the creation and use of metadata elements affects the timely and correct retrieval of photographs.

8.4 Metadata traits omitted in the management of digital photographs

The findings revealed that the metadata traits captured in photographs were largely determined by metadata fields offered by the IPhoto photographic management software that was in place. The metadata fields available on the application determine the metadata traits that will be captured. The study concludes that the records staff should determine metadata traits to be captured as a way of supporting the storage, preservation and retrieval of photographs from the whole photographic collection. Searching of specific photographs was affected by insufficient metadata that cannot support quick retrieval of images.

9. Recommendations

- The archivist should craft metadata standards that should be employed in the management of photographs. Metadata standards that are suitable for the management of photographs should be implemented.
- The records and archives department should come up with vigorous goals and visions that fit in the overall organisational strategic plans. This will enable the department to gain the support

of management and as a result the archives department can receive funds that will enable it to purchase latest and viable technologies that support the capturing of adequate metadata.

- The archives department organisation should engage software developers and allow them to design a metadata capturing system that will allow the capturing of adequate metadata types and traits. The system should meet the requirements of metadata standards in place.
- The records and archives department should draft a policy that specifically caters for the management of metadata in photographic collections.

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