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How to use object biographies to manage your data

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Abstract

Natural history collections are not only a source for the earth- and life sciences, but they are also historical sources with cultural and sometimes emotional value. The histories of these objects are often not complete as peoples and cultures have been erased from their narratives. In order to be more inclusive and offer more perspectives on their collections, natural history museums need to expand their collection's documentation. Object biographies are a concept from the study of material culture that state that objects can be viewed in many different contexts, based on the perspective of the viewer. We need to document these different perspectives throughout time and space in order to fully understand our collections and make them accessible. This article outlines a metadata framework for museum collections and archives based on the concept of object biographies, along with a practical way to structure your data on a budget. It closes with further ideas for future applications of object biographies in linked data.

Keywords: object biography; museum collection; museum archives; collection history; data management; metadata framework; linked data; unheard voices; inclusivity; accessibility

Introduction

In recent years there has been a growing awareness for, and interest in, the unheard voices of history. Within the field of the history of science this has also been the case, and studies have been conducted to uncover all those involved in the natural sciences that have historically been overlooked; indigenous peoples, low-income workers, female naturalists, collectors and artists of colour, non-western scholars and many more (eg. Das and Lowe, 2018; Ashby 2021; Ashby and Machin, 2021; Gelsthorpe, 2021; Hearth and Robbins, 2022). Natural history collections cannot only be used to tell the story of evolution, ecology and life on earth, they can also tell the story of the history of science. Objects could be displayed in new ways to showcase the socio-cultural dimension of natural history, and to highlight the stories of cultures, communities and individuals. In order to do this they need to be researched through a new lens and the collection data needs to be stored and made accessible in such a way that we can access these stories. This can be achieved by using the theory and practice of object biographies.

The concept of object biographies

At its core, an object biography is the complete history of an object (see Kopytoff, 1986 for the original concept). This history is however written with a certain intent and based on theories about understanding the past. Object biographies were

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first developed for historical objects for which we have incomplete or no documentation in their original time of use and which have since been recognized and treated as heritage. People wanted to understand these objects within a narrative and thus different perspectives were sought out. Object biographies became common practice within the field of archaeology and were developed further within the theoretical movements of first post-processual archaeology (Hodder and Hutson, 2003) and later symmetrical archaeology (Shanks, 2007). The theory behind this is that the past is subjective; material culture can be interpreted in any context and this can lead to different conclusions, all based on the framework through which the object is studied.

This does not mean that we cannot draw conclusions about the past based on these objects; it simply means there are many truths and we decide which one(s) get told. Now that this perspective on the past has gained prevalence, we also recognize that objects that were studied in the past might hold more or different information if we study them again. Especially older museum and university collections that have been classified and described in the past could benefit from a new description. This is what object biographies are designed for; a description of an object that takes into account the different contexts in which the object was used and the different meanings that people have attached (and still attach) to it over the centuries. Within archaeology this does not only include the original period in which it was made and used, and perhaps repurposed in a different time, but also how it was excavated, traded, collected, classified, displayed and used for research. The theory behind object biographies states that objects only carry the meaning we ascribe to them and are not intrinsically valuable. As such it is this meaning that should be documented if we want to fully understand the object. (Renfrew and Bahn provide an introduction to archaeological theory.) For an example of object biographies as a curational tool for archaeological collections, see Friberg and Huvila, 2019, with critical response to object biographies, outlined in Nanouschka, 2014.

Facilitating interpretation through data

How can a theory from archaeology help us understand natural history collections? If you apply this framework of the importance of context and meaning to natural history collections, they suddenly become a lot more than biological or geological specimens. The original period of use within archaeology becomes the specimen data that is most often recorded in natural history museums; the biology, ecology, habits etc. for biological specimens and the chemistry, formation, location etc. for geological specimens. Everything that happened "in life", before collection. What the documentation of natural history collections often lack is the human interaction, especially for the older collections. What importance did these specimens hold for the local inhabitants that interacted with them? How were they used in daily or religious life? When, how and for what purpose were the specimens collected? Who was involved in this process? How were the specimens documented, illustrated and described? How were they prepared for storage and shipped? In what (private) collections have they resided and how did they end up in their current repository? How were they classified, displayed and interpreted while part of these collections? In what research have they featured? Once we start asking and answering these questions we can give a voice to everyone who was involved with these objects and see them from new perspectives.

It takes a lot of intensive research to gather all this information and most museums do not have the time or resources to devote to it. When this type of historical research is carried out on natural history collections, it is often done by external parties and the information is not recorded with the collection itself. One way to start enabling a more diverse and multifaceted interpretation of objects is to facilitate recording this historical information for the future. Just writing it down somewhere is not enough. The data needs to be linked to the objects and to other sources; it needs to be easily found.

An object biography metadata framework

Meaning and interpretation come down to context, and context comes down to metadata. Metadata is data about data (Ince, 2009), or in this case data about an information object. An information object could be anything that holds information. More traditionally this would be a physical object on which information has been recorded, such as a book or photograph, but lately it has come to include digital objects as well as physical objects that hold inherent and implicit information, such as museum objects. (For more on museum objects and metadata, see Arna Bontemps Museum, 2023.) For every information object there are generally five categories of metadata:

1. Administrative data, which includes anything you need for management such as location, loan information, rights, access, etc.

2. Preservation data, which records the physical state of the object and documentation on any changes it has gone through while in the collection, both natural and through intervention.

3. Technical data, which documents hardware and software such as format and security data.

4. Use data, which includes the use in exhibits and research, content reuse and user tracking.

5. Descriptive data, or anything that is used to identify, authenticate, and describe collections and related trusted information resources (Gilliland, 2016).

Descriptive metadata are wide-ranging and can include any aspect of an object. The aspects that are chosen to be described will dictate what information we have on the objects and how we interpret them. Three different aspects of an object need to be described in order to enable object biographies: The object as a representation, as a human-made object and as part of a collection. The representation is already quite common; this is a specimen of a certain species and as such represents this species. It is of importance because of what it can teach us about a broader category of entities. The human-made object is usually partly present in descriptions, with details such as the collecting date and location. This description is important for what it can tell us about how people have interacted with the object. The final aspect is the object as part of a collection, or more likely, of many collections. This is important for understanding in which categories or classifications the object has been and could be placed. You can also view the three aspects as relationships: The object in relation to a

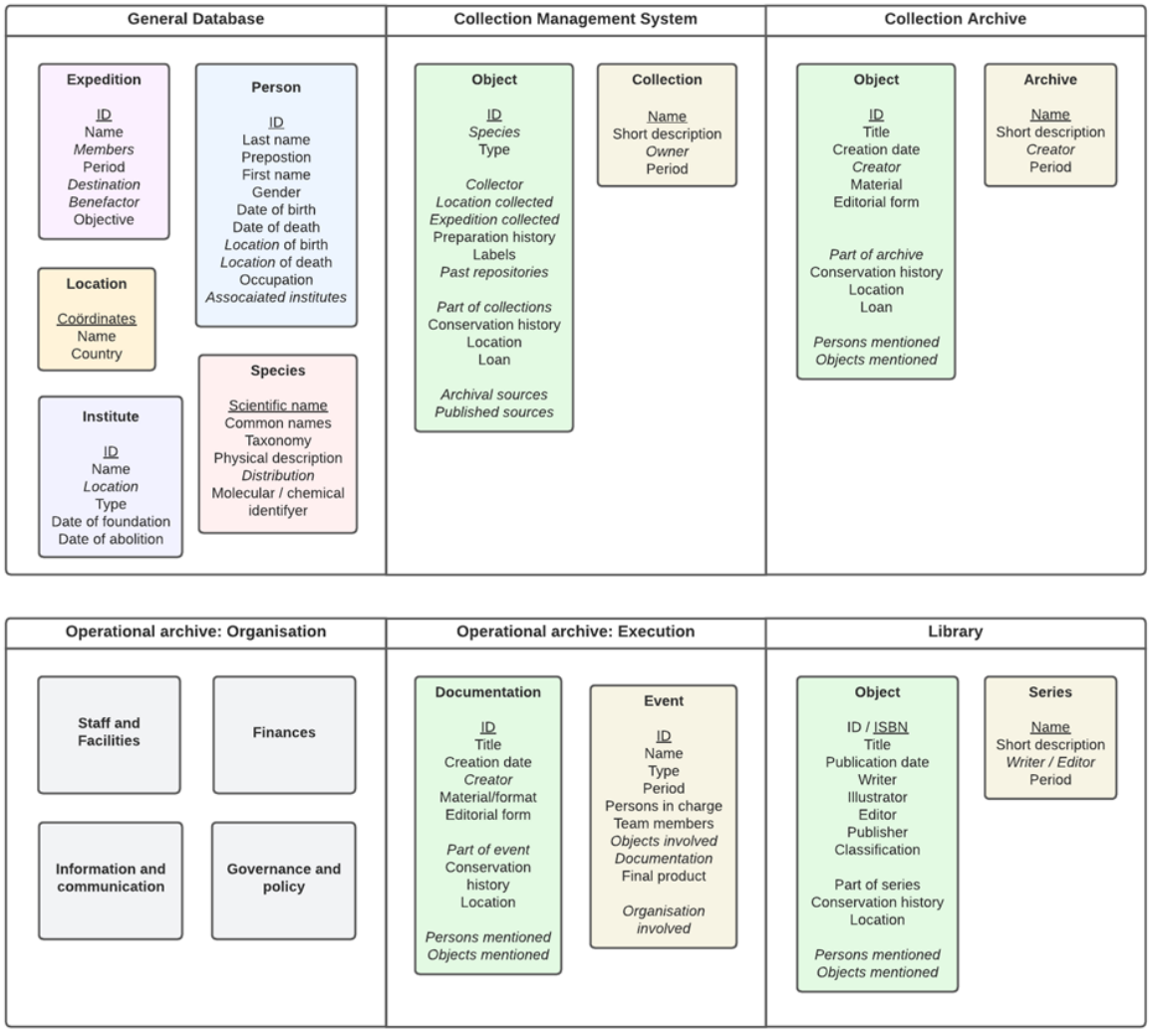

Figure 1. A metadata framework that facilitates object biographies. (Created by Lisa Winters, 2023)

concept, the object in relation to people and the object in relation to other objects. Ultimately, every relationship is fabricated by the observer.

The different objects and what metadata should be recorded for each of them is shown in Figure 1. In database terminology these are entities and attributes. Any time an attribute appears in cursive, it refers to another entity which in turn has its own attributes. For example: An object from the collection has a collector, which is a person with a name, age and place of birth. This person could have worked for a university, which is an institute, which has their own associated data etc.

Where to store what data

The metadata framework does not just show the different entities that need to be documented along with their attributes, it also shows the place where these entities should ideally be stored. Every museum needs to have a collection management system and an archive, and many will also have libraries. This article won't elaborate on collection- and library management systems since there is a lot of (free) software available that can often be customized to the needs of your institute. In these cases, the metadata framework can be used as a guideline to keep in mind when (re)designing your databases and management systems.

Apart from the collection database and the library, the metadata framework in Figure 1 also shows a general database and three types of archives. When thinking about a museum's archive most people imagine old field books from expeditions and lists with objects that were bought or donated. This constitutes the collection archive, and is mostly made up from historical material. Collection archives collect all documentation related to the museum collections, such as correspondence, collection history, and the historical equivalent of all the acquisition and management information that is nowadays stored in the collection management system.

Museums however also produce a lot of documents just by existing day to day. This is the operational archive, which should include the documentation of all key processes in the organization. Operational archives can be separated into two categories: Organisation and Execution. Organisation spans governance, policy, finances, staff, facilities and in formation and communication. Execution includes the planning and execution of research programs and trips, exhibits, (community outreach) programs, educational activities and collaboration with schools, talks/lectures given at the museum and any other activities that support the core mission of the museum. Both the collection and operational archives should ideally be managed by an archivist, to make sure all the information is well-structured, has the correct metadata and is tidied regularly (including destroying records and files that are no longer relevant).

The final place to store data in the metadata framework is the general database, which at the time of writing is more of an ideal than an existing repository. The general database should be a shared digital resource between all heritage organisations which records general information that you can link to, such as species, people, locations and institutions. While the collection management system, archives and library are specific to your museum and are managed internally, the general database is interoperable between organisations and should be owned and managed independently. You could then upload information to this platform and link to your own collections. This means the general database can link objects from different museums but it can also provide background sources on collections from other archives or libraries. In this way, natural history collections become linked to the broader heritage scene which makes them more accessible to researchers from other fields.

The general database thus reduces redundancy in the museum's own recordkeeping and could (in an advanced state) enable people to link all entities in the metadata framework through this general database. In practice this means that you could look at an object in the database, click on the collector of this object and find other objects this person has collected, alongside general information about this person and more links to the expeditions they have been involved with, the institutes they associate with etc. This advanced state requires a digitization and online publication of the objects (not necessarily open to the public), while in its most basic form the general database could be a place to store data with a one-way link from entity to entity. This means you can click on a collector of an object and find information on this person with further links to expeditions and institutes, but you can't see the other objects that this person is associated with; imagine clicking through Wikipedia articles.

If a museum's collection management system does not have a dedicated place for certain types of information, it can be easily lost after projects are done or people leave. Information is stored on personal drives or not clearly/uniformly described when stored on shared drives. This can also be the

case for physical paper archives which are not described at document - or file level; the current archivist or archive keeper might know which shelf contains what specific information while the labels only show a research field, name or date. The general rule here is: if someone else can't find it, it might as well not exist. It can be really difficult to implement new systems however, and not every museum has the resources to commit to new software or hire professionals to document and structure the existing archives. How can you use this metadata framework with as little time investment and financial aid possible?

How to get started

The most straightforward way of linking your collection management system to your collection's archive and your operational archive is by making sure your archives are well-structured and each object has a unique ID. Museum specimens get a specific ID based on the collection they are in but archival material also needs an ID in order to easily identify and link them. These ID's can then be added to each other's metadata, so we know what objects are connected to certain documentation and vice versa. These ID's and the links to other objects should be applied as soon as the documents are created, which means that anyone creating archival material needs to be aware of the importance of well-structured metadata, and the specific system that your museum uses. To this end, you should not only invest in a framework or software but also in awareness and training among your colleagues.

Archives are made accessible through an inventory in which the organic relationships between information-objects (documents, files, photo's) are visible. Objects are described on different levels, which allows you to group together objects based on operational processes. The descriptions of the different levels can be incorporated into the ID, meaning that you can know what part of the archive an ID refers to without seeing the whole inventory. Figure 2 shows an example of a digital operational archive that can be realized in folders on any operating system. Metadata can be added to the folders and the digital files, allowing for both the event and the documentation to be described (see Figure 1). Not only can you refer to specific

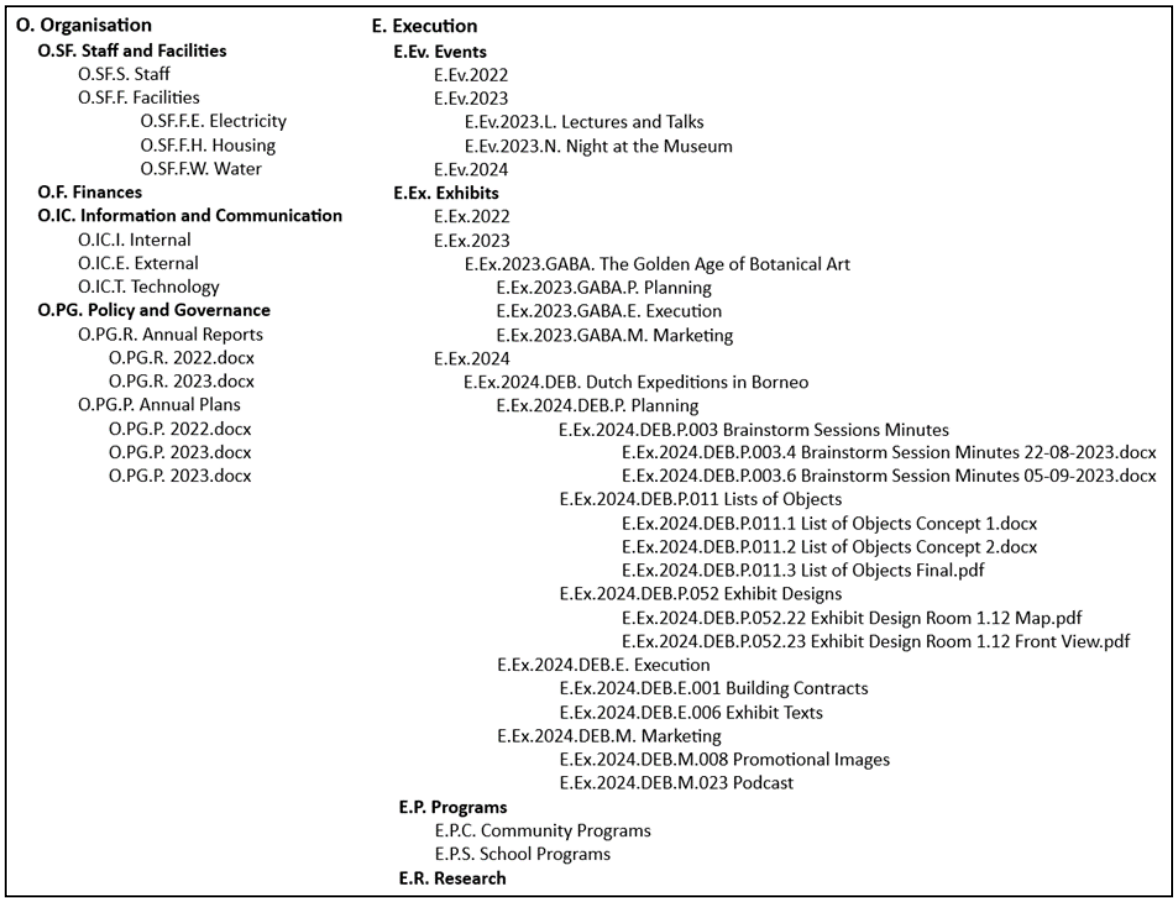

Figure 2. Example of select parts of a fictional operational archive: The document ID shows which part of the archive it belongs to, in order to easily locate it and related material. (Created by Lisa Winters, 2023)

documents, you can also link to an entire folder. Even if the link isn't "clickable", you can still easily find the right document by following the path in the ID or simply search the archive for the ID. In this manner you can also store any information on the objects in your collections that doesn't fit in your current collection management system (CMS).

Collection archives can be structured in a similar way, only the path won't end in a digital file but in an ID and description linked to a location in the physical archive. Since the collection archive might be a little less organically structured, a structure such as is shown in Figure 3 can be used.

While these figures can be used as examples, there are also standards on which you can base your own archive structure. The most commonly used standard for archive inventories is ISAD(G) (International Council on Archives, 2023), which figure 2 and 3 are also based on. The structure of your archives and the ID's attached to your documents should be logical but most importantly practical in use. The only rule is that ID's must be unique.

Towards a linked future

The concept and framework presented here are a guideline to help facilitate more interpretations within one museum collection. There are however many ways to implement it on a broader scale, and to combine it with existing standards to create a fully linked network of databases.

In the aftermath of Covid-19 the practice of creating digital exhibits has become more prevalent. Many museums have put resources into digitizing their collections and archives to make them available to people from home. Publishing your digitized collections with a linked database will allow visitors to view the objects and documents in the contexts that is most interesting to them personally. It is no longer necessary to develop an elaborate story for an exhibit as the related information objects in the database will be able to provide any background information needed. Of course there is always the pitfall of having too much data available to find what you are looking for, but it could be possible to use artificial intelligence to suggest a way to progress through it. (For more information on the online museum and making digitized collections accessible, see Navarrete and Mackenzie Owen, 2016.)

As mentioned earlier when elaborating on the general database, it is possible to create an inter-museum network. This is done through the concept of linked data, where many museums use the same metadata scheme (the same types of metadata recorded in the same format) in order to link their databases online and make them fully interoperable. The idea is that there is one shared database that any museum could upload their data into, and people can search through all this information online and find related collections from all over the world. While this is a more common concept for biodiversity data, it is not widely used for the museum collections themselves. An example of a project creating such a linked database is Europeana (2023), which is funded by the European Union and aims to make

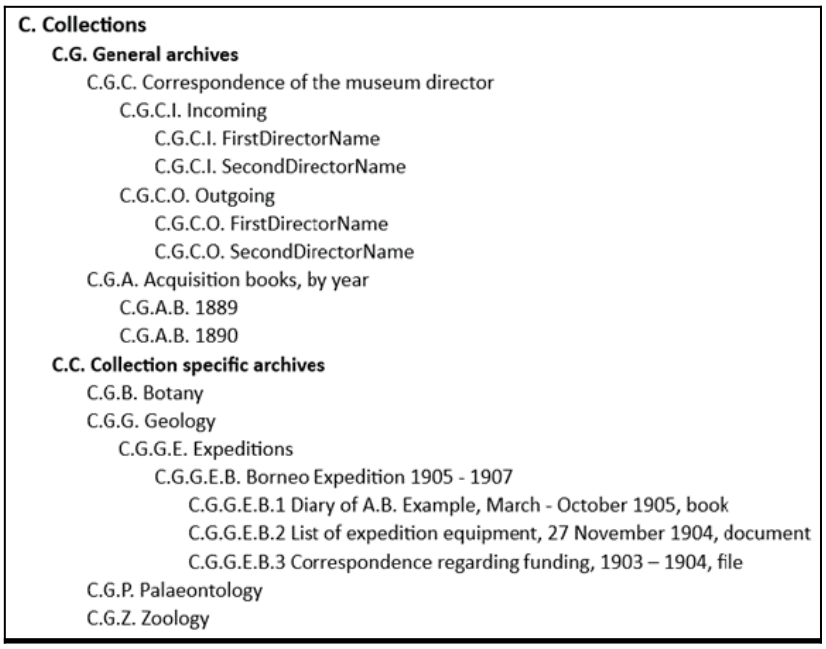

Figure 3. Example of select parts of a fictional collection archive. (Created by Lisa Winters, 2023)

Europe's digital cultural heritage accessible through one online platform. On the website you can search for a specific object or browse different collections based on shared metadata (subject, person, location, etc.). There are many local examples as well, such as the linked collections of the Dutch Rijksmuseum (National Museum of Arts) (Dijkshoorn *et al.*, 2018). Implementing this on a large scale would mean that researchers no longer have to guess what institutes hold objects or information on their topic of interest. New connections between places, people and objects could be forged that would otherwise never have occurred to anyone. Not only is this beneficial to researchers and the general public, but it can also help you gain more insight into your own collections. (See also McKenna, Debruyne and O'Sullivan, 2022, for the exploration of a new linked data framework for the heritage sector.)

The linked data ideal requires a lot of collaboration; a network of museums all working towards the same goal. Many standards already exist for linked data, but it is difficult to find a standard that fulfils every museum's and collection's need. Even the standards that were developed expressly for natural history museums do not yet include all the historical aspects and links to archival and published material. Object biographies and linked data go hand-in-hand, but you need the incentive of a network of meaning and contexts in which every perspective is welcome in order to synthesize the two. We should not implement technology for technology's sake. The ideals laid out in this section are far from reality, but it all comes down to accessibility. Accessible means that you can find information and are able to ingest and interpret it. But it also means that something is approachable, easily understood and used. It means that everyone, regardless of their background or identity, can access the museum collections and feels welcomed to do so. Object biographies allow for a space in which every interpretation is valued. Clearly cataloguing and linking your own collections can be the first step.

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This article is a product of the 2023 NatSCA "How to…" conference. My original paper for this conference only included a first introduction into object biographies and how they can be used to research and display natural history collections. During the conference it became clear that lots of people are already interested in this socio-historical point view, but the main obstacle in facilitating it was documentation. This article would not exists without the NatSCA conference, and thus I would like to thank the NatSCA conference committee for organizing it and bringing together such an insightful range of topics. I would also like to thank everyone in attendance, speakers and guests, for the conversations and general positive environment to share and develop new ideas.

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