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Preserving Information Relating to Instruments in Museums

Introduction Museums not only preserve objects, but also information about these objects. Information can be acquired with the object, generated by the museum, or provided by visitors and other external sources. The kinds of information museums preserve and how they do it vary widely, despite professional codes of good practice and the availability of content management systems tailored to museums. In the case of musical instruments, there are specific kinds of information that do not always fit into commercial packages. This article analyses the various kinds of information relating to musical instruments in terms of importance and vulnerability to loss and degradation, suggests priorities for data storage and long-term preservation, examines some of the systems museums have employed for information storage and retrieval, and discusses what museums can learn from digital preservation techniques adopted by research institutions.

Categories of information Musical instruments entering museum collections are re-purposed. As originally produced, they are primarily equipment for music-making with a cultural context, but can also have roles as aesthetic objects for the visual delight of their owner or as status symbols. A museum instrument, however, justifies the deployment of the resources required to curate, conserve and store it by its potential for fulfilling one or more of a variety of purposes in a new cultural context. These can include education, providing evidence of historical music-making practices, and providing models for copying. Performance, museum display and research examination are means to these ends. This re-purposing also often takes place in private ownership. Factual information underlies and valorises most museum activities: display and interpretation, use in performance, security and insurance.

This re-purposing requires a re-prioritising of stored information. A performer's instrument might be accompanied by a stack of sheet music, while museum instruments need conservation, education and research-oriented information. Museum instruments can be interrogated through different disciplines: acoustics, musicology, art history, technology; the future could bring more. We cannot predict future priorities in research or new research techniques. In some cases, it is possible that museum instruments have delivered all they have to teach us, and will never be studied again.

The view is sometimes expressed that *all* information ought to be preserved. This policy has an immediate appeal, but is it practicable? Is there not a danger that we will

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devote resources to keeping large quantities of low-quality information? The costs of keeping data may be low, but the costs of evaluating, managing, retrieving and using it are high, since these tasks require skilled human resources.

Much of the content of museum records and catalogues is replaceable. Measurements and transcriptions of inscriptions could be repeated in the event of data being lost. Other information is irreplaceable and justifies considered, planned, and resourced measures for its preservation. The irreplaceable data include ownership provenance, information about who played the instrument and in what musical and social context, and information about its manufacture. The intangible attributes of an instrument contribute significantly to its financial and cultural value, and may need to be validated by research. It is necessary to assess these different kinds of information in terms of their importance and vulnerability to loss and degradation.

Much (but not all) of the information that requires long-term preservation is the data traditionally included in published catalogues. Although printed museum catalogues are long established (some are today available electronically), from the viewpoint of long-term preservation of information, the important criteria may look different from those generally included in a catalogue[1] or aggregation service such as MIMO (which is not primarily a data repository).[2] The kinds of information used in typical catalogues of instruments are listed in Table 1. For collections with large holdings of specific kinds of instrument, additional fields may be needed for measurements and technical description.[3]

The first priority is identifying and naming the instrument. MIMO has a carefully, thoroughly organised thesaurus of instrument names with translations in a number of languages, which is an excellent tool for retrieval by the general public. However, it does not offer details of all the different names used by the various actors in an instrument's history. The inventor, manufacturer, publishers of music scores, players and organologists often used variant names for the same instrument in the one language, and these should perhaps form part of the permanent record together with the sources for the information.

The name of the maker, place and date of production are all data which form part of any catalogue or record display. This information is always subject to revision in the light

1 Arnold Myers: Cataloguing Standards for Instrument Collections, in: CIMCIM *Newsletter* 14 (1989), pp. 14–28, https://cimcim.mini.icom.museum/wp-content/uploads/sites/7/2019/01/Newsletter_14_1989.pdf (all weblinks in this article last consulted 15 February 2022).

2 See https://mimo-international.com/MIMO/.

3 Arnold Myers/Cary Karp: Documentation, in: *The Care of Historic Musical Instruments*, ed. by Robert L. Barclay, Ottawa/London/Edinburgh 1997, pp. 109–123.

of research: if the data is changed, keeping an archive copy of an old file may not be enough without a cogent explanation of the reasons for change.

Museum catalogues often include copious measurements, many of which are without clear purpose and inadequately supported by statements of method and target accuracy. Recording measurements which have no immediate purpose – just in case they are useful to someone some day – is an expensive luxury. If the data were to be lost, one can in most cases recreate much of it through fresh measuring. Measurements should be entirely objective, and in principle are independent of the person doing the measuring, although levels of precision vary. There is a risk that the instrument might be lost, degraded, or that the act of measuring itself risks damage. In the case of brass instruments, for example, some moving parts such as tuning slides can become stuck over a period of time, which means that measurements can no longer be taken. There can be an issue with the volume of measurement data produced by methods such as X-ray, 3D-computed tomography of musical instruments, or even a traditional technical drawing.

The technical description of an instrument can be more a work of art than a science. This is an area where connoisseurship is paramount. Experience of working with similar instruments elsewhere can provide insight and an ability to detect alterations and repairs. Identifying the operation of woodwind fingering systems, for example, is a specialist task. There is no substitute for a trained and experienced eye and keeping one's powers of observation exercised and in good form. A training in museum studies does little to equip one to detect fakes and forgeries.

Describing an instrument is not just a matter of recording facts. The cataloguer has to decide which features are worth recording, and which should be omitted because they are trivial. The guiding principle is to describe distinguishing features in more detail, while indicating the presence of common features as concisely as possible.[4] Since different scholars see different things, there is a strong case for preserving all descriptive information, whether this is the result of systematic documentation or notes made by experts visiting the museum. This is particularly true when it comes to ascertaining the usable pitch of wind instruments. The pitches at which different players find instruments work best vary over tens of cents. There are two aims in pitch measurement: (a) to establish for what pitch standard the maker of the instrument optimised it, which could be an established standard such as *diapason normal*, and (b) to establish at what pitch it actually works best. This is a measurement that should be repeated with as many competent players as possible, whose varying answers should all be recorded. For brass instruments, some objective data can be found by acoustical methods such as the use of

4 Myers: Cataloguing Standards, p. 17.

Table 1 Typical catalogue information relating to musical instruments

Instrument identification
Title(s), keyword(s):
Nominal pitch:
Type or system:

Creation
Maker:
Place:
Date of production:
Serial number:

Measures
Overall size:
Measured sizes including string lengths, sounding lengths, bore profile, weight, etc:
Fitting measurements (such as diameter of mouthpiece receiver):

Description
Technical description:
Inscriptions:
Decorative features:
Faults:
Repair history:
Usable pitch:
Performance characteristics:

Provenance and history
Specific usage history:
Previous ownership:
Current ownership:
Assignment to a named collection:

Curatorial data
Conservation treatment:
Monitoring of condition:
Assignment to a playing/non-playing regime:

BIAS,[5] though even here there is a need for expert judgement over decisions such as the choice of mouthpiece, the settings of tuning slides, and air temperature.

Since actually playing museum instruments is not sustainable in the long-term, if an instrument is played, the experience is definitely unique (for both the player and the audience), probably of lasting value, and certainly vulnerable to neglect and loss. Any findings made by musicians about an instrument's performance characteristics are strong candidates for long-term preservation, along with sound recordings. Information such as which bow or mouthpiece was used in playing an instrument is easily, and probably frequently, lost.

Provenance information is arguably the most precious, and the most vulnerable to degradation and loss. Collectors private and public are often surprisingly uncurious about the past history of their acquisitions. The commercial apparatus of auction houses and dealers often strips instruments of any provenance information they may have had. The intangible attributes of an instrument contribute significantly to its value both financial and cultural.

John Lennon's upright piano, new in 1970 and in itself worth a few hundred pounds, was sold at auction in 2000 for £1.67 million and subsequently placed in the Beatles Story Museum in Liverpool.[6] This may be an extreme example of monetary value deriving from provenance, but scholarly value can also depend on provenance. Statements of provenance and attributions to makers too often rely only on word of mouth. In the case of high value items – whether high financial value or high research value – this is not enough, and the metadata in the form of supporting documentation is crucial. Jeff Nussbaum, Niles Eldredge and Robb Stewart discuss a cornet in a prominent U.S. museum, bought for $108,000 and displayed as "the instrument on which Louis Armstrong learned to play when he was just 12 years old". Research into the instrument and the dates when the model was marketed suggest that the claim is false, and that any association with Armstrong is unsubstantiated as far as publicly available knowledge is concerned.[7] The more prominent the association with a particular previous owner or player, the more important it is to obtain and preserve the supporting documentation.

Records of past treatment and condition-monitoring reports need to be kept indefinitely in order to inform future treatments. Conservation treatment reports often

5 See Gregor Widholm: Brass Instrument Analysis System 7 Handbuch, Vienna 2015, available under www.artim.at/download/.

6 Georgina Stubbs: George Michael paid £1.67m for the piano John Lennon wrote Imagine on so people could see it, in: Independent, 26 December 2016, www.independent.co.uk/news/people/george-michael-john-lennon-piano-imagine-liverpool-a7496566.html.

7 Jeffrey Nussbaum/Niles Eldredge/Robb Stewart: Louis Armstrong's First Cornet?, in: Historic Brass Society Journal 15 (2003), pp. 355–358.

contain valuable original research about the instrument, and copious photography. It can be difficult to integrate the data into other records for the instrument. Information about comparable examples elsewhere may influence decisions about risk-taking when playing instruments, and can be worth recording.

Visiting experts who study instruments are normally required to send a copy of their measurements and observations afterwards, following the CIMCIM *Recommendations for Access*.[8] Museums are able to keep this data and the associated metadata, and, if they do, they can allow other scholars to access them. Some museums keep the data in their files, while others have no policy of storing such data or lack the resources to do so.

Storage The above discussion itemises some of the kinds of information that can be important to keep long-term. Deciding how this is to be done requires one to consider data storage and long-term preservation techniques. Information is most vulnerable to loss when staff changes and inadequate metadata result in degradation of information. Almost inevitably, some metadata has been memorised but not recorded. The time-honoured way to preserve information is to print a catalogue and to place it in libraries around the world. This is often effective, but it can only be part of a solution.

Many musical instrument museums use a commercial content-management system (CMS). Among the many commercially produced content-management systems are: The Museum System (TMS), Vernon Systems, and Axiell's MIMSY. Some are web browser-based and some cloud-based, while others are open-source. They have functions such as storage and retrieval facilities that are difficult to achieve with home-made systems using basic software. However, they can be more popular with museum management than with the staff who have to operate them. They are set up to optimise access by the institution and the general public rather than for storing 'big data'. Some smaller museums have customised existing database management systems and relational database software, such as FileMaker Pro and Microsoft Access, in order to create their own collection-management systems.

Data is entrusted to these systems as an act of faith, since as commercial products no-one knows how long they will last, and whether there will be safe migration to the next generation. Some museums use multiple systems or keep paper printouts of everything as a kind of insurance policy. One solution is to keep data in the most basic, software-independent format available, ASCII plain text, which can at any time be migrated easily into a content management system with no loss of content. The use of a CMS

8 CIMCIM: *Recommendations for Regulating the Access to Musical Instruments in Public Collections*, [s. l.] 1985. Published in English, French, Spanish, German, Italian and Japanese.

has many advantages, but puts data at risk of loss and corruption when the time comes to migrate to the next CMS (even though this might well be a low-level risk).

There can be an issue with the sheer volume of data produced by methods such as X-ray, 3D-computed tomography of musical instruments. Traditional technical drawings can of course be scanned, necessitating a decision about the choice of file format. Similar considerations apply to the circuit diagrams and software which constitute electronic instruments.

The issue of the permanent storage of 'big data' is important to institutions creating research data. There is a significant intersection here with the museum community, and opportunities for knowledge exchange. Major research universities can have a whole department devoted to digital curation that largely works with data from research projects. A large part of the work of such a department involves data appraisal: selecting and setting retention periods. Major research projects have legal requirements and codes of practice that can require making data and research evidence available to other researchers.[9]

However, even well-funded research projects cannot keep everything. Although storage is cheap and getting cheaper,

- data expansion can outstrip storage expansion;
- backup and mirroring are costly;
- retrieval difficulty increases as the volume of data increases;
- creating metadata to preserve context, continuously managing storage, maintaining information integrity through migrations, and ensuring access all require human input and so are expensive.

Retention costs need to be justified; on other hand, selection is a considerable up-front expense.

Archivists need to work closely with data generators and managers. Researchers, who are data generators, can be helped to ensure that their research continues to have an impact when it is in an accessible repository. When archiving research data, the research team needs to provide information on data quality, give guidance on the community who might re-use the data, provide the data in recommended formats, and provide metadata. Meaningful file names can be useful. Formats are a potential issue. Even commonly used formats such as Excel spreadsheets are proprietary and may become unreadable in future if no one intervenes to migrate the data. At the same time, the data repository managers who receive the research data need to make explicit its mission, ensure legal compliance,

9 Digital Curation Centre (DCC): *Curation Reference Manual*, www.dcc.ac.uk/resources/curation-reference-manual.

check and maintain the integrity of data and metadata, create audit trails, and plan long-term preservation.

The criteria for selection can include:

- relevance to the mission of the institution;
- scientific or historical value (assessment of significance, involving projections of future use);
- uniqueness (is the same data preserved elsewhere?);
- potential for redistribution (assessment of reliability and integrity of data, suitability of format);
- non-replicability (would it be expensive or impossible to repeat the work?);
- economics (is the expense of managing and preserving the data justified?);
- full documentation (is the metadata sufficient to allow the data to be used in future?).

The level of appraisal is not by individual record, but at dataset level or higher. Research data is appraised by archive managers on advice from research teams; peer review can be sought to inform decisions. The rationale for decisions has to be recorded and preserved.

In some cases, a visiting researcher comes from an institution with its own research data management regime, while in other cases a museum might cooperate on a project with a scientific institution. A decision needs to be made here about who keeps the data: the museum or the partner, or both? Since the museum is already committed to the preservation of objects, it would seem to be the most appropriate institution for preserving related data.

The present generation has opportunities for information preservation that would have been unimaginable before the digital revolution. If managers of musical instrument museums can combine resilient data storage techniques with discerning curatorial connoisseurship, they will maximise the value to future generations of the instruments in their care.

Content

To Play or Not to Play

Corrosion of Historic Brass Instruments

Romantic Brass Symposium 4 • Edited by Adrian von Steiger, Daniel Allenbach and Martin Skamletz

Musikforschung der
Hochschule der Künste Bern
Edited by Martin Skamletz
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