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From Museum Collections to Digital Interpretation: An Evidence-to-Audience Workflow for Cultural Heritage Communication and Learning

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Abstract: A digitised collection can be extensive and still be difficult to explain. Museum records, photographs, 3D files, and related assets are usually made for documentation, research, conservation, or reuse; public communication asks a different question: what should a visitor meet first, and why? This article examines the editorial work between those two ends. Rather than comparing technologies, it brings together literature on digital museums, online collections, interfaces, and cultural-heritage communication to identify four recurring trouble spots: specialist entry barriers, media that accumulate without an interpretive role, loss of context, and projects that start with a platform instead of a communication problem. From these issues, a five-stage Evidence-to-Audience Workflow is set out: source verification, audience-purpose selection, interpretive structuring, media assignment, and adaptation and review. A short planning matrix accompanies the workflow. The proposal is deliberately practical. It does not predict audience response; it helps teams keep what they publish connected to collection evidence, a stated purpose, and the circumstances in which the material will be used.

Keywords: Digital interpretation; Museum collections; Cultural heritage communication; Digital museums; Public learning

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1. Introduction

A museum can place thousands of records online and still leave a visitor wondering why a particular object matters. High-resolution images, 3D models, virtual exhibitions, and interactive installations have widened access, and digital technologies now appear across exhibition, education, collection management, and visitor engagement [1]. More access is useful. It is not the same thing as explanation.

Records of collections were written to be read by specialists. A registrar or curator depends on accurate identification, provenance, measurements, and research notes. A member of the public approaches the same text with other questions. Technical terms can require glossing, and one detail can weigh more than the rest of the entry. A record by itself may also need a theme or comparison in order to make sense. The same combination of interests - visual browsing, factual information, provenance, and context - is found in work on museum websites [2-4].

Most interpretive labour sits between the database and the screen. Someone decides which facts come forward, which remain secondary, how uncertainty is worded, and whether a medium clarifies the object or merely decorates the interface. Because those choices are spread across curatorial, educational, writing, and design work, they often disappear from accounts of the final product. The Evidence-to-Audience Workflow makes that middle layer visible.

The concern is intentionally narrow. A collection record should not be rewritten as though documentation and public communication were the same task, but neither should public interpretation float free of the record. The practical question is how to build a public layer that remains answerable to professional documentation while giving non-specialists a sensible way into the material.

2. Analytical approach and scope

The discussion draws on a focused narrative synthesis, not a systematic review. Sources were selected for four parts of the problem: digitisation and virtual access, the distance between collection metadata and public language [5,6], narrative and interface choices [7-10], and the use and ethical handling of digital collections. The aim is to organise a planning sequence that can be applied and questioned in practice, not to claim exhaustive coverage or estimate effects.

One practical test recurs throughout the sequence: can an important public claim still be followed back to the evidence and the reason it was included? I use interpretive traceability as shorthand for that test. It links source evidence, communicative purpose, information layer, and use context. It is not a measured construct, but a way to keep editorial decisions visible before audience evaluation.

3. From collection digitization to public interpretation

More digital material can still produce a poor first encounter. A database may list title, date, material, dimensions, accession number, provenance, and specialist notes, yet a non-specialist may not know which detail explains the object's significance. Kist and Economou describe this distance between collection metadata and public-facing use as a semantic problem. The remedy is not weaker documentation, but a deliberate first public layer with deeper evidence still available.

The first screen must not do too much. When one comes across the object for the first time, identifying it and providing some basic orientation is normally sufficient. Technique, use, relationships, and historical setting can be postponed for readers who want to go further. Nappi et al. advocate the same open, flexible structure of cultural-heritage knowledge [6]. Layering retains specialist material without having to place the entire record in the initial view.

Media complicate the same problem. A photograph shows the object; a diagram may clarify construction or comparison; video can show process; audio can carry voice or pronunciation; a 3D model supports

inspection from several angles. Research on virtual-reality narrative, tangible interfaces, digital exhibit labels, and museum digitalisation indicates that information structure and delivery shape heritage encounters. Having a medium available, however, is not yet a reason to use it.

What is displayed first is an editorial choice, not a default of the layout. For browsing purposes, identification, date, material, use, and a brief note of significance may be the first to appear. A learning resource can begin with a comparison or question. There is no one-size-fits-all set of fields. What is included and what is left out should follow the project's communication purpose.

After selection comes sequence. A short orientation can lead to context, related objects, technical detail, or references, and not every user has to travel through the same amount of information. Connections often do more interpretive work than extra text. Place, period, material, maker, function, or theme can turn a stand-alone record into something that can be situated and compared.

The page should not be determined by the media that a project happens to have. There can be photographs, video, and a 3D scan, but each of them must have a reason for being there. A diagram with labels can usually explain construction better than prose, and a brief video is appropriate for a making process. Different media should carry different parts of the explanation rather than duplicate what another medium already covers.

4. Four recurrent breakdowns

4.1. Semantic entry barriers

Searchable is not the same as readable. Controlled vocabulary, abbreviations, long metadata fields, and specialist classifications can be essential inside a collection system while creating an immediate barrier for a general reader. Important technical terms need not be removed, but they do need explanation and a hierarchy that tells the reader where to start.

4.2. Fragmented multimedia

A digital display can be crowded and still feel thin. Text, photographs, video, maps, and 3D material may sit together without a division of labour: several items repeat one fact while the relationship the visitor needs remains unstated. The problem is media without an assigned interpretive role.

4.3. Decontextualization

An object page can strip away relationships that a gallery supplies almost silently. Scale, neighbouring objects, sequence, place, and theme may vanish when the record is viewed alone. Reuse can remove more. An image may continue circulating after provenance, function, uncertainty, or source notes have fallen away, leaving an attractive asset that is harder to interpret responsibly.

4.4. Technology-first development

Planning that starts with technology can bend the brief out of shape. A team can commit to VR, AR, or an interactive wall before the interpretive task is even settled, and the content then has to fit the platform. When the communication problem is still open, the task and the application scenario should come first; only then is it possible to judge whether a given technology is actually useful.

5. Evidence-to-audience workflow

Seen together, these problems are failures of handoff rather than failures of digitisation. Evidence is gathered, but purpose is vague; content is selected, but hierarchy is unclear; media are added, but their role is uncertain. **Figure 1** turns those handoffs into five planning stages. The route is reversible: a late review may reveal a weak source, a dense layer, or a medium that decorates more than it explains.

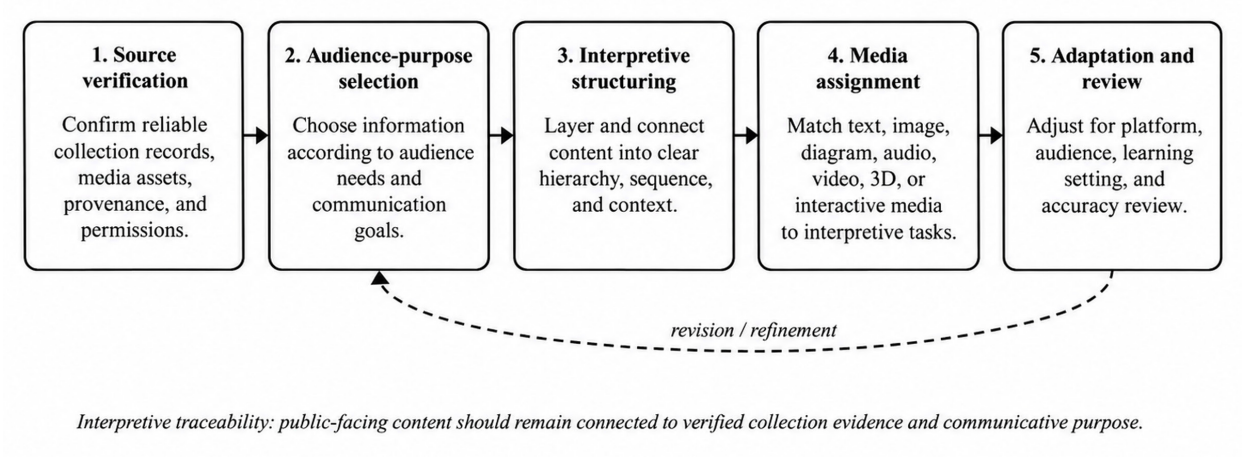


Figure 1. Evidence-to-Audience Workflow for digital interpretation.

The workflow starts by checking what the project can actually stand behind. Records, images, earlier interpretation, conservation material, audiovisual files, and 3D assets are inventoried together with limits such as uncertain attribution, incomplete provenance, or reuse restrictions. Only then is a public content set chosen. That second decision is editorial, not clerical; a metadata field is not promoted simply because it exists.

After the content has been selected, the next problem is arrangement. The first layer must assist a user to locate and position the object. Subsequent content may cover technique, use, comparison, or further learning based on context. Uncertainty also needs an apparent home. If attribution remains unresolved, the wording must indicate this rather than present a provisional statement as settled fact.

Only once the hierarchy is clear is it worth asking which media carry each part best. A 3D model is justified when spatial inspection matters; a labelled image may answer another question more directly. The last stage adapts the verified content to the setting — touchscreen, website, mobile guide, school resource, or university task — and checks whether the main claims still lead back to evidence and purpose.

When adaptation is considered resizing, reuse tends to go awry. A visitor in a gallery can spend seconds with an object, but a reader on a website can remain much longer. School material also requires more scaffolding than a university assignment. The evidence may remain consistent in these environments as pacing, emphasis, and wording change. Planning those differences in advance is what maintains the context.

Uncertainty provides a useful stress test. Museum information may contain a debated attribution, a gap in provenance, or a date revised by new scholarship. Public text need not become a miniature research article, but it should not erase that status. A fuller internal note can record the basis of a claim; the public version can use proportionate wording such as “probably,” “attributed to,” or “scholars disagree.”

These planning documents are modest outputs, but they matter when responsibility is split across teams.

A curator, educator, writer, designer, and developer may otherwise work from different assumptions about the same object. A checked resource set, priority statement, content hierarchy, and media map provide shared reference points, especially when work is outsourced or revised later by people who were not part of the original discussion.

6. Implications for museum practice and learning resources

For museum practice, the immediate change is procedural. Evidence, public purpose, hierarchy, and media roles need to be settled far enough in advance that interface design responds to an interpretive brief rather than replacing one. This is not an argument against ambitious technology. It is an argument for knowing what the technology is being asked to explain.

Technical access can coexist with interpretive difficulty. A page may load quickly and still be hard to understand because the vocabulary is specialist, the hierarchy is weak, or relationships are left implicit. Plain language, layered detail, useful cross-links, and brief explanations of necessary terms can widen entry without thinning the scholarship behind it.

The other risk of reuse is that an asset can go further than the information that provides it with authority. A photograph might be transferred from an exhibition page to a learning platform or a social-media post after its attribution, uncertainty, or source information has fallen away. Work on impact, ownership, and reuse cautions against treating availability as sufficient [11,12]. Reuse in education also implies a task that requires learners to compare, question, explain, or apply the material.

The workflow also exposes omissions before they become expensive. If a team cannot explain why an asset is present, who it is for, or what part of the interpretation it carries, the problem appears while content is still cheap to change. Unsupported claims become visible in the same way: a statement that cannot be traced to a catalogue, record, or other reliable source can be checked before publication.

Accessibility does not imply a very short label. There are museum-website users who want substantial factual and contextual information. The question is whether they can get into that material and find their way around it. A brief introduction may be placed next to more substantial material, and being clear does not necessarily mean being less scholarly.

7. Discussion

Much of this process relates to work that does not get displayed in project showcases. Scanners, models, immersive systems, and interfaces are readily displayable, but editorial decisions are not. Yet all public-facing representations already involve decisions about what to include, what to exclude, how to sequence, how to qualify, and how media are combined. Documenting those decisions gives the team something concrete to refer back to.

The majority of interpretive traceability can remain behind the interface. A label does not have to be made longer because the team maintains a record of the evidence and reasoning behind it. Such a record comes in handy when material is corrected, reused, or passed on to another group, particularly after the original decision-makers are no longer present. Recent research on digital cultural-heritage communication raises a similar concern: digital form may eclipse the content [13].

What remains unresolved is empirical. The workflow cannot tell us which hierarchy produces the best

comprehension, how much context different audiences want, or when one medium outperforms another. Those questions need testing in particular museums through comprehension tasks, search behaviour, interviews, professional judgement, or learning outcomes.

That distinction matters. Better planning may produce a clearer object for evaluation, but it is not evidence that visitors will understand, enjoy, remember, or learn from it. The value claimed here is narrower: the assumptions behind selection and presentation become explicit enough for later audience research to examine rather than inherit unnoticed.

8. Conclusion

Digitisation puts an object within reach, whereas interpretation is concerned with how that object is made ready for use. The work flows through selection, context, explanation, and adaptation. Those decisions are held together by the five-stage Evidence-to-Audience Workflow, which remains tied to collection evidence. Its practical principle is modest: resolve the communication requirement before selecting the technology, and retain the source and context when the content is repurposed.

Disclosure statement

The author declares no conflict of interest.

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