

NOTIONS OF VALUE IN DIGITAL OBJECTS

A debate with myself and others

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Abstract – The world of digital preservation and archiving has drawn heavily on the thinking of our analogue predecessors. When it comes to selecting materials, we are familiar with the idea of appraisal: “the process of determining whether records and other materials have permanent (archival) value” [1]. Typically, the notion of “value” is then further refined into broad sub-genres, such as evidential, informational, intrinsic, contextual, and so forth [2]. At iPres 2022, a panel session and related poster examined the problem of “The Value of Catastrophic Data Loss” but the debate repeatedly returned to measuring this value purely in terms of economic costs. This paper unpicks the notion of value further, and offers some reflections on how these ideas might apply to digital materials and be predicated on the essential differences between analog and digital sources.

Keywords – Appraisal, value, cost

Conference Topics – Theory to Practice.

I. INTRODUCTION (HEADING 1)

When it comes to collecting digital materials, appraisal is often one step in the accessioning process that nowadays is rather overlooked. Most of the collecting organizations and archives who present at iPres have very clear collection development policies and remits, and so need to give very little thought to the “value” of what they are collecting. They know what they need to collect, and why, and so can focus on that job and the associated challenges that arise from trying to preserve digital materials for any length of time.

Traditional archival practices have long ago settled on a consensus regarding the features of an analogue object that contribute to its intrinsic value (rather than its informational content) [3]. But discussions of digital materials can be somewhat reductive [4], and typically only discuss digital materials in terms of their value as surrogates for analogue items.

But surely there are some classes or aspects of digital objects that have a “value” that goes beyond the purely monetary (i.e. the economic costs of creation or replacement)? And in attempting to address this question I am conscious of the need to avoid straying into the intellectual weeds around notions of “significant properties” [5] and the like.

This paper attempts to explore some of the many ways that a digital object might be considered to be in some way “valuable”, and implicitly suggests that the digital preservation community perhaps needs to broaden and update its thinking around the appraisal of digital objects.

II. INTRINSIC VALUE IN ARCHIVAL MATERIALS

It has been over forty years since the Archives Library Information Centre (ALIC) of the US National Archives published Staff Information Paper Number 21 on “Intrinsic Value in Archival Material” [3]. The paper states that “All record materials having intrinsic value possess one or more of the following specific qualities or characteristics” – and then goes on to list nine features of such records, namely:

1. *Physical form that may be the subject for study if the records provide meaningful documentation or significant examples of the form*
2. *Aesthetic or artistic quality*
3. *Unique or curious physical features*
4. *Age that provides a quality of uniqueness*
5. *Value for use in exhibits*
6. *Questionable authenticity, date, author, or other characteristic that is significant and ascertainable by physical examination*
7. *General and substantial public interest because of direct association with famous or historically significant people, places, things, issues, or events*
8. *Significance as documentation of the establishment or continuing legal basis of an agency or institution*
9. *Significance as documentation of the formulation of policy at the highest executive levels when the policy has significance and broad effect throughout or beyond the agency or institution*

The ALIC Paper then goes on to advise that records that have intrinsic value should be “retained in their original form if possible” and notes that “...opinions concerning whether records have intrinsic value may vary from archivist to archivist and from one generation of archives to another”.

Whilst this document is clearly concerned with appraising analogue materials, can any of these qualities be reinterpreted and applied to assessing the *intrinsic* value of digital materials?

III. INTRINSIC VALUE IN DIGITAL MATERIALS?

If we take the first characteristic, “Physical form...”, then whilst superficially this might seem irrelevant when we come to consider digital materials, surely the resurgent interest in emulation as a preservation strategy and the growth in computer museums, implies that there is something about the “original” form / appearance / rendition of certain digital materials that archivists recognize and value? This is particularly notable in the preservation of video games and early interactive works, where reproducing the look-and-feel of the material when it was first released is considered essential. Moreover, stories of retro games on their original (preferably untouched) media commanding eye-watering prices at auction are now commonplace [6].

One might argue that some of these same properties spill-over into the second characteristic of “aesthetic or artistic quality”. This is best evidenced by the work of archivists involved in the preservation

of digital works of art, who nowadays seek to work with artists to improve the likelihood that their creations will remain accessible to future generations. In addition, the furor around the prices paid for NFT artworks over recent years [7] arguably demonstrates that there are many people who clearly consider these digital materials to have intrinsic value – both aesthetic and economic.

It is perhaps less immediately obvious how digital materials might possess “unique or curious physical features” that attribute intrinsic value (item 3 in the ALIC list). Indeed, digital materials that are unique (or “curious”!) are likely to be very difficult to preserve, and so it seems implausible that such a characteristic would be seen in a positive light. One conceivable exception might be the case of program source code which includes the first use of particular algorithm.

I would suggest that for digital materials the characteristic of “age that provides a quality of uniqueness” (item 4 in the list), is still an emergent property. The commonplace digital preservation practices of data normalization and migration would seem to suggest that, as a profession, digital archivists rarely value the age of digital material per se (and even in those instances where an object is also kept in its original deposited form, this is primarily done as a safeguard against possible migration errors or as an indicator of provenance or authenticity, rather than because the original is valued for its age). However, the growing interest in historical computing, will surely lead to more digital objects being seen as having intrinsic value because of their age (e.g. early program code written in a particular language) – but such instances will surely be relatively few.

In contrast, it is relatively straightforward to think of instances of digital materials that will have “value for use in exhibits” (item 5). Whilst the overwhelming majority of digital materials we collect and preserve may not display this characteristic, there are plenty of examples in existence – such as site CERN has created to recount “The birth of the Web” [8].

The sixth suggested characteristic indicating intrinsic value, “Questionable authenticity...” Is perhaps less likely to apply to digital materials. Appropriate metadata collected at the point of ingest, or the application of digital forensic techniques to the materials concerned, seem the most likely options to resolve any questions about

authenticity or provenance. Failing that, computational analysis of the content of the material (e.g. stylistic analysis of an electronic document) may be sufficient to resolve concerns about its authenticity, in much the same way as we might use handwriting analysis to discover the authorship of a manuscript.

“General and substantial public interest because of direct association...” (item 7 in the ALIC list) seems eminently likely to apply to digital materials as much as analogue. Digital archivists go to great lengths to preserve the provenance, authenticity, and integrity of the digital materials they collect, and so when they have records which pertain to a particular person, event, or issue, the association (and any concomitant suggestion of “value”) can usually be demonstrated. When The Telegraph newspaper in the UK recently began publishing extracts from 100,000 WhatsApp messages sent by a former government minister during the Covid-19 crisis [9], despite the fact that those messages had not been properly collected, curated, and preserved, there was apparently no doubt in the public’s mind that the messages were genuine. Even the ex-Minister concerned did not attempt to dispute the veracity of the messages, but rather took exception to his words being taken out of context – and encouraged his critics to read the complete exchanges before levelling their complaints. This would appear to be an area where the value of a collection of digital materials – certainly when expressed in terms of their utility – far exceeds what we might have expected from analogue counterparts.

The intrinsic value accruing from a digital record’s “Significance as documentation of the establishment or continuing legal basis of an agency or institution” (item 8) seems to be self-evident. As new legal documents, agreements, and charters increasingly exist (only in) digital form, and as key players continue to digitize their analogue holdings of such records, then their intrinsic value seems to be widely accepted.

Likewise, digital materials “significance as documentation of the formulation of policy...” (item 9), with the ability of archivists to capture and record the fine details of a digital record’s provenance, history of creation and updates, links to other digital materials, and so forth, would seem ample demonstration of their potential to possess this quality of intrinsic value.

IV. WHAT’S DIFFERENT ABOUT DIGITAL MATERIALS?

Having established that digital archival materials can satisfy many, indeed most, of the criteria used as possible indicators of intrinsic value, perhaps the obvious question that remains is: are there other qualities and characteristics that digital materials might possess in addition to those that have been suggested for analogue materials?

Perhaps one of the most obvious differences between archival materials in analog and digital form is that the latter typically offer greater utility. Compared to its physical counterpart, a digital record is often quicker and easier to create, reproduce, and share. It can be more readily stored, shared, accessed, and analyzed by tools which support a range of research activities. One might argue, therefore, that the greater the speed and ease with which digital material can be used, the greater its value to users – and so perhaps it follows that digital materials which conform to accepted and well-supported open standards and which are more amenable to study are inherently more ‘valuable’ than those which do not.

In a similar vein, the fact that most digital materials carry with them technical and sometimes descriptive information (e.g. in associated metadata), sometimes also details of how (and by whom) they may have been altered, and other evidence of their provenance and authenticity – all of which can be accessed and exploited relatively easily – might be said to enhance their value. The tools to unpick the history of a digital file are readily available to most digital archivists, whereas undertaking comparable research with analog sources often requires specialist skills and knowledge that is only available to comparatively few.

In crude terms it is also often far easier to establish and track the economic costs of creating, storing, and using digital materials than it is with analog records. Digital archivists typically have the information and tools to record the costs associated with born-digital or digitized materials, whereas comparable information about analog materials is often completely lacking.

Yet some of these very qualities which differentiate, and potentially add value to, digital materials as opposed to their analog equivalents, might arguably be said to *reduce* their value.

Whilst easy reproducibility is a helpful characteristic of digital materials, intuitively we feel that this reduces the sense of “rarity” and “specialness” in such items, and this affects our judgement of their intrinsic value. Whilst a given digital object might be undeniably unique, the fact that one can create an absolutely identical copy with a few keystrokes influences our judgement of its worth not least because we know that we could not undertake the same action with an analog source. Even the very best facsimile copy of an analog source is never judged to be of equivalent intrinsic value as the original item from which the copy was made. Indeed, the value-laden terminology of “original” and “copy” seems to be considered largely redundant when we are examining digital materials – where there might be no way of distinguishing between two seemingly identical files.

Earlier, I asserted that many (indeed most) digital materials nowadays carry buried within them the metadata and other pieces of information necessary to establish their provenance and authenticity, and further suggested that this ascribed additional intrinsic value to a digital source. However, the very plasticity of digital information makes it all too easy to create, manipulate, or fake such details. From early examples of crude PhotoShopping, to the sophisticated deepfakes littering the internet of today [10], we have well-and-truly put paid to the adage that “the camera never lies” and have learned that we should no longer immediately trust what we can see with our own eyes. Fixity checks can help digital archivists identify any changes to digital materials that are in their care but they will not establish the veracity of the digital material itself. Likewise, although the use of digital rights management and digital signatures offer some degree of reassurance as to the provenance of material, most digital objects are not secured in that way. Those that are protected using such methods are most usually afforded this defense because of the perceived monetary value they represent.

V. IS IT REALLY ALL ABOUT THE MONEY?

I have made several assertions above that perhaps suggest the main characteristic that distinguishes digital from analogue archival materials, is their explicit or implicit economic value. Digital materials can be expensive to create, store, and manage – and anything which affects their

usability, utility, or results in their loss, can be measured in cold, hard cash. Ransomware attacks are big news [11] and typically work by denying legitimate users access to data, rather than by removing or destroying the data itself.

Yet it might be argued that ransomware attacks or instances of data loss or destruction, do not actually alter the intrinsic value of digital materials in the same way that comparable incidents might affect analog materials. If a criminal were to burn the Mona Lisa, that work of art would be lost forever, but if a ransomware gang was to encrypt a company's essential data the company could largely mitigate the consequences of such a crime by keeping comprehensive, up-to-date backups that are (in every sense that matters), indistinguishable from the original digital records. So whilst it might be possible to put an economic cost on the data loss that results from the crime, this is perhaps better characterized as the costs of (temporary) loss of the utility and functionality made possible by the digital data, as with a suitable digital preservation strategy a bit-for-bit, byte-for-byte identical copy of the original material can be made available; something that could never happen with the smoldering ashes of the Mona Lisa, however technically proficient one might be.

I began this paper by stating that the focus of discussion would be on the non-monetary/economic value of digital materials, but I acknowledge that establishing value in such terms is not without its problems. Whilst we might be able to establish evidence for the financial ‘input’ costs of creation or replacement (e.g. how much it might cost to repeat the digitization of a particular manuscript, if an earlier set of image files were found to be unreadable or unavailable for some reason), there are many kinds of digital record which are literally irreplaceable (e.g. the astronomical data gathered from observing a comet which subsequently crashed into the sun).

Previous discussions about assigning monetary value to digital archives, such as Jeremy Heil's paper delivered to the Association of Canadian Archivists in 2017 [12], have explored the challenge of trying to establish a “fair market value” (e.g. for insurance or tax purposes) when there is no obvious market, or direct comparators, for a given set of digital records or material. And whilst establishing provenance of digital records might in many instances be easier and

more reliable than doing so for their analog counterparts, it is less clear how conventional notions like “condition” or original vs copy, might apply in a digital context.

Freda Matassa’s book *Valuing Your Collection* [13], is a monograph entirely devoted to notions of “value” and how this term might be interpreted and applied to materials. Matassa notes:

The word ‘value’ has many meanings: price, worth, cost, significance, desirability, importance, asset, quality or excellence. It applies equally to financial or cultural worth. Curators know their collections in terms of significance. Stakeholders, however, often think of value only in financial terms. There may be times when both meanings coincide... (ibid., p17)

The vast majority of examples discussed in the book relate to valuing analog materials (most often from museum/gallery collections), but there are some remarks which might apply equally well to digital materials in the context of this discussion, such as “For historic, scientific or aesthetic items, i.e. most of the objects in our collections, value cannot be based on the actual costs of production”, (*ibid.*, p19), and “Some items have very little or no market value, but considerable significance in the information they reveal” (*ibid.*, p29).

When discussing factors which can influence the perceived (monetary) value of a work of art, Matassa makes an observation about authenticity which will ring particularly true with the community of digital preservationists, namely “Authenticity can make an item priceless and lack of it can equally render it worthless if it is found not to be by the artist or maker in question” (*ibid.*, p33). Digital archivists and preservationists have long recognized the importance of recording provenance, and using checksums to establish that something is unaltered, and one might almost be tempted to suggest that perhaps the “true” value (whether monetary or cultural) lies in the metadata of a digital object, rather than in the object itself.

VI. CONCLUSION

As may be all too evident, this paper is very much a thought-piece – and, worse, one without any clear

conclusion. To me, it feels overly reductive and simplistic to measure the intrinsic value of digital materials merely(!) in terms of the monetary value that they represent simply because this can be measured (or guesstimated) using details we simply do not have about most analog archival materials. Moreover, the impossibility of retrospectively establishing a “fair market value” for many digital materials adds to the difficulty of trying to assign a monetary value to them once they have been created, collected, and ingested into a digital collection.

Digital archival materials offer so much more, in so many ways, than their analog antecedents. To ignore these characteristics and qualities when we talk about their value, or the consequences of their loss, seems to overlook the very features which make digital materials so valuable and worth preserving.

VII. AFTERWORD

Any ideas or views expressed in this paper are entirely my own, and should not be attributed to my employer, the Digital Preservation Coalition. I have not shared or discussed these ideas with my colleagues, and as such I take full responsibility for any mistakes, omissions, half-formed statements, or wild assertions made herein. I offer these thoughts in the spirit of open debate.

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