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iSchool academics and the value of their Personal Digital Archives

Drosopoulou, Loukia and Cox, Andrew M.

Abstract

Introduction

To explore the value that academics in an iSchool assign to their digital files and how this relates to their personal information management (PIM) and personal digital archiving (PDA) practices.

Method

An interpretivist qualitative approach was adopted with data from in-depth interviews and participant led tours of their digital storage space.

Analysis

The approach taken was thematic analysis.

Results

Participants placed little value on their digital material beyond its immediate use value. They did not attach worth to their digital files for reuse by others, for sentiment, to project their identity or for the study of the development of the discipline or the study of the creative process. This was reflected in storage and filenaming practices, and the lack of curatorial activity.

Conclusion

The paper is one of the first to investigate academics' PIM and PDA practices, especially to focus on the value of digital possessions. The paper begins to uncover the importance of wider contextual factors in shaping such practices. Institutions need to do more to encourage academics to perceive the diverse types of value in the digital material they create.

Introduction

Much of the work of academics today revolves around producing digital files, be that for research, such as bids and grant applications, ethics documentation, data files, files produced during analysis, drafts of publications; course handbooks, slides etc for teaching; or the plethora of documents generated by administration.

Academics produce a large and probably growing amount of such content.

Significant changes to infrastructures, such as cheaper storage devices, cloud storage and use of social media, are both enabling and driving this growth. But new infrastructure does not necessarily improve information management. The constant change of technologies means academics need to adapt their practice to the new context. Many cloud services, though convenient, would be perceived by institutions as risky. Changes often create fragmentation in location of collections between print

and digital as well as duplication through multiple locations of digital files. Generally, research has shown that people acknowledge the inadequacies of their Personal Information Management (PIM) or Personal Digital Archiving (PDA) practices (Becker and Nogue, 2012; Marshall, Bly and Brun-Cottan, 2006; Jones and Teevan, 2007; Bergman and Whittaker, 2016; Marshall, 2018). There are many challenges to managing content, such as lack of skills, over confidence, unwillingness to spend time on management tasks (such as filing) and lack of curatorial awareness, including failure to select files to be kept, preserve their provenance and authenticity, and maintain a complete description of valuable files (Jones and Teevan, 2007; Marshall, 2018).

At the same time as there being complex challenges to personal information management, there is a growing understanding that most individuals today place value in some digital objects – “digital belongings” (Marshall, Bly and Brun-Cottan, 2006) or “digital possessions” (Cushing, 2013). It is not unreasonable to imagine that immediate use value is the main value attached for most work-related digital content. Yet we know that people increasingly attach value to some digital material, such as for sentiment, memory and identity (Odom, Zimmerman, and Forlizzi, 2011; Watkins and Molesworth, 2012; Watkins, Sellen and Lindley, 2015; Zhao and Lindley, 2014). For example, Odom et al. (2011, p. 3) found that young adults attached special value to “homework assignments, blog entries, status messages from social networking systems, archived SMS messages, digital video, various self-made digital art works, and expansive archives of digital music (often with accompanying artwork).” Thus valued items include significant material created by ourselves but also private messages received from others, social media comments and responses, and even institutional documents about ourselves.

While we are beginning to discern what digital content the general public places worth on, we do not know much about what types of material academics value. However, the evidence we do have would suggest that academics might value digital files beyond their direct use because:

- Content itself could include valuable data (including research data) for reuse or for legacy (Kaye et al., 2006);
- Some material could be associated with personal memory and sentiment, for example emails as prompts to significant personal experiences, such as their own intellectual journey or significant relationships/events;
- Material can be a means to project identity (Kaye et al., 2006);
- Material such as working documents could potentially be data for a study of the creative process/development of the relevant discipline, and so of value;
- The investment in time in creating material could lend them perceived value;

- Certain characteristics of the items themselves could increase sense of ownership, e.g. bounded control over them (Cushing, 2013).

The combination of increasing attachment to some digital objects, but evolving infrastructure and low PIM skills and awareness is a potentially challenging environment. In this context the purpose of the study reported in this paper was to answer the following research questions:

1. What types of value do iSchool academics place on their digital files?
2. How does this relate to how they manage their files, such as how they are organised, named, stored etc?

Answering these questions will enhance our theoretical understanding of the nature of value in digital possessions, especially in the academic context and how this relates to practices of information management. It will also help us to understand the relation between PDA and PIM. In practical terms, it would enable records managers in institutions to better understand how to improve information management, and think through the potential impact of contextual changes such as to infrastructure. In the context of increasing amounts of content, some increasingly recognised to be of value, such as research data, this is an important practical objective.

The paper is organised as follows. A literature review considers what we know about digital possessions and about PIM and PDA, especially among academics. The methodology explains the approach to the study and data collection and analysis methods. The findings section outlines the type of value participants in the study attached to digital material and then explores how this relates to PIM/PDA practices. The discussion seeks to explain these patterns, and the conclusion further draws out the findings and considers practical implications.

Literature review

The purpose of this section is to reflect on what we currently know about the value placed in digital possessions. After considering the types of value discovered in studies of the general public, the paper considers the limited amount we know about academics as such. It then considers how questions of value might relate to practices of personal information management.

Much research has shown that non-digital possessions are important to our sense of identity (Cushing, 2013). A number of studies have also begun to reveal the types of value the public attach to digital objects, be that using the terms “digital mementos”, “digital collections”, “virtual possessions” or “digital possessions” (Petrelli and Whittaker, 2010; Watkins, Sellen and Lindley, 2015; Odom et al., 2014; Cushing, 2013; Marshall et al. 2006). Cushing’s (2013) research suggests that digital possessions have four qualities:

1. They provide evidence about the individual;
2. They represent the individual's identity "back to themselves";
3. They are recognised as having value, be that sentimental, financial or temporal (for example, where there had been a cost associated with its acquisition or because of the time invested in creating them.)
4. The individual has bounded control over them (it has to be a thing that they can control, for example move about across different storage spaces).

Thus what has value is usually about the self, either for oneself or others. Value might be based on its intrinsic meaning (such as sentiment) or on its use value (financial documents) or on effort to create or acquire them (paid for material). Some characteristics of the objects such as their boundedness also matter. Material from hobbies and interests play a particularly important part in such identity work, because it is seen to represent the individual (Cushing, 2013).

Petrelli and Whittaker (2010) found that it was only with some prompting that people realised that, like non-digital objects, certain digital objects were important as mementoes. Siddiqui and Turley (2006) also found people slow to transfer attachment to the digital, partly because of its changing nature. Such hesitancy may also be explained by Odom et al.'s (2014) characterisation of virtual possessions as having the qualities of "placelessness, spacelessness and formlessness". They cannot be located in a specific place; they occupy no space; and they can be easily reproduced. These qualities define how virtual possessions differ from material possessions in beneficial but also problematic ways. Thus they are easy to share and access from anywhere, save physical space and can be customised, but equally their scale is hard to grasp and their lack of uniqueness makes them feel less real.

The work of Odom et al. (2011) and others cited in the introduction points to the diversity of material that is seen as of value by members of the public. In contrast, we have fairly limited knowledge about what academics value. Marshall, Bly and Brun-Cottan (2006, p. 4) list some general ideas about what academics value, but provide no real detail. Academics' categories of value are also summarised in Williams, Rowlands, Dean and Leighton (2008): 'demonstrated worth; creative effort; labour; reconstituteability and emotional impact' (p. 5). This summary points to value deriving both from the nature of the output, but also from the effort or resource input to create it. Marshall (2008a) talks about the need to preserve digital assets that have 'emotional, intellectual and historical value to individuals' (p. 2). These are suggestive hints but there is a dearth of empirical studies identifying what this might look like in practice.

Probably the most instructive study is Kaye et al.'s (2006) investigation into how academics store material (primarily print) in different ways. They see this as motivated by a desire to:

- Find material again (so use value)
- Build a legacy (so could include data, maybe their own works – including material about the development of their own thinking)
- Share resources with others (likely to be research data);
- Cope with fear of loss;
- Manage impressions people have of the individual (and so identity).

The Digital Lives project also had some suggestive findings (John et al, 2009). When asked to think about a “recent computer file of great importance to your personal or working life” survey participants who were academics valued word processed documents most (41%) and photographs or digital art second (21%). In contrast, the wider public rated photographs and digital objects highest (34%), followed by word processed documents (14%) and other sorts of text (16%). One could interpret this to reflect the textual nature of academic work. Academics also tended to rate files of “great importance” because of their value for future historians quite highly (46%). They also saw them of value because of sensitive, personal or financial information (23%) or sentimental reasons (10%). In contrast the public put sensitive information top (32%), followed by interest to future historians (20%), sentimental reasons (18%). The authors were surprised by the low rating of sentimental reasons for both groups. This might reflect Petrelli and Whittaker's (2010) sense that many people at that time had not grasped the importance of digital possessions. The file of great importance for 52% of academics related to working rather than personal life. It was usually created by the individual, rather than acquired from elsewhere (90%).

It is also of interest to consider the shaping of such attitudes by wider pressures. Thus for example, Al-Omar and Cox (2016) researched the formation, characteristics and factors that shape academics' research-related personal information collections (PICs), observing that pressure to do research, time pressures in general, self-presentation and management, lack of support from central services, and technology opportunities were some of the determining factors that shaped such collections.

Thus, as suggested in the introduction, there are a number of types of value that academics might attach to digital files, but there is a lack of empirical studies exploring the value they actually place on their digital possessions.

How people value things relates to how they manage them: on this topic there are a number of fundamental perspectives. Thus PIM usually deals with finding, re-finding and managing material in the present moment, as an aspect of personal effectiveness (Jones and Teevan, 2007). In contrast PDA reflects archival principles

and focuses on digital stewardship and curation, value, appraisal, provenance, authenticity and ownership of digital possessions (Lee and Capra, 2011; Marshall 2008; John, Rowlands, Williams and Dean, 2009). The two perspectives reflect differing disciplinary roots, Information Management in the case of PIM and archival studies in the case of PDA. There are also other perspectives, such as that of information security, which might actually see stored material as primarily a cause of risk, for example if it involves confidential personal data.

If people place increasing value on their digital possessions, long-term preservation of material does raise a number of serious challenges. Marshall, Bly and Brun-Cottan (2006) identify four significant issues in PDA, in the scale of digital accumulation combined with difficulties in predicting value, fragmentation across different storage places, lack of understanding of curation, and the particular challenges around long-term access. Other environmental threats are malware, ad hoc IT development, and misunderstandings of the real nature of the challenges for digital preservation (Marshall, Bly and Brun-Cottan 2006). Marshall (2008) adds to the list the dependence of digital content on context for meaning, the fact that curating digital files is time consuming and requires specialist skills, and the lack of the computing environment incorporating means or prompts to support long-term access. More recently Redwine (2015) summarises the challenges to PDA in terms of obsolescence of software and hardware; lack of secure storage; natural and man-made disasters; neglect; lack of planning; and death of an individual. The context is not favourable to long-term preservation, while attitudes and skills of individuals suggest that people are ill-prepared for these challenges.

Thus we know people value digital objects but not much about how academics value them. Equally we know quite a lot about how people do PIM/PDA, but relatively little about what academics do. The purpose of the paper is to begin to fill this gap.

Method

Previous studies have found great variety in people's PIM practices with few clear patterns emerging (Williams, Rowlands, Dean and Leighton, 2008). Therefore, the sample group for this study was purposely narrowed to include only academics from one department, who all shared roughly the same technical context – the Information School at Sheffield. It was hoped that this would increase comparability, since issues around technical, and to some extent discipline, were limited.

The data for the study was seven semi-structured interviews with Information School academics that sought to investigate their PIM and PDA practices in depth. Participants were purposefully selected to include members of staff who had recently joined the Information School as well as more senior members of staff with

many years' of experience at the department. Participants were contacted by email, and were provided with an overview of the research project. Following their acceptance to take part in the research, informed consent was obtained from all participants prior to the interviews taking place. The interviews were audio recorded and lasted between 30-60 min.

To address research question 1, participants were asked specifically about the value that they ascribed to their digital collections. Participants were asked to name any valuable files they owned and whether they saw any archival value in them for themselves, as well as for future researchers. Then to address research question 2, participants were asked to describe where they kept their digital files by giving a tour of their computer, emulating the method used by authors such as Kaye et al. (2006). During this tour, participants were prompted to talk about how they managed their files; the folder and file naming practices they used; the classification of files and folders; how they stored and retrieved files; whether they saved interim versions of files; what PIM tools they used. Following this, participants were asked to focus on a particular project or folder and describe in more detail their PIM practices. With the permission of the interviewees, visual data was taken in the form of screenshots of participants' folders and their structure to be analysed together with their responses. Participants were also asked whether they were satisfied with the organisation of their files and why. Although these questions were exploring academics' PIM what value was associated to digital files based on their PIM practices was also observed. Participants were also asked a number of contextual questions concerning the university's role to support academics' PIM skills and PDA and whether their institutions ought to have an active role in educating them how to best manage and curate their digital collections.

The data was analysed through thematic analysis (Braun and Clarke, 2006). After familiarising themselves with the data, the researchers created codes, partly based on the data itself, but also using concepts drawn from the literature review (such as around types of value). Themes were then developed, reviewed and refined, and named. These fell broadly in the two groupings around value and about personal information management practices. The final stage of the process was writing up. While the sample size is rather small and narrowly focussed on ischool academics, emphasis was given to conceptual development and the intention is to open up this neglected topic for further research.

The research gained approval through the University of Sheffield's research ethics review process. As an aspect of this, in this paper, given that all participants were based in the Sheffield Information School, special care is taken to preserve their anonymity by avoiding reference of specific teaching or research activities or citing responses that would enable their identification.

Results

The following results section begins by exploring the types of value academics' placed on their digital possessions, and then describes some of the main features of their PIM, such as their preference for browsing over search, file naming, file organisation and preferences for storage location.

Academics' value in digital possessions

The results relating to questions of value were striking. The only value participants saw in their personal files was work related and for themselves.

'Well, I would be a bit stuck if anything disappeared [...] so they are very valuable to me because this is how I work [...] However, if at some point it [the material] gets published in an article, then I'll have no real interest in it, unless I happen to reuse it in a later project [...] For practical purposes, I would be devastated if this was not available tomorrow [...] it would be catastrophic in terms of work but in terms of sentiment I don't think there would be any feeling'.

When asked whether he considered his files could be discarded if they ceased to have work value one participant said 'Yeah, I think that's what I am saying.'

Another participant noted that: 'In terms of my work it's really important for me to store material that I will reuse, so the value is kind of possessing, having these documents that I can then refer back to or work with.'

Thus a focus on use did not preclude collecting material, and it having some long-term value, but primarily for its use value to themselves:

'I suppose that I see value in the files or the things I am working on particularly for me because I think that I am quite a bit of an obsessive saving everything. But also anything I read which is relevant to the work I archive it and I think that's really important because the type of research I do is often about gathering lots of disparate materials together and then trying to find some kind of story in them. So for me I think it's a very important part of my work that as I am just going about my daily work going through papers, reading materials, that I make sure that anything that's useful I'm archiving or saving coherently so that I can use that in later work.'

Beyond their worth for use, interviewees did not seem to place any other types of value on their digital material. Thus they did not mention worth in digital files arising from sentimental reasons. Nor did they think other scholars would have an interest in their files in the future. 'I can't imagine what it could be mined for.' They only saw as valuable files to themselves and other scholars their publications and to a certain extent research data. This was despite the collaborative ethos of their discipline. Only a couple of participants noted examples of intellectual value in their files such as the files they kept as part of their PhD.

One participant said that his most valuable file was his CV. It is interesting that such a type of file was picked rather than an irreplaceable file or a file that reflected significant intellectual effort. It would seem that the reason this item was selected was that it showed the importance of the 'self'. However, the participant did not keep other files for such purposes nor did he use such material to project identity to the wider world. None of the participants talked about the value of digital possessions for projecting something about their identity, even to themselves (cf. Cushing, 2013).

Academics' management of digital files

This strong emphasis on use value was linked to participants' PIM and PDA practices. Thus one major feature of their PIM was that the organisation of files was very much project and immediate activity oriented. As one participant observed: 'It's quite an interesting reflection actually, it is a very project way of thinking.' Material did not seem to be organised around long-standing, sustained interests. The idea implicit in the organisation of material was immediate and convenient retrieval, without concerns for other sorts of value.

Linked to this, with the exception of one participant, all interviewees said that they never or very rarely used a search tool on their computer to find something. The reason was, as one participant observed, the project oriented and compartmentalised organisation of their files which enabled easy retrieval based on memory.

'I never search ... I always browse, and I generally find what I want. The way I remember is because things are compartmentalised into bits of work [...] so it's immediately obvious [...] and I remember where the stuff is. If I want to find something I very rarely can't find it.'

The convenience of browsing small compartmentalised folders could also be seen as discouraging curatorial activities such as naming files carefully or organising them in order to be able to retrieve them after many years, or viewing them in their entirety as an archive.

Four participants kept earlier versions of files as opposed to the latest version only. But they said that this was primarily done in order to reuse material or ideas in later work, and to have a record that they could refer back to in the future. It did not seem, therefore, to be of potential interest to record how an article developed, or trace how their writing style and ideas developed over the years, as might be found with creative writers who value early versions of work (Becker and Noguees, 2012). Of the remaining participants, two did not save multiple versions of their work at all, one reporting that 'In general I might keep a previous version but I would normally keep only the most recent one' and the other:

‘Probably more than I should I just carry on working in the same file, I just update it so it’s still called by the same file name and just keep on updating it, then maybe the first time I share it with co-authors or something of that sort I would I call it ‘version1’ and give it a date.’

One participant said that he actively deleted files after a project had been completed so only keeping the latest version or not even that if he thought he would no longer need that file. Both these practices seem to reflect a lack of archival awareness about the potential importance of interim versions of creative work.

Divergent practices were observed in academics’ file-naming practices, but most practices of content and version control seemed to reflect an exclusive focus on use value. Regarding content control, most files were given descriptive names recognisable to the participant. One participant stated: ‘I try and create a name which in the future I think I’ll be able to recognise its contents, without actually opening it. And that obviously is quite a challenge’. Other participants were less conscious about their naming practices:

‘I’ve never thought seriously about it, its descriptive name. I’ve never sort of consciously developed [a naming practice] but in general for research papers it tends to be the name of the principal author followed by the subject/title of the paper’

Another participant admitted about his file naming that ‘it’s completely non-logical, there is absolutely no logical title’.

Thus file naming was governed by immediate need or was unplanned, reflecting a use value preference. It did not appear to be influenced by a concern with long-term curation that might be associated with forms of worth beyond immediate use value.

Another participant drew attention to an additional factor affecting file naming practices and that could be linked to how value was placed on digital material: the collaborative nature of much of the research.

‘I am probably less systematic than I ought to be about that, but it does depend to a great extent to the collaborators you are working with and who first created a draft of the article, right? [...] So I would tend to call it by something resembling what will ultimately be the title, but a lot of other people don’t.’

The collaborative nature of research meant participants did not have the bounded control over items that according to Cushing (2013) is a precondition of material becoming a digital possession.

All had developed mechanisms to work around the limitations of computer file organisation, demonstrating ingenuity in managing their files, but were likely to

work against more curatorial purposes. For example, some participants included the date in the file name to force the computer to sort items to the beginning of the list in order to know what the latest version of a file is. 'When I name a file I try and include the date that it was created in the name of the file [...] so year, month, day, so when it is sorted alphabetically it is ordered by date'. Here the desire for efficient retrieval worked against authenticity. Other practices for forcing the order of files were also observed. One participant would prefix a high-priority file with a hyphen to bring it at the top of the list thus working round the computer's automated alphabetical sorting of files. Participants would also index their files and prefix them with a number to force the hierarchy as they wanted it to be, i.e. 01, 02 etc.

Diverse practices were observed in the location of where participants kept personal digital files, even though they were working in a similar technical context: and again this seemed to be linked to how material was valued. Three participants used laptops, which they connected to the computer monitor in their office; the others used a desktop computer. In terms of the primary location of their files, two participants stored all their files in the Information School shared 'M' drive, two participants used cloud storage, and three participants stored their files on their computer hard drive (such as in My Documents). Two out of the three participants who stored their files on their computer hard drive were laptop users. Participants did not use the University 'U' drive –a personal, secure space provided by the University for academics to store their files– or only had limited files on it such as research or confidential data, because, they said, there was not enough space to store all their files on there. They all expressed the wish to have all their files in one location where, ideally, it would also be possible to access them remotely and back them up easily. The fragmentation of files due to the lack of a single storage space made file management complicated because as one participant stated: 'where is stuff? I don't know... half of the time...'. This fragmentation could be seen to impact on value, because it reinforces the intangible, "formless" (Odom et al., 2014) character of digital material.

Participants mentioned few curatorial activities associated with the care of digital files apart from keeping files in secure storage and regularly backing them up. For example, participants did not select files to archive or attach metadata to older files to remind them in the future of their content and context. Participants were also seemingly unconcerned about the authenticity of their files, i.e. files that they created, external files, shared files or copies of files. Some did keep earlier versions of files in order to preserve earlier ideas and work but not in order to preserve and record the creative process of their work; others did not systematically keep earlier versions. Files that were no longer active were copied across without selecting some or changing file names. One reason for this lack of selection of archival files to keep,

participants reported, was that there is unlimited space to store files so there is no need to delete anything.

Despite the issues that were mentioned particularly with regards to ordering files but also file naming conventions, all but one participants were satisfied with the organisation of their digital files. This was mainly because, as they reported, they could find what they wanted. This illustrates that for participants the main purpose of good PIM is restricted to the ability to find information, with little curatorial concern.

Discussion

A striking finding of the study was the lack of value attached to digital objects beyond their immediate use. Even though named for memory it did not seem to follow that this practice was associated with any attachment to digital objects as possessions or mementos. Participants kept final versions of publications, but ironically these are by definition already in the public domain, so they are one thing that did not need to be kept. Keeping of drafts publications could be seen as evidence of sentimental value or for sense of accomplishment but if so this was not acknowledged. Sentimental attachments to digital files in general was not acknowledged. Nor was digital material seemingly used to project identity or kept to document the creative process. It is true that equally participants did not see digital files, as through an information security lens, as a risk. But the strong impression was of a purely instrumental relationship with their digital material.

This view of value was linked in various ways to how material was managed: to PIM and PDA practices. File naming and storage practices seemed to be driven purely by efficient retrieval; little curatorial thinking was identified. Various aspects of the digital material such as its shared character or fragmented storage seemingly contributed to how its worth was evaluated. The need to develop workarounds prevented more systematic curatorial approaches to files' management.

Some explanation of the weak sense of the wider value of material is required. What follows suggests some possible aspects of the explanation, some rooted in the interview data, other is more speculative. One explanation of a lack of sense of value would be that simply much digital material is genuinely of limited value beyond immediate purposes. The vast mass of files created have low worth. Even research data did not emerge as something interviewees placed value on. When discussing the value of research data, Borgman (2015) argues that final publications are the cornerstones of academic work; data lacks inherent value compared to published papers. The redundant storing of final versions of publications by participants in the study, reinforces the sense that papers are all important. Any research data

participants stored was not mentioned as highly valuable. This could be interpreted as partly a reflection of a limited culture of data reuse in many IS specialities, be that for new research or reproducibility. In a field where data sharing was more prevalent one would expect research data to be also seen as having more worth.

Disciplinary and institutional culture could also have influenced the results. PIM as a professional practice in IS is often seen to focus primarily on retrieval of information. It could be suggested that participants all came from this tradition. PDA with its rather different roots in archival traditions, and so more curatorial assumptions, was not an influence.

Further, it could be argued that the lack of value placed in their documents by participants reflected a limited sense of the history of IS. It would be expected that many humanities scholars would have had a different attitude to the value of their files because they themselves are intrigued by the creative process. Certainly the respondents to the Digital Lives questionnaire had a much greater sense of the potential value of material to future scholars. In the current study participants did not seem to think in these terms.

Another factor could have been that the institution itself (like most others) did not project a sense of the high value of material, e.g. there was no policy on data ownership. In general, participants' practices were idiosyncratic and seemed to have been developed as a pragmatic response to a gradually evolving infrastructure. There was little evidence of training or institutional guidelines influencing behaviour. The low amount of storage space provided to individuals implicitly communicated that the material stored is not important. Reinforcing this, the typical software being used (MS office) has limited archival thinking built into it. Files cannot be ordered according to the user's preference and are sorted alphabetically or by date, which is not helpful for long-term file management. Files can also not be annotated to reflect their content for long-term storage and archiving.

Thus, many factors seem to play out in the lack of value placed on digital files. To some extent also - although we know some digital objects come to have special value as mementos or possessions to some people - the qualities of digital material undercut value being placed in them. The sheer quantity of digital information reduces its perceived value. Its "placelessness, spacelessness and formlessness" work against the development of such meaning, such as that would be attached to a non-digital object (Odom et al., 2014). The digital lacks the aura of the unique, physical object. It is hard to grasp and easily reproducible. Material was also usually produced or acquired without actual cost, and for this reason can be perceived to have no value. In the case of academics with their vast production of files, its fragmented storage and the lack of bounded control over content arising from them

being shared seemed to have operated against any feelings that there was a distinct collection and that could have been led to it being seen to have higher value.

Critically, the type of digital material created in academic work is poor for projecting identity to others, an important role of personal collections of academics found by Kaye et al. (2006), but mostly for tangible archives. Although much material was shared with others, it was not seen as projecting something about the self to those others. Cushing (2013) found that if material is about the self it is valued, even if it is not actually shared. But this did not seem to operate here.

A final explanation of the lack of value placed in academics' material could be the increasing alienation of academic life through heavy workload, project focus and a stress on external evaluation (e.g. Fanghanel, 2012). This potentially leads to a loss of meaning attached to products of academic work. Equally the intangibility of digital outputs may itself contribute to such alienation. If some form of academic alienation was a factor it was unacknowledged by participants, but should be given consideration.

[Figure 1 around here]

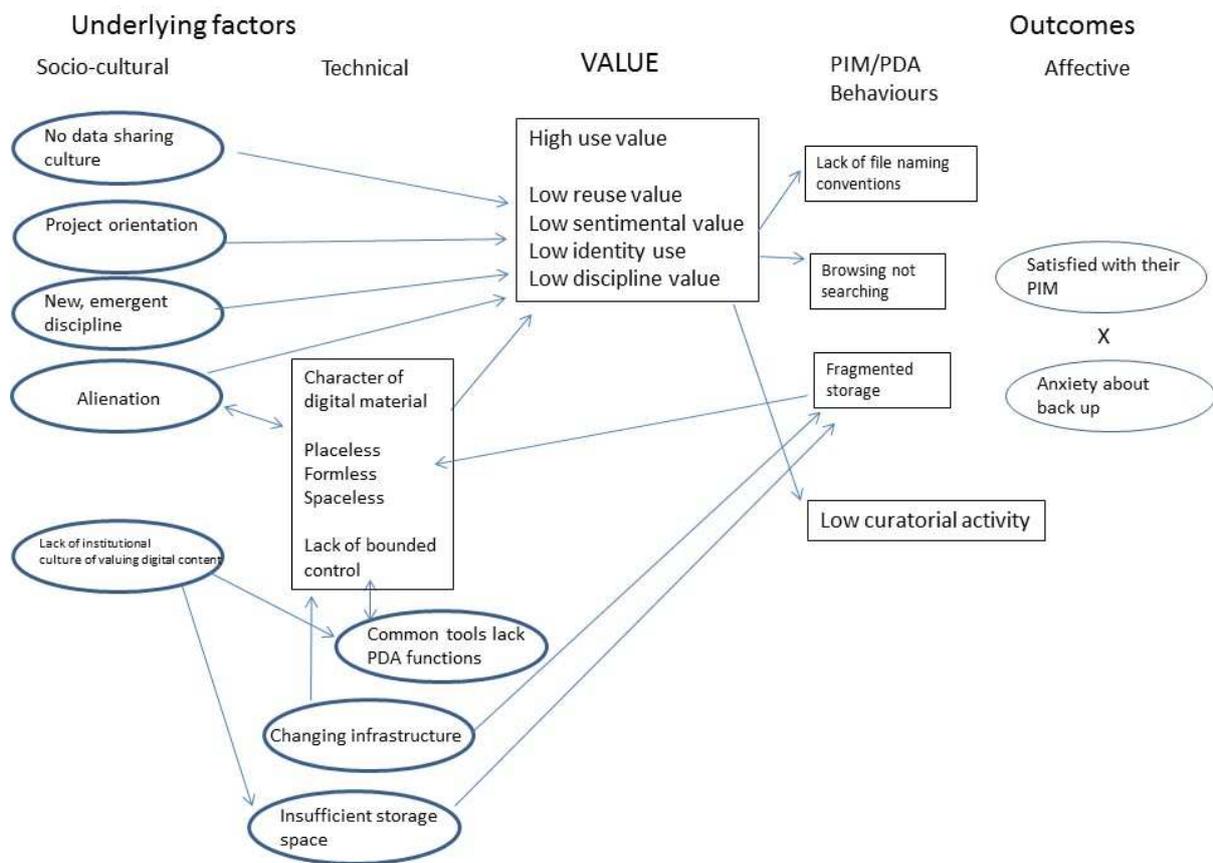


Figure 1 iSchool academics' PIM and PDA

Figure 1 summarises some of the forces seemingly at work in how files were stored and valued, and their inter-relations. Underlying cultural and technical factors are presented on the left of the diagram. In the centre are behaviours arising; and on the right outcomes both behavioural and affective.

Conclusion

This paper is one of the first to explore the PIM and PDA of academics; and the first to specifically focus on the issue of value, and its relation to how material is managed. These are currently underexplored topics, but ones that are important in the context of personal effectiveness of academic staff, information security concerns and particularly in the context of efforts to improve research data management.

The paper gathered and analysed empirical data about academics' PIM practices. Overall they could be characterised as individualistic, linked to task management, pragmatic and often using bricolage as a tactic. Paradoxically, participants were satisfied with their PIM but also quite anxious about back-ups and annoyed by fragmentation of storage location. Most surprising was the limited value that academics placed on their digital collections. Underlying factors shaping these practices are a mixture of cultural and technical factors. Reflecting on this it is important to acknowledge that PIM and PDA are rarely considered in their wider social context. They are seen as largely pragmatic activities, yet they are surely shaped by wider contexts such as the drive for the evaluation of academics, project based funding, the pressures of the complexity of academic work and the increasing alienation identified in many studies of academic life. There is a need for more studies that link PIM and PDA to this social context; and explore differences across disciplines and types of institution.

One of the practical implications of the study findings is that if universities want to steward the vast amount of content created by academics they will need to overcome their sense of low value of their documents. Viewed from an information security perspective, current idiosyncratic, poorly planned and dynamic practices seem to create risk. Universities could do more in terms of developing policies that emphasise the different forms of value of digital material; give more training in basic skills in PIM and PDA; and provide more stable infrastructures within which to operate.

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