On Human Remains: Excavating the Home Archive

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ABSTRACT

Creating digital archives of personal and family memories is an area of growing interest, but which seemingly is often not supported by a thorough understanding of current home archiving practice. In this paper we seek to excavate the home archive. Based on extensive field research in family homes we present a taxonomy of the kinds of sentimental objects to be found in homes, and through in-depth interviews with family members, we explore why and how those objects are kept and archived within the home. From this understanding of existing practice we derive requirements and implications for the design of digital archiving or memory technologies.

Author Keywords

Archive, home, ethnography, memories, photos, videos, artefacts.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

The starting point for this research is an idea, the idea that our lives our filled with things. These things, small and large, serve many purposes, and fill the spaces in which we live [17]. Our relationships with these objects are either simple or complex. Some items we have are purely functional, but others allude to something more.

Ultimately, functional items can be replaced, their existence within the home is temporary, a desire for their presence vacillating with fashions of use. There is another category of objects however, those previously mentioned, which signify something deeper. Such items offer a more complex relationship with the owner and these remain present (to varying extents) within the home. Humans it appears, have a natural inclination to horde items to which they have attached sentimental value. As our lives progress from childhood to adulthood to old age, most of us amass a collection of objects which we refuse to part with, which we feel in some way attached to, and which merge with the collected items of others with whom we share our lives. These objects become aggregated into home or family archives of collected sentimental artefacts. These evocative objects [19] can also have an extended life, living beyond one lifetime of use or admiration as they are passed from generation to generation.

Intriguingly, it has been argued that such artefacts are used by people to construct identities [4]. And this can be seen perhaps most evidently in the ways in which artefacts of sentimental value are used to mediate both our actual and articulated memories of the past [5, 13, 19]. Objects we own, imbued with sentiment, can be used as keys to unlock memories. As researchers of human nature, we are interested in how material culture is appropriated. In particular, we are interested in sentimental objects or "memorabilia": how such objects are kept, how they are archived and how they are managed within the home.

Given the current shifting climate of digitalization, it seems that a study of material culture in the home is particularly timely as our reliance on digital forms of memory mediation, through digital photos and videos [11, 12] and perhaps even web blogs and online forums [5] becomes increasingly pervasive. How digital and physical forms of sentimental artefacts overlap in purpose, replace one another or indeed offer opportunities for enhancing one another remains an open question. As researchers of technology we see great potential for building devices that will help people to manage their archive of sentimental possessions, devices that might help 'back-up' and protect important artefacts and consequently memories, or that might enhance performative aspects of experiencing objects, perhaps by dynamically linking to other media.

This paper then is an attempt to explore what the requirements of a digital home or family archive might be. It is an attempt to understand the complex practices that go into building and managing a lifetime of mediated memories, exploring how, why and for whom they are archived within the home, and to begin to understand the implications that this might have for the design of supportive technologies.

BACKGROUND AND MOTIVATION

There has been a relative paucity of research conducted on home archives. Whilst *personal* archives have previously been considered [10], this work has been focussed on the working archives of academics, and consequently has had a rather more narrow focus than we might wish for in the study of a home archive. With such work-oriented archives, the role of sentimentality is a grey area, whereas clearly within the home archive this is a driving force behind its construction and management.

Some aspects of sentimental artefact storage in the home have however been considered, but they tend to focus on specific sub-sets of mediated memories. In particular there has been a groundswell of research in the areas of video and photo usage, the shift to digital forms of these media dictating a proliferation of activity in designing software to manage what was perceived to be a potential tsunami of digital content entering the home [11]. Inevitably much of the work has considered more technical aspects of browsing and auto-annotating digital content, with the aim of aiding retrieval [1, 14]. Consequentially cultural theorists have decried such a focus and argued for a deeper reflection on the implications of digitizing and storing memories in such ways. Van Dijck [5], for example argues:

> "The performative nature of memory is, I believe, much under exposed in current research on memory machines. Memories are narratives as well as artefacts, performances as well as objects – things that work in everyday lives and cultures of people." (p.169)

To make this argument however, we feel that van Dijck is perhaps unaware of a strong strand of research, focussed in particular on photographs, that has been considering exactly these performative aspects of interacting with artefacts of memory. Various researchers [3, 9, 18] have addressed the nature of how such artefacts are used to ground articulation of memory and (with particular reference to [18]) how the locative aspects of display and issues of curatorial control of images are important aspects of their use, to be negotiated within the home. So some aspects of mediated memories within the home have obviously already been considered, and aspects of *archiving* photos in particular given direct consideration [11]. In all cases this has lead to the articulation of requirements for the design of devices to facilitate either performative aspects of mediated memories or home users' interactions with the archive in general.

This however, is only one element of a broader picture: clearly photos and home movies are not the only sentimental artefacts kept within the home. Some research has begun to consider this notion, and a couple of devices have been built with the express intention of supporting the archiving of items within the home that are of sentimental value but that are not as easily digitized as photos and videos. The 'Memory Box' [8] is perhaps the earliest example of such a device. In this small box, RFID tagged items could be placed (rather than stored) which would then trigger the replay of associated audio commentaries, essentially enhancing the experience of the object. Such a

device however, had many limitations, size clearly being one of them. Building on this, Stevens et al. [15, 16] engaged in a more detailed study in their 'Living Memory Box' concept. Here they sought to archive and annotate a greater range of objects, and they constructed an associated device based on the requirements they elicited from some ethnographic work with families. However, this work focuses on the needs of parents to record memories of their children. This is an inherently narrow conception of the family, specifying the presence of parents and children and giving no importance to other family structures, such as the needs of couples without children or older 'empty-nesters'. Consequently this gives a narrow representation of what the requirements of a home archive device might actually be. Additionally, the work does not give a thorough account of home archiving practices or the types of things that are to be archived. As a result, few implications can be taken more broadly from the research.

The need to adequately support existing home archiving practices or the potential to enhance them through digital means has been touched upon again recently [7]. Again, however this work focuses more on designing for specific small scale examples of practice, and whilst it admirably speaks to some of the broader issues of concern with the construction of a home archive, it fails to articulate in any great depth examples of existing archiving practice from which design can draw inspiration. There is a clear need therefore for substantive work to illuminate this whole area.

In this paper then, we have tried to excavate the home archive as it currently exists (with elements both physical and digital) to set an understanding of the requirements of home archiving technologies on a firmer footing. We have attempted to articulate a framework for understanding the bigger questions concerning home archives, such as: What is it that people wish to archive? Why are they doing it? For whom do they do it, and how? From this exploration of the material culture of the home we hope to provide a more grounded understanding of the values of importance to a digital home archive and the implications that this has for technology design.

Note that as this is such a broad topic, we have deliberately limited the scope of this research to artefacts in the home that have sentimental or emotional value. Obviously the home contains many other kinds of objects, including many which are kept and used for purely functional reasons, or which may have little value at all. These topics we reserve for another time and another project.

FIELDWORK

To begin to investigate these issues we recruited 11 families to take part in our research. We ensured that we recruited a mix family structures: young couples with no children, families with children (including variously, infant, pre-school, elementary school and high school age groups), older couples whose children had left home, and one widower who lived part-time with his adult children. In

each family we spoke to at least two people: one person who was usually determined to be the person most in charge of organizing the family archive, and at least one other family member. In most cases we spoke to all adults and several of the children (where present) as well. Consequently, our participants (that actively contributed) ranged in age from 5 to 70. Our participants came from a variety of backgrounds and occupations and in every family (with the exception of the oldest retired couple) at least one adult was in full-time employment.

Guided Tour

The first question we wished to address concerned the nature of things archived. We wanted to explore people's homes, examine the objects out on display and dig up the objects stored away. We therefore arranged for each of our families to give us a guided tour of their home. These tours normally lasted between 1 and 1 ½ hours. The participating family members showed us every room of their house (excluding inaccessible lofts or garages) and were instructed to show us any items of sentimental value that they could find. Prior to the start of the tour we discussed with our families what we might mean by 'sentimental items' (suggesting that an item was sentimental if it was special in some way, more than purely decorative or functional) but variously throughout the tours we resolved any ambiguity through discourse with the participants.

In all cases, participants were keen to show us their artefacts; even those boxed away and in some form of storage, and would often resort to pulling objects out of various semi-hidden places. As we were shown the items we photographed them for the record. At this stage we held off from asking explicit questions about the items, but normally participants spontaneously produced accounts of what the objects were, giving the history of the object and its associations, and often explicitly stating why the object was being kept where it was. Participants were also asked about the nature of things kept in more inaccessible places such as lofts, for comparison with what was otherwise being seen. At the most appropriate point in the tour (usually in the presence of a computer) participants were also asked to give details of the kinds of digital artefacts that they were keeping for sentimental reasons. This usually included prompting the participants to consider digital photos and videos, emails, and archived digital work. This would often lead to discussion of other digital devices which might store sentimental items such as cell phones and answer machines. Again, photos were taken of relevant screen shots or devices, as a part of the cataloguing process.

In-Depth Interview

Having determined what items people were actively archiving (and to a large extent having already been told why items were being kept) we returned to each family to seek clarification about the issues of *why* different items were kept. A second visit, again lasting between 1 and 1 ½ hours was conducted (performed 1-2 weeks after the initial visit). On this return trip, participants engaged in an informal semi-structured interview in which they were shown some of the photos of their items that had been recorded previously (images were usually picked on the basis that they represented different categories of objects that we saw emerging in the data). Participants were asked to give more detail about how they felt about those particular objects and why they had kept them, and how they had kept them. Participants were also encouraged to think about the nature of differences between physical artefacts and digital artefacts, and were asked as to whether a digital copy of the items they were being asked about could be a substitute for the original physical item, or indeed if items could be enhanced in some way by being associated with other digital media. Questions about who had control of the family archive and who should have access to items within it were also broached in an attempt to explore issues of how collected artefacts were merged and managed within the family.

Data Collection and Analysis

In both study sessions, an audio record was kept of all conversations; this along with the photo record of items excavated in homes was used as the primary source of evidence in our analysis. From the interview data and the photo record, we were able to construct a framework for *what* kinds of objects we observed being archived in people's homes, for *why* they are kept, for *whom* they are kept, and *how*. Our intention in doing this is not necessarily to claim that we have produced the definitive piece of fieldwork on home archives (space here being a significant limitation in articulating everything we observed), but to begin to redress the imbalance in which designs for devices are rushing ahead without seemingly being based on a thorough understanding of the existing requirements for home archiving practice. We wish to improve understanding of this rich area and to provide a general framework to begin to articulate the processes that occur in people's homes and the ways in which people think about these issues. Consequently the broader issues of what and why things are archived are addressed in the following sections of the paper. Some of the implications that these hold for designing a digital home archive are then elucidated and discussed in the final section.
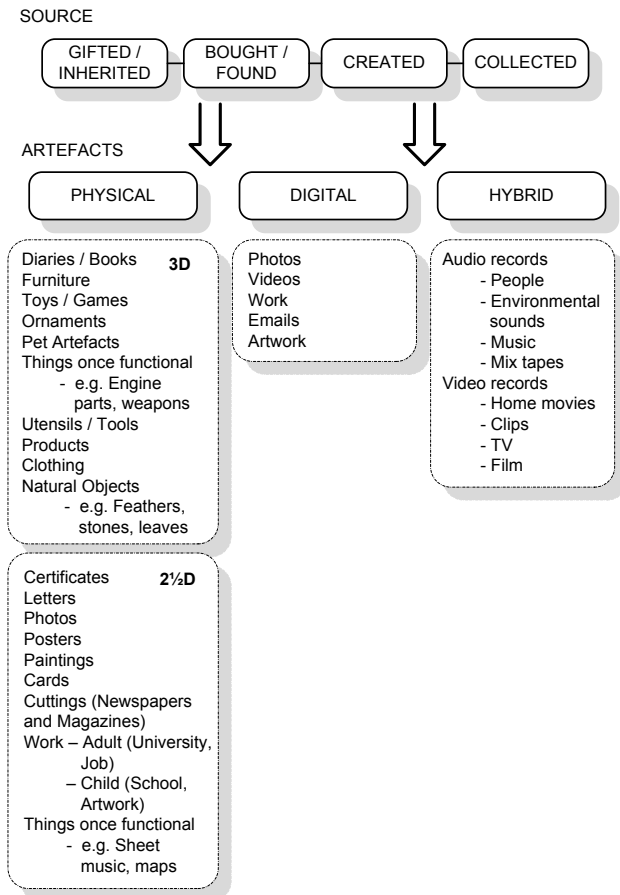
FINDINGS

What Gets Archived?

An important starting point in understanding the home archive is to uncover *what* it actually contains. In Figure 1 below, we sketch out a summary of the various types of sentimental artefacts that we found in people's homes, starting first with a brief high level breakdown of how they come into peoples' lives and then providing a taxonomy of the objects themselves.

Artefacts enter into people's lives in four principle ways: they can be given as gifts or inherited, bought or found, created by the owner or collected. (We set collections aside here as a separate category, as they can contain items from all three of the other categories, individual items within a

collection potentially arriving in different ways, but generally collections are often treated as a whole and therefore deserve special consideration.)

SOURCE

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GIFTED /     BOUGHT /     CREATED     COLLECTED
INHERITED    FOUND
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ARTEFACTS

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PHYSICAL          DIGITAL           HYBRID
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Diaries / Books   3D    Photos       Audio records
Furniture               Videos        - People
Toys / Games            Work          - Environmental
Ornaments               Emails          sounds
Pet Artefacts           Artwork       - Music
Things once functional                - Mix tapes
   - e.g. Engine                    Video records
     parts, weapons                   - Home movies
Utensils / Tools                       - Clips
Products                               - TV
Clothing                               - Film
Natural Objects
   - e.g. Feathers,
     stones, leaves
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Certificates    2½D
Letters
Photos
Posters
Paintings
Cards
Cuttings (Newspapers
and Magazines)
Work – Adult (University,
   Job)
   – Child (School,
     Artwork)
Things once functional
   - e.g. Sheet
     music, maps
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Figure 1. A Taxonomy of Types of Items Archived

Moving on from how items arrive in Figure 1 we have a broad taxonomic classification of the items that we observed. Items of sentimental value could be either physical items, digital items or hybrid items. We shall consider each of these in turn.

Physical Items
Most other research into home archives has suggested the importance of being able to archive physical items in some way, but none of the studies appear to have really considered the great wealth of types of objects that this can include. In Figure 1 we have split physical objects into two broad categories, the purely 3D objects people keep and those we refer to as "2½D".

3D objects comprise a variety of shapes and sizes, textures and materials, as listed in Figure 1. Participants showed us an interesting diversity of objects they treasured, including feathers and stones collected on beaches, small engine parts from a first (exploding) motorbike, board games, teddy bears, swords, and ornaments (which themselves range in scale from the hand held – to 1 ton pieces of art work).

The other category of physical objects and perhaps in some sense the more voluminous, was that which we refer to as 2½D. These objects are largely paper or card based items. In essence they are 2-dimensional, but they sometimes have an important tangible aspect to them. For example, sometimes they had ribbon or other adornments or there was an aspect of the paper/card quality or imprint which was considered an essential inherent quality of the object. Here again there was a huge variety of objects including children's artwork, schoolwork and certificates, letters, pictures, photos and newspaper cuttings.

The extent to which any of these things could be digitized and included in some form of digital family archive depends very much on factors we discuss later, hinging more perhaps on *why* the items are archived. However it is clear that for the most part it is far easier to create a more representative digital trace of a 2½D object than it is to digitally represent a 3D object, especially given the dimensions of some of the objects uncovered. Whilst some participants clearly stated that a physical object could never be replaced or be substituted, many participants felt that a digital copy of a 2½D object could be almost as good, and in both 3D and 2½D there were clear instances where participants felt that a digital copy might help leverage memories of an object should it become damaged, get lost or simply become too much of a burden to keep.

"There are jigsaws from when I was a kiddy, which, erm, its more history in a way. I'd take a photo of them before I got rid of them." (Wife, family 10)

Digital Items
Increasingly people are finding that they wish to archive sentimental digital items. The most common examples that we observed were digital photos and video clips. Additionally, though, we found people keeping sentimental emails, copies of digital work documents that they had produced but no longer needed (often kept purely for sentimental reasons such as associated feelings of achievement), and also some examples of digital artwork (in various forms), created and given as a gift. Anecdotally we were made aware of other digital items such as text messages and web-content (e.g. blogs written) although in our sample we saw no first hand evidence of this.

Hybrid Items
The third category in our taxonomy is what we call "hybrid" objects. Hybrid objects are physical instantiations of digital content such as cassette tapes, video tapes, CDs and vinyl records. These items could easily become part of a larger digital collection, but currently exist in physical format. We observed many instances of media storage, where the media in question was kept for sentimental reasons, such as TV shows and voice recordings taped during childhood, and therefore having associations with fond childhood memories. In these cases, the actual VHS or tape cassettes used for storage held no sentimental value whatsoever, but the content was held to be very precious.

There were clear instances where audio-video materials did get kept in original formats because of a tangible quality that they held, such as the evocative sound quality and sleeve art of a vinyl record, but in many cases this was not seen as important as the information content itself. In particular, with created audio records stored on cassette tape, either compilation tapes or voice recordings, there was often a fear expressed that the cases were very breakable, and the tape itself was prone to degrading. Consequently there was a strong desire to push these forms of media into a digital instantiation to safeguard the quality of the material recorded.

A significant caveat when considering this however comes from the work of Brown & Sellen [2] who clearly demonstrated the pride with which some collectors display the physical copies of their music collections, and who enjoy browsing through the physical media. In these cases if there is an advantage to the digitization of such materials, such factors must be considered.

Why Do Things Get Archived?
Understanding what items are being kept in a home archive only tells us so much. To fully understand the home archive it is imperative to begin to consider *why* things are kept. With initial probing our participants accounted for their archiving behaviours by claiming that sentimental items were kept so as to protect them and for their purposes in facilitating memories and evoking feelings. Essentially any sentimental object has become sentimental because it has moved beyond being a mere object in isolation to being an object that embodies an association with some other entity. From interviewing our families we found the following commonly held associations with objects: people, places, periods (events, ages in life, spans of time), feelings and achievements.

But beyond merely enacting sentiment through simple reminiscing and enjoying that act in its own right, our participants informed us about four core values that underpin why items are archived. We consider each of these in turn.

Constructing the persona
For many of the objects, people kept objects to provide a link to their personal histories. In many instances, this was tied to the notion of constructing or bolstering a sense of identity, through knowing who one is by keeping hold of memories and reflections of the past. For example, in one family, all members were assigned a named box, stored in the loft, which had items to be kept which were of a personal nature. In Figure 2, below, we can see some of the items: part of an engine from a man's first motorbike, a Bay City Rollers annual from his wife's childhood, and some toys belonging to their adopted children.

Figure 2. Items kept to support personal identity.

In all cases it is assumed that these objects have little value to people other than their owners. And in these examples the objects are for personal reflection, for the father reminding him that before family commitments he was a motorbike rider and for the mother something that links her back to her own childhood, to remind her of the things she used to like. With the children's toys we have a particularly interesting case. The decision to keep these items was made by the mother (more often than not it was the mothers who made these archiving decisions in our sample). In this case as the children were adopted and the toys came with them from their previous families, the mother felt obligated to store the toys after the children had grown too old to play with them. She knew it was a link to their past. She felt that they would appreciate that link at some time in the future and it would be important for them when they wanted to understand more about where they had come from.

At other times, these reinforcements of self, through linking to personal history, were altogether more publicly situated. Often people displayed items within the home to not only decorate but to invest of themselves in the decoration, to express their own personal history and identity through items archived throughout the house and on display. In the Figure 3, below, we see such publicly available items, the peacock motif picture indicative of the owner's Pennsylvania Dutch roots (and sentimental as a gift from home), the model car collection, with each item sentimental for different reasons but as a whole articulating the owner's love of cars to anyone who should care to look, and the collected works of Austen as an archive of working achievement.

Figure 3. Publicly displayed items expressing identity.

This last image in Figure 3, is indicative not only of displayed or public archived items giving a sense of personal history and identity but also represents a collection, which is made greater by its sense of completeness. Herein the image represents a large amount of invested effort on the part of the owner who works for a publisher and who worked extensively on this collection. She has chosen to display this collection of works to mark

both a period in her life and a sense of achievement with the work itself. Inherently collections such as this tend to be of more personal value than anything else. Whilst individual items might have specific sentimental value, where a collection is involved and in particular is put on display, it indicates something of the owner. It is an expression of their interests and identity (a point previously considered in relation to music collections [2]).

Connecting with a shared past
Of course for many of the objects we explored, there was a sense in which the sentiment attached to the object was to be shared amongst the family. Items were being kept to link to a shared past (and in some cases a family identity). Again these items were found either locked away in a deeper storage or were readily present and displayed, perhaps reflecting in part a tension between making some things publicly available and keeping others private. Certainly much of this shared past was archived in an audio-visual medium, with videos and photos being particularly salient examples. And in particular with the photos, there was often some element of oral history that came with the photo as a commonly understood explanation of what the image represented. In Figure 4, below, we see some examples of these kinds of items.

Figure 4. Items that help connect with a shared past

The heart shaped stones of Figure 4, represent items collected by the family, through their 'never leave a beach on holiday without a heart shaped stone' rule. This rule reflected a shared value that linked these family members to memories of holidays they had enjoyed together. The maps in the box example also represent shared memories for one couple of specific holidays they had had together. Photos often supported connectedness. We frequently encountered images often framed and displayed (see figure above) of family members either no longer alive or infrequently visited. Our participants would comment that having such images was important as a way of making sure that their children had a sense of who their relatives were, or in part understanding more of where their family had come from. In this way then artefacts were observedly being used to "keep alive" a connection to a remote/distant or deceased family member

We also encountered artefacts that were clearly designated as items to be passed down from generation to generation. The stool and the teddy bear, seen in Figure 5, are good examples. Toys or other items from a parent's past were sometimes kept with the expressed intention that they be passed on and used by the owner's children as this sense of

a linked use of an item, passed down, was particularly comforting for people. They enjoyed the idea of their own children enjoying items that they had enjoyed themselves d, this somehow affirming a bond between generations.

Figure 5. Connections to the past through shared use.

To preserve a legacy
Another issue that we encountered, but less prevalent, was the notion of archiving items as some form of legacy. Here, rather than keeping items for oneself or for known others, these items were kept and would be passed on to unknown others. For example, with a couple of our families, we found items which had some social historical interest, often written documents of quite some age, see Figure 6.
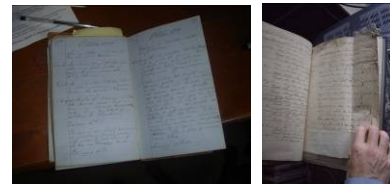
Figure 6. Historically valuable documents kept as a legacy.

Whilst these items were sentimentally viewed by the families that owned them, these pieces often took up space, and in some cases were degrading with age. There was a definite sense that these artefacts might be of value to others outside of the family in the longer term. As such, they were being preserved, and the desire for the content to be digitised in some way was discussed. The intention here was that the information that was contained within could be passed on to more people who would find it of interest. With such old documents there was a tangible concern for preserving the original however and people felt very loathe to get rid of the original because of its antiquity once it had been digitised in some way.

In Honorium
Honouring the past is the last of our core values. It permeates much of what we have already discussed and can be seen also in the keeping of items for personal identity and for keeping items for shared family reflection. In many cases, we observed pictures being present in the home not just to provide a tacit link to the past but to also show respect for the people in the pictures. People often considered who was 'on display' in their homes, making sure that key family members and friends had equal representation within the home. Much as discussed by Taylor et al [18] and Drazin and Frohlich [6], the display space within the home, a finite resource, acts *in honorium* to elevate others into family consciousness.

Beyond this however, much of what is archived is kept to honour other things, such as achievements. This seems to be a particular driver for the archiving instinct. Artefacts were often kept as markers of milestones passed, or as indicators of some great effort expended. It seems that things hard won are often give particular honorific status. In Figure 7 below, we see two examples, one a marker of the owner's PhD graduation, (following a tradition in which in that country a special graduation hat, representative of one's thesis is made), and the other picture showing the last ever circuit board built by a semi-retired engineer.

Figure 7. Objects to honour achievement.

The hat, though dusty, is kept out on display: something to talk about and clearly something instilled with pride, not necessarily just in the making of the object, but in the effort invested in the thesis that it represents. The circuit board, a memento of a particular shift in employment and life status, was kept in a drawer for 20 years. It is now framed, to further signify its importance, but this is a recent modification. It was, before, simply archived away in a drawer, protected and somehow indispensible, but for a long time, somewhat at a loose end.

This last example perhaps also points to a distinction between those items that are honoured through display, (such as children's artwork and certificates which seem to be the focus for much home archiving research) and those items which are kept but are stored in different ways. For some items, we encountered a clear sense of obligation in keeping the them, but they were not to be displayed or kept readily to hand. Sometimes we encountered letters, deeply personal, even occasionally upsetting in content, which were important to keep, but were almost not wanted at the same time. But additionally we also found large amounts of work: schoolwork, university work, job work, things that had seen a large investment of effort, which the owners felt they had to honour by keeping. However impractical or frustrating, they could not reconcile themselves to getting rid of these items. More often than not, such items were held in some deep storage (conceptually if not literally), some inaccessible or infrequently visited place in the home, this process absolving the worried conscience, ensuring that the items were being respected, by being kept, but were not otherwise cluttering the home.

One final aspect of honouring the past, can be seen in another class of objects that we encountered, those inherited

items which had some functional purpose. These items were often neither 'on display' nor in 'deep storage' but were kept somewhere altogether more accessible, at the point of use and expedient access (like the clutter discussed in [17]). These artefacts, like tools and utensils, such as the ladle in Figure 5, were kept and used so as to honour the past through their use.

These functional items, such as the ladle shown, were indicative of the person they were inherited from. The items were used by that person. In their re-use, they reminded the new owner of the past, drawing them closer to the previous owner, thereby honouring the memory of the previous owner by allowing the user to reflect on the skill or passions that the tool represented. With the ladle shown, its owner accounted for its continued use by explaining how it reminded her of its previous owner, her grandmother, and reminding her of her grandmother's skill and passion for cooking, and the times that they shared together when she was a child in her kitchen.

For Whom and How Are Things Archived in the Home?
Cutting across these core values for why people keep artefacts are some considerations which we felt it was important to highlight, and which in part summarize some of the previous discussion. For every artefact we uncovered, there were two key features that reflected these core values: for whom the object was being kept and where/how it was being kept. In many instances these are strong analytic tools for classifying the objects and the reasons for keeping them. These dimensions, and the observed levels within each of them, are derived from studying our participating families' accounts of their archiving practices and can be seen in Figure 8 below.
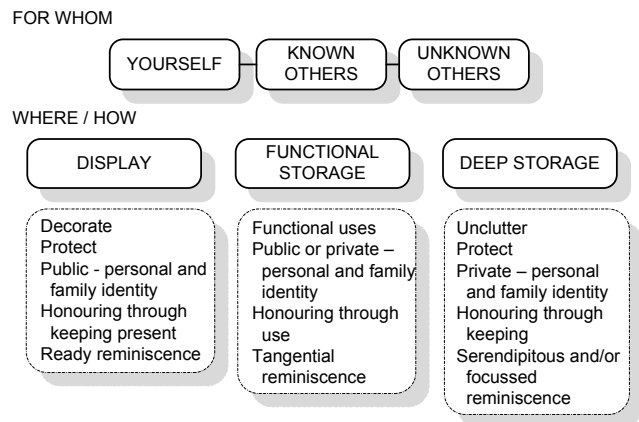

Figure 8. Two key features of home archiving practice.

The first dimension, for whom something is kept, clearly resonates with the first three of our core values as to why people archive items: keeping objects for oneself, keeping them for known others such as the family, and keeping objects for unknown others such as preserving a legacy for the public at large. With any artefact archived in the home, this aspect of archiving practice has important implications for the design of any supporting digital resource. In

particular, it will influence the presence and type of any annotation that might be required for an object, those items that link to a shared past, such as items kept for known others were more often accompanied by annotation (such as inscriptions on the back of photos) or stories attached to them in the telling about why they were important. Clearly as well, access to artefacts is influenced by for whom it is being kept. In most instances, we observed that items linked to a shared past also tended to be made "publicly" available (within the household). Mothers, for example, would make large chests of photos easily available; objects for display would be kept on mantelpieces. But other items of a more personal nature were often placed so as to restrict access, such as in personal boxes on inaccessible shelves. Again this might have implications for how one designs digital support for a home archive.

The second key dimension we observed which cut across the various issues was where and how items were being kept in the home. In Figure 8, we also highlight the three ways in which we found items being archived.

For those items being displayed there was a clear desire to decorate within the home, issues of creating and expressing a personal identity and of honouring the past, one's family and one's achievements, could all be seen played out in a public sense across available surfaces for display. Some items placed on display also being held in such a way as a form of protection, being readily observable and ensuring therefore that they are always visibly safe. This issue of being readily available is particularly germane, and we noticed how items placed on display seem to offer the property of being available for ready reminiscence.

For items functionally stored, there was as discussed above an element of honouring the past through use. The items were placed to hand, when needed, so that they could be engaged with and enjoyed through activity but not contemplated necessarily in their own right. Here then was a more tangential form of reminiscence, less direct, less conscious, but no less important in interweaving items of sentimental value into the fabric of the home.

The last way in which we observed items being archived is what we have termed deep storage. Whilst boxes of items (see Figure 2) were commonly involved, it is a conceptual category more than literal. In many instances items were 'put out of the way'- stored, sometimes loosely organized and sometimes not, but nonetheless not immediately retrievable. In part this effort was clearly to unclutter the house and also to keep an archive of links to the past for the various reasons highlighted above. Often, though, they were held in deep storage because they were of a more private nature, and were less items of the public persona. At the same time, items in deep storage were sometimes found to be unwanted but which our participants were obligated to keep, through a sense of honouring the past.

The forms of reminiscence associated with these items in deep storage are characteristically different to the others already mentioned. Here, our participants told us that they rarely looked at these more hidden artefacts. Maybe once a year they would consider the box or container and look through the items, offering a much more focussed reminiscence. Alternatively some participants told us of how they liked to serendipitously come across such deeply-stored objects, and for them this was the joy of deep storage--, the unearthing of old, half-forgotten memories at unexpected times.

Clearly such different concepts of storage should affect how one thinks about the home archive and the design of any supporting digital technology. Unlike the existing models implicit in many systems, current archiving practices are much richer and more diverse than these would suggest.

DISCUSSION / IMPLICATIONS

We have seen that there are many reasons why sentimental artefacts, whether they be physical, digital or hybrid objects are kept and valued in the home. Through these archived objects, which often form an integral part of the very fabric of our homes, we can celebrate our identities and achievements, reminisce about our past, preserve, share and tell stories about our connections with that past, and show and honour our connections with significant others. In achieving these goals, the place of objects, how they are stumbled across or rummaged through, how they are shared or kept private, how they are collected or singled out and how they are left as human remains for others are all aspects which we have seen are important. As digital technologies begin to find new places in our homes, such systems can serve to complicate and clutter our home lives, or they can help support the things we value, enhance and help protect the things we treasure, and make the legacy we construct richer and easier to share with others.

What then are the implications and important considerations for designing systems to help support the aspects of home archiving that we have seen valued?

Family archives are both physical and digital:
A home archiving system needs to provide the ability to capture and store the burgeoning array of digital objects we collect, as well as the possibility to capture digital representations of physical objects. Physical objects are just as important as digital (in many cases more so).

Easy capture of physical objects is needed: The process of capturing physical objects in a digital form is outside of current practice. Even where possible, such as the capture of 2½D objects, this does not commonly happen despite most people owning the necessary technologies e.g. scanners. Our participants told us that this form of scanning is simply too much effort to make the process worthwhile.

Upload from a variety of digital devices is required: Amongst the digital items we saw being kept, there were a variety of creation and capture technologies being used, any archival device must accommodate connections from these multiple devices.

Digital artefacts can sometimes replace physical ones, but equally may supplement or augment:
The issue of 'replacing' archived physical items with digital representations is a complicated one and often depends on the particular object in question and the type of object in general. Where not replaceable, though, there is scope for augmenting the object with digital information.

2 ½ D objects: 2½D objects in particular were arguably good candidates for digitization, even though it is difficult if not impossible to replicate important features of paper. That being said if archival devices can be tied in intuitive ways to good forms of reproduction there is greater scope for replacing the physical objects with digital copies.

Hybrid objects: In developing these technologies and understanding where digitization will be beneficial, the hybrid objects also pose an interesting challenge. Clearly much of this home content is ripe for digitization but here there are legacy technology issues that must be addressed first. Designs for archiving systems would clearly benefit from incorporating means for solving the practical difficulties of transferring media such as tape cassettes into a digital format.

3D objects: Many physical artefacts though will not be things that could be replaced by the digital (that would be to misunderstand the value of many physical objects). For example, functional items are obvious cases where it simply does not make sense: they are physical objects there to be used. However, for some physical objects, digital traces might be used as a different kind of media, as an index, a set of "stand-in" objects or as a lasting representation in case anything should happen to the original.

There is value in association, and in collections:
Many of the physical objects we saw archived were in fact loose collections of artefacts according to some common theme (e.g. person, place, event or media type). Many of the digital items were subject to more structured organization as a by-product of the software used to manage them. Yet it is clear there is special value from the associations between artefacts.

The need to preserve aspects of existing collections: Consequently, we need to look for ways in which the essence of collections is protected. Somehow their completeness, often reflected in the fact they are displayed, would need to be supported and could perhaps even be enhanced in a digital archiving system.

The opportunity for new connections and for integration: Beyond connecting between similar items there is scope for linking heterogeneous objects, whose connection is more semantic. Technological restrictions currently mean there is little opportunity to associate the digital and physical, but there is no reason to suppose that opening up that possibility would not add value. For example, holiday photos might be made richer if linked to representations of found or collected physical memorabilia (train tickets, sea shells and the like).

Support for easy, flexible management:
Once items have been placed in an archive, and consequently digitised in some way, there is the question of how to organize them within the system. Clearly much of the organization would be based on pictorial representations, either actual photos as objects or file images. Accordingly, much that has been considered of importance in archiving photos [11] would be of relevance here. The need to support triaging and loose categorization, the need to append meta information and easily label digital objects are all important considerations especially at the inception of objects entering the archive.

Flexible organization: Once inside the device, however, attention should be given to how information is parsed or browsed, the advantage of the digital medium over current practice being that it might allow different 'lenses' to be used to view the content, based on person, place, event or media type. Understanding how users might wish to enact such practices is hard to determine from current practice as such behaviours simply aren't possible with physical materials.

Access and management rights: A final caveat when considering flexible management is consideration of defining access and management rights. We observed that in practice this is resolved in part socially within the family, but on occasion, people do appear to safeguard personal items and literally restrict access to them for other family members. The ability to carve out personal areas of an archive is thus another important design consideration.

The value in stories and annotations:
Our research evidence suggests that some kinds of archived objects may be made more valuable if stories or annotations can be attached to them. In particular, those to be shared and especially those to be passed on to others may not speak for themselves. Legacy items especially might need special forms of elaboration to give them context in the longer term. Clearly this has implications for enabling different ways of narrating and annotating content which will be dictated by the intended purpose of archived artefact. But flexibility here is again imperative as objects may change status from being purely personal to being shared throughout their lifetime. Again from discourse with families, it is evident that the overhead for performing this kind of activity must be kept extremely low, suggesting unobtrusive audio capture during viewing of archived items, as an example of how this might be done.

Access and display:
Making a single central repository of archived items is in some sense at odds with current practice. Where things were found in our participants' homes has implications for how those objects might be accessed and used after they are archived. Things which are displayed to honour the past and celebrate events suggest a need for a more persistent and literal presence than current digital means allow. Links to heterogeneous display devices throughout the home, such as digital picture frames, might help to resolve this issue.

Equally those more functional items such as music and video might be well placed if accessible at the point of use – i.e. accessing the archived content through existing functional devices such as stereo and video equipment. Additionally, the main archive unit (i.e. device) invokes the deep storage metaphor, like a box, and in terms of access is therefore perhaps most suited to facilitating the focused and possibly serendipitous reminiscence with items. Creating evocative and non-contrived ways of enacting serendipitous encounter with old memories presents some interesting design challenges.

Keeping safe:

Ultimately any archive must preserve and protect the memorabilia they store. And the prevailing format and storage fears of working with digital content must be overcome. Already our respondents (many early email users) are aware of the legacy issues with old file formats, and the irony that paper documents will last for hundreds of years whilst digital files haven't managed 15-20. Such issues are a real barrier to adoption of digital archiving technologies. But in principal there is a desire amongst people to have some form of networked back-up device that is secure both against invasion from outsiders but also to environmental damage and which can be rescued with ease in the worst of circumstances.

CONCLUSIONS

Through excavating the home archive this research has attempted to demonstrate that home environments and the archives of sentimental items that we keep are complex entities, perhaps more so than has been considered by previous designers of digital archiving and memory devices. More than just flicking through a repository of 'memories' we interact with our home archives in distinct ways, showing different types of reminiscence and different motivations for archiving at all. Ultimately this work demonstrates that more important than a focus on 'remembering' and how that happens, is a focus on human values, as it is those that truly underpin home archiving practices.

ACKNOWLEDGMENTS

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