

Companions: Objects accruing Value and Memories by being a Part of our Lives

Annemarie Zijlema^{1 5}

¹ University of Technology
Sydney, FEIT, Australia

² University of Technology
Sydney, DAB, Australia

annemarie.f.zijlema@student.uts.edu.au

Elise van den Hoven^{1 5 3 4}

³ University of Dundee,
DJCAD, United Kingdom

⁴ ARC Centre of Excellence in
Cognition and its Disorders,

Sydney, Australia

elise.vandenhoven@uts.edu.au

Berry Eggen^{5 2}

⁵ Eindhoven University of
Technology, Department of

Industrial Design,
the Netherlands

j.h.eggen@tue.nl

ABSTRACT

Cherished utilitarian objects can provide comfort and pleasure through their associations to our personal past and the time and energy we have invested in and with them. In this paper, we present a specific type of object relationship, which we call the companion. They are mundane objects that accrued meaning over time, and evoke tiny pleasures when we interact with them. We then draw insights from the HCI research literature on digital possessions and attachment that could be applied to enhance digital products or processes with companion qualities. We argue the importance to design for digital companionship in everyday use products, for example by enabling the accrual of subtle marks of the owners past with the product. We wish to evoke thought and awareness of the role of companions, and how this relationship can be supported in digital products.

Author Keywords

Digital possessions, memory cues, product relationships, traces of use, interaction design

ACM Classification Keywords

H5.2. Information interfaces and presentation (e.g., HCI): User-centered design; Miscellaneous.

INTRODUCTION

The perception of digital possessions, such as photos, music and social media profiles, differ in many ways compared to their material counterparts. Material objects have qualities that can engage all the senses, whereas digital possessions are mainly visual and sometimes auditory (Banks, 2011). Digital objects have qualities that physical objects do not have and the other way around (Odom et al., 2014; Banks, 2011).

People are surrounded by and interact with digital and material objects every day, which often reflects their identity and relationships, and carries associations to the

owner's past (Csikszentmihalyi and Rochberg-Halton, 1981; Golsteijn et al., 2012; Kleine et al., 1995; Petrelli and Whittaker, 2010; Wallendorf and Arnould, 1988). Although people may barely be aware of their meaning in their day-to-day life, objects such as favourite utensils and furniture can provide feelings of comfort due to their positive associations. On the contrary, our least favourite possessions often relate to periods we would rather want to part with (Kleine et al., 1995).

The role of attachment and memory inducer is often neglected when objects and processes are being digitised. Information may be hidden, allowing for less serendipitous encounters. For example, visas for visiting foreign countries are now increasingly stored digitally and hardly accessible to the owner, in contrast to a passport that is owned by the person travelling. Handwritten scribbles on different pieces of paper in a wallet, are a neatly organised collection of almost identical looking notes on a smartphone, with little reference to where they came from or when they were made. When digitising utilitarian objects (e.g. money, passports, and notebooks) and organisational processes, the focus is generally on efficiency, usability, and user experience. The user may be able to personalise certain software aesthetically, for example, the layout of a text processor, but there is little that allows the accrual of memory cues and the formation of emotional bonds. We empathise with Light and Petrelli (2014), who challenged the 'efficiency paradigm' in HCI in the context of their research on Christmas preparations and celebrations. Efficiency and utility may still be the major goal of digital companions, but besides, they could play a subtle reminder to the owners past.

In this paper, we will first describe an object relationship that emerged from a 'home tour' study about digital and physical items related to a holiday: companions. They tend to be mundane objects that accrued meaning over time by travelling with the owner, carrying marks from past experiences, and evoking tiny pleasures when encountered. We then turn towards existing HCI literature and draw insights in what ways digital objects could be enriched, to become potentially meaningful companions to their users.

We intend to provide two contributions to the HCI community. First, we present our finding of the companion relationship and propose it is important to design for enabling companionship. Second, we present our insights

based on the HCI literature on how digital companionship can be supported. We wish to spark thought and awareness on how digital products can fulfil the role of companions, and how this can be supported.

METHOD - HOME MEMORY TOUR INTERVIEWS

The concept of the companion came forth from a data collection on items related to people's holidays and the memories attached. It was a small explorative study on the 'cuing' of memories through a variety of personal objects. Some were acquired for remembering purposes; others were acquired for other reasons and accidentally related to a particular holiday. We conducted 'home memory tour' interviews (Petrelli et al., 2008; Petrelli and Whittaker, 2010; Shenk et al., 2004) with nine participants (six females and three males, aged between 27 and 66 years) and discussed 71 personal items in total. The collected research data have been used to investigate the memory cuing responses evoked by the personal items that emerged through thematic analysis (Braun and Clarke, 2012; Braun and Clarke, 2006). These outcomes will not be discussed in this paper, but can be found in Zijlema et al. (in press, 2016) in which also more details about the method and participants are explained.

The interviews were audio recorded and transcribed afterwards, and photos of the objects were taken on their original location. Participants were asked to list up to ten possessions related to one particular holiday. They were asked to also include digital items if they had not already listed them spontaneously. The interview focussed on cuing and memory cues, and the researcher asked questions about the item itself (e.g. how and when the item was acquired) as well as questions about the memories attached (e.g. what came to mind when they see the item). After the home tour, the participants carried out a rank order task (Fabbris, 2012), in which they ordered the items on several scales from high to low.

The companion relationship was an observation from the 'home memory tour' interviews and their transcripts. This concept was further developed by revisiting relevant parts of the transcripts, focusing on defining the companion's characteristics by using open coding. The results of this process are presented in this paper.

COMPANIONS

In this section, we introduce an object relationship in which the object had been 'travelling' with the owner and been involved in activities, which allowed accrued personal value and associations with memories. By 'travelling' we mean, being a companion in parts of the owner's life journey. This could be by literally travelling, such as items brought on holidays, or by being involved in activities or traditions at home. Examples of companions from our data collection were: a journal, a passport, and a wallet. The owner wrote a bit in the journal, as did two other people who the participant had met on a train during his holiday. The journal, a year after the trip, had been used again as a diary at home. The passport had been taken on many travels, and the stamps reminded the owner of where he had been and when. The wallet contained scraps of paper from several experiences. The examples we present here are all material items, which does not necessarily

mean people currently do not possess digital companions. Denecri-Knott et al. (2012) investigated how people make virtual possessions their own and bond with them, and some of the examples may be described as a companion relationship with a virtual object. However, we did not find them in the study from which our observation of the companion was drawn. Therefore we will illustrate the concept with material objects in this paper. We will then turn to digital items in the section 'Designing for digital companions'.

Our concept of companions shows overlap with the product relation category 'living object', as proposed by Battarbee and Mattelmäki (2002). The companion differs from the 'living object' in that we do not define the companion as something with human properties. Companions are objects that provide a service and play a role in the background. They provide comfort and contentment to the owner when interacting with the object. We will discuss the concept in relation to modifications and personalisation, the owners' memories, identity, and the interaction and use with the companion.

Modifications and companions

Companions provided subtle cues to the events they have been on with the owner. For example, one of the participants showed the passport stamps he collected along his cruise trip to the Pacific Islands. Getting stamps in the passport is not necessary for entering the islands, it is just offered by the local people as a souvenir, and the stamps include the date on which they had been acquired.

"If I ever need to look at my passport for any reason. I have a flick through and look at all the stamps, just to remember where I've been". [P3]

This is an example in which the presence of subtle marks evokes memories of the places he had been to. They evoked tiny pleasures when in use.



Figure 1. Passport stamps as reminders of the owner's past.

Just like human beings and personal memories, material objects also change over time. They age, they alter, and if cherished enough, they are also repaired when broken. Sometimes these alterations are a natural change in the material, such as patina. In other cases, modifications are intentionally made, such as the decoration or personalisation of objects. What characterises the companion is that they often have modifications, intentionally or unintentionally made, associated to the

moments they accompanied their owner. Those marks and modifications can trigger the comfort or memories these objects evoke.

Memories and companions

Companions have a double role. They are often a utilitarian object, involved in performing activities with the owner, but they are also a memory inducer and perhaps a cherished object. Because they are objects of use, and join the owner on several adventures, they have the potential to connect to the owner's memories as well.

A recent stance on how autobiographical memories evolve proposes that memories are formed through changes in routines (Brown, 2016). For example, moving house, a change of job, a holiday, or having a child. Companions are a witness of the owner's routines, such as their travels, and can convey a part of their life and identity. This aligns with the findings of Csikszentmihalyi and Rochberg-Halton in their extensive study on personal possessions: "we found that things are cherished not because of the material comfort they provide but for the information they convey about the owner and his/her ties to others" (Csikszentmihalyi and Rochberg-Halton, 1981: 239).

A characteristic of companions is their ability to accrue associations to memories over time, and remind the owner of these past experiences. The fact that companions were involved in multiple events may also make their memory associations less specific unless it contains clear marks for individual memories. A companion object that tends to accrue memory cues is, for example, a wallet. One of our participants showed us scraps of paper that he kept in his wallet. They spark joy when he stumbles upon them.

"Each time I look at it, oh yeah that song, I really enjoyed it!" [P7]

The participant had asked a staff member in a pizza restaurant for the name of a song he was hearing through the speakers at that moment, and had written it on the back of the receipt. It also contained other notes made during the holiday. Although these scribbles were intended to look up at a later point, in practice they served as trivial memory cues when encountered in his wallet.

Interaction and use of companion

The involvement in activities and routines such as 'joining the owner on holiday' is an important aspect for the object to become a companion. In our home tours we saw objects such as a travel journal, which was used a little bit during the trip and was now used as a diary, or a wallet, full of notes from different experiences. Companions typically are objects that spend a lot of time with their owner in multiple situations. While being in use, owners may not consciously recognise them as meaningful objects. We discussed that companions are often utilitarian objects, however, this role may change over time, for example when the object is being replaced or not needed anymore. The item may change from an object of everyday use to a souvenir, but these roles may overlap during its lifetime.

DESIGNING FOR DIGITAL COMPANIONS

We reviewed the literature of case studies on digital attachment relationships and improved remembering

experience. Below we list a couple of insights that could be applied when embedding companion qualities in digital objects or systems. The majority of the work in this area comes from interaction design and software design, and HCI-research on remembering. For reviews on these topics, we refer to Lee and Nam (2013) for a case study analysis on using interaction history for emotional bonding, and to Van den Hoven et al. (2012) for an overview of design for remembering. The field of product and consumer research has an abundance of literature attachment to material objects, and we also found work on bonding with digital products within the meaning of electronics (Turner and Turner, 2013), but little work was found on bonding with products or applications in digital format. An exception forms the work by Denegri-Knott et al. (2012) on virtual possessions.

Insight 1: Modifications need to be meaningful

It is important that people consider the alteration or augmentation as an improvement. Although patina on material objects often increase its emotional value (Odom and Pierce, 2009), findings indicate that this is not the case for electronics and digital photos. Participants wanted digital technology such as laptops and I-phones to look like new (Odom and Pierce, 2009). Also 'digital patina' for digital photos were perceived as not desired, not practical, and not a quality that belonged to digital photos (Gulotta et al., 2013). Participants thought augmenting the digital items with information (e.g. narratives) could potentially enrich the objects.

In the literature about digital traces, we found not only digital traces augmented to digital applications or files, but also digital traces materialised in physical things. Findings indicate that this increases the emotional bond with the product and the individuals' past. An interesting example for companions comes from Lee et al. (2016), who conducted a study in which cyclists' digital bicycle-history was gradually engraved as patina-like patterns on a bicycle bag over a period of 3 weeks. One important design implication leading from the research by Lee et al. (2016) is that augmented traces need to be tailored towards the users. Participants felt the traces had to be personally meaningful. This resonates with Kleine et al., who found that people attach to objects they identify with, and detach from objects related to periods they rather disconnect from (Kleine et al., 1995).

Insight 2: Allowing control

In the case of passively captured traces (e.g. by logging information behaviour or geo-information), people expressed their desire to control what information is kept and shown (Gulotta et al., 2013; Lee et al., 2016), not only in relation to privacy concerns (what is captured about me and where) but also relating to which experiences are traced. Experiences may not always be meaningful to the owner or evoke negative emotions, or turn out to be less important in hindsight (e.g. Alallah and Hinze, 2011). Allowing control can be done at the moment of collecting the traces, such as 'marking moments' that can be revisited and augmented later (Alallah and Hinze, 2011), or afterwards, for example by allowing the user to select

which traces are being made permanent or by creating erasable traces (Lee et al., 2016).

Insight 3: Usage - awareness of time spent together

For a long time, it has been known that time and energy invested with a material possession is an indicator for gaining significance. Csikszentmihalyi and Rochberg-Halton proposed that “[c]herished possessions attain their significance through psychic activities or transactions” (1981: 173), meaning that the owner has invested time and energy with or in the object. Studies have found that crafting, spending time creating digital possessions, is also linked to bonding with the object (Banks, 2011; Denegri-Knott et al., 2012; Golsteijn et al., 2012).

Insight 4: Augmentation and repurposing

In the HCI literature on reminiscing and storytelling we observed examples of digital objects enriched with (other) digital information, and integrations of the digital and the physical to combine the best of both worlds (e.g. Banks and Sellen, 2009; Frohlich, 2004; Van den Hoven and Eggen, 2005; Lee et al., 2015). We also found differences in how closely the cues that the object collects or provides are attached to or incorporated in the object. The original object and added cue can be completely separate, which allows for repurposing of the objects as well, or closely connected to the application or object itself. For example, in a study on traces to movie content by Lee et al. (2015), pictures of the audience were automatically printed after the movie had finished, as a trace of the movie watching experience. These images are separated from its digital object and can be used in other locations and situations. For example, one of the participants commented she wanted to keep the images in her diary. This kind of repurposing was also seen in a research among teenagers by Odom et al. (2011), where people would print Facebook conversations and put them on the wall of their bedroom. Opportunities for repurposing allow the owner to store it in locations where it is likely to be seen and reflected on, and it may provide ways to express identity.

DISCUSSION

We have discussed in this paper the companion and identified design opportunities from the literature to allow companionship with applications in an increasing digitised world. Personal (material) possessions have been linked to increased wellbeing (Sherman, 1991) and may “help mark a path, or trail [...] along which we have traveled in arriving at the current me” (Kleine et al., 1995: 341). We have stressed their role for the owners individually in providing tiny pleasures when in use. Besides, in their ability to cover a lifetime period, companions may play a role in storytelling to friends or significant others as well.

The findings of related work suggest that to capture people’s past with an object, devices and data unrelated to the companion itself may be a useful source to represent the owners’ past with the object. We consider the recent spur in the emergence of the Internet of Things (Koreshoff et al., 2013) as an opportunity for a wide selection of meaningful information (and pattern creation) becoming available. Companionship is not so much about the object’s past, but about the owner’s past, in which the companion has been a witness.

The memories that the item triggers play an important but modest role. Companions are often utilitarian objects, and the emotional response and memories may be side effects of the utility-relation, perhaps hardly consciously perceived. Nevertheless, they are part of the user experience and would be missed if the object was replaced by another object that did not have the companion status.

CONCLUSIONS

In this paper, we present the companion. It is an object relationship we believe many people have and is more important than is expressed by their owners or HCI researchers, designers and software engineers are aware of. The companion is defined as mundane objects that accrued meaning over time, often carrying marks of the owner’s personal experiences, and evoke feelings of comfort and contentment when interacting with them.

Design for remembering and storytelling has been of growing interest in the last decades, but we argue that the design of memory cues is not something that should be left to specific reminiscence products and applications alone. Remembering is around us all day, and inevitable for human beings to feel well and connected. Its remembering quality is naturally embedded in material objects, and we may need to purposefully embed it in digital objects, and especially in functional applications.

This paper has further addressed how we can enrich digital objects or applications, to facilitate a companionship relation with their users. We identified four insights from the HCI-literature that could be applied to digital applications or files to facilitate the companionship relation. First, the traces or modifications that the companion undergoes need to be meaningful to the owner, in a way that they connect with experiences the owners identify themselves with. Second, allowing control over which experiences are traced, enhances ownership and also provides the opportunity to choose marks with pleasant associations. The third insight, awareness of time spent together (cultivation), means that the owner is aware of the object’s presence by having spent time and energy with the object. The fourth insight is enhancing the digital object by augmentation and allowing for repurposing. The insights are meant to inform the design of companions, and further research is needed to understand the nature of digital companion relations and how to facilitate this relationship. We expect companionship can also develop with digital objects, but we did not find any examples in our data, and further research is needed to investigate digital companions. With the insights for digital companions in this paper, we hope to have sparked interest and inspiration to include qualities in digital applications to allow companionship.

ACKNOWLEDGMENTS

This research was supported by PhD scholarships of UTS, and STW VIDI grant number 016.128.303 of the Netherlands Organization for Scientific Research (NWO), awarded to Elise van den Hoven. We would like to thank the participants who took part in the home tour study, and also our team members of Materialising Memories for their thoughts and ideas when the concept of ‘companions’ came up in our discussions and team workshops.

REFERENCES

- Alallah, J. and Hinze, A. Feeding the digital parrot: capturing situational context in an augmented memory system. Proc. OZCHI 2011, ACM Press (2011), 1-10.
- Banks, R. The future of looking back: Microsoft Press (2011).
- Banks, R. and Sellen, A. Shoebox: mixing storage and display of digital images in the home. Proc. TEI 2009, (2009), ACM Press, 35-40.
- Battarbee, K. and Mattelmäki, T. Meaningful product relationships. Proc. Design and Emotion 2002, (2002), 337-344.
- Braun, V. and Clarke, V. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3 (2006), 77-101.
- Braun, V. and Clarke, V. Thematic analysis. In: Cooper H., Camic P.M., Long D.L., et al. (eds) *APA handbook of research methods in psychology, Vol 2: Research designs: Quantitative, qualitative, neuropsychological, and biological*. Washington USA, APA (2012), 57-71.
- Brown, N.R. Transition Theory: A Minimalist Perspective on the Organization of Autobiographical Memory. *Journal of Applied Research in Memory and Cognition* 5 (2016), 128-134.
- Csikszentmihalyi, M. and Rochberg-Halton, E. *The meaning of things: Domestic symbols and the self*: Cambridge University Press (1981).
- Denegri-Knott, J., Watkins, R. and Wood, J. Transforming digital virtual goods into meaningful possessions. *Digital virtual consumption* 23 (2012), 76-91.
- Fabbris, L. Measurement Scales for Scoring or Ranking Sets of Interrelated Items. In: Davino C. and Fabbris L. (eds) *Survey Data Collection and Integration*. Springer (2012), 21-43.
- Frohlich, D.M. *Audiophotography: Bringing photos to life with sounds*, Springer (2004).
- Golsteijn, C., van den Hoven, E., Frohlich, D., Sellen, A. Towards a more cherishable digital object. Proc. DIS 2012, ACM Press (2012), 655-664.
- Gulotta, R., Odom, W., Forlizzi J., Faste, H. Digital artifacts as legacy: exploring the lifespan and value of digital data. Proc. CHI 2013, ACM Press (2013), 1813-1822.
- Kleine, S.S., Kleine III, R.E. and Allen, C.T. How is a possession "me" or "not me"? Characterizing types and an antecedent of material possession attachment. *Journal of Consumer Research* (1995), 327-343.
- Koreshoff, T.L., Robertson, T. and Leong, T.W. Internet of Things: a review of literature and products. Proc. OZCHI 2013, ACM Press (2013), 335-344.
- Lee, M., Cha, S. and Nam T. Impact of digital traces on the appreciation of movie contents. *Digital Creativity* 26 (2015), 287-303.
- Lee, M., Son, O. and Nam, T. Patina-inspired Personalization: Personalizing Products with Traces of Daily Use. Proc. DIS 2016, ACM Press (2016), 251-263.
- Lee, M. and Nam, T. Critical understanding of interaction history as a design resource. Proc. IASDR 2013 (2013).
- Light, A. and Petrelli, D. The Rhythm of Christmas: Temporality, ICT Use and Design for the Idiosyncrasies of a Major Festival. Proc. OZCHI 2014, ACM Press (2014).
- Odom, W. and Pierce, J. Improving with age: designing enduring interactive products. Proc. Ext. Abstracts CHI 2009, ACM Press (2009), 3793-3798.
- Odom, W., Zimmerman, J. and Forlizzi, J. Teenagers and their virtual possessions: design opportunities and issues. Proc. CHI 2011, ACM Press (2011), 1491-1500.
- Odom, W., Zimmerman, J. and Forlizzi, J. Placelessness, spacelessness, and formlessness: experiential qualities of virtual possessions. Proc. DIS 2014, ACM Press (2014), 985-994.
- Petrelli, D. and Whittaker, S. Family memories in the home: contrasting physical and digital mementos. *Personal and Ubiquitous Computing* 14 (2010), 153-169.
- Petrelli, D., Whittaker, S. and Brockmeier, J. AutoTopography: what can physical mementos tell us about digital memories? Proc. CHI 2008, ACM Press (2008), 53-62.
- Shenk, D., Kuwahara, K. and Zablotsky, D. Older women's attachments to their home and possessions. *Journal of Aging Studies* 18 (2004), 157-169.
- Sherman, E. Reminiscentia: Cherished objects as memorabilia in late-life reminiscence. *The International Journal of Aging & Human Development* 33 (1991), 89-100.
- Turner, P. and Turner, S. Emotional and aesthetic attachment to digital artefacts. *Cognition, technology & work* 15 (2013), 403-414.
- Van den Hoven, E. and Eggen, B. Personal souvenirs as ambient intelligent objects. Proc. joint conference on Smart objects and ambient intelligence: innovative context-aware services: usages and technologies, ACM Press (2005), 123-128.
- Van den Hoven, E., Sas, C. and Whittaker, S. Introduction to this special issue on designing for personal memories: past, present, and future. *Human-Computer Interaction* 27 (2012), 1-12.
- Wallendorf, M. and Arnould, E.J. "My Favorite Things": A Cross-Cultural Inquiry into Object Attachment, Possessiveness, and Social Linkage. *Journal of Consumer Research* (1988), 531-547.
- Zijlema, A., Van den Hoven, E. and Eggen, B. A qualitative exploration of memory cuing by personal items in the home. *Memory Studies* (in press, 2016).