Digital Christmas: An Exploration of Festive Technology

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ABSTRACT
Elaborating on the result of a field study of Christmas traditions in eight British households, we explore the design of technology specifically aimed at augmenting existing practices. Four concepts that favoured playfulness and engagement across generations were discussed in a workshop with eight people who took part in the initial field study. The importance of being connected and spending time together in a way that reinforces the family bonding was evident. The enthusiasm demonstrated during the workshop for some proposals and participants' engagement in revisiting those that did not feel right to produce better concepts seems to demonstrate there is space for interaction design that is ethnographically motivated and aesthetically harmonious with the meaning of home.

Author Keywords
Tangible interaction, celebration, digital mementos.

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

INTRODUCTION
How to capture autobiographical memories and support reminiscing has been the focus of much HCI research in recent years. Initially it was life-logging, the record of every event we experience, conversation we participate in, and any piece of digital data we touch [4, 24] to be accessed at a later stage to reconstruct the past. More recently researchers have gone beyond data streams and looked at motivations and values [32, 20, 34, 23] as well as at how to bridge the material and digital [2, 38, 40, 1, 31]. But, with few exceptions [38, 30], the design is centred on the individual, ignoring research in sociology that sees autobiographical memories as reconstruction through shared narrative [16]. The act of remembering mostly occurs in a social context: the memory of an individual triggers the memory of others.

In our work, we bridge the gap between individual and collective experience, and between material and digital culture by looking at times when a tight group comes together: the family at Christmas[1]. Year after year, Christmas creates a chain of reference points in people's life. It is an ideal context for collective remembering [36]: remote friends and family meet; events are made special by exceptional behaviours (e.g., preparing special food) and the performance of rituals (e.g., home decoration or gift giving) [22]. By designing around Christmas we explore the potential for collective remembering via digital media.

A field study on family traditions at Christmas was conducted, revealing aspects of togetherness that could be augmented by technology, particularly that the family is dispersed for the most of the year and reunited for a few days. Design concepts were generated and explored, props made (e.g., Figure 1) and used in a workshop with some of the families of the initial study. This paper reports on the whole process, from the study to the workshop.



Figure 1. The sound bauble: concept (left) and props (right). Pressing the carrot nose plays the recorded sound.

RELATED WORK
HCI seems to have ignored Christmas so far and only a limited literature exists in general. Anthropologists have tracked the origins of Christmas back to Roman times and the rites related to the sun solstice [28] while contemporary Christmas has been analysed under different lenses, including its role in non-western cultures like Japan and Trinidad, or the tension between secular and religious in France [29]. More relevant to our work are the studies of Christmas in Britain as celebration of the family [22] and the act of reaching out through sending cards [40]. The

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[1] The importance is in being a family event within a cultural celebration [22]. Other cultures have different celebrations in some cases connected to religious beliefs, e.g. Eid or Hanukkah, in others to the identity of a community, e.g. Thanks Giving in the USA. What is common across the different cultural contexts is the fact that it is a family event.

ritual of gift giving as an expression of consumerism [19] and its opposite, an expression of love and care within the family [22] have also been investigated. While the first identifies elements of stress in gift-buying, the second rejects notions of consumerism for a ritual that encompasses time spent thinking of something special for a dear person, buying or making a present, wrapping and giving. The value of dedicating time and effort to the people we love at Christmas is confirmed by our data. It is also relevant for design.

Our Christmas theme touches on elements of planning, preparation and celebration. HCI research on supporting task management and planning started in the workplace [26] but extended then to the family home [17] and recently to less traditional domestic spaces, divorced families managing diaries and children between households [32]. All this research focuses on who does what in a workload share; but at Christmas there is no duty: one person or a few people organize and plan for everyone as an act of love [22]. More than sharing the duties, at this time of the year people want to share anticipation and excitement.

The home and what a family does when together have touched on aspects of taking [15] and sharing family photos [39], preparing and sharing food [14], as well as playing videogames as a family [40]. These studies focus on existing family activities, but the different tempo and mood of the home offers opportunities for designing technology that is not centred on accomplishing a task. Examples of objects that alter the idea of domesticity to produce engaging (but task-less) experiences are a tablecloth that "remembers" activities on its surface [12], a "barometer" that captures the mood of the neighbourhood through newsposts, a TV set that displays on a world map the flights crossing the sky above [13]. Our design effort is more in tune with the last examples although our concepts contained compelling personal content, not just fun data.

Tangible interaction with personal content looked at souvenirs as access points to digital content, to photos to be displayed on TV [10] or tablets [18]. Audio is not currently integrated with existing home technology and researchers have proposed dedicated devices: a sonic box for objects augmented with audio [11], a radio with memory channels [38]. To offer more flexibility between content and objects [31] suggest QRcode engraved cabinets of curiosity to pair and access material-digital memories. Our approach to accessing memories is less functional: it ignores the issue of retrieval of content and tries to include a dimension of surprise and playfulness into the design for personal memories.

IN SEARCH OF DIGITAL OBJECTS OF MEMORY

This work follows our previous investigations into material and digital objects of memory [34, 37] and devices for personal [5] and social reminiscing [38]. It builds upon the finding that digital mementos should become in their appearance and function closer to material mementos. Indeed material objects have the power to trigger recollection: a memento is the material side of a memory [8]; it combines ideas and emotions; it is not a mere possession, but an active presence in the life of its owner [6]. Anything can become a memento: a piece of furniture, a book, a plant [6], a receipt, a golf tee, a dog tag [34]. It is the investment of time and emotion that transforms objects from commodities to personal properties, or objects that are affectively charged [21]. They lose their global, generic characteristics of endless mechanical reproductions and become localized, particular and individual. Material mementos are deliberate, carefully selected as meaningful; they are scattered around the house on display or stored in cupboards for safekeeping; they are looked after and periodically revisited [34,35].

Digital objects of memory do exist: people have many digital photographs and videos; they have emails and text messages they would never delete; they have audio recordings and digital artifacts [37]. The owner cherishes digital belongings as much as physical ones, but the lack of easy access makes the appropriation of digital objects of memory particularly difficult and frustrating: the current technology is 'too much like work' [37]. What hampers the appropriation of digital mementos is the lack of immediacy (a need to switch the computer on, navigate the file system, start the right application) and the burden of maintenance (e.g., sorting, or grouping). 'Digital' is also perceived as ephemeral, there is no trust it will last for future generations and the need to migrate to new technology is seen with trepidation [37]. Digital is conceived as consumption: it becomes obsolete quickly and abandoned for something new. Current technology makes it difficult for people to build meaning through long-term interaction: ageing with digital possessions requires digital curation expertise [7] that is rarely carried out in domestic settings [27]. In short our findings directed our thinking toward the potential of encasing digital mementos into material objects.

Our first exploration of what a digital memento could be was speculative [5]. Here we go a step further to combine ethnography and aesthetics [9] looking into family traditions at Christmas to ground the design of digital mementos that are easily accessible and enjoyable, fun to use, easy to preserve, personalizable and shareable [37]. Our interest is in the Christmas traditions that take place within the family and grow meaningful through shared repetition. Participation is instrumental to the creation of bonding and collective remembering [16]. Family traditions and family remembering are intertwined; they capture the group's attitudes, their values and their past. These were the motivations for the field study that would background the following design phase.

THE FIELD STUDY

Different from all previous research that looks at personal and family memory (e.g. [20, 32]), we focus on memories that gain much of their meaning in being attached to a specific context and a repeated event. Christmas and its

trappings is an example of a repeated event that inspires strong emotional and nostalgic responses. Furthermore the ritual of putting away after Christmas and taking out a year after fosters defamiliarization and periodical rediscovery, a powerful emotional effect on reminiscing [37].

Eight households recruited via local mailing lists took part in the study. Although traditions can be similar, no two Christmas celebrations are alike [19]. We therefore favoured variety over consistency trying to recruit across different situations in life and different faiths: the only condition in sampling was to have family traditions at Christmas. Participants were from different demographics (young singles; young couples - with and without children; established families - with teenagers) and different faith backgrounds (Anglican, Roman Catholic, Jewish). Except for one young family that was openly religious (Anglican) and a young single who identified as a believer but did not practice, most participants identified as secular. For this stage of the research, two meetings were held, before and after Christmas Day. Participants were first interviewed about their Christmas traditions and instructed on the self-directed data collection. A multimedia mobile phone was given to record different media; and diary-like pages were left to annotate events that have not been recorded.

In the second meeting, participants retold their Christmas with the aid of their collected data and the diary. They often made connections with what they said in the first interview. The transcribed oral accounts, recorded material, and diary were coded and analysed. As we focus on the resultant designs, we only summarise the results that influenced our thinking but include some extended recounting as this "can help sketch out cultural and social terrain" [10]. In this way we maintain a bi-focal perspective on both the individual and the global ([10, 25]) and pass to the reader the affective dimension captured in the data.

As might be expected from a self-selected sample and evident in our data, volunteers were enthusiastic about their Christmas and happy to share their practices with external researchers. It must be acknowledged that not everyone views Christmas with the same anticipation and good cheer.

RESULTS

Although every celebration is different, consistencies emerged across the whole sample. Three phases were identified: an extended preparation lasting for few weeks over advent time preceding an intense few days of celebration, followed by a short time of storing away (mainly decorations) for next year.

Although the celebrations bring together members of a dispersed – possibly large – social group, the preparation is carried out mainly in the hosting house by an individual or a small team. The amount of preparation varies from a few days to several weeks and depends on the motivations: personal enjoyment, as an act of love toward others, or just because it must be done. Preparation is not only functional organization: with tree decoration and opening an advent calendar it becomes merry. Some households dedicate time to baking and other making, and little rituals emerge from individual passions, e.g. 'competing' with relatives as to who makes the best home-made Christmas card. At some point in December, people send cards to friends, families and acquaintances that may not be seen in person. In addition, our participants made an effort to meet close friends in public places like restaurants or pubs, and at home, e.g. for an informal dinner, a board game or just a tea and a chat. Those with small children also attended nursery parties and school plays. Attending or taking part in musical events, such as carol singing, New Year concert or Morris Dance performance, is also popular.

Christmas Day is spent with family, all three generations, sometimes including aunts, uncles and cousins. Everyone makes an effort to attend and it is often the only time in the year when the whole family is together. Common traditions across participants include gift giving (and stockings for the youngsters), sharing a big meal, and playing together.

The 26th and the next few days are dedicated again to intimate friends and the enlarged family. Following this, Christmas decorations are taken down signalling the end of the season and the folding back to normal life.

Technology is not central to preparation or celebration activities, apart from two cases of Facebook use to share a wish list or a few pictures among the cousins. In fact, it is noticeably absent. Pictures might be taken occasionally, particularly if there are small children. It seems that, although is it a special occasion, Christmas, unlike a wedding or a trip, does not trigger the use of the camera. This is consistent with our previous findings [35] that familiar situations are not captured thus allowing important aspects of life to slip by.

In taking part in the study, participants had to record their traditions: pictures were taken; audio was used a few times (e.g. carol singing in the street or cake decoration with the kids). A few videos were recorded (e.g. the chaos of waking up on Christmas morning).

VIGNETTES OF CHRISTMAS

"Tree decoration is a point of some dispute"

Making is a pleasure for Sylvia and her family: they make the presents (knitting, painting, and woodwork), the cards, the crackers, and the decorations. "*There is a lot that goes on about decoration in this house, because I really like making things*." Activities start early and gradually build up to Christmas: "*we normally design the card in the autumn half term [school holiday], and then start making it after that. Because we make quite a lot, like about 150*." The pleasure is not limited to the process of creating, but extends to "*something we do together*", which is "*nice*". The value in being together as a family is beyond the happy moments, and extends to discussions and arguments: "*there has always been a sort of slight tension over who does what in terms of decorating the tree. […] It is that wonderful*

mixture of tension and traditions, the need to do what they have always done, and yet, actually the need to share and do things together." An example is the reassembling of the paper chain (Figure 2): "*It's sort of extra ginormous paper chain that goes right across the kitchen. We made it probably 15 years ago: I bought some large coloured cardboard and the children made it; each year we take out the staples and each year we put it back together again. There used to be arguments about which order the colours had to go in but that has now fortunately gone, now that the children are older.*"





Figure 2. The same decoration put up every year.

The recounting of their Christmas is an intense description of remembering, connections, relationships, and caring for others that extends from the family to friends and neighbours: "*steadily we have been putting Christmas cards up which I actually really enjoy. I think its important to write cards: it's an opportunity to be in touch, and to catch up with people and, you know, I value that.*"

"Here we get to the food, food and even more food"

Undoubtedly food plays an important part in Christmas as in many others cultural rituals. For Jane, a cook and food lover, the preparation starts early: "*I make the same kind of Christmas chutney in November, and store it in my cupboard for a month until I can get my hands on it.*" Preparation is as important as the meal; it is a way of caring for others and is entangled with personal values: "*I used to go to church on Christmas morning and I don't any longer because I am helping Mom with making Christmas dinner for 11 people and see my God wouldn't want me to get stressed out and wouldn't want my Mom to get stressed out.*" Love also makes her accept exceptions to the rule of good, well prepared, healthy food: "*We have a little ritual that I am not particularly proud of, but we stop for fast food along the way [to my parents on Christmas eve]. It is usually McDonalds but this year because of the snow we took the motorway and we stopped at a Burger King, still the boys had to stop and fill themselves with junk food.*"

Her account of Christmas day is a triumph of food: "*Christmas eve is always 'hot ham' as we call it in the family, a piece of gammon with cheese sauce and cauliflower and peas and roast potatoes. […] Christmas lunch is always turkey, and sprouts and carrots and peas, and roast potatoes and gravy and bread sauce, and cranberry, so very traditional. Teatime on Christmas day is a cold buffet, because different people want to eat, but there is always one thing which is always the same."*

"There is always the same Marks & Spencer seafood terrine and if that Marks & Spencer seafood terrine is not on the table it is not Christmas. So I have already said to my mom 'Are you getting the terrine this year or shall I get it?', you know, just to make sure that its definitely there. One day we will end up with 2!""After that, Boxing Day, it starts to get into sort of leftovers. But Christmas eve and Christmas day is always the same, always the same thing."



Figure 3. A food tradition, though not traditional food.

"The aggregate score is 5 to 4 to the boys"

All participants reported playing games at Christmas, but some take competition very seriously. For Mike, single and in his late 20s, Christmas is the time to reconnect with his enlarged family and old friends: "*I am away most of the year from where my family lives, back at home, so that is the only real time of the year when I see everybody*". The few days he spends at his parents seem crowded and loud, spent catching up: "*The meal is when we sit and tell one another what we have been doing in the past year. It is the only time of the year when we sit together for a meal, the once time of the year.*" After the updating on each others' life, it's play time: "*We play Trivial Pursuit and this is quite competitive it is 'boys' versus 'girls' and we keep an aggregate score and we are 5 - 4 to us [the boys]. We all play, all uncles and aunties, and it has gone on for years it is really good fun. We all come together and we have to work as a team so it is very nice in that sense. And we always play it later on, on Christmas day*." The organizer is "*my uncle [he] is like a quiz master for this pub quiz so he knows loads. Him and my aunty, his wife, they argue about it and it's always like really competitive because they always want to outdo one another.*"

"I'm doing it again"

Traditions are repeated every year, but they must start somewhere. Samuel enjoys creating new traditions for himself and his partner: "*This is a kind of newish tradition, so we have this database of all our records, so last year, I found that you can get books made, and its really cheap its about £1 to have a book made like an actual paper back book, and so I wrote this programme that sort of pulled out what we had been buying over the past year and what we had been giving marks to and things and made it into a book, so that is the last years one, I did it again this year and made it a bit fancier."* A young couple, their Christmas is split between their families and their own house "*when we come back we open our presents and we usually have another a sort of vegan Christmas meal*" then "*we play cards, play a card game to determine who opens the presents first.*" These traditions mark their own intimate Christmas as different and other than that of their parents'. But traditions do not have to have any specific function: "*Our friend M is a brewer, and he gave me a bottle of one*

of their beers in May and I have held it back until Christmas. It's going to be my Christmas drink. It should have matured a bit so it should be really nice. Quite looking forward to that." (Samuel, before Christmas)

Samuel has gone a step further than enjoying a nice beer and shaped a little ritual for next Christmas: the special box, the careful selection of the beer every month, the anticipation and the final climax of drinking them all.

"That was my special Christmas drink. I am doing it again this year, except I am building it up now, so every month I am buying like a special bottle of beer that I am going to keep for Christmas and then I am going to have like a week of just drinking this beer. So that is something I did for the first time and I am doing it again. I have got a special box in the garage for all these beers." (Samuel, after Christmas)



Figure 4. A new tradition.

What the vignettes tell us

The vignettes illustrate in colourful terms, elements that recur across the data.

The paper chain shows how repeated behaviours shape traditions and how traditions transform and change over time while maintaining consistency [3]. It shows how a calendrical event (happening once a year on the same day) affects the rediscovery of something familiar that has been intentionally concealed for a year. Finally it shows how the decoration of the space marks this as a special time [3]. Designers can exploit the concealing-revealing property of Christmas preparation as well as the lasting alteration of the environment over the Christmas period.

The seafood terrine shows the need for coordination even when remote (who will buy the terrine) and how something as mundane as food can become the embodiment of the family identity (the same courses and its naming). It also shows love in the making for others (cooking Christmas lunch) and bending the rules (good food vs. junk food). For design, this example underlines the importance of openness that gives room for appropriation and meaning building.

Trivial Pursuit provides another example of family identity, this time through playing. It shows the value of getting together and how a tool (the game) can be instrumental to sharing the fun across generations and personalities. Designers can be inspired to make special objects used only once a year and which are valued for *when* they are used and not by *how often*.

Finally the beer shows that traditions can be created for no particular reason and perfected with 'rules' [3]. And all of the above demonstrate that for the tradition to occur, someone needs to care enough. There is room for digital interventions that augment the experience of a special time of year, but new designs have to add a unique value and be appealing enough for someone to adopt it.

DESIGN CONCEPTS

Two designers joined the team to explore how digital technology could support and enhance Christmas, primarily its personal and social affects. Practical considerations such as digital obsolescence and battery life were temporarily disregarded to free up idea generation, and sympathy with families' identity and values was given precedence over usability following a human-centred approach. Concepts were generated individually then selected and refined in shared meetings. The findings inspired a variety of concepts addressing different aspects of family traditions:

The Social Advent Calendar

Dispersed families get together and do things together on Christmas day. The preparation, however, stays with the hosting household and sometimes with a single person. Preparation and celebration are disconnected – remote members do not actually take part in the building up.

Advent calendars mark the passing of the period between 1st and 24th of December with daily windows that reveal a picture or treat when opened. A digital version can spread anticipation and excitement through online sharing: virtual windows contain bits of digital content and can only be accessed on and after the relevant date. Content is chosen, created or added by the family – a short home movie, a funny video on YouTube, a photograph, an audio recording, an animation (made in PowerPoint, perhaps), a little game. It could be video message reminders about things that need to be done, like ordering the seafood terrine or the turkey.

Different families may create calendars in different ways: each person getting a set of dates, or Mum and Dad always doing 1st, or the whole family together on the 25th recording a Christmas song for the 24th for the following year. The content might raise disputes: the teenage daughter could be embarrassed that Mum still puts the recording of her singing *Away in a Manger*, aged 3, in the calendar. It also touches on the issue of loss: What should the family do when an Elder passes away? One window could be a bitter-sweet reminder of that person - both commemorating and celebrating their part in the family.

The 'Dear Santa' App and The Wish Cracker

Families congregate and do special things together at Christmas. Could there be a device or application that has certain functions for personal use, but transforms itself into something inherently social when the family is together, bringing their own components? A symbolic representation of the family being 'greater than the sum of its parts'?

We develop this idea based on typically British artefacts, Christmas crackers: pipe-like paper parcels that make a loud crack/bang when pulled apart at the dining table by two people to release their contents of a paper hat, a small gift, and a joke to the 'winner' with the largest half. In the

workshop, two researchers had images of crackers on their smartphones and mimicked the storyboard in Figure 5.



It's November. Every year the same probolem: what am I gonna get this person?

This is the 'Dear Santa' application for a smart phone that displays the 'wishlists' of the people in the family and the websites where you can buy the presents. I click on Josephine's wishlist on Amazon…

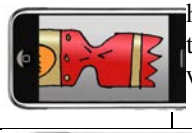


You can look at everyone's wishlist in your family and you can swap wishlists. It's an App that lets you manage your present buying.

It works like any other wishlist that tells you 'someone might have already bought you this'.

Time passes and it is now December, the 25th





It is Christmas Day and we are having the big meal. My phone starts buzzing and shows half a red cracker. Someone else has half a cracker, but it is blue so I start to look around to find if there is someone with half a red cracker.



We put the two phones together and they start to vibrate even more and then we start to pull them apart and …



… and I get a video clip of (comedian) Eddie Izzard from YouTube. But because I have the bang I also have an item from my wishlist. It will only work with others who have used the App for their Christmas presents but now that we are here we have fun playing this little game.

Figure 5. The 'Dear Santa' App. The transcription of what was said gives readers a sense of how the concept was situated.

The Memory Baubles

On Christmas day, the celebration is very intense: it can be the only day in the whole year when the whole family meet. It is not surprising then that people want to catch up and stay together instead of, for example, taking pictures. However, exactly because it is such an occasion, there is value in recording, preserving, and revisiting it over time. Recording can be through many media, e.g. photo, audio and video, and from many angles, e.g. while in the bedroom opening the stockings, around the Christmas tree, while having lunch or a snowball fight.

Figure 6 shows two different ways of capturing moments: the stand alone device gives an objective view of the environment, e.g. the table at lunch; the wearable device, a subjective perspective, e.g. sledging or carol singing.

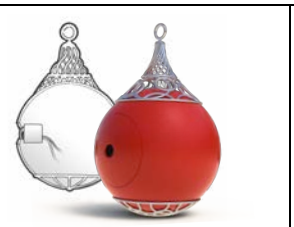
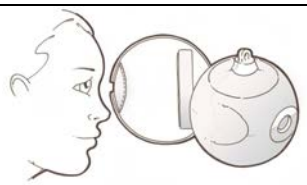




Figure 6 Sketches of recording devices: as a standalone image or video device (left) and a wearable audio recorder (right).

To make the digital content accessible in a social context and across generations and abilities, we used tangible interaction that brings the richness of digital content into the familiar world of material objects. There is no restriction on the medium, one can imagine a touch screen that captures children's handwriting year after year. Here we explore audio (Figure 1, both capturing and playback) and images (Figure 7, a slide show of pre-loaded photos).



A thumbnail size digital photo frame is encased inside the bauble. The view is through a viewfinder. A lens (located just inside) increases the viewing angle.



The digital photo frame and the case. A rectangular opening on the base allows us to place and remove the frame for an easier upload of the pictures. The round base gently rocks the bauble when placed on the table.



The digital bauble as used during the workshop: it has been decorated with painted papermache and gold and red ribbons to match the other elements of a table centrepiece. The viewfinder on the top glows gently when the frame is on.

Figure 7 The bauble for digital photos.

The captured mementos can be put away until next year to capitalize on the emotional power of defamiliarization [5]. We explore the idea of content sealed and inaccessible until precisely next year with the time bauble (Figure 8) that progressively glows to show the time when the content will be available again.



Figure 8 The time bauble progressively glows brighter with passing time, signalling the approach of Christmas. Initial sketch (left) and prop used in the workshop (right).

The capturing of Christmas over the years creates a trajectory in time that, when recomposed in a single show, represents the evolution of the family across life and generations [36]. Revisiting the past can be a new tradition fostered by the possibility of dynamically re-combining what has been captured in the previous years.

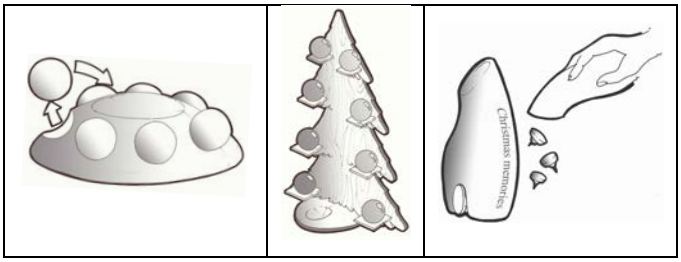


Figure 9 Tangible organisers for the memory baubles.

Figure 9 shows ways of revisiting and recombining memory baubles: the round centrepiece (left) plays the content of the bauble placed in the centre; the tree (centre) provides an order for multiple contents; the standing container (right) plays the audio badges when inserted in the base.

The Forgetting Box

Families spend hours together on Christmas Day, which suggests designing an entertaining activity personal to those gatherings and to be used only at Christmas time. The fact that people disperse after and re-congregate one year later provides material for a social interaction based on what happened a year ago and what will happen next year.

A festively-decorated box with an 'ear-trumpet' records and then plays back audio recordings from one Christmas to the next. It is a table centrepiece and at the end of a communal meal people take turns to speak into the trumpet voicing the things that they wish to put behind them at the end of the year. E.g. the two children put in their regular argument over who gets the top bunk on holiday, Dad stops criticizing the children's favourite TV show, etc. Once all the forgetting items are recorded, the box is used to play back last year's recordings and everyone decides whether the individual has succeeded. If they have, the box rewards them with a chocolate. If everyone has done well, the box opens and a special treat is revealed.

PROTOTYPES AND WORKSHOP

Eight people from the five families participating in the field study accepted an invitation to join us in a workshop to explore our design concepts. Our being to open-up a discussion of the possibilities such devices and applications suggested rather than simply evaluate their desirability and relevance. Hence, we chose four concepts that provided enough variety to explore relevant issues and could be plausibly mocked-up to convey their physical experience. Sketches created but not used in the workshop are in Figure 6 and Figure 9. Interestingly, without being prompted, during the workshop participants proposed concepts similar to these showing a keen interest in new designs.

The prototypes of the three baubles were loaded with participants' content. Their form and the decoration were intentionally very different to provoke discussion. We proposed that the baubles could be sold finished (Figure 8) or raw and to be decorated at home, as the children did for the sound bauble (Figure 1).

The app and the opening of the calendar were acted out using smartphones and a browser. Three days of the calendar had been populated with elaborations of the material recorded by families in the field study (e.g., a humorous video clip where heads of animated characters were portraits of the members of a family). The forgetting box was simulated too through the mechanical opening of a Lego house made for the occasion.

Although none of the singles participated in the workshop, all other groups were represented: two couples with young children; the mother of an older child; a mother with her teenage son; and a man in a partnership with no children. The workshop was organized for a summer evening at one of the researchers' houses, lasted for about 2.5 hours, and was recorded and transcribed. We created the feeling of Christmas by decorating the house, setting up a Christmas tree with presents (thank you gifts), playing carols, eating Christmas food (mince pies and biscuits, stilton cheese and port wine) and drinking champagne. It was very pleasing that two families arrived with a present (a large marrow shaped as a 'C' for Christmas) and a box of Christmas crackers that we opened before starting. The atmosphere was relaxed and cheerful.

At the beginning we made clear that the purpose was "*to have a conversation on digital Christmas: how would a digital Christmas look like, what would it be, based on what we already do at Christmas with family and friends as a group of people.* We told them*: "We have some ideas to show you just to get going. It doesn't have to be 'is this good or is it bad?' more 'what would it be like if we had*

something that would do this?' and then we can have a conversation about it."

The workshop developed chronologically and the props were discussed intertwined with one another depending on the timeframe: we started by pretending we were in November with the Dear Santa wishlist, then we started the advent calendar on 1st December; in mid December the digital baubles were used to decorate the tree and we opened another advent day. When it was Christmas Day, we gave presents to the participants, presented the second part of the Dear Santa app and, finally, the Forgetting Box.

CONVERSATIONS AROUND DIGITAL CHRISTMAS

Each concept was discussed individually engendering specific discussions although similar themes emerged. Here below we try to highlight both specific and generic.

Repeatedly the need to be inclusive of all technical abilities came out as core: not everyone will have a smartphone therefore a web presence is always needed. With **Dear Santa** wish list the discussion hit a controversial point: "*It does flip the whole meaning of presents on its head in terms of 'I want this therefore you give me this' ... oh, hang on a minute, I thought presents was about other people thinking about you. Presents are a way to connect with people. […] my pleasure in present giving is in spending a bit of time thinking about that person and of what actually that person would enjoy and if that person has already told me what they want, it totally takes the pleasure out of me*." There was consensus that a better meaning for the wishlist would be as a way to get to know members of the family and as a valid mediator between less close connections, e.g. aunts/uncles and nephews/nieces, more a "this is what I am about" than "this is what I want". However the teenager seemed concerned to preserve his privacy and, although agreeing on it being a good tool "*to direct ideas toward something that is more appropriate [for me]*", insisted on keeping the content more broad, e.g. *"I generally like this*."

The cracker banging uncovered what seems to be a general ban on computers and technology at Christmas. Technology was valued for connecting members of the family that cannot be together. However an active connection, like a video link, does not seem appropriate as it can easily take one away from one's own celebration. The discussion converged toward "*a digital frame connected to the internet where you can send a photo that just says 'hey this is what we are doing'* " and can engage also those who do not want to be proactive. The frame then becomes a collector for what the distant family is doing over time, not just at Christmas.

Similar comments on the value of bringing together remote people and the preserving of family content for future use were made when discussing the **Social Advent Calendar**. There was much discussion on the possibility that the calendar becomes a family memento and a repeated activity to be carried out over Christmas. The content would be downloaded, saved and treasured for the future.

The playful dimension of the calendar was well received in both its creation and content: the humorous video generated much laughter and the mother of the family in the video, Sylvia, the card maker in Figure 2, while giggling, commented "*It's weird… I think we should send one this year.*" The idea of a family constructed advent calendar where, apart from who loaded that day, no one would know what would pop up when clicking was an intriguing perspective for all.

Questioned what they would load on their own family advent calendar many different elements were proposed: recipes; the kids' nativities; "*a video captured first thing on Christmas morning when nobody's showered or had their makeup on, everyone still in their pyjamas, everybody's shouting and the dogs jump on the bed and everybody just says 'no, please no', and just that fact makes it really funny so that would definitely go in every year*" (this was actually a recording done by Jane (Figure 3) during the study). The reminder to order the seafood terrine sparked conversation on aspects of organizing Christmas and the possibility of remote people engaging with the preparation like ordering online. Laughter started when imagining the family getting up early to be the first to order the terrine in a sort of game against each other. There was also an affective value in being made aware of the preparation going on: "*for families that are not near by in a way it brought you together - there is generally one host family and it is quite nice to know what's happening in there so this would be a memento of the preparation, you know, the turkey has been ordered.*"

The sound **bauble** (Figure 1) was taken from the tree first and played: "*I love that - that would be such a family heirloom*" summarises the general reaction. There were different opinions on having all recordings in a bauble or a bauble for one record: "*one that could add things to each year and then play it back at random so that you don't know what's coming up - but you would need some form of management in case the recording was not nice*" and the opposite *"I liked the idea that you were not able to manage it, that you have 1 chance to do your Christmas recording for that year and then you have just to buy more baubles [general laughter] and then you have a full tree of baubles that look the same, and some of them would have those recordings that are so bad that you want to forget them but you keep coming back to those every year.*"

Suggestions of a bauble that displayed pictures started naturally when the sound one was passed around, before we actually brought it in for discussion (Figure 7). The interaction with the photo bauble was very interesting to observe as people kept looking into it and talking about who they were looking at despite being the only one who could see it. Sometimes, they felt challenged in identifying who was displayed. Indeed the very small screen and the lens introduced some distortion but instead of being a hindrance it started a kind of game in trying to guess who was in it. The control was another controversial point. As the frame was hidden in the bauble, there was no way to

move to the next or keep the picture - it had been set to automatic slideshow. Participants agreed that some control was needed, like shaking or clicking, to get to the next one so that it would be possible to pass an image around while talking about it.

The on-off switch is inside the image bauble. As it was left on from before starting the workshop, by the time the image bauble was picked up it was out of power. This started a discussion on how to charge it: on the fairy light, with power cells, by the heat of the angel chime, or by a pull cord. Manual mechanisms, like the pull cord, provoked discussion on the lasting of the recording/playing to be as long as the pulled string and on the value of manipulating the bauble to make something happen.

The time bauble (Figure 8) generated some discussion for its aesthetic: it was suggested to make it translucent, with the image 'ghostly' appearing inside. The progressive lightening was deemed interesting but the static image was maybe a bit boring compared with the content of the other baubles. Suggestions for improvement focussed on displaying multiple images, for example a new one every time the bauble is switched on.

The **Forgetting Box** did not seem to appeal but the proposal of using it as storage for cumulative stories of important events that happened during the year raised interest. What was precious was the accumulation year after year: "*it would be nice to store your treasures from this year - the things that happen this year and you want to hang on to - and it would be wonderful next year to look at what happened this year and the year before, each with its own bauble*." The place and time, on the table during the meal, generates new possibilities: a 360° recording of who was at the table to be taken before those recorded in previous years can be displayed. Interestingly, this resembles the round centrepiece in Figure 9 that was not presented in the workshop. Similarly, the tree in Figure 9 was spontaneously mentioned after opening one of the gifts, a USB desktop Christmas tree: a personal tree with 24 branches, one for each day in advent, with one thing to do or remember form last year to this one.

"YOU SHOULD REALLY MAKE THOSE"

The field study showed the lack of technology use at Christmas; in the workshop, Christmas was confirmed to be the 'technology free zone' that it had appeared to be in the earlier field study, reserved for family time together. However, the enthusiastic reception of some proposed concepts and the many proposals that were offered in the workshop lead us to believe that the rejection of technology is due to its ill design – it does not fit with the moral order of the family Christmas. With the exception of a few examples of social video games (e.g. [41]), much of today's technology is designed for the individual taking his/her attention away from their surroundings to, for example, attend to communications with remote parties or engage with remote content. Individuality and remoteness are both in contrast with the nature of the actions we observed and heard about, focussed on *we*, *here* and *now*.

The specific pattern of Christmas, i.e. an extended preparation, an intense celebration, and a short time to put away, opens up new spaces for design. For example, the building up to Christmas Day offers a unique opportunity for explicitly designing for anticipation. Similarly the actions of putting away and opening again in a year's time can become material for design. Unlike the norm, what is important here is not the frequency of use, i.e. the more used the better. Here, it is quite the opposite: something that happens only once a year is special but not exceptional. Thus, an event for the same group of people can inspire designers to specifically address the challenge of a closed community meeting once a year for many years.

The concepts discussed show our vision of a digital Christmas captured in simple but engaging and fun objects that contain compelling content. The enthusiasm for some of our proposals and the participants' interest in helping to review those that did not feel right to produce better concepts seems to demonstrate that there is much room for interaction design that is ethnographically motivated and aesthetically harmonious with the home. While design often aims at generalization, our research shows the value of being very specific: at Christmas, within a culture (e.g. the crackers), in a family. Since specificity is essential to convey the feeling of a special occasion, technology must enable each family to appropriate it in the way that best suites them. Easy capturing, accumulation, recombination and play are the key elements: the family can then decide which content will be captured and treasured for future generations.

Our work is progressing: the advent calendar and the sound bauble have been re-designed and given to the five families to use during Christmas 2011. Preliminary results are positive and show an interest in doing it again next year thus starting a new digital tradition.

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