“Making Memories”: A Mobile Application to Support Memory Making and Reminiscence

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Abstract
Humans naturally prescribe meaning to objects and experiences throughout their life, yet there are no convenient ways to tag and reminisce about these experiences as they are happening. Our paper outlines the design for “Making Memories”, a mobile phone application that supports both memory making and reminiscence in order to help people live healthy and happier lives.

Keywords
Reminiscence, mobile phone, application, design, memory

ACM Classification Keywords
H5.1. Information interfaces and presentation: Evaluation/Methodology

Introduction
Current research across the fields of psychology and human-computer interaction (HCI) has yielded significant findings about the value of reminiscence, or “the process of recalling personally experienced events from one’s past”. Reminiscence is valuable not only for constructing identity in adults [2], but also for

improving moods and reaffirming values [11]. While a number of tools aimed to encourage reminiscence have been developed [1, 5, 6, 9, 10], few of these technologies exist beyond the desktop. In this paper, we outline the potential design of a location-aware mobile application to support memory making and reminiscence. Our application incorporates the "Principles for Autobiographical Technology" that [7] outlines, including supporting users in creating objects to reminisce upon, affording automatic capture of data, revealing patterns of behavior, and providing contextual information, including records of past interactions with the objects.

Benefits of Mobile Applications

Given that almost 40% of adults were using their mobile phones to access the Internet in 2010 [8], and the number of Internet-capable mobile devices is steadily increasing, mobile phone applications serve as a seamless platform for supporting memory making and reminiscence activities. Many mobile phones contain cameras, which assist in recording activities for reminisce. In addition, [10] illustrated the value in users receiving email prompts to encourage reminiscing, a function that many mobile phones currently support. Finally, mobile phones provide opportunities to support memory making and reminiscence where learners are: out of their seats and in the world. More than simply being mobile, many new mobile phones are location-aware, using wireless networks and GPS data to locate mobile phone users in the physical world, with the potential to sense information as specific as in what establishment the person is, with whom the person is spending time, or who else may be in the vicinity.

Goals for the Workshop

Our intentions with this submission are to (1) suggest a new type of technology to support reminiscence, (2) solicit feedback on not only the design of the specific application but also on the broader idea of applications to support reminiscence, and (3) learn about and engage in current dialogue about how others conceive of reminiscence and are working on technology that supports it in the field of HCI.

Proposed Application Design

In order to encourage reminiscence, we propose a mobile application, Making Memories, that encourages users to participate in new activities; keeps a geo-tagged record of users' activities, which users tag and annotate; and, in the future, sends *memories* of those activities to users, prompting them to reminisce or reflect.

Making Memories utilizes a Web-accessible activity service, such as the one developed by [4], which identifies the set of potential activities supported by the location(s) a person may visit by processing community-authored reviews. The application (1) suggests activities within certain proximity of the user, based on interests the user has input, (2) geo-tags activities and waymarks the user has recorded, and (3) notifies users of memories that were created nearby. Users also have the option of receiving memories periodically. Users can connect with and share or create memories with friends who also use the application.

Making Memories provides a maximally-curated reminiscence experience, where users participate in the "active reconstruction of [their] future past" [7], as well as reflect on their past through a variety of inputs, with

the ability to annotate their memories and contact others who also participated in the activity, prompting those others to reminisce as well.

(1) Receiving Activity Suggestions and Entering To-Dos
Users may choose from a list of activity categories (e.g., bicycling, games, concerts) of interest to receive suggestions for activities in the area. Users can mark suggested activities or enter new activities as To-Dos. Users control how often the application searches for and suggests activities. The application suggests activities in the user's interest area that the user has not done before, encouraging new activity.

This aspect satisfies the principle of supporting users in creating objects to reminisce upon [7].

(2) Recording Activities
Each activity is tagged, associating it with an activity category; activities can have multiple tags. Tags make browsing memories easier and influence the algorithm for reminiscence prompting.

The application records the user's path, if applicable (i.e. walking, bicycling, etc.), overlaying the path on Google Maps, or as a point on the map, if the activity is stationary (i.e. attending a play). Users have the option to insert geo-tagged waymarks, which can be photos, videos, notes, or markers of points of interest. Users can tag waymarks, using tags from a pre-defined list of tags or creating their own.

All activity records are available on a single Google Map, or users may have separate maps for separate activities. This type of *in situ* map creation falls in accordance with the studies done by [5, 6, 7] around map usage and the value of maps in prompting reminiscence. Furthermore, these maps would assist with other principles that [6, 7] outline such as affording automatic capture of data, revealing patterns of behavior, and providing contextual information.

(3) Receiving Memories and Prompting Reminiscence and Reflection
This feature of Making Memories is the most powerful and the most relevant to the workshop. Users may receive memories (1) when they are in certain proximity of where the memory was created, so they may retrace their steps if they wish, remembering, reminiscing, and reflecting as they go, and (2) periodically, since people rarely consciously decide to reminisce or reflect and periodic memories sent to users will encourage this healthy behavior [3].

Memories consist of media from the waymarks. Users receive these media along with questions to prompt reminiscence and reflection, such as, "What did you like best about this activity?", "How did you feel when you were bicycling that day?", and "How does this memory make you feel?" Users may answer the prompts by typing notes or recording a video; these responses are added to the activity record and used in subsequent memory prompts. Users may opt to send memory prompts, including their own reflections, to others who participated in the activity, prompting those others to reminisce.

While prior tools such as [1, 5, 6, 9, 10] exist, none of these allow for such an integrated engagement with both the physical and digital landscapes; something we believe is essential for the next generation of reminiscence technologies. We acknowledge the way

that [1, 5] explore using images to prompt reminiscence and the value that maps, as shown in studies conducted by [6, 7], but we seek to take another step and combine these functions into an application that allows for immediate, contextual reminiscence.

This type of application will not only allow for patterns of behavior to become more visible, it will also encourage social reminiscence, or the sharing of memories.

Making Memories to Share

Given that Making Memories is supported by a Web-based service, a potential area of use for this application is a social network by which users in certain physical locations or of certain personal interests can view what types of activities or waymarks others are visiting and how they reminisce about them. This type of public or social reminiscence can not only create stronger bonds between users, but also strengthen the quality of the memories, as users will prompt each other to reminisce more.

A Use Case

The following story outlines a potential set of experiences and opportunities to reminisce that Making Memories could support.

Michael has installed Making Memories on his phone. One Saturday, he goes to a picnic at a local park with his friends. While he's there, he decides to use the Making Memories application. He uses it to take photos of kebabs on the grill and record a video of his friends playing bocchi ball. Then he uses the activity suggestion feature to see that there's a short loop he and his girlfriend can walk to go see some sculptures.

He and his girlfriend, who has also installed Making Memories, go on the short walk, taking photos of the sculpture and entering a waymark on their path to mark the sculpture's location. Then they walk back to the picnic and eventually the day ends.

A couple months later, Michael is riding the bus to work when he is prompted with a memory of the day at the picnic. He is shown photos he took that day and has the option to watch the video, which he decides not to do because he doesn't want others on the bus to hear. After viewing these media, Michael is prompted with the question, "What was your favorite thing about this activity?" He remembers the walk he and his girlfriend took, and he types a few sentences about it. When he's done, he enters his reflection, then goes and looks at the photos he and his girlfriend took. Feeling happy, he sends a memory of the day to his girlfriend using the application; Michael has opted to show her his reflective thoughts. She sees the photos she took and the thoughts he has entered, and then reminisces on the event herself. Though they are apart, they are able to reminiscence about their shared memory together.

Conclusions and Questions

As illustrated above, reminiscence is a valuable practice for people's health and happiness, and currently lacks portable memory capturing technology. Through the work of [1, 3, 5, 6, 9, 10] and others, it is clear that reminiscence is best supported by multimedia recordings, a capability that can be found in most mobile devices. Making Memories would be a valuable application for reminiscence as it prompts both the

recording of memories as well as reflection on and sharing of these memories.

We look forward to discussing the potential of Making Memories to support memory making and reminiscence, especially around the following questions:

- What are the best methods (e.g., user-centered design, value-sensitive design) to ensure Making Memories supports, yet may still improve, people's current practices around reminiscing?
- How can Making Memories complement existing tools that support reminiscence?
- What are the potential benefits and risks of sharing "memories" socially?
- What are the potential benefits and risks of sporadic, unexpected memory prompts?

We also look forward to discussing the possibility of supporting reminiscence in family, romantic, and other close, personal relationships.

We believe that Making Memories, as well as the discussion of applications like it, will be a valuable step forward in promoting reminiscence as a common activity in everyday life. It begins to fill a gap left in the current literature as there has yet to be support for reminiscence in such a portable and accessible manner.

About the Authors

Katie Derthick is a PhD student interested in user experience, computer-mediated relationships, and technology-supported reflection.

Behzod Sirjani is a Masters student researching how people engage with technology in order to create and support relationships and networks. He is interested in how people define and articulate friendship with technology, as well as how the physical and digital converge in these relationships.

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