Photo browsing in a
SMART ENVIRONMENT

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Hypothesis: People have a need for Ambient Intelligent products that support digital photo browsing, and the Memory Browser concept is suited to meet that need

Concept: A system that helps people to navigate their photo collection at any place in the home in an intuitive manner, by means of physical objects such as souvenirs and "drag-and-view" of images to stationary and portable screens

Results: Users were delighted by the meaningful navigation concept and device, and acknowledged the need for it: "Great, when will it be on the market?'

One of the concepts being studied in HomeLab is that of Memory Browsing. The aim is to provide users with natural, intuitive means to recollect and share experiences of past events. The motivation for choosing this concept came from an extensive user-study into what people find important in their homes. One of the major conclusions was that "Photographs are irreplaceable representatives of memories that people have. They are the undisputed number one in the ranks of important objects'. Many people mention the need to share their memories with others, for example, by showing them their photos and telling about the experiences they had at the time.

With the advent of digital photo and video cameras, recording snapshots of important events in one's life has become much easier. However, retrieving them has not. On the contrary: the amount of personal content increases dramatically, and is typically stored ➡

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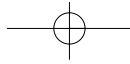
on a PC which is not located where the photos are needed. To address these problems, a first version of a Memory Browser was developed, which focuses on intuitive retrieval and sharing of digital photos.

This Photo Browser has the following features:
• It consists of a portable touch-screen device ('Sepia'), which is wirelessly connected to a PC or other storage and processing unit. This PC with stored photos remains where it normally is (the study), while the Sepia can be used anywhere in the home to retrieve the photos.
• The user interface on a Sepia shows all available albums in a continuously moving photo-roll. By touching a particular album, the photos contained in it are shown in the roll. These can now be dragged to the center of the screen to enlarge them. The photo-roll can be grabbed with a finger or pen, and the movement can be reversed, accelerated or stopped at will.
• Other available screens (both fixed and portable) are shown as icons, and photos can simply be dragged to an icon for immediate display on the related screen ('drag-and-Vview'). Any screen can be used, provided it is connected to a device on the home network that can run a small Java "servant". A distributed software platform ('Empire') takes care of discovery and connection of all available servants in the network.
• The system is location-aware: in HomeLab the location of each Sepia can be tracked, and only the screens in the room where the user is

located are shown in the user interface (UI). This helps to keep the UI free of irrelevant information.
• Finally, tagged graspable objects can be used as shortcuts: by placing a souvenir on the table, the photos associated with this souvenir are presented instantly in the photo-roll.

The user study
Besides a technical evaluation, a sequence of user studies was performed. This started with a focus group on reminiscence, followed by an expert evaluation of the UI during the design process, and an evaluation of the total system in HomeLab.

Results
After incorporating all lessons learned in the focus group and formative evaluation, the total system was implemented in HomeLab. Specific attention was paid to realising a truly ambient system, i.e. keeping the PC s and wireless access point outside the living room, and integrating the RFID-detection system for the objects in the existing coffee table.

The implemented system works quite well. The implementation of the Empire platform proved a major improvement in system robustness, compared to an earlier demonstrator based on the commercially available Jini platform. A tablet PC was selected initially as an implementation of
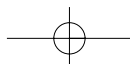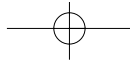
Sepia, to enable rapid prototyping. Later, it was demonstrated that the Photo Browser runs equally well on the Philips Detachable Monitor, albeit with less smoothness in rendering the moving photo-roll.

For the user evaluation, the Photo Browser has been demonstrated to many visitors (roughly 2000) since its implementation in HomeLab. Recurring themes that emerged were:
• Visitors generally recognised the usefulness of the system immediately: many own a digital camera, and have encountered the problems described above themselves: "This is great, when will it be on the market?'.
• Stimuli for picking up a photo album are very diverse, ranging from a simple question, a typical smell or sound, or missing a loved one badly. Once people are in such a mood, photo browsing is considered a fulfilling activity.
• Photo browsing is often characterized as a social activity. Photos, and the memories they evoke, are used by people to share perspectives, consolidate and tighten relationships, or simply have fun. The possibility offered by the Photo Browser to use screens present in the environment for displaying photos, as well as the option to instantly access relevant albums by means of objects, is valued as an enhancement of photo browsing in a social context.
• People discriminated between two different contexts of use: an individual setting in which the experience of remembering is linked to mood, and a multi-user setting in which the activity of recollecting memories is related to telling stories about the past. In both situations people mainly talk about the experiences and less about the actual photos. This seems to indicate that efforts to solve the problem of how to support the recollecting of memories should focus on how the system can optimally *trigger* the experience of remembering. To fully explore this concept we are conducting a large-scale study in HomeLab, evaluating the power of photos, smells, sounds, videos and graspable objects as memory triggers. ←

Insights gained into:

User needs, wants and wishes related to retrieval and sharing of memories
System requirements for a product that can fulfill these
Feasibility, usability and appreciation of a first prototype system, focusing on photo browsing and enabling drag-and-view and use of personal souvenirs.

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