

Sticky Spots: A Location-Based Messaging System for the Home

Kathryn Elliot, Carman Neustaedter and Saul Greenberg

University of Calgary
2500 University Drive NW
Calgary, AB, Canada T2M 1N4

{elliotk, carman, saul}@cpsc.ucalgary.ca

ABSTRACT

Ethnographic studies of domestic environments have shown the fundamental role that contextual locations and routines play in helping people understand and manage communication information. We apply this knowledge to the design of StickySpots – a location-based messaging system that allows household members to send short digital messages to various places in their home.

Categories and Subject Descriptors

H.5.3 [Group and Organization Interfaces]: Computer supported cooperative work

General Terms

Design, Human Factors.

Keywords

Messages, domestic computing, home inhabitants.

1. INTRODUCTION

The technology enhanced home could have many benefits for its inhabitants. [6, 8]. Consequently, many researchers have begun looking at how information is currently used in the home, e.g. [2, 7]. They do this to understand current uses and patterns, and to discover opportunities where technologies can be designed to fit into people's natural routines and patterns of the home [3].

Our own specific interest is in domestic communication information, which we define to be any item in the home that is used to communicate with other members of the household, or with the outside world, e.g. notes, messages, lists, newsletters, schedules, calendars, voice mail, email, letters, pictures, etc. In our own previous study of the home, we discovered the importance that *contextual locations* and *routines* play in helping people understand and manage communication information [4]. In essence, location of information in the home was what provided household members with the context they needed to understand, filter and manage information. Household members also know each others' routines and pathways through the home, and exploit this understanding to place information so that it becomes a part of their home context. Contextual locations allow information to be interwoven with not only action and activities [2], but also

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CSCW'06, November 4-8, 2006, Banff, Alberta, Canada.
ACM ISBN #06/011.

with time, ownership and awareness. That is, household members, know who a message is for, what actions need to be taken on it, and when they need to see it by the context of where the message is placed and the social routines around those locations. Finally, information in the home can be categorized as one of 5 information types: time-sensitive *memory triggers* (reminders, to-do lists, and notes), *member awareness information* that provides knowledge of the activities and whereabouts of household members, *exhibits* to be shared, noticed or admired, *notices* that provide household members with information about activities or people outside the home, and *resource coordination information* used to coordinate the sharing of common household resources.

More narrowly, the studies emphasized that location of messages in the home is chosen by household members to give the message all kinds of valuable time, ownership and awareness context. The message is more valuable because of where it is. Household members know how urgent a message is, who it is for and even what needs to be done with it by where it is placed or seen.

2. LOCATION-BASED MESSAGING

We then applied this knowledge to the design of StickySpots – a location-based messaging system that allows household members to send short digital messages to various places in their home. The video illustrates how the system works, and Figure 1 shows a screenshot. StickySpots sends messages primarily to locations rather than to people. These locations are specific spots in the home, realized as a network of various-sized displays incorporated into the domestic environment, e.g., existing TVs, personal computer monitors, small dedicated displays, and so on. Each display in the home is signed in to a central server, so the messages can be sent to any of these displays from any other one.

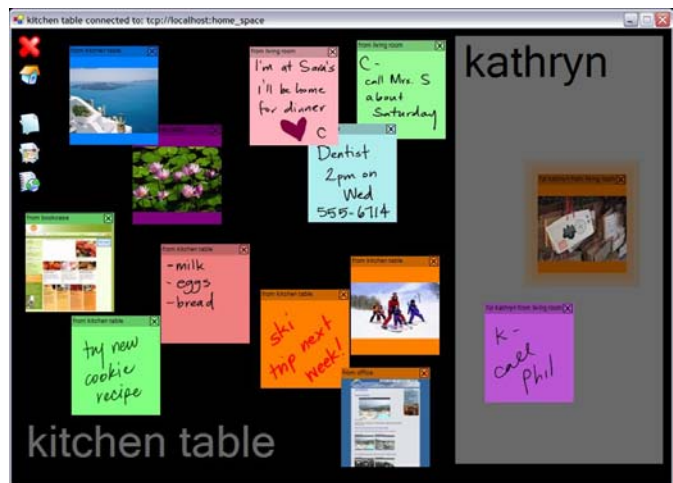


Figure 1: StickySpots

With the displays placed in locations important to the household as message centres, this becomes *location-based messaging*.

A StickySpot display is designed to look similar to a bulletin board. Intended for touch sensitive or pen enabled displays, household members can create simple handwritten notes atop of it (Figure 2 shows some examples), reflecting the manner in which people already leave messages (via pen and paper).

Messages can be sent to locations in two different ways. First, a message can be sent to the actual location, e.g. the living room TV. Senders create a new note, and then select a destination. The note appears on the receiving display. The colour of a note is chosen by the sender, and thus can be used to communicate anything the household chose – for instance urgency or ownership. New notes have a soft halo to indicate their status (Figure 2b) so household members can easily see changes.

Touching the note shows when it was sent and where from. Notes can be opened to a larger size by double tapping, and replies can be easily added and sent. Web links and small images can also be sent as stickies, as in figures 2c (photo) and 2d (web link). Double tapping on a web note opens the link in a browser window. Notes appear in a random arrangement on the display, but can then be dragged around as desired.

The second way that messages can be sent to a location is to send them to a person as a sort of location proxy. Messages sent to people can be shown on any display. People can either sign in explicitly through a simple dialog or can be sensed by the system. We use RFID tags small enough to be attached to a watch band and RFID readers in the display locations to detect people. When a person is detected, all messages sent to that person show up on the nearest display in a smaller grey side window, as on the far right of figure 1. This allows messages to be sent to wherever the person is, without the sender needing to predict where they are or will be, or to wait for the recipient to go to a specific location.

3. IMPLEMENTATION

StickySpots was built using several prototyping toolkits. GroupLab.Networking enables the easy creation of a server to store and share information between locations [1]. The notes are delivered as multimedia photos using the Collabrary [1]. The system uses Phidget [5] RFID readers to identify people.

4. CONCLUSIONS

The video illustrates StickySpots in action. Of course, this is just a scenario of what could be. In reality, many things have to come together before StickySpots becomes a fixture in the home: affordable ubiquitous touch-sensitive displays of all sizes, portable displays that can be placed anywhere by home inhabitants, and attractive displays that fit within the home setting, and that perhaps double as another purpose, e.g., digital photo frame. However, while we know there are many issues with our implementation, we feel that StickySpots is a good initial example of one way to apply an understanding of contextual locations to design for the home.

StickySpots is not intended to replace existing home messaging techniques, indeed it would be almost impossible to replicate, for instance, the physicality and ease of a sticky note. It is intended rather to extend and compliment them. Our next steps include expanding StickySpots to include audio messages, as well as automated messages such as calendar reminders, that would be

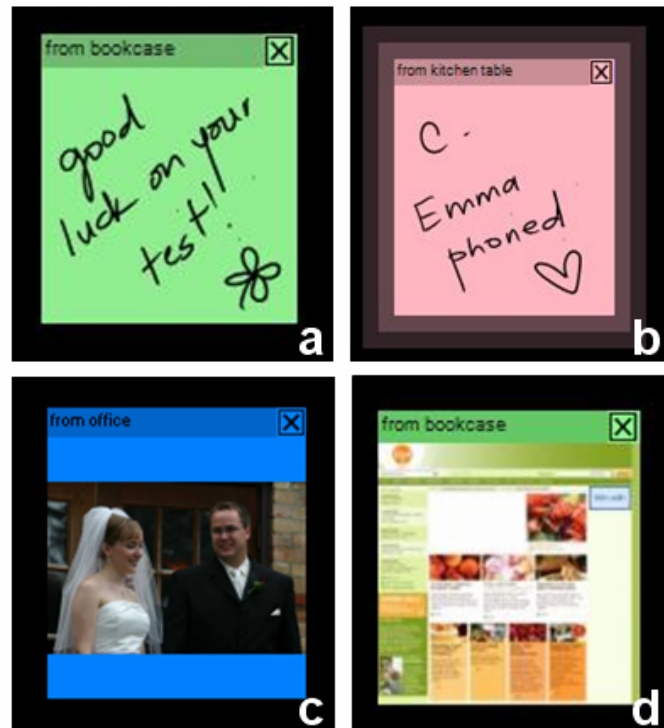


Figure 2: Example notes sent with StickySpots

sent to a specified location at a specific time, so you would receive the reminder at the right time and in the right place.

Acknowledgements. This research was partially funded by TR Laboratories, Alberta Ingenuity, the NSERC Nectar Research Nectar grant and its industrial sponsors Smart Technologies, Inc. and Microsoft, Inc.

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