DRIP: A Toast to Interpersonal Communications and Information Exchange

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ABSTRACT

We introduce a new framework called DRIP (Drinking Real-time Information Protocol) for the display, consumption, and sharing of digital information by infusing liquid with digital bits. Presently, the process of information acquisition is integrated into our everyday lives, while the process of information sharing has become more distant and impersonal. By merging the affordances of beverage containers and digital information, we aim to bring back the social component of face-to-face information sharing while also creating an environment for serendipitous interactions to occur. The DRIP platform has three main components. First, DRIP enables people to attach digital bits to specially designed computer-mediated beverage containers. Second, embedded within the beverage containers are displays that allow people to view and browse the attached information. Third, through intuitive drinking manners, such as stirring and toasting, one can alter or exchange information with others. The milieus we seek for implementation are those that inherently foster interpersonal exchanges, such as: coffee shops, teahouses, and cocktail lounges.



Figure 1. Sketch of a DRIP-enabled beverage container.

Author Keywords

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Information sharing, social setting, encountered information, tangible user interface.

ACM Classification Keywords

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

INTRODUCTION

Information gathering and exchanging is an inherently interactive and social process, yet over the years, this process has become less interactive and social. For instance, before the "computer on every desktop" era, one would gain the majority of their information about their world and community through the newspaper. To take an example, every Sunday morning you might sit down with your coffee and newspaper and glance through the articles. Every now and then, an article would spark an interest, or remind you of a friend or family member. This spark would lead you to clip the article and set it aside for that person. Later you may deliver this article in person, by postal mail, or leave it on their desk.

This type of information gathering and sharing occurs because people naturally enjoy sharing information with others, regardless of the immediate utility of the material. Information that does not contain any immediate utility is often taken as "thinking of you" acts by the receiver of the information [2]. Blogs are a perfect contemporary example of how people enjoy sharing information with others.

Accessing and sharing information has become easier than ever before. Information surrounds us on the Internet through e-mail, blogs, and electronic libraries. Because of this immediate access to information, we often encounter items we want to share. Now sharing information has never been easier, and e-mail has allowed this process to become virtually instantaneous. This immediate exchange begins to erode the once personal system of information sharing. People will no longer associate the exchange as a "thinking of you" act when 50 other names are listed within the To: line of an e-mail. This relative ease may cause some to share too much information leading to the eventual spamming of family and friends.

BACKGROUND

Information acquisition is part of our everyday lives.

Did you read the newspaper this morning? Or did you watch the weather forecast on TV last night? Without realizing it, you acquired new information just in order to be aware of what is going on in the world or to know what to wear the next day. We acquire new information constantly. The purpose of our daily fact-finding is not learning as such, or memorizing of all information that comes our way; rather it is to use the information at that particular moment and then to forget it [7].

According to Toms [8], people acquire information in three ways.

- from the search for information about a welldefined and known object(s);
- 2. from the search for information about an object that cannot be fully described, but will be recognized on sight; and,
- 3. from the accidental, incidental, or serendipitous discovery of an object.

At times, one of these information-moments may provide us with information that leads to a serendipitous event, or the accidental discovery of information that we did not seek. Serendipitous information retrieval occurs when a user with no *a priori* intentions interacts with a node of information and acquires useful information [8]. Serendipity is recognized today as playing a key role in sparking innovation. X-rays, the Rosetta stone, nylon, and vaccination were all discovered by accident, or serendipitously [3].

DRIP is an information-for-the-moment (or accidental, incidental, serendipitous) system that simultaneously provides an environment where people will encounter new information, which may lead to a serendipitous moment.

RELATED WORK

Our inspiration for DRIP comes from work done with Tangible User Interfaces. These works center on the integration of technology with everyday artifacts to weave together the physical and digital worlds [5].

We specifically looked at works that focused on the containment and manipulation of electronic information. These works include: musicBottles [4], which act as containers of electronic information, and use an auditory display as a means transmitting the state of information; MediaCups, an [1] attempt to integrate technology into everyday artifacts, thus enabling them to become contextually aware; and MusicCocktail [6], which allows for the direct interaction and manipulation of audio content through the means of mixing a drink.Overall, the affordances of these technologies are not built to enable or encourage face-to-face communication and information sharing. Many of these technologies exist within a predefined location that has been created for them to function. This is why DRIP is looking towards combining the social nature of information sharing with the natural

affordances of beverage containers. This allows for a system that is portable, that is available in public and private spaces, and that is used in social engagements. This unique combination positions DRIP to encourage and foster the face-to-face social component of information sharing while creating an environment for serendipitous interactions to occur.

DESIGN OF THE DRIP SYSTEM Overview

DRIP is a self-contained drinking unit designed for the display and consumption of digital information (Figure 1).

A DRIP-enabled beverage container consists of the following elements: content, display, input, and sharing.

Content

Content comes in the form of albums, called *drip-albums*. The structure of a drip-album is similar to the layout of a CD, except within a drip-album each track can be composed of a different type of multimedia content. The drip-album can range in size from one track of information that consists of one character of textual information, to ten or more tracks that encompass a variety of multimedia mediums (audio, video, text, photos, and graphics).

One browses the contents of a drip-album by sipping the contents in their DRIP-enabled beverage container. Each sip displays the next track of information in the drip-album. Information is accessed moving forward, similar to drinking a beverage. Once all of the information has been viewed in a drip-album, the album will start from the beginning. Once the beverage has been finished you no longer have access to the drip-album's contents. To re-access the drip-album the DRIP container needs to be refilled with liquid.

Display

A DRIP-enabled beverage container contains three displays: two visual and one auditory.

Visual Display 1

The main visual display on the beverage container is located on the inside near the lip, on the opposite side from which you drink (Figure 1). This LCD display allows for the viewing of information and refreshes with every sip.

Visual Display 2

The second visual display is located inside the container, on the bottom. This LCD displays information about the contents you are viewing. For example, if the album consists of an artist's drawing, credit can be given to the artist by displaying additional details on the bottom of the cup.



Figure 2. Sketch of visual displays.

Audio

As a third display in the DRIP-enabled cup, we have embedded a small speaker in the base of the container. This allows you to listen to audio content in a drip-album.

Sharing

Essential to DRIP is the ability to share information. It is within the information sharing we hope to develop an atmosphere that encourages the face-to-face exchange of information, and allow serendipitous moments to occur.

Sharing information with others can be performed by "cheersing" or using a drip-stick (see Input for further explanation of drip-stick).

Cheer

Raising your glass and saying "Cheers!" has long been recognized as a social exchange of congratulations or recognition. Cheering, or toasting, is often seen in congratulatory settings, i.e., weddings, party's, friends.



Figure 3. Sketch of sharing information.

Building from this social exchange, we have embedded this interaction into the core of DRIP to exchange information.

Once the two DRIP-enabled containers come together in a cheers fashion, information is swapped from each container. A LED on each cup illuminates to indicate the successful transmission of information from each container.

Input

There are two ways to input information into a DRIPenabled beverage container: drip-stick and direct input.

Drip-Stick

A drip-stick is similar to a standard plastic swizzle stick; except a drip-stick is a container and disseminator of information (Figure 4).

To begin, a drip-stick is linked to a computer. Once the drip-stick is connected, multimedia content can be

transferred to the drip-stick. One drip-stick contains one drip-album.

To transfer this information to a DRIP-enabled beverage container, one places the drip-stick into a container and literally stirs in the information. Your content is now ready to share with others.



Figure 4. Drip-stick in beverage container.

Direct Input

The second way to input information into a DRIP-enabled beverage container is by directly recording audio into the container. In this process, one would be recording over the tracks of the album currently attached to the container.

Technical Implementation

Our current implementation consists of a beverage container that we outfitted with a LCD to display text, a tilt sensor to record movement of the container, an iButton to transfer information, and a LED to indicate the successful transfer of information.



Figure 5: Current prototype of DRIP-enabled beverage container.

DRIP IN ACTION

To illustrate DRIP we have outlined a specific scenario to highlight some of DRIP's possibilities. For this scenario, we have chosen the theme of a CD release party.

CD Release Party

Pop sensation Liu³ has just released her new album entitled, *Fly Away*. To generate hype for her new album, Liu³ is developing several drip-albums to be passed around the evenings crowd at the pre-release party. So far Liu³ has developed three drip albums, and is hoping to finish a total of six before the evenings festivities. The current drip-albums consist of lyrics cut from the new album, photos of

album covers that were under consideration, and sample clips to new songs. The remaining drip albums consist of club re-mixes of various songs on the new album.

Several hours later at the pre-release party Liu³'s promoter assembles the drip-albums and begins distributing them through the crowd. Shortly after the information is dispensed, Liu³walks out to the party in order to observe the crowds reactions. In one corner, people are looking at the album covers that were under consideration and over time, she watches that album virally spread across the room. Liu³ can tell what people are looking at by their immediate vocal responses of, "Read this," and "Look at this." People are clinking glasses all around to share information and see more.

Armed with her re-mix drip-albums, Liu³ walks into the crowd and stirs the re-mix into one persons beverage. Slowly, the song virally spreads through the room without much fanfare. Disappointed because the remix appeared to be a flop Liu³ initiates the next remix. This time she receives the fanfare she was looking for. People began grooving to the mix, and sounds of excitement fill the air as the music-clip plays. Soon the excitement grows to a feverish chant to play the entire song of re-mix. Liu³ knew this was her cue; it was time to officially introduce herself and appear on stage.

EVALUATION

Surprisingly, many first reactions to DRIP are that it is unnatural to look inside ones beverage container. In our observational prototyping at a popular coffee shop, we found people looked in their coffee cups or water glasses when:

- 1. sitting alone and taking a mental break
- 2. finishing up a beverage
- 3. lull in conversation occurs
- 4. picking up a beverage

FUTURE WORK

As we gaze into the future, we envision many DRIP-related possibilities. What we see is developing new ways for people to receive information. Potentially, we seek communal information/beverage containers (i.e., water cooler) as a means to dispense community-related information.

Other areas under consideration are:

- Σ Develop safe-guards against inappropriate content
- Σ Ensure we are not influencing drinking behavior Σ Using a variety of trinkets to input data into a
- Σ Using a variety of trinkets to input data into a DRIP-enabled container, i.e., umbrellas, toys.
- Σ Input content into drip-sticks by means of cell phone or PDA.
- Σ Manipulation of content, i.e., stirring drink makes audio play faster; melting ice cube dissolves information in your cup.

CONCLUSION

DRIP brings us one-step closer towards the ubiquitous world we hear and read about. We are interested in integrating technologies that work towards encouraging face-to-face interactions and fostering these interactions by means of an intuitive exchange of information. This information can help stimulate conversation between people, while creating an environment for serendipitous information exchange to occur. Our preliminary findings have given further encouragement that the adoption of DRIP would be well received.

ACKNOWLEDGMENTS

We want to thank Professor Hiroshi Ishii, Amanda Parkes, Hayes Raffle, Kimiko Ryokai, Angela Chang, and the Tangible Interfaces class for their guidance, support, and feedback.

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