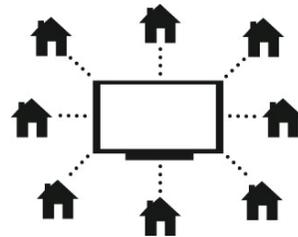


Social TV Peripherals: Ethnographic Research and Design Implications

Report Prepared for
Social Media Research Lab
Motorola Labs



Design Anthropology Class, University of North Texas, Spring 2008
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Slide Show Design: Julie Ramirez and Manal Fashi

1. *The Project by Christina Wasson*



The Project

This project was conducted for Motorola's Social Media Research Lab by a class in design anthropology at the University of North Texas. Our client was Crysta Metcalf, Anthropologist and Distinguished Member of the Technical Staff, Social Media Research Lab, Motorola Labs. It has been a great pleasure to work with Crysta; she was tremendously dedicated to the project, participating in most of our class meetings.

The project is part of ongoing Social TV research in Motorola Labs. The following description is based on information from Crysta Metcalf. The concept of Social TV is to re-create a sociable viewing experience even when people cannot be together in person. An example use-case is watching the Super Bowl with friends who live in another state, but the idea extends to other types of content and contexts. For Social TV to be practicable, users of the Social TV application have to be able to share the viewing experience, minimally by joining one another in watching a particular show.

In a Phase 2 field study, Motorola's Social Media Research Lab found that presence and awareness information, including 1) the fact that others are watching, 2) who is watching, and 3) what they are watching, draws people into the Social TV experience and provides the necessary knowledge for users to engage with their friends and family members. They also found that rich modes of communication, such as voice, are necessary for the experience to be perceived as truly social and engaging. In addition, Phase 2 research strongly indicated that participants want to engage with people in their own social network, but not people in the social networks of others – even others in their own household.

In order to provide the necessary information and capabilities for an engaging sociable TV experience, the Social TV project is currently using peripheral devices such as the *remote control* (for interaction with the application), an *ambient orb* (for indicating presence), and a *microphone* (for voice communication). But because the TV is often a shared device in a household with multiple people, it is uncertain whether or not the information and capabilities needed for a Social TV experience should be accessed via shared devices (and if so, how) or if the peripherals need to be personalized and “owned.”

It was the purpose of this project to determine in what ways the information and capabilities provided by the peripheral devices need to be personalized for each user within a household, if personalization also implies ownership (each household member requiring his or her own peripheral device(s)), and to understand how these peripheral devices can be modified or combined to provide the necessary information and capabilities appropriately for a multi-user household.

Our findings were presented to Motorola in two forms: through this report, and through a verbal presentation.

The Research

We engaged in two forms of fieldwork. First, we conducted ten in-home interviews. Then, we conducted five participatory design sessions.

In the report, references to these two forms of fieldwork are sometimes abbreviated as “IHI” for in-home interviews and “PDS” or “PD Session” for the participatory design sessions.

Data Collection

The in-home interviews were based on semi-structured interview protocols, and included an artifact walk-through. The goals were to understand how people were sharing their devices, and the needs people had for personalizing the information and capabilities provided by those devices. The interviews were one to one and a half hours in length. They were videotaped and we also took photos of relevant devices and home settings. The study participants were recruited based on the following characteristics:

- Members of the target market of people in their 20s to 50s, or older
- Diversity in household type, but all multi-user households: families with teenage children, families with parents at home, two-person families
- Watch TV regularly
- Share a computer (at least 3 participants)
- Share e-mail addresses (at least 3 participants)
- Have an answering machine at home (at least 4 participants)
- Range of income levels
- Diversity in ethnic background

The participatory design sessions brought together 3-5 study participants for two hours. The goal was to gather additional needs related to ownership of the information and capabilities STV peripherals provide, and to stimulate design ideas for presentation of such data. At the start of the participatory design sessions, the concept of Social TV was explained, and then participants were invited to design peripherals using Legos, Play-Doh, and colored pencils and paper. These sessions were also videotaped and again we took photos of their designs. The study participants were recruited based on the following characteristics:

- Members of the target market of people in their 20s to 50s, or older
- “Creatives”
- Multiple people in household
- Watch TV with family and friends who do not reside in their household
- Have distributed family and friends who they used to/would like to watch TV with
- Watch TV regularly

- Range of income levels
- Diversity in ethnic background

Data Analysis

The student researchers placed all fieldnotes, photos, and salient video clips on a website designed for this class. This made field data available to the whole group for comparison and analysis purposes.

Much of the analysis was conducted during class time, by all students working together as a group, with Christina as guide and facilitator. The students presented findings from their research over the course of six weeks. Each student group verbally described their fieldwork experience, and illustrated key moments and insights with photos and video clips. Other students asked questions and discussed the fieldwork.

During this process, Christina as facilitator noted emergent insights and patterns in a Word document that was visible to the whole class via an LCD projector. Initially, the Word document functioned somewhat like a more sophisticated and deep version of a flipchart. As the Word document became longer, students started to group the ideas and patterns by having Christina cut and paste bits of text. This process was somewhat similar to creating an affinity, moving to an increasingly sophisticated and abstracted level of analysis. The analysis followed the classic ethnographic trajectory of identifying first *instances*, then *patterns*, and subsequently *models*. The patterns and models were used to identify design implications and illustrative design ideas.

Toward the end of the semester, students developed a list of topics that should be included in the final report. Then they each chose a topic to write about. These topics became chapters, or parts of chapters, in the final report. Each chapter included both research findings and design implications. In preparing their chapters, students reviewed all fieldnotes for pertinent material.

I wish to acknowledge the contributions of student Debbie Middleton. She is not listed as a chapter author due to an emergency health situation that happened at the end of the semester. However, she did excellent fieldwork, wrote outstanding fieldnotes, and was a valuable contributor during our analysis discussions.

Organization of Report

The report is organized by peripherals and their use.

First, chapters 2-5 consider how the remote fits into family dynamics. Chapter 2 starts by developing a model of sharing practices that provides a framework for subsequent discussions.

Chapters 6 and 7 then consider how the remote is used to connect with people outside of the household.

Chapters 8 and 9 examine audio communication with members of one's "buddy list."

Chapter 10 presents our findings regarding the buddy indicator, which has been an ambient orb in previous Motorola research, but could also be other kinds of ambient lights or sounds.

Then, Chapters 11-13 review findings that apply to all peripherals, in the areas of aesthetics, simplicity, and customizability.

The report concludes with two appendices. One notes a potential marketing application for Social TV. The other provides our learnings with respect to conducting participatory design sessions.

HOW THE REMOTE FITS INTO FAMILY DYNAMICS



2. How Families Share Devices: One Remote is OK by Matthew Lamb, Fei Li, Perla Aguilera, and Greg Adams



Who in the Household is Sharing?

In order to understand how devices are shared, it is important to first understand the relationships that exist within a multi-person household. Our data yielded six types of relationships.

- The Family (three or more members)
- Spouses (or cohabitants)
- Parent/Child (adolescent)
- Parent/Child (adult)
- Siblings
- Resident/Guest

Additionally, it is important to understand the dynamics by which these relationships are characterized.

- **The Egalitarian Family**
Members share a device with no conflict or negotiation over its use. The most explicit example of this relationship in our data can be seen in the sharing of a living room television when all viewers wish to watch the same program.
- **The Democratic Family**
Members share a device based on majority rule or negotiation. The most explicit example of this would be the negotiation over control of the remote control between viewers who wish to watch different programming, with those who are not in control of the remote watching the controller's choice despite wishing otherwise.
- **The Bureaucratic Family**
Members share a device based on established ground rules. The most explicit example would be the sharing of a television based on a first-come-first-serve basis.
- **The Family Hierarchy**
Members share the use of a device based on the merit, urgency, or importance of each person's need. The most explicit example of this is a single household computer whose use is dictated by the importance of the user's activity. For instance, a child who needs to do homework can use the computer before his mother browses the web for leisure.

- **The Family Dictatorship**
 A single member dictates a device's use without negotiation, with other members conceding power. The most explicit example of this would be a father controlling the remote control with a "my way or the highway" mentality.
- **Spousal Equality**
 Spouses share a device equally without conflict or negotiation. The most explicit example of this would be spouses sharing the television to watch a program of mutual interest
- **Spousal Inequality**
 One spouse regularly controls the use of a device. The most explicit example of this would a wife conceding control of the remote when her husband is present with the mentality of "he always wins."
- **Spousal Balance**
 Spouses share a device based on negotiation. The most explicit example of this would be a quid pro quo agreement made concerning the choice of programming viewed on a television.
- **Parental Authority**
 The parent controls a device without negotiating with the child. The most explicit example of this would be a father's desire to watch the nightly news superceding a child's wish to continue watching cartoons.
- **Parental Control**
 The parent regulates an adolescent child's use of a device. The most explicit example of this would be a parent limiting the scope of programming a child is allowed to watch on television.
- **Parental Allowance**
 A parent allows an adolescent child to control the use of a device. The most explicit example of this would be a child being allowed to surf the internet without restriction.
- **Parental Negotiation**
 A parent and adult child share a device based on a negotiation. The most explicit example of this would be sharing of a landline phone and answering machine by a parent and their adult child with the terms that the parent listens to the messages and then disseminates the information to the child if necessary.
- **Parental Equality**
 A parent and adult child share a device without conflict or negotiation. The most explicit example of this would be the sharing of a television when both parent and child wish to watch the same programming.

- **Good Siblings**
Siblings share a device without conflict or negotiation. The most explicit example of this would be the sharing of a television by siblings who wish to view the same programming.
- **Bad Siblings**
One sibling does not share a device with another based on ownership. The most explicit example of this would be an older brother not letting his younger brother play the gaming console in his room.
- **Open Houseguests**
Household members share a device with guests without restriction. The most explicit example of this would be the hosting of a Superbowl watch party.
- **Closed Houseguests**
Household members share a device with a guest with restrictions. The most explicit example of this would be a person logging out of their email account before they allow a guest to use a computer

The Continuum from Sharing to Autonomy

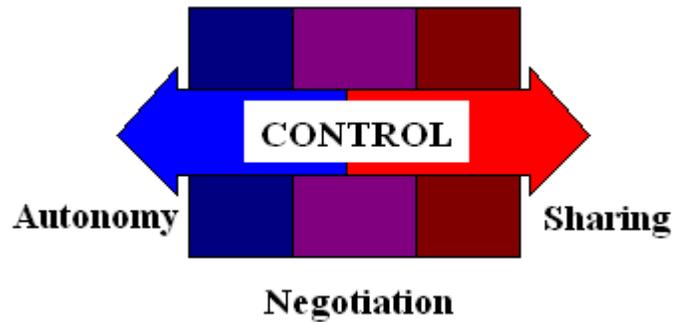
To better understand the nature of device sharing, it is useful to conceptualize the possible forms this practice can take falling along a continuum based on the amount of exclusive *control* that is exerted during the use of a device. The level of control has a direct correlation with *autonomy* and an inverse correlation with *sharing*. (Fig. 1)



(Fig. 1)

Autonomy can be defined as a single user being in control of a device's use without regard for other users' desires. *Sharing* can be defined as a form of compromise in which multiple users use a device for the same purpose at the same time. However, these definitions are only applicable to the most extreme form of each side, with a number of sharing practices falling along the continuum.

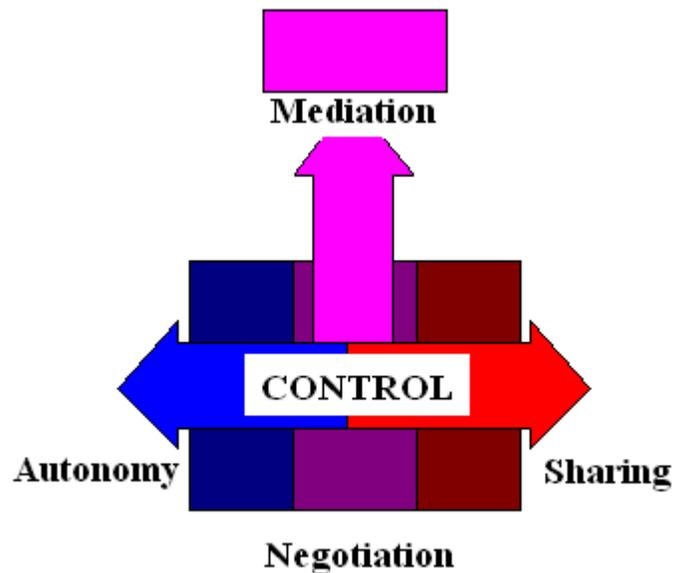
The extent to which either force is exerted by a user or users during a contest for device usage influences the nature of the situation that results. Three distinct situations of device usage following a contest can be seen from the data. These three situations are *autonomy, negotiation, and sharing*. (Fig.2)



(Fig.2)

In this sense, *autonomy* can be defined as a device being controlled exclusively by a single user. *Negotiation* can be defined as a state in which multiple users balance or exert the forces of *control* towards a desired end, or use of a device. *Sharing* can be defined as a situation in which multiple users desire the same use; with the device being utilized towards the desires of the all users.

One final influence on device usage when contested by multiple users is *mediation*. This is both a force and situation, both of which are independent of *autonomy* and *sharing* and arises during a situation of *negotiation* as a mutually beneficial solution to the conflict arising from the contested use of a device. (Fig.3)



(Fig.3)

This model can be better understood through an examination of its individual parts. The following sections discuss practices associated with this model that arise in our research data.

Practices of Sharing

Each participant exhibits one or more of the following patterns of practices of sharing. One family may apply different ways of negotiating shared use of different devices and may take different approaches to negotiating use of the same device in different situations.

■ No Conflicts, No Negotiation Needed

This pattern applies to people in the household who have similar interests or the same usage pattern. For instance, Lina and her husband share very similar interests in TV shows (PDS 4). When watching TV together, they do not need to negotiate TV sharing because no conflict exists. This pattern also applies to Sally's two daughters who watch the secondary TV in Sally's bedroom in the morning as they get ready for school (IHI 7). They both like to watch cartoons and the Disney channel; therefore, no sharing conflicts exist for the use of the secondary TV.

■ No Negotiation Needed Because Certain Person(s) Always Give(s) In

When conflicts arise, someone in the household always gives in to another's preferences. Examples include the grandmother allowing her grandson to watch whatever he likes (Jasmin in PDS 4), parents giving their children control of the remote (Lina and Jason in PDS 4), and the wife watching what her husband wants to watch (Janet in IHI 10).

■ Conflicts Avoided By Setting Up Separate Accounts or a Schedule For Sharing

Some households avoid conflicts by establishing a schedule in advance or setting up separate accounts for each person. For instance, Sally and her daughters created a schedule for sharing of the primary TV: on the weekdays, the daughters watch TV from 4 pm to 5:30 pm and may continue watching TV once finishing their homework (IHI 7). Additionally, Sally sets up three separate profiles on the shared answering machine for each person in the household.

■ Conflicts Negotiated and Resolved Before Sharing Occurs

In some situations, the sharing behavior occurs prior to conflict negotiation and resolution. For instance, Jack and Jill only allow their children to watch TV together when they can agree on what they will watch (IHI 9).

■ Sharing of Communications Negotiated By Making One Person In Charge Of Everything

Lt. Dan's family shares one profile on their answering machine. His father checks all messages initially. Once all messages are listened to, the machine stops beeping. If the message comes in for another person in the household, the father keeps that message on the machine and tells that person to check his/her message (IHI 5).

Practices of Autonomy

Although many households do have shared devices, this does not always mean that there is a sharing practice in place. Some simply do not share or negotiate but have other methods of determining the way in which a shared device is used by all members of the household even if it is unequal. In researching this topic, we have found three examples that seem to particularly reflect this idea of no sharing or compromising. Those three examples are that instead of sharing there can be an enforced autonomy, where one person maintains control, a way of blocking family members from using the family device with technological adjustments not everyone is aware of, and having more than one of a single device so that sharing is no longer necessary. The determinants for these practices vary but they have an element in common in that they each keep those who want to stay in control in control.

■ Enforced Autonomy

There were some participants that simply did not like to share control of some of the devices in their households. It seemed to be a trend that the device that was least likely to be shared was that of the remote of the main TV. Instead it was a household rule, unspoken or not, that when a certain member of the family was home then control of the main TV was theirs and everyone would watch what that person wanted to watch. An excellent example of this was that of Andrew from the fourth participatory design session. In his household that included himself, his wife, and two daughters, it was him that had absolute control over the main TV. If another member of the household did not want to watch what he was watching then they would go to another room because it was his choice about what would be viewed in the main room. Even when viewing a program together as a family he continued to maintain control of the remote. Only when he was not at home could the other members of the household have control of the remote unless he allowed them to watch a program of their choosing while there but still the remote would remain in his grasp.

■ Technologically Blocked

In every household there seems to be at least one person that is the most knowledgeable in dealing with technology. It is these people who are able to make adjustments and customizations to their shared devices with ease and often assume that it should be just as simple for another member of the family to understand or even perform themselves. However, it seems to be the case that there is always a member of the household that has no technological knowledge and who is forced to rely on those that are to set up devices for them and even to show them how to work the remote for the TV in some cases. Although, it may not be intentional to block some family members from accessing certain devices it occurs due to the difficulty of programming and customizing a TV set or surrounding devices to ones liking and then not teaching the others how everything works. This is further explained in the Stewart family, in home interview 6, where the husband and son were the technology experts and the wife relied on them to set up and explain the electronics to her. One of the more troublesome technological items in her household was the gigantic

remote that she could not figure out how to use. Even though it had been purchased in order to reduce the amount of remotes that they would need, and she acknowledged that it did just that, she did not know how to make it work but her husband and son thought it simple to use.

■ Multiples of Same Device

In some of the households their way of negotiating sharing of shared devices was simply to have multiples of a device so that there was no need to share. In these cases, ownership played a big role in determining who was able to use what device, when and for how long. The reasons for this practice varied from avoiding conflicts to simply avoiding the need to share. There were many example of this but two that were brought to mind were that of Jerry, in home interview 8, and Mike, in home interview 3. Jerry lived in a two member household that included his mother. Although it was only the two of them there were multiples of certain devices such as three TVs, two laptops as well as WebTV and even separate phone lines. In his interview, ownership of the devices was not overly stressed because the devices were kept in the owners bedrooms and thus eliminating the need to share. However, if there was a time when if Jerry's laptop broke down and he needed to use a computer then he could use his mothers' and the reverse was applicable as well. He mentioned that having multiples of the same devices was more for convenience than for anything else. If his mother was using the main landline than he could use the one in his room without having to interrupt her and if he wanted to watch a program but she was watching something on the main TV then he could just view it in his room. It also seemed as if though in Jerry's household, the use of multiple devices also prevented conflicts in that there was always another device that could be used so that there was no need to have a sharing practice established. This also seemed to be the practice in Mike's household, in home interview 3, where there were three other members of the family, his wife and two kids. Their household has 4 television sets, 2 laptops, as well as other devices. He and his wife have separate laptops and she is not allowed to touch his cameras because they are for his work, he is a photographer. They have separate laptops so that he can use his for work and so that he does not need to worry about missing a work-related message. In Mike's household it seems as if though the main reason for having separate devices is so that it does not interfere with his job and so in this way conflict is avoided.

The Middle: Practices Somewhere Between Sharing and Autonomy

The practices that fall between autonomy and sharing can be seen as forms of negotiation. This can include discussions seeking agreement in sharing or a transitional period in which autonomy is contested. Different negotiation practices include:

■ Conflicts Negotiated On the Basis Of Ground Rules

Lt. Dan's family shares the primary TV based on the first-come-first-serve rule (IHI 5). However, the rule sometimes breaks when a second person who wants to watch another show sits down and begins to gripe until the first person gives in (see the next

bullet point). He and his siblings also share the home computer. The use is first-come-first-serve as well. When someone needs to use the computer and someone else is on it at that moment, the person on it will log off when he/she is finished and leave the computer on for the next person in queue.

- **Conflicts Negotiated By One Person Griping Until the Other Person Gives In**
In Lt. Dan's family, the first-come-first-serve behavior of TV sharing converts to another pattern: the second person gripes and talks the first person into changing the channel. The person who gives in varies from time to time (IHI 5). This pattern most likely applies to sharing among siblings and their friends only.
- **Conflicts Negotiated Based On the Importance Of the Work**
This pattern derives from the shared use of home computers in Sally's and Janet's families (IHIs 7 and 10). It is, however, not applicable to sharing situations in which importance is not an issue, such as sharing of TV.
- **Conflicts Negotiated By Making Reciprocal Exchanges**
Jasmin and her husband resolve conflicts by watching shows together and making TV-viewing experience an equal trade off (PDS 4). For example, she will watch CNN with him so that he will watch a movie of her choice with her next time. This pattern of reciprocal exchanges is possibly more common to sharing habits between friends, spouses, and siblings, although less likely to sharing practices between parents and children.
- **Use/Communications Shared By Taking Turns**
When Lt. Dan's family watches TV together, if programming is not an issue, they pass the remote around and take turns (IHI 5). Similarly, when the family engages in group calls, they alternate speaking if the topic is not critical. However, when someone prefers to watch a particular show or wants to say something important on the phone, this pattern collapses, converting to a practice somewhere between sharing and autonomy.

A practice arising from negotiation is mediation, which can be seen in the ways that users attempt to solve contests for device usage without the need for autonomy or sharing. Examples of this would be the mention of TiVo resolving conflict arising from multiple users wishing to see different television programs at the same time. Furthermore, this concept can be seen when one user simply goes to another room to watch television when autonomy is enforced the main set. A final example of mediation can be seen in parents buying each of their children separate devices, which although creates a form of autonomy for the new device arising from ownership, it eliminates the possibility of autonomy and need for sharing for the original device that was contested.

The following table summarizes the relationships between sharing practices along the continuum and the family relationship dynamics described above:

<i>Practices in the Continuum</i>	<i>Family Relationship Dynamics</i>
No conflicts, no negotiation needed	The Egalitarian Family, Spousal Equality, Parental Equality, Good Siblings
No negotiation needed because certain person(s) always give(s) in	Spousal Inequality, Parental Authority
Conflicts avoided by setting up separate accounts or a schedule for sharing	The Bureaucratic Family
Conflicts negotiated and resolved before sharing occurs	The Democratic Family
Sharing of communications negotiated by making one person in charge of everything	Parental Negotiation
Enforced autonomy	The Family Dictatorship, Bad Sibling
Technologically blocked	Parental Control
Multiples of same devices	Mediation
Conflicts negotiated on the basis of ground rules	The Bureaucratic Family
Conflicts negotiated by one person griping until the other person gives in	Occurs in certain situations; does not apply to a particular type of relationship
Conflicts negotiated based on the importance of the work	The Family Hierarchy
Conflicts negotiated by making reciprocal exchanges	Spousal Balance
Use/Communications shared by taking turns	Occurs in certain situations; does not apply to a particular type of relationship

Design Implications

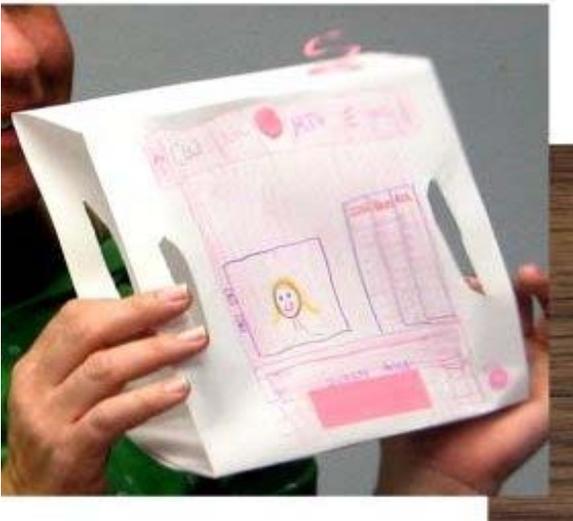
Given the data on the participants' sharing practices, if Social TV maximized its function as a mediator its value to the user would increase. It would be unreasonable to try and eliminate all negotiation between members of households. Rather than reinventing or forcing a household to adopt new systems of sharing, the device could build on previously established systems, thus maintaining the household's ability to determine its own style of mediation. Accommodation for the different sharing practices can be made in several ways: multiple and master control over functions (remotes), personal and household accounts, portability into cell phones, and multiple televisions.

One Shared Remote is OK

The issue of personal messaging using Social TV led into a discussion of remote usage. The researchers concluded that the use of a shared remote as opposed to a multiple remote system would be acceptable. We reasoned that most families in our data didn't express serious problems with sharing a remote. Most had worked out functional routines which involved hierarchy/priority systems.

In the shared remote model, personal accounts that a user could log into would be used to manage messages. The accounts would mediate so members of the household wouldn't be burdened with the task of forwarding messages to one another. Participants in several PD sessions (5, 1, 4) all expressed an interest in using an access code to log on to a Social TV account.

Although the research team decided that a one remote model would be most consistent with the aims of Social TV, many strong arguments were made in favor of a multiple remote model. Unlike common television remotes, Social TV remotes involve communication. The multiple remote model offers a solution to the conflict of messages being sent by different members simultaneously and allows for individualization. Individualized remotes specifically catered towards children or senior citizens could increase the device's use by these respective groups.

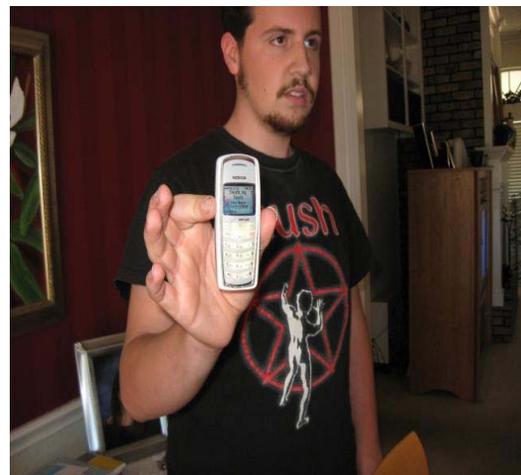


The iPhone seemed to capture many of the participants' imaginations and the touch screen design has appeared various times in the PD sessions*. The advantage of such a screen on a Social TV remote is the screen's highly customizable functionality. Members of a household could program different layouts for each other much in the same way a computer user may personalize his/her home desktop. The iPhone idea could work for either a shared remote or an individual remote.

**A participant from a PD session makes a remote that resembles the iPhone's touch screen (PDS 3)*

Cell Phones

The prevalence of cell phones among our research participants led us to believe that including cell phone functionality into the model of Social TV could be beneficial in many ways. The cell phone could both manage personal messaging and perform Social TV functions. This portability would also provide users with a high degree of customization. Some participants have even shown an emotional attachment towards their cell phone*. The phones already serve a variety of roles and are capable of handling many functions related to Social TV. A user may also use a preexisting contact list on his/her



**Lt. Dan shows his cell phone (IHI 5)*

cellphone as a basis for Social TV buddy lists.

However, if the cell phone with the Social TV program is not available to others who may want to use the television, such as visitors or members of the household who do not have a cell phone, they wouldn't be able to operate the device. Another issue of the cell phone remote is among the service providers. Many phones are constantly being updated and this may pose problems for the user who uses his/her phone for their Social TV remote.

Multiple Televisions

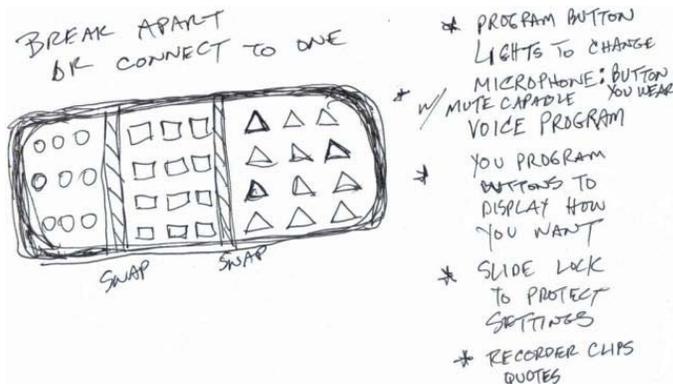
Every household in our data had more than one television. Participants such as Lisa and her husband make use of the multiple televisions when both would like to watch different programs (IHI 3). Social TV could accommodate to the sharing practices in which family members split up to watch shows on separate televisions by adding a feature that allows for Social TV functions to operate on more than one television in the household.

3. Customizing the Remote for Family Members by Elliott Davis



Our overall goal in this chapter is to create a remote that meets the needs of each member of a household. As described in the previous chapter, we considered whether or not each individual using Social TV would require their own remote. Due to the many conflicts that would arise from this situation, including redundancy, we concluded that one remote was acceptable, so long as each member of the household could have a different account on it.

So how do you consolidate users' different needs into one remote that suits an entire family? The answer is that the remote needs to be customizable and personalized to each user. To illustrate the principle of a remote that is both shared and customizable, here is a picture by Miss Independent. She designed a model that could split into several separate units the moment a person wished to connect themselves to the device.



Our study participants seemed to move back and forth between comparing the Social TV remote to a TV remote, and comparing it to a cellphone. It had aspects of both since it managed the TV as well as managing voice communications. While a TV remote is typically not customizable, a cellphone typically is customizable. Miss Independent's model was one of the suggestions for a remote with a premise close to a cell phone in that each person would be able to operate their own device apart from another; yet at the same time it was able to function as a single unit as well. While we do not recommend her particular design, it illustrates an important point about the need for customizability if Social TV has one remote per family.

Our findings and design implications concerning customizability fall into three main categories: complexity of interface, personalized look and feel, and buddy signals.

Complexity of Interface

In our fieldwork, members of a household varied considerably in their desire or ability to learn complex functions on a remote, and several of them said that functions of the remote should not exceed the technological savvyness of particular individuals. For instance, the Stewart mom said that when a remote was too complex, she would ask her husband or son to use it for her. She showed us this very complicated looking remote to illustrate her point:



The mere thought of having to learn to use a new remote made many individuals cringe. Hot Rod was one who mentioned the importance of remembering the overall purpose of the television; that is to be watched. Instances where viewing pleasures are disturbed may result in a lack of interest in using Social TV.

We therefore recommend that users be able to customize the degree of complexity on the remote.

Personalized Look and Feel

Our study participants expressed a desire to personalize the remote in visual and auditory ways. This was especially true for remote designs based on an iPhone type of touch screen device. For instance, the screen could be given a different look and feel, much as a computer desktop (PDS 1). Also font size could be adjustable for those whose vision was not so good. One person also wanted shortcut buttons for their five favorite TV channels on the remote; the channels selected would be different according to the user.

Buddy Signals

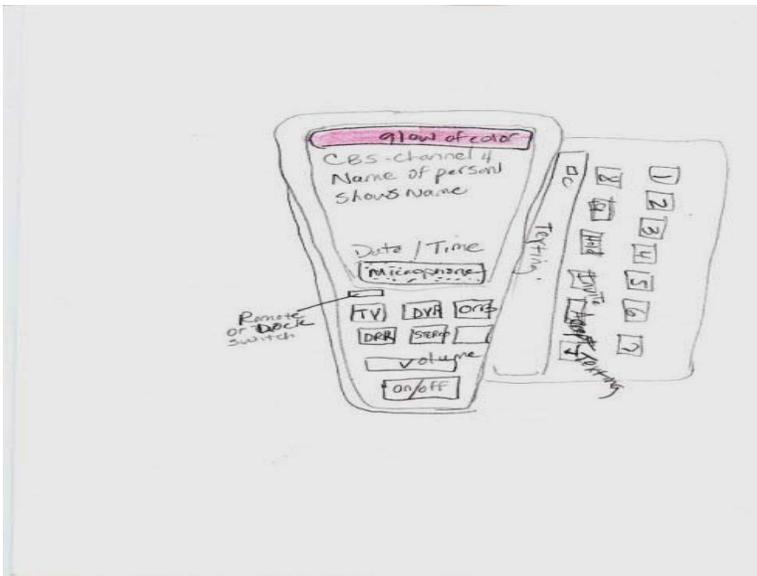
Study participants wanted to be able to customize the signals that would indicate whose friends, and which of that person's friends, were watching TV. They suggested ambient lights in different colors, or sounds like ringtones that could be chosen for different users and different buddies. Advantages and disadvantages of different buddy signals are discussed in detail in chapter 10.

Core Functions

In our study, research participants identified four potential core functions for the remote, which are described in more detail in other chapters:

- Check who is watching what on your buddy list. This is of course central to the concept of Social TV. In terms of how to show this information, see chapter 4 on the question “one screen or two.” The information could be displayed either on a remote with a screen, or on the TV.
- Parental control. See chapter 5.
- Managing privacy and security. See chapter 9.
- Social multimedia functions. This is a set of functions that was attractive to many study participants, but it is much more optional than the other three, depending on the direction Motorola wishes to take its Social TV offering. See chapter 7.

Furthermore, other peripheral functions could be placed on the remote. For instance, ambient lights indicating buddies could be incorporated on it, as shown in the picture below.



The remote would be a good device to put the light on because it is the first thing a person looks for when they have the urge to watch TV, something that is left around most of the time, usually always in the open to be seen if not already with the person watching the television, and would not necessarily take away from the overall presence of a room.

Finally, the remote could incorporate the mic and/or speaker used to communicate with buddies.

If the remote had either a light or a speaker, it could also incorporate a search feature. Diego, Hot Rod and Miss Independent commented on how it would be nice to be able to

press a button to find your remote by lights or sounds, in the event that the remote found itself in the cracks of a couch, a kitchen, or even a bathroom or closet by mistake.

4. *One Screen or Two?* by Juan Rangel



For Social TV, a method of user interface is of the utmost importance. It's desirable to have some method in which to look through your list of friends and communicate with them. In addition, there are vast arrays of other purposes the interface will be used for, such as privacy concerns, customizability, operating peripherals, etc. Due to this, some sort of interface tool, a device with which the user can operate the interface with a minimal amount of hassle and a great amount of ease is desirable. This takes the form of the Social TV remote, similar to the ways remotes of the past allow the user to conveniently operate their television or electronic device without resorting to manually operating it at a close distance.

However, there is a difficulty in deciding what *kind* of remote would be useful, simple, and desirable. In our limited interviews and participatory design sessions, we came up with two conclusions, based on the desires of our interviewees. One would be a single remote, similar to others (with a few differences, of course, such as a possible letter pad), that would interface directly with the Social TV. The second device would be a remote with a screen attachment; this allows a degree of portability away from the television, as well as a device that could be seen as “modern” (in comparison to the average remote). Our data did not show a clear preference for one or the other, so we discuss the advantages and disadvantages of each.

One Screen

First would be a normal, typical remote, with a few differences. Operating similar to other remotes, this remote would interface with the Social TV hardware/software, allowing them to use it as an extension of the Social TV product. Providing a method of possible communication as well, it would have a simple button layout, perhaps a keypad for entering in letters as well as numbers (or something similar to cell phones presently). It would be not unduly complex, and in fact would be very similar to a keyboard of a computer – itself being a fairly simple device for complex functions on a complex device. The aesthetics of which we didn't get into, however. Suffice to say, it would not be as “modern” as a screened remote. It would need to operate the buddy lists of Social TV, the possible different user customizations, the peripherals, a possible webcam, etc, etc. There are difficulties that arise with this notion, however. This method of remote controlling would require a portion of the screen space on televisions be used for Social TV – it's literally not possible to not have it done this way. Among the various methods to do this would be to use it similar to the satellite systems (minimizing the screen to bring up Social TV), or using some method of scrolling text, a tickertape, if you will. In addition, communication via texting (if the microphone is eschewed) would be impossible without some method of text going across the screen.

Miss Independent (PDS Session 5) is quoted as not minding the ticker scroll on the bottom of the screen, while other individuals (such as Lisa, of the same group) hated the concept. However, it should be noted that though Lisa professed dislike of the “ticker tape” feature, she did in fact watch Talk Soup, which is known as having a large amount of tickertape that runs during the program.

Alternatively, another method could be used, describe by another method of PD Session 5. Hot Rod mentioned that giving up screen real estate for buddy lists is not an issue. However, he did in fact mention that the screen would be reduced in overall size, rather than just a section being sliced off for use. This would effectively render the screen as it would be on a smaller television, rather than an uneven display.

Yet another issue that needs to be looked into is elderly individuals who decide to use this device. Ofttimes vision and sound are an issue, and perhaps aid should be provided for them. In PDS 4, Lina mentioned her mother, and how she was terribly nearsighted, and stated that rather than have a small screen, it would be easier for her to see large letters on a television. This goes directly back to the issue of customizability, but does play a facet on deciding what type of remote to use.

In terms of cost, a non-screen remote is going to be cheaper, likely more durable, and last longer than a touch-screen remote. Issues about children and pets need to be looked into, as well, as well as adaptation to new technology (the touch-screen).

Two Screens

While a non-screen remote does display a number of benefits, there are a number of issues, as well. Most individuals in the PDS groups who saw the idea of a touch-screen remote (PDS groups 3, 4, and 6, among others), immediately saw the idea as modern and interesting, comparative to the iphone. This is in stark contrast to the concept of a normal remote. Indeed, almost every single individual in every PDS and interview had multiple remotes for various devices, either scattered around, or located in one central area, thrown together (Hot Rod and his basket, for example). This was to their frustration, and touches upon the entire idea of Social TV being “just another device with another remote”. To mitigate this, in part, perhaps a touch-screen remote would be desirable. For a touch-screen remote, the first and foremost thing to mention would be that it is more “modern” to the individuals in the PDS groups. Note that this doesn’t necessarily mean that it *is* more modern, just that it is perceived that way. This itself could be a great boon to attracting individuals to the concept of Social TV, and a useful selling point. In terms of user interface, the touch-screen remote could do things that a normal remote simply could not.

First, privacy would be possible for conversations. If a typical remote were used, any and all conversations that took place without a microphone would have to be displayed on the television screen. This is directly opposite to a touch-screen remote, as it would be

possible to have a private conversation with another individual, simply by holding it in the palm of your hand.

Another issue is portability. Something that was discussed among virtually every PDS group was the idea of a microphone. In PD Session 5, for example, a portable headset was deemed helpful, as it would be possible to travel to another room without worrying about not talking to the individual who you are watching the show with. It would also make communication easier in large rooms, or great rooms, that mix a living room and kitchen together. Expanding directly upon that, if a microphone is not a viable option, or not preferred for some reason, texting will be the alternative method of communication. With a typical remote, the screen will be what is used for texting, and if you wish to talk to the individual who you are socializing with, you *have* to stay near the television. With a touch-screen remote, texting, viewing buddy lists, even seeing a webcam could be done as far as the remote technology allows.

In PDS Session 4, Jasmin mentioned how she would like to have a touch-screen remote that had a glowing outline of lights, or some method of alerting you when a friend logged into the program. Lina seconded this idea, stating that it would be possible to both see and use the remote in the dark. This was an idea that we have not heavily researched – the number of individuals who prefer a dim-light environment when watching television. If the number were significantly high, the touch-screen remote would be even more useful, if a backlight was included.

In addition, because the power usage of a touch-screen remote would be higher than that of a normal remote, it could possibly also power a headset or microphone, mitigating the need for it to be wireless, and also allowing free-range communication (see PDS Session 4, Picture 004. This idea is exactly what Andrew mentioned in his design scheme). A handful of PDS group members from various groups (4, 2, and 5) mentioned a docking station for the remote, to charge it. With a normal remote, the need for charging is negligible – a normal remote can last for up to five years on a single pair of old AA batteries. For a touch-screen remote, however, a “docking station” would serve both as a way to separate it from that “basket of remotes”, show it to your friends, and mitigate the need for a constant battery replacement.

There are a number of issues that need to be brought up for consideration. The required cost of a touch-screen remote would be higher, the possibility of it’s breaking and it’s durability higher as well. If the individual who uses this remote is in a household with pets, the claws of a dog or cat could permanently mar the remote, so some sort of protection would be needed (though a docking station could reduce the need for this). In addition, because this type of device has never been released before, there would be a significant learning curve. It would be new, and unknown, possibly similar to when computers were first released. Out of all the PDS group members who mentioned an iphone, directly comparison the Social TV to such, only two, maybe three individuals actually owned an iphone (and as far as I know, we didn’t question how thorough their knowledge of how to use it was). This implies a number of things, but the learning curve in using a new type of interface for a device is primary.

Overall, the superiority of either type of remote is unknown – more research needs to be done. There are definite benefits to both types, but there are so many unknown factors, such as cost, type of “modern” look to be advertised, ease of use, etc, etc. On a personal note, I would say that it’s impossible to prejudge this sort of thing without more research. For example, while we interviewed various individuals in both the Home and PDS session, when interviewing them, this was a one time thing. This means that rather than observing what they actually did or do with their devices; we only learned *what they said they did*. Their personal perception of reality is going to be different from the actual reality, and always will be (Lisa and Talk Soup, for example). Either way, it brings up interesting points that hopefully will be elaborated sometime in the future.

5. *Parental Control by Susan Mosi*



Television is one of the most popular media because it provides both visual and audio stimulation. It has become so much part of daily life that it is difficult for a majority proportion of children to imagine life without television. Although television is a major source of information and entertainment, it may have a number of negative influences and therefore the effects of television viewing on children are a concern and cause controversy.

In many of our interviews we found out that parents are concerned and would like to know what their children are watching and who they are interacting with. Using parental controls ensures that your child is only watching content that you deem appropriate. Television violence is one of the main factors of aggressive behavior. It is generally believed that children may not be able to differentiate an exciting and unusual experience from reality. Without sufficient parents' guide and censorship of media, television violence is harmful to children. Sally from in house interview with group seven stated she tries to monitor what her children are watching. Sally makes sure she is able to monitor their email and internet use. None of them uses IM at this time. She made sure to listen to her daughters voice message on a family shared home phone. She would not allow them have separate passwords to listen to their messages because she would like to keep tabs on them. In interview 6 (IHI) Ms Stewart's Son frequently uses webcam and "Log Me In" to interact with father out of state. In these "interactions" over video conference, the son says his dad can take control of the computer on the son's end if there's ever any tech work needed on the computer. Most information exchanged is personal. It seems as though no one in the family was concerned about the father who lived halfway 'cross country finding out any information that was considered too valuable to share or discovering anything on the computer that they might not want him to find. Ms Stewart also checks son's and his girlfriend's MySpace .

If utilized and supervised appropriately, television will always provide more positive effects than negative ones for children. Lina on PD session 4 states that he will have her son have control of the remote when they watch television together, she would let his son push the buttons but she can change the channel anytime she wants. She would watch History Channel and National Geographic Channel which are both educational.

Design Implications

Our research has shown that parents would most likely buy the idea of having control of what their children watch. A television remote control designed for their children. While offering simple controls for the child to operate, it also features the parental control to select only those channels you want your child to view, and the ability to program a

certain amount of channels of your choosing. It should be easy to program and should include its own unique shape or color for each favorite channel.

If it's a shared remote, one remote for all users, then it should include a block button feature. A parental program area that is secured and hidden from the child. Should allow parents to set rating levels so that certain TV shows need a password to be viewed. It should be possible to block specific channels so they cannot be viewed. The design should also have an option to blog or text on the remote for private conversations when children are around.

USING THE REMOTE TO INTERACT WITH BUDDIES



6. *The TV Is On But Is Anyone Watching?* by Jenna Rose



There is adequate research showing that in many homes, the TV is on for the majority of the day, regardless of whether or not it is being watched. People leave their television on for different reasons depending on their needs, including routine, multi-tasking, virtual presence, and security. In most cases, the TV is focused on only at certain prime times, to catch favorite shows or to relax after work. However, because it is always left on, there is always an option of focusing on the TV if something interesting arises on screen.

In the at-home interviews, we learned the most. Many people use the TV as background noise, implementing it into their daily routine. In Interview 2, Betty and her husband say they use their TV not only for entertainment, but also as a background noise; the news and sports are left on in the background so they can “keep up”. Sometimes they leave it on while preparing food in the kitchen. Mary Jane from Interview 4 also leaves the TV on while she is at home, especially when she is in the kitchen. In Interview 7, Sally Smith says she leaves the TV on while preparing dinner, as does Rori from PD Session 3. Lisa (Interview 3) tells how she watches her main TV during the day and mostly uses it at night as background noise, as she considers herself an insomniac. It is on most of the time that she is awake. She waits for her bedroom TV to come on before she turns off her living room TV; hence, it is always on. This is the case for Lt. Dan from Interview 5 as well, as he says it stays on throughout the day, unless no one is home so he can save on electricity.

Others also keep their TV on for the purpose of multi-tasking, as well as the feeling of emotional and physical security. Their attention may not be completely focused on the TV, but they are “half-watching” and like to tune in when something interesting comes on. Mary Jane says she is always multi-tasking with multiple media, including her TV, phone, blackberry, and laptop. Sally Smith discusses the multifunction of her two televisions. Her daughters will come into the master bedroom in the mornings and watch cartoons or the Disney channel on that TV as they get ready for school. The main TV in the den is on most of the day, especially during the weekends. Sally likes to focus and watch the TV to relax when she gets home from work, and she leaves it on as she prepares dinner. Rori (PD Session 3) said she would like to take the remote in the kitchen with her to multi-task. Sally’s daughters sometimes talk on their phones while watching TV. Her oldest daughter will also use her laptop while watching TV occasionally. Jerry from Interview 8 only turns the TV on when he can give his full attention to it; however, his mother has a tendency to leave the TV on as a background noise, even when she leaves the house. She considers leaving it on as a crime deterrent, as people may assume that someone is home if they see the blue light shadow in the window; this way, the chances of someone breaking in are much lower, creating a greater sense of security.

In addition to physical security, TVs also provide higher emotional security. Many people appear to feel comfort from the ambience the TV provides by constantly being on. It is described as a “presence” by the majority of the participants, which is preferred in the house, especially when one is alone with no personal company. The TV acts as company, constantly talking and giving the household member security and peace of mind. Even those who don’t prefer to keep their TV on still have a need for ambience. In Interview 10, Janet keeps her TVs shut in the armoire but has an ambient device, an air purifier in her living room with an ambient blue LCD light that she keeps on. She says, “Whether it works or not... the verdict is still out,” but she leaves it on and running at all times anyway. The reason is linked to emotional security. From PD Session 2, every participant agreed that they take part in the ambience of the TV being on in the background whether they are watching it or not.

Design Implications

The fact that televisions in most homes are left on all day have important implications for the design of Social TV. First of all, there is an overwhelming necessity for an availability status. Everyone voiced a need to have a way to let others know when they are watching or when they are away/multi-tasking. It could be very much like the IM status of “I’m available”, “I’m away”, and “I’m idle”. Having a ticker that determined idle status would be very useful, as their Social TV buddies would know when and when not to make contact. Also, there were many voiced concerns of an “invisible” status that would hide the fact that they were online Social TV if they so chose. People cherish privacy in their own homes, so this would be a necessity. It would also be important in maintaining the routine they have created and take comfort in.

The implications for the remote can be categorized as relative control. People want ease of portability with their remote, as they will be taking it into their kitchen and other rooms while the TV is left on. Most options should be contained within the remote to make access as easy as possible. The remote should also have long-range capabilities, as it would need to access TVs that are in a different room or perhaps on the other side of the house. As the TV is being heard more than watched in these cases, many agreed that it would be incredibly useful to have a sound alert, indicating the presence of buddies. It would have to be a distinctive sound, louder than regular TV. Most participants concurred they would prefer to customize each special sound, as they are used to with picking ring tones for different friends or family members. Also, buddy alerts could be sent straight to the remote so it would be noticed.

The evidence is indicative that because so many families already use their TV as an ambient device for virtual presence, Social TV can be easily implemented into their lives. People enjoy the calm that comes with having such a device remaining on in their homes. Adding a new ambient device and a remote could definitely enhance their feeling of control, comfort, and security.

7. From “Social TV” to “Social Multimedia” by Priscilla Ombwayo



Participants in the participatory design sessions brought up several Social TV features and ideas that changed the whole concept from simply watching TV shows with friends remotely to fully socializing with the friends in several different ways using the TV.

TV Becomes a Computer

Our research revealed that in addition to watching TV shows with friends and family in other locations, people are interested in sharing the following:

- Recorded shows
- Home videos
- Favorite clips
- CDs and DVDs
- Photographs
- Screenshots

These are items that are currently shared over the internet through the use of computers. As a result, Social TV with these data exchange capabilities would turn today’s television into a computer. The ability to share recorded shows would allow TiVo to be used as a solution to timing issues when Social TV buddies are unavailable to watch a show at the time it airs.

In participatory design session one (1), the participants felt that being able to share data using Social TV was important because they felt it would be a simpler method than the current available methods which they find complicated. The number of people who know how to operate a TV is much greater than the number of people who know how to use a computer.

In participatory design session five (5), Miss Independent expressed the desire to be able to record a short clip or sound bite that she could then share with her Social TV buddies. This would allow her friends to see a certain section of a show she found funny or even hear a specific quote which would be better than having Miss Independent try to explain the quote or the clip verbally.

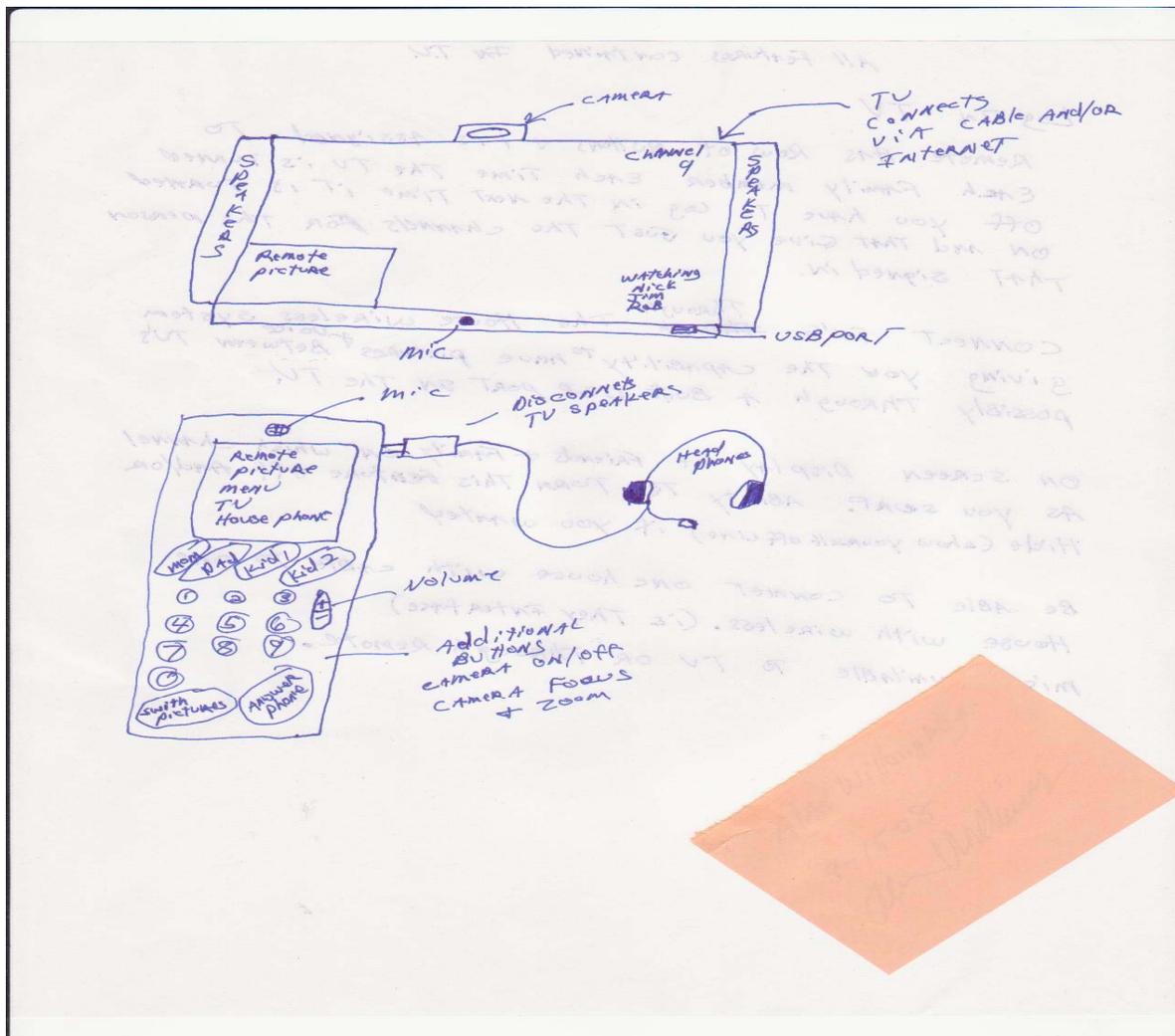
The drag and drop functionality similar to that of a computer was brought up by Greg in participatory design session one (1). This would allow him to move images and boxes on his screen around just like he would on a computer. This would be especially important if there was a buddy list visible on the screen or a picture of the person sharing a show.

Diego in participatory design session five (5) recommended the inclusion of a search engine feature and an internet type system in Social TV. These features would be utilized to look up relatives, search for friends and allow for an online buddy list to be added to the Social TV buddy list.

Mr. Fort Worth in participatory design session (2) felt that Social TV should have the ability to download updates from the internet and allow data transfer from computer to TV and from TV to computer. He also suggested the ability to download ring tones.

Social TV as the Telephone

As part of the Social TV experience, several participants expressed the desire to talk to the people they were watching a show with.



Design created by Andrew (Participatory Design Session 4)

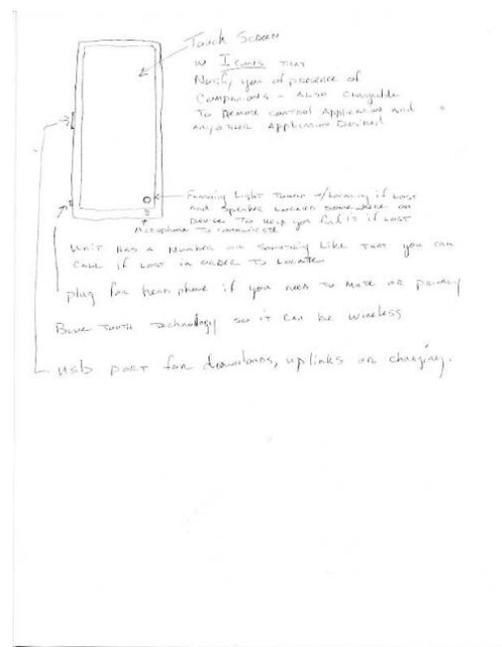
Andrew in participatory design session four (4) suggested that Social TV have the ability to act as the house phone. The remote control could be used as a handset. Once the call was answered, the volume on the TV would lower itself automatically. The TV could also be programmed to leave the television volume as is for the viewing convenience of others when a handset is being used for a private conversation. The phone number or picture of the person calling would be displayed either on the television screen or on the remote control.

Mr. Fort Worth in participatory design session three (3) recommended that through Social TV, the television set should be able to dial phone numbers. Nathan in participatory design session two (2) requested a conference call function as part of Social TV.

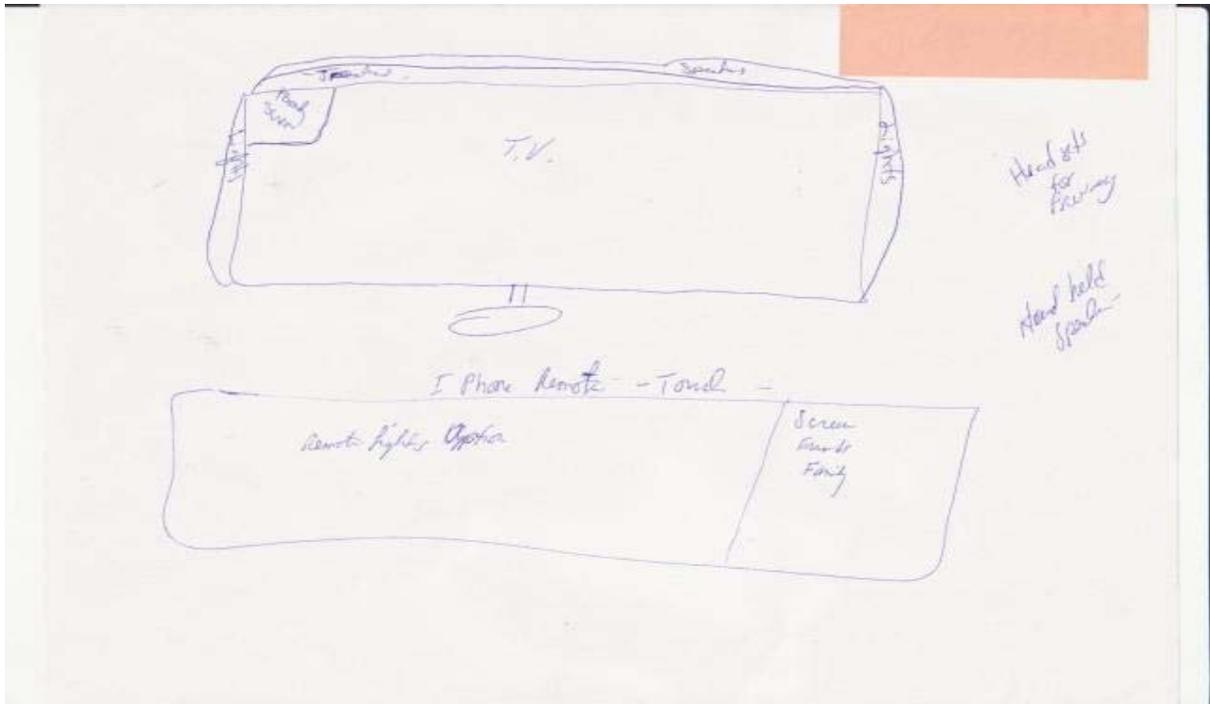
In participatory design session four (4), Jasmine and Lina both suggested that the remote control also serve as an iPhone, iPod and regular house phone. They wanted the main phone to be capable of doing everything just like the iPhone. The remote control would have buttons with options for television, music, telephone and so on. A menu option on the television would reveal the buddy list showing who was watching television and what show they were watching.



Photo of touch screen on iPhone



Design of remote that looks similar to iPhone in PDS 2



Design from Participatory Design Session 4 showing iPhone remote control.

Text messaging as a feature of Social TV was brought up in several sessions as well. Susie Q in participatory session three (3) came up with the idea of a text message being sent to a user's phone to notify when someone is watching TV. Both women in participatory design session one (1) also recommended the ability to text message and specifically requested a full QWERTY keyboard cell phone type keyboards were difficult to use.

Picture in Picture

The ability to see who you were sharing a show with came up in several conversations during participatory sessions one (1), two (2), three (3) and four (4). This included the use of a high quality video camera so that the pictures or videos would be clear.

In participatory design session one (1), the group mentioned having several boxes on the screen for the different people sharing at the same time. Mrs. New York in participatory design session two (2) felt it was very important to be able to see who she was sharing a show with and talking to. Jason in participatory design session four (4) thought it would be great to hear everyone laughing together. This feature would require the ability to move the boxes around the screen so as to be able to still view the show or to see any text on the screen such as sports scores.

Susie Q in participatory design session three (3) suggested that the camera be located on top of the TV so that not everything in the entire room could be seen by the other people and to minimize distractions on the other end. The group in participatory design session

one (1) to resolve these issues suggested a single field of vision camera mounted on the TV as well and recommended that the picture in picture video portion of Social TV be able to flip from video to still photo when needed. This would increase the level of privacy for everyone.

An alternative to the picture in picture was to have a picture or video of the other person on the remote control instead of the screen.

Social Networking through Social TV

Social networking websites such as MySpace and Facebook are very popular among all ages these days. They allow people to connect with friends and family as well as meet new people who have similar interests. Susie Q in participatory design session three (3) suggested a social networking channel for Social TV that would be very similar to MySpace. This would allow her to meet people who share a love for the same shows or movies as she does. Diego in participatory design session four (4) felt that a social networking feature through Social TV would be very interesting and beneficial especially since he was planning to move to a new state in the coming weeks.

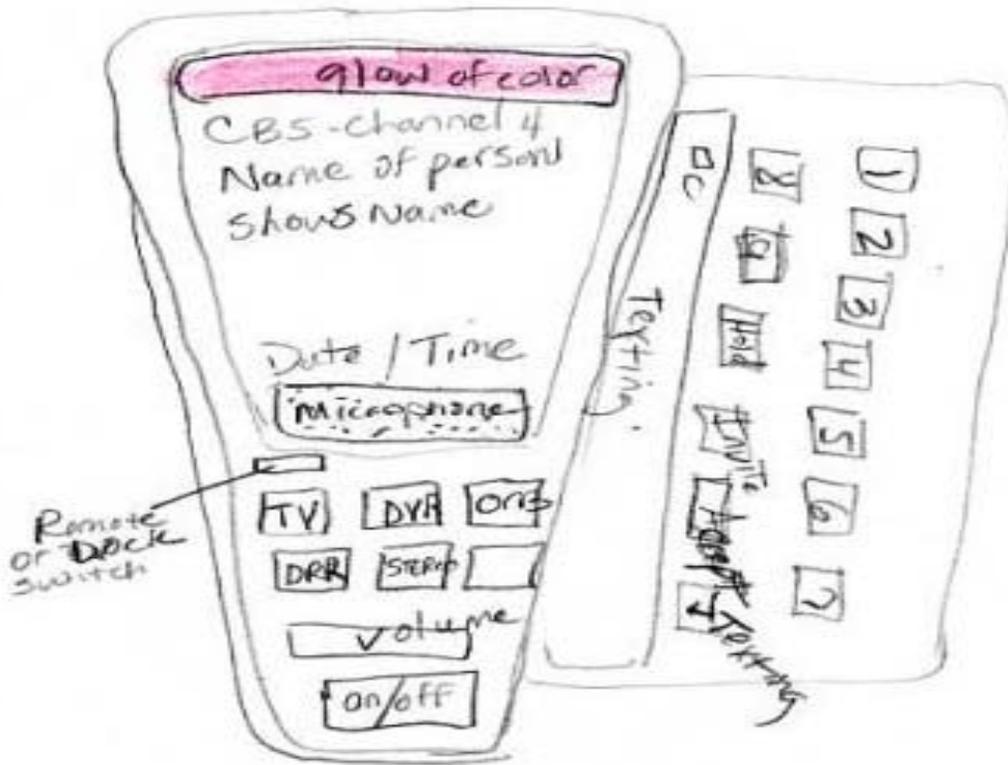
Design Implications

As technology advances, finding more and more ways to stay connected with their loved ones who are located in different parts of the country and the world. As such, there is a desire to be able to communicate through the use of Social TV. Based on the findings from the participatory sessions, Social TV should include the following features:

- Internet connectivity to allow for data exchange, internet searches, integration of internet buddy lists, ring tone and software update downloads and so on.
- Telephone functionality including caller ID to allow people to talk to each other and send text messages.
- A camera for picture in picture including video streaming and still photo features.
- Social networking capabilities similar to MySpace website.

With Social TV expected to perform so many functions, the design of the remote becomes a critical component. As indicated in the research, the remote is expected to perform all functions similar to an iPhone. The remote control would need the following features to meet the needs of the users:

- An inbuilt microphone and possibly a speaker so as to function as a telephone.
- A touch screen similar to that of an iPhone to allow users to see videos or photos of the people they are sharing the experience with and buddy lists.
- Greg in participatory design session one (1) stated that he would want a Wii-like controller with a pointer device on the screen similar to a mouse cursor and a touchpad screen. The laser pointer would be used to circle items on the screen to bring other's attention to them.
- Full QWERTY keyboard for the text message feature.



Design of Multimedia remote control during Participatory Design Session 2

MANAGING AUDIO COMMUNICATION WITH BUDDIES



8. Mobility and Being Heard by Clayton Lane



The Mobile User

The portability of devices in the 21st century cannot be understated. If you can't take it with you, you might as well not buy it. Mobile microphones are everywhere these days and while some people are still not used to them, others have taken in the technology with arms wide open. The mobile microphone is for the modern user in the multi-tasking world. Throughout our in home interviews and participatory design sessions, people have expressed that they are not always just sitting in front of the TV with full attention. Many people walk from room to room, prepare meals, and carry out other mobile tasks all while listening to what is on TV. They may not seem to be focused on the entertainment, but they are actively listening and taking in the program content none-the-less. Microphones can be designed as mobile peripherals in various ways. Group #5's design session stressed portability which has also come up again and again in other sessions. One design member proposed a "lapel microphone" that could be attached to your clothing and provide hands free talking without an "uncomfortable ear bud." In class, we came to refer to this as the "star trek button." Other members are ok with the feel of the headset as long as it looked good and as one member said "not dorky." Below are two solutions to portable communication devices.



FIG 1. Lapel Microphone



FIG 2. Countryman Headset

In group #5's participatory design session, one member stressed the need for an "xbox like device" that allows communication seamlessly and easily for any user. When Xbox live introduced headsets to online console gaming, it set the bar to a new height. Wireless controllers and mobile microphones have become the norm so anything less may be perceived as outdated. Another pro to having these personal mobile devices would be to increase privacy. Certainly everyone in the house doesn't want to hear what you and your

friends think of the new American Idol. Personal headsets cut down on extraneous chatter. Possible cons to having mobile microphones might include having to create a “docking/recharging station” and also being very susceptible to being lost because of kids and couch cushions.

Desire To Be Heard Over Others

Many participants expressed a desire for control when multiple users are watching on one device. A “room mic” is sort of a conditional device. People would love to just talk aloud in certain situations but it is dependent upon whether the mic is set up to perform certain functions and meet certain qualifications. Many participants are worried about the quality of a microphone in a large room and the feedback this “room mic” would give off. Another concern is when there are multiple users all trying to talk at once the owner of the device or head of household has expressed a desire to be able to override background chatter. Two solutions have been brought up concerning this concept. Design session #3 had a participant offered a simple solution to this desire. They conceived that it would be easy to just have a microphone in the remote which designated that user as the primary controller. If the environment is loud or the room mic isn’t working as well, the primary user can press a button on the remote and speak directly into it giving them much better quality and overriding outside forces. Design session #5 came up with a more advanced solution to the problem. Their participants proposed to implement voice recognition software in the microphone. Their solution would require users of the device to program their voices. If many people are talking the software will pick up on the user that is logged in and isolate that frequency. The voice would then be filtered and amplified before being sent giving the primary user privileged status.

Design Implications

Our data has shown, ironically or not, that people are more likely to use social television alone than in groups. While families do have similar interests and programs they watch together, most users have their individual favorites. The mobile headset or microphone in the remote seems to be the most common suggestion from participants. In households with multiple users (i.e. families) participants desire to have multiple headsets, one for each user. The individual headsets could be customizable with colored plates or stickers and even sign a person in when it is removed from the docking station. As with all communication devices, our research has shown that people also want to be able to control the volume of the speakers and mics and be able to mute with a touch of a button.

9. *Privacy and Security by Lawana Woodlock*



Several times throughout our research the concepts of privacy and security appeared. The beginning phase of our research focused on “who and why” Social TV would be used, and we were focused primarily on the usage of Social TV within the group setting. During the course of our research a new focus presented itself. Our research indicated the primary usage of the equipment would be by an individual user instead of the predicted “group usage.” Since events such as the Oscars, Super Bowl parties, and others only happen sparsely throughout the year, the participants felt immediately intrigued by the use of the equipment when they were at home by themselves. This was a surprise to us as a class and researchers. We focused on the design implications associated with internal and external privacy and security.

Internal Privacy and Security

The term internal privacy and security applied directly to the application of privacy and sharing practices within the current household. Currently users are accustomed to sharing multiple devices within the home. However, these are devices that have no specific personalization to them. For example, the home answering machine is not personalized to one user, so there is no sense of “this is my phone, therefore conversation should be private.” The cell phone becomes an important communication device in the daily lives of the user. Lt. Dan is a good example of this method of sharing. In his in home interview, he described the central phone an answering machine as a source of “business communication”. This was the way businesses, church members, and other “non personal” communication could reach the family. Each member of the family had their own cell phone where they could be reached by their own buddies or other “private” contacts. Rarely, if ever, would they be contacted by *their* friends the home phone.

Another good example of shared technology with no personalization is the remote for the television or stereo. People throughout the majority of the in home interviews already shared the remote within their homes with little or no problem doing so. The only issue that arose was negotiating when they would get to use the remote. In this instance each family had their own prescribed set of “rules” as to when they could use the remote. This was important, because it established that we do not need to figure out how they share devices, as much as accept the idea that they are already doing so and have their own specific rules in place.

The home computer posits the first real instance where sharing and privacy became an issue. Each user typically had a log in of their own for the computer and applications on it (such as instant messaging (IM), email, My Space, etc.) For example, in Lt. Dan’s home, each user had a separate log in identification moniker. This allowed individual privacy to the user. In the in home interview with Sally Smith, she mentioned that her

daughter was provided a lap top from school, and they (the school) provided “security” to prevent the children from accessing improper sites. Another example of privacy applied to computer use in the in home interview of “Janet”. Janet stated that she and her husband have a joint email account, however they each chose to use their work email since they can log in at home (remote access). This allowed them to have privacy while using their email. Her son also had a My Space account and used a private log in as well. Several other examples of the suggestion of logins or access codes mentioned during the sessions include:

- Lisa (In home interview) – She and fiancé had two primary passwords and used on individual computers.
- Andrew (PD Session #4) – Ability to disable a popup buddy list and make yourself private if you did not want anyone to know you were on the system.
- Andrew (PD Session #4) – Recommended headset for private conversation- turning on of headset would disable or turn off main speakers.
- Jazmine and Lina (PD Session #4) – Ability to set their status as private and blocking users they did not want to communicate with.
- Mrs. New York (PD Session #2) – Separate accounts. Ability to distinguish between groups of people such as friends and family – separate log ins.
- PD Session #1 – Touch screen that allows for individualized set ups for each user. Also, single field of vision if camera part of system – allows for privacy within home.
- Hot Rod (PD Session #5) – Ability to turn people off – fifteen friends on but only want to turn on two.
- Miss Independent (PD Session #5) – Access codes to your system, given only to people you choose.
- Red (PD Session #5) – Password protected like email.

Privacy Concerns With the Microphone?

Another assertion of privacy concerns centered upon the microphone and the methods of communication used by the social TV system. While only a few participants such as Cleo (PD session #3), preferred no ear piece, the overwhelming consensus was the application of a headset or earpiece for communicating with other users. The participants expressed the need for mobility, as well as the need for privacy when communicating with their buddies. The following are some examples of the needs expressed by various participants:

- Brainstorming session (PD Session #2) – Requested audio option – privacy headphones, Bluetooth.
- Red, Hot Rod, and Diego (PD Session #5) – Microphone in middle of table, option to move to headset
 - Background noise a concern
 - Slight concern that moving to headsets may miss “the point” of Social TV
- Miss Muffet (PD Session #5) - Headset concept a plus – “If mom is in the room watching TV with you, headset prevents her from hearing something your buddy says

that you may not want her to hear. Head set allows each used to talk to their friends independently based on who is programmed into their headset.

- Miss Muffet and Miss Independent (PD Session #5) – System transitions to idle after a period of non-use (i.e. IM)
- Miss Independent (PD Session #5) – Mute button important (example – if you need to go to the restroom).
- PD Session #1 (unknown participant) – Mute setting shown on system by different color light, allows for personal or private conversation.
- Mrs. Nebraska (PD Session #2) – “Stealth Mode” for times when user does not want to be social.
- Jazmine and Lina (PD Session # 4) – Faux plant the speaker – “leaves” could be the microphone.

External Privacy and Security

External privacy and security was primarily focused on the ability of the user to protect their children or other family members from strangers on Social TV. However in some sense security would also be applied to “outside” users attempting to message adults on the system. Several participants were specifically worried about the ability of such strangers to see into their homes or “talk” with their small children by accessing the system. The first example was given by Miss Muffet (PD Session #5) while describing her desire to watch *Dora the Explorer* with her two year old niece. She immediately noted that this would also be an opportunity for strangers to see into a child’s home. Hot Rod (PD Session #5) expressed his concerns while reiterating the idea of a stranger seeing the user in their own environment. Miss Independent (PD Session #5) also expressed the needs for parental controls for children. Several other examples included:

- Lisa (In Home Interview) - Spam major concern and having blocking function essential on Social TV.
- Unknown participant (PD Session #1) - Parental control features that allows user or parents to manage children’s accounts.
- Cleo (PD Session #3) – Block feature to protect her children.
- Miss Independent (PD Session #5) – Parental controls.
- Diego – Ability to manage groups or other people not in your buddy list to allow/not allow them to join you.

Clearly, the focus of this area should be centered on controls that prevent the access of the user’s system without the user’s permission, especially if the design is to include a video camera.

Design Implications

One may ask, “Why is this important to social TV?” These are concrete examples that people ascribe the need for individuality and privacy to the devices they use for personal communication. The conclusion can be asserted if people are going to associate their

remotes with “communication”, then specific design implications will arise. One specific example of this occurred during the in home interview of “Janet”. Janet stated “she felt most of the devices in her home were a ‘family product’, with the exception of the individual cell phone, her husband’s laptop, and the devices in her son’s room.” Each of these items were used for “personal communication”, thus each user had their own logins, etc. We have established the following guidelines for the device to incorporate themes of privacy and security.

- Headset as well as speakers -Accommodate both group and individual user interaction with Social TV.
- Main system log in, followed by individual logins or access codes – Ability to provide security and privacy for buddies and user.
- System transitions to idle after user specified period of non-activity – Ensures users of privacy if they “forget” to switch system off.
 - Mute button on remote – Personalized private time.
- Parental controls – Alleviate concerns of strangers or un-welcomed guests accessing system to contact children.
- Access codes for user to give to buddies – Allows user to only give “chosen buddies” access to their system.

Conclusion

As shown above, privacy and security has an immediate and direct impact on the design of Social TV. Although not explicitly stated in every interview, user privacy and security was implicit throughout the process. Once interpersonal communication is performed with a device, the user automatically ascribed ownership and personalization to it. The salient theme through this chapter, once again, is customizability. The user wants choices and wants the ability to seamlessly transition this new concept into their current space. The best way to accomplish that is to integrate new and innovative technology associated with Social TV with the existing technology they are using in their daily lives (logins, access codes, parental controls, and choices). If the product achieves this, it will be a success.

THE BUDDY INDICATOR



10. *How to Indicate Different Buddies* by Melissa Sines



In every interview and design session, the concept of Social TV was explained to the participants. Thereafter, the conversations always turned to how it would work in their lives. Since ours is a technological society already immersed in the social use of the available technologies, thoughts usually turned to how to indicate that a contact was “online,” so to speak.

As a whole, most participants referred to AIM-type *Buddy lists* in which the user would see a list of their contacts and an indicator to let them know who would be available or not for communication.

This pattern indicates that the Buddy List would be the most compatible for people already using similar technology in instant messenger programs and on internet-compatible cell phones.

When actively questioned on how the participants themselves would create the Buddy List Indicators, ideas ranged from strings of lights (on one side of the remote), to holograms (inside the ambient orb).

One of the overall patterns was to combine the ambient light with the remote or TV so that the user could simply glance at the peripherals and know when a contact became available. For instance, one idea was to have lights in different shapes on the remote which would glow when the contact assigned to a particular shape became available. Other ideas began to emerge when the ambient orb was removed from general consideration. (See chapter 11 for more on responses to the orb.)

For instance, in the third participatory design session, one participant did not like the idea of light cues at all. Instead, she preferred sound, stating that with sound she would be able to tell if a friend became available if she were in another room.

Granted, that the sound idea is present in every participatory design session. It came up so often that availability indicators became a light versus sound issue.

Light Versus Sound

Taking the data from all interviews and participatory design sessions, we had enough information to begin a list of advantages and disadvantages of each.

Advantages of Light

- Persistence – A light can appear and remain either blinking or steady until the user responds in some way.
- Less intrusive than sound – A tone, beep or ringtone means being “bothered” while watching a favorite television show.
- We are already used to being aware of lights as indicators of other technology: on remotes, the television itself, a cable box, VCR, DVD player, PDA, etc.
- Different colors can indicate different available buddies.

Disadvantages of Light

- Unless there is a string of lights on the remote, light cues cannot be seen in another room.

Advantages of Sound

- Unlike lights, sound can be heard in a different room.
- Customizability – It could be possible for a different sound to be assigned to individual contacts.
- With sound, the ambient orb becomes unnecessary. (See Chapter 11 for the Importance of Aesthetics in the Home.)

Disadvantages of Sound

- A tone or ringtone could conflict with the sounds from the television during a favorite show.
- If it had persistence, it could become annoying.

Design Implications

The design implications of our data indicate more a preference for customizability than specific preferences for being notified of contact availability (See Chapter 13). However, our data can be used to determine *what* components to make customizable. For instance, to solve the light versus sound controversy, the very first option could be the customizing option of *either* sound or light *or both*. Therefore, there could be an option of either colored lights being a visual cue or a tone (made loud or soft) being an audible cue attributed to individual contacts.

Finally, an option that should be noted for users already “online” is the image/video pop-up. A couple of participants liked the idea of a picture or even video of their friend popping up unobtrusively like a picture-in-picture on the television screen when they became available.

*FINDINGS THAT APPLY TO ALL PERIPHERALS: AESTHETICS,
SIMPLICITY, CUSTOMIZABILITY*



11. Importance of Aesthetics in the Home by Carrie Hickey and Jonathan Grubbs



“Without aesthetic, design is either the humdrum repetition of familiar clichés or a wild scramble for novelty. Without the aesthetic, the computer is but a mindless speed machine, producing effects without substance. Form without relevant content, or content without meaningful form.” – Paul Rand

“Oh you know even the box is going to be sexy” – John Mayer on the iPhone

The Home Environment

Aesthetics have officially taken over. Long gone are the days of bulky electronics, cheap plastic phones and clunky cable boxes. Consumers have come to expect their products to be sleek, attractive and stylish. When working with study participants on the social TV concept, the theme of stylish aesthetics was reiterated time and time again. One of the most talked about areas was, “How is social TV actually going to *look* in my home?”

Here are some examples:

- In design group two, “Mr. New Yorker” said he would like his social TV device to be, “aesthetically pleasing. Round or oval shape, kind of like an Ipod”
- In design group five, “Miss Independent” said, “Overall aesthetics of home must remain clean and modern, so device needs to avoid looking too “gadgety”.
- In design group three, “Cleo” described the device she wanted as “thin, futuristic and compact”
- “Susie Q”, also from group three, explained that the actual product should be small, like a mini laptop. The screen should be “fun”. She wants it to be sleek and modern, silver or black.
- “Jazmine” from group four, reiterated that she envisioned her social TV remote to look like an iPhone. “Lina”, also from this session shared the desire for an “iPhone” like design.
- In group one, the entire group agreed that they desired a design that was “timeless, sleek and unobtrusive”. The entire group also repeatedly used the term “iPhone” for a large part of the design session.
- Another comment about an ideal device made by the group in session one was, “It must be thin, but strong enough to withstand falls and drops.”

While it is clear that Apple’s general aesthetic has been well received by consumers, it is important to remember the reasons why. Apple has done a good job defining what good-looking technology should look like today. Our research showed an overwhelming desire for attractive devices. And attractive technology today means sleek, small, thin and smart.



Examples of sleek and attractive social TV models

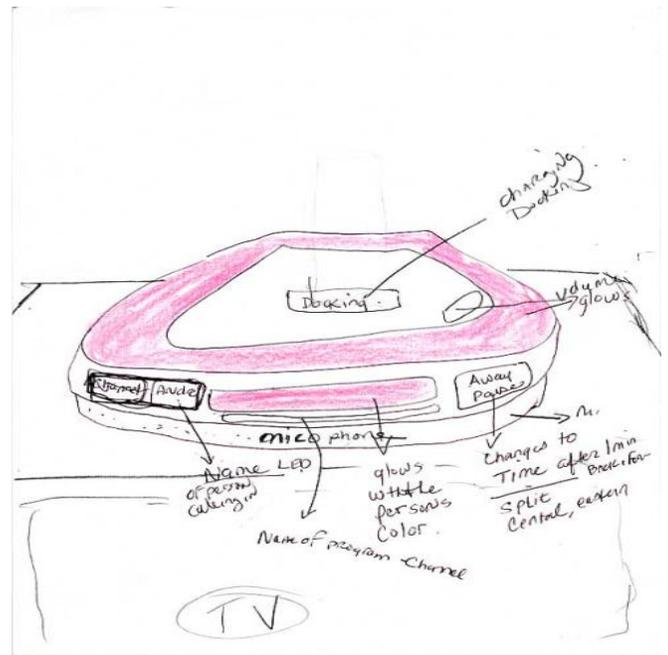
Aesthetics of the Ambient Devices

Besides the importance of the overall aesthetics and design of Social TV as a whole, there was a large concern over how the peripheral devices would be displayed and presented, including the ambient orb, microphone, speaker, and remote control. The majority of the research found that people did not have a desire for the peripherals to be displayed openly and for the most part, included them into one or two main devices. Therefore, we must be concerned about the ability of Social TV to be able to fit into a multitude of homes, and a multitude of home decors. With the large number of participants showing regard towards the peripheral and ambient devices in their designs, we must take consideration in the application of these ideas to product design.

There was an overwhelming dislike for the orb in nearly all of the participatory design sessions.

- In participatory design sessions one, four, and five, no one liked the orb.
- In group three one “DJ” liked the orb, and compared it to a lava lamp. While in group one there was comparison of the orb to something that was cool for a day, then put in the closet along with the lava lamp.
- Also in group three, one person sort of liked the orb, but the other two participants did not.
- In group two no strong feelings were expressed one way or the other towards the lava lamp.
- In group one there was concern over the children breaking it, the orb being distracting, and a sense of embarrassment if friends saw it.
- In groups two “Ms. New York” mentions the use of audio alerts that are not too annoying or maybe music in conjunction with the ambient visual element. This was also asserted by all group members in group one.
- In group four “Jason” says that the ambient lighting could be behind the television as a back light.

- Also in group four, “Lina” brings up the idea of the ambient device being in the shape of a plant that emitted a different song for each person on the buddy list. This is quite a distinct change from what most people wanted and suggest a much more involving device, as opposed to the minimalistic feel most others wanted from their ambient devices.



These models illustrate two different ways of incorporating the ambient devices into the Social TV system. The “ficus tree” (as its maker described it) on the left represents a style which allows for the ambient devices to be displayed much more openly and with less regard to “hiding” the system. The ambient devices were to be located in the branches of the ficus tree. We were struck by the playful aesthetic of the ficus tree, but it was relatively unusual. The image on the right represents a more popular idea of keeping the ambient devices concealed within the larger unit and creating a more subtle alert or indication of information. The pink bands represent ambient lights embedded on a docking station.

Design Implications

Placing Social TV in the Home Environment

When designing the Social TV devices, we must ask, “Which type of home are we designing for?”



or



??

Can you guess which of the following devices belong in each home?



Which place would you rather reside in? And which device would you rather own? Our research showed an overwhelming desire for option #2.

- Based on research findings, designers should attempt to create an attractive device that incorporates clean lines and emulates the general aesthetic seen in most modern technology today (touch screen, chrome/black/white finishes and symmetrical shapes)
- When designing the dimensions of the device, it will be important to remember that study participants repeatedly spoke of wanting a device that was small and unobtrusive.
- A wireless device would promote a “clean” look
- The device must be timeless and stylish. It should be an object of desire, worthy of eliciting envy from your friends.

Designing the Ambient Devices

- While there was some variation, the majority of participants wanted the ambient device to be concealed within another part of the Social TV device. This could either be in the head unit or the remote control or a combination of both.
- The inclusion of sound into the ambient alert would make it more easily recognized if there was not a separate orb. This also promotes the “clean” aesthetic, and sound could even be taken as far as replacing ambient light or lighting all together. Also the ability to use or not use sound depending on preference.
- As we have seen there is a large desire for personalization from the design groups. Therefore the sounds should be changeable.
- Combining the ambient devices together with other control pieces of Social TV would add to the overall sleek look, especially if the remote could be stored in the

head unit. This way there would be an appeal to both those who want everything compact and hidden and those who are not worried about, or prefer, having their devices on display.

12. *Keep It Simple by Marcela Musgrove*



Simplicity was a recurring theme in terms of both functionality and design. Usability and user-friendliness was a strong component of this as people wanted to be able to use their devices easily. Many had clearly experienced frustration with other devices or controls, some to the extent that they let another person in the household (typically a husband or child though we explore this stereotype further in the appendix) take control of remotes and appliances.

Greg mentioned he hated new remotes because there were too many buttons with too many functions and not everyone knew how to use the remote. He expressed an interest in a simple remote with easy to use functions (PD Session 1).

Mary Jane explained that since the TV in the living room has so many remotes, she finds it confusing and finds it very hard to learn. Her husband, who she describes as very adept and knowledgeable about all of the technology, knows how to control the TV in the living room so he helps her when he is present. But when he is gone and she wants easy access, she will she will occasionally watch cable or movies in the guest room as it is much easier to use (Interview 4).

On the other hand, people's prior experience with technology also served as positives for them to reference, particularly with the Iphone/Itouch line of products as examples where many features were presented in a simple format with easy touch access.

Maintenance was another element of simplicity. PD Session 1 felt that if they were paying for the service there shouldn't be access to the operating system and the devices should be serviceable by a third party like a cable repair man. Preferably there wouldn't even be a need for the technician to visit the home and maintenance could occur online without their intervention.

With respect to physical design, details were mentioned such as large wide buttons to make it easier for typing (PD Session 5) and tactile access which could make it possible to use their remote from their bed at night (PD Session 2). Accessibility was a concern since elderly might have trouble seeing text and would prefer a mic whereas texting would help deaf people (PD Session 4).

Indestructibility was another key concern related to physical design, especially with PD Session 1. Design requirement they suggested were that the remote be water proof and shock-proof, making it strong enough to withstand everyday use with occasional falls and drops since adults and children were always dropping the remote. Household pets accidentally jumping on items and knocking things over were a concern. Misplacing items was also a potential hazard so facilitating findability could be an added feature. Participants from PD Sessions 1 and 2 suggested a phone number or button to page the

remote (such as the feature in cordless phones) in case it got misplaced under furniture or in a different room.

Simplicity was also used in reference to having “all-in-one device” and consolidating objects such as one remote with buttons for each user or being able to use your phone earpiece or even the phone itself as part of the system. For instance, Mr. Fort Worth wanted an inclusive dock design: “I like simple, everything all-in-one, one big touch-screen with icons” (PD Session 2).

Of course, as was pointed out by usability expert Don Norman in *The Design of Everyday Things*, there is sometimes a conflict between usability and the desire for multi-function devices which will definitely be a consideration in the final design. This was expressed by one of our participants, Miss Muffet: “They keep saying this device will do everything and then the device fails.”

This overall theme was perhaps summarized by participant Miss Independent in PD session 5 with her statements: “Less is more” and “If you need a degree in rocket science to use it, then no one is going to buy it.”

13. Customizability by Marcela Musgrove



With the degree of diversity in people's preferences, it is inevitable that customizability was requested by many during design sessions. PD Session 5 was particularly keen on this, stressing the ability to choose what fits their household, letting the customer decide key features and having the option to turn features on and off. PD Session 4 all wanted to have personal settings for their profile or individual remote. Several groups wanted the ability to vary the aesthetics ranging from being able to update the look and feel through different interface backgrounds and font size (PD Session 1 and 3) to selling different lines similar to the MacBook.

Customizing could also serve very practical purposes. It could become a way to manage buddy signals by customizing colors and songs for buddies. Discussion around whether shared or individual remotes hinged partially on whether they could be customized. For instance Miss Independent in PD Session 5 suggested a shared remote that could be broken up and customized for each user. The argument for having individual remotes was that the need for personalization was so strong while using a cell phone as remote would make customization even easier.

Customizability will definitely have to be balanced with the need for simplicity and usability. The stereotypical example of VCRs blinking when their owners can't figure out how to program it stands as a warning. Even though some participants such as Cleo in PD Session 3 believes that time spent programming the device is necessary and understandable, usability testing will be necessary to make sure that the procedure is learnable to a wide audience, not just the self-described "tech-savvy".

APPENDICES



A. Marketing: Social TV as an Antidote to Loneliness by Nathan Hendrix



Introduction

The question of whether the Social TV network should be expanded to include an option for ‘social networking’—i.e., MySpace, Facebook, etc., came up primarily during PD Session 5 and Session 3 as it was mentioned by two participants named Diego and Susie Q. The Social TV system is expected to allow network connections to be made between families and friends, although the specific details of the technology were not given. This has given rise to a new perspective adopted by the participants of our class. As this new question of openness in the network emerges, two fundamental divisions are now created in the Social TV system. These divisions are as follows:

■ **Internal**

An internal network consisting of family and friends.

■ **External**

An open network intended for social networking.

The first division reflects a focus on a sort of intranet, where family and known-friends connect to one another to utilize Social TV’s features. The second division brings a new level of complexity, as it supposes a social networking service—which would most likely have to be developed and hosted by Motorola—that allows for strangers to meet and communicate. It is unknown whether Motorola intends to allow for such an open network, as the focus of the research for our class was to help design the three peripherals—microphone, ambient orb, and remote. However, the question posed does have marketing implications that no doubt tie into the overall picture. We will take a quick look at the interview and PD session examples that reflect the public’s interest in a social networking service.

Examples

- The participant Diego in Session 5 expressed a desire for social networking options to be built into Social TV. Diego was a young individual who lived with his sister who was around the same age. He elaborated on a search engine option that would find other individuals based on common interests. He even went as far as to mention the possibility of entire communities being able to view television programming together.
- In a response to a query about speaking to strangers in Session 5, Miss Muffet utilized an online video gaming analogy to explain how new friends can be made.

- In Session 3 Susie Q mentioned the option of a social TV channel equivalent to MySpace as a means to network with people.
- In the home interview with the Stewart family, the young son expressed a desire for a social networking option that would be analogous to the X-Box Live experience.

The rest of the home interviews and PDS sessions contain no further examples for social networking. A number of individuals expressed a desire for a closed network that did not allow for contact with anyone outside of the family/friends sphere—i.e., Lisa from home interview 3, Red from PD Session 5. However, the majority of individuals were neutral, as they expressed no desire either way. It should be noted that the interviewers in PD Session 5 inquired about speaking to strangers, and the conversation quickly turned apprehensive as the participants began discussing security issues.

Patterns

In light of this, no clear patterns really emerge from the data. For one, examples are limited to only two individuals. Also, the interviewers did not pose the question of social networking; instead it came up arbitrarily through one of the participants. If the question had been part of the interviewing curriculum, then more data may have emerged. However, as it stands, only 2 out of around 50 individuals mentioned the idea of a social networking service, which demonstrates a clear minority.

A few themes concerning this question do emerge.

- **Social Maturity:** The majority of interviewee's were settled individuals with established social networks—i.e., parents and grandparents, young and middle-aged couples. They displayed no desire for social networking. However, the two individuals that did express a desire for social networking were young and mobile; their social networks were transitory—i.e., Diego was single and moving to a new city, while the Stewart's son was living with his parents and still in school.
- **Separation:** Though no direct evidence from interviewee's supports this, members in PD Session 5 mentioned friends and family they knew that might like to use Social TV in a situation where they are separated from one another. This included individuals who were serving in the military overseas, living in retirement homes, hospitalized due to conditions, serving incarceration sentences, and so fourth. In this context, Social TV could help them connect with loved ones.

Now we will turn to design/marketing implications that can be drawn from the above data.

Design/Marketing Implications

- Social TV could be designed for both internal and external networking to broaden its potential customer-base. As two individuals expressed the desire for a social networking device, and since social networking in and of itself is highly popular among a wide range of individuals, the implementation of social networking in Social TV could possibly reach a demographic where it normally wouldn't otherwise. Expanding the customer-base is a sound move.
- A social networking service could be offered by Motorola Co., and marketed towards younger individuals. The X-Box Live service hosted by Microsoft has been extremely successful, and could prove to be a worthy example for Motorola to build from. The service allows X-Box owners to share gaming experiences together, with both friends/family and complete strangers.
- Motorola might want to conduct another study focusing on the question posed in this work, as it is extremely pertinent to the fundamental design of Social TV.

B. Lessons Learned For Participatory Design Sessions



Participatory Design Sessions

- It was easy to get people to participate in the process. Participants were generally enthusiastic and interested – in contrast to our fears beforehand that it would be hard to get them engaged!
- Comparison of the three design media we used: paper, Play-Doh, Legos:
 - Paper was ultimately the most useful for illustrating ideas, and for writing out descriptions of ideas
 - Play-Doh and Legos could be useful as a catalyst
 - Some participants were uncomfortable with Play-Doh and Legos, preferring to use only paper.
 - For some, the possibility of assigning meaning to different colors of Play-Doh was useful (for instance, the little green knob on each of their three designs had the same function – it was a mic or whatever)
 - Play-Doh doesn't dry well; we tested fridge and heat; use a different kind of modeling clay that hardens as it dries. Also with Play-Doh the components stop sticking to each other over time.
 - Legos were the hardest for people – maybe more limiting in terms of what you can do with it, maybe aesthetics too boxy; maybe too hard to reach into box.
 - Try Legos container with lower lip or dump Legos on table; try more complex Legos to generate more options for design
- Don't show the examples until after initial brainstorming; the danger is that participants may be too influenced if they see the designs at start; they really don't need examples to come up with their own
- Play music in background to set a relaxed mood
- Specifically ask people how would you share this device, why did you design it this way – need to refocus people from just talking about WHAT the device is
- Use 2 videocameras, and don't keep videocamera on tripod
- Make sure everyone talks, go around circle at the beginning and ask people for their views if they are quiet, manage others who are too chatty

Recruiting

- Be more careful to get people who have not done other kinds of studies like this; quite a few of the study participants (in both the interviews and the PDS) indicated that they regularly participated in such studies; in one PD session, 2 people even shared a ride to Denton; they both found out about study via Craig's List
 - Add a question in screener about when was the last time that the person participated in a study, and terminate anyone who says less than 3 years ago

- If time, call each participant; it is often possible to tell during a conversation if they have prior experience with such studies; they are too knowledgeable in certain ways (CW's experience)
- Be careful about contact information
 - Obtain alternate email addresses – several people said they didn't receive email messages
 - One person gave office phone but never checked it