Micah Alpern

Interaction Designer

Portfolio

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Consistency

Visibility

Navigation

Feedback

Before I design an interface I like to understand the user's goals, motivations, and desires. A central tenet of Human Computer Interaction (HCI) is that "the user is not like me." In fact, for many products the interface has to serve multiple market segments simultaneously. By understanding the goals of each constituent I'm able to make informed decisions about difficult design trade-offs.

I have diverse interface design experience. I've worked on web interfaces, product design, desktop applications, kiosks, speech and gesture interfaces. What I've found is that many of the same design principles apply across modalities. This is because they're driven not by technology but by the strengths and limitations of human memory and cognition.

I'm looking for an opportunity as an interface designer where I can use my interaction design skills to create applications that users will love to use.

iWave

a car gesture interface to control navigation and entertainment

iWave

General Motors came to us with the following challenge:

Create an innovative human-car interface that incorporates human-like, low-impedance interaction styles, like gestures, to support information or entertainment goals without compromising safety.

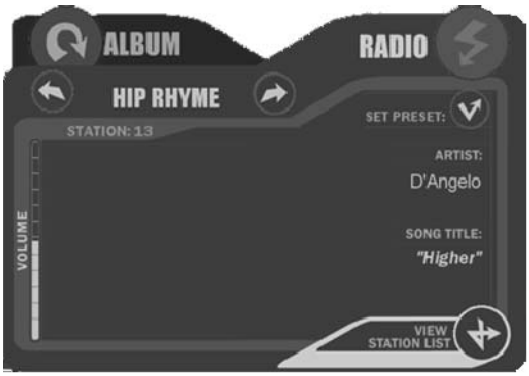
This was a difficult task:

Current gesture recognition systems are very limited.

We had to find a way to design and test a gesture interface before the technology was ready.

After extensive fieldwork and literature review we began designing **a gesture based car navigation and entertainment system**.

Entertainment



Entertainment

Displays the currently playing song

Browse stations
Go to favorite stations
Change the volume

Pick an album
Pick a song

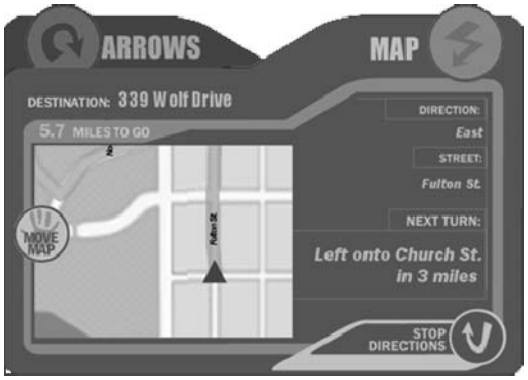
Navigation

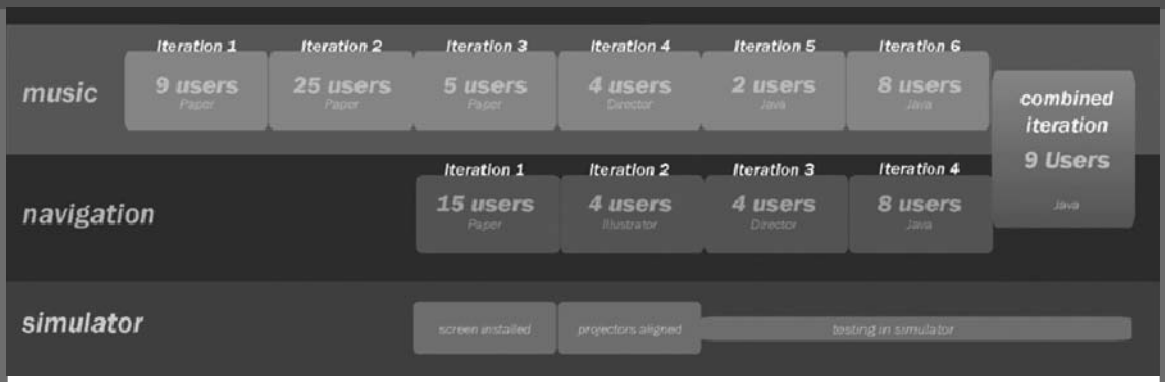
Get Directions:

- To a named location
  e.g., Pittsburgh Airport
- Based on recent destinations
- Using a street address
- Destination found in City Guide

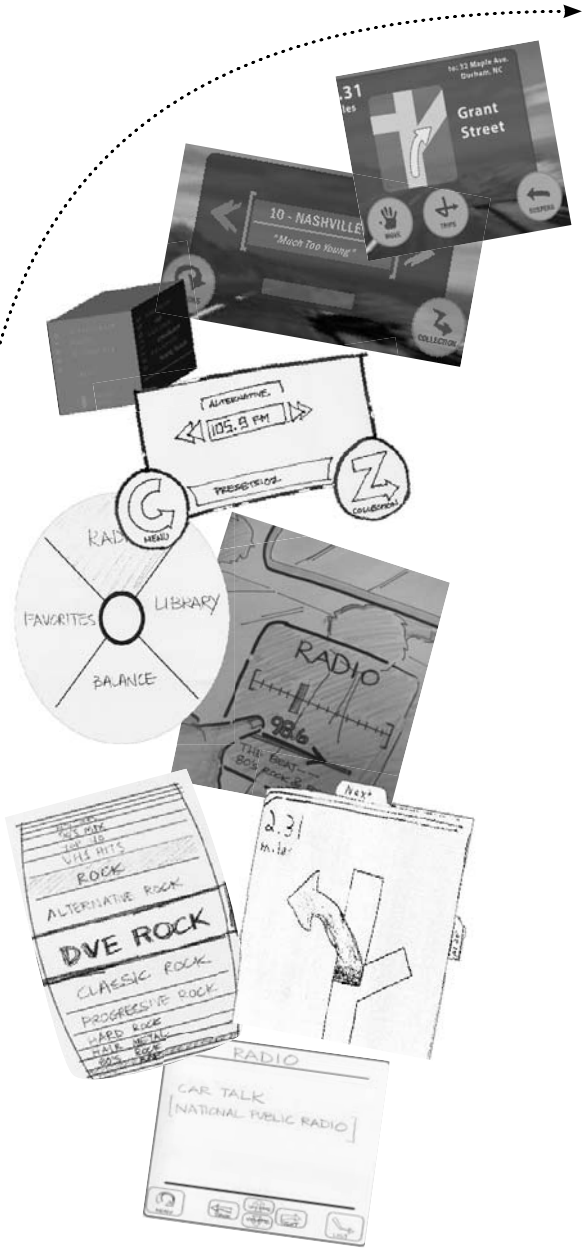
Follow Directions:

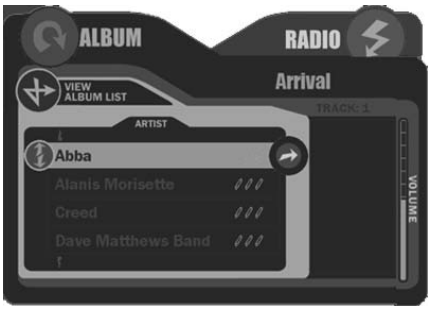
- On a map
- Turn by turn





Iterative Design & Testing

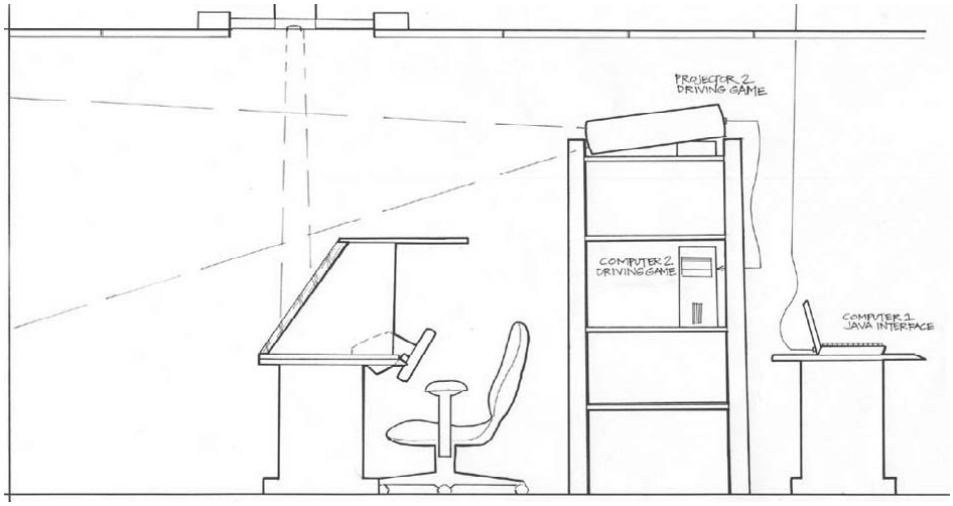




In three months, the interface underwent **twelve design iterations** with over ninety user tests. The prototypes began on paper, and then moved to static mockups, interactive demos, and finally a Java prototype in a driving simulator.

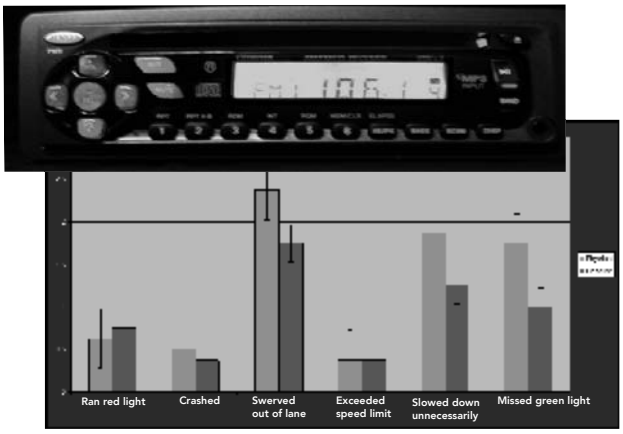
User Testing in the Simulator

Users were asked to perform several benchmark tasks while driving. We measured their performance against objective variables (e.g., number of crashes), user problems we observed, and driver feedback.

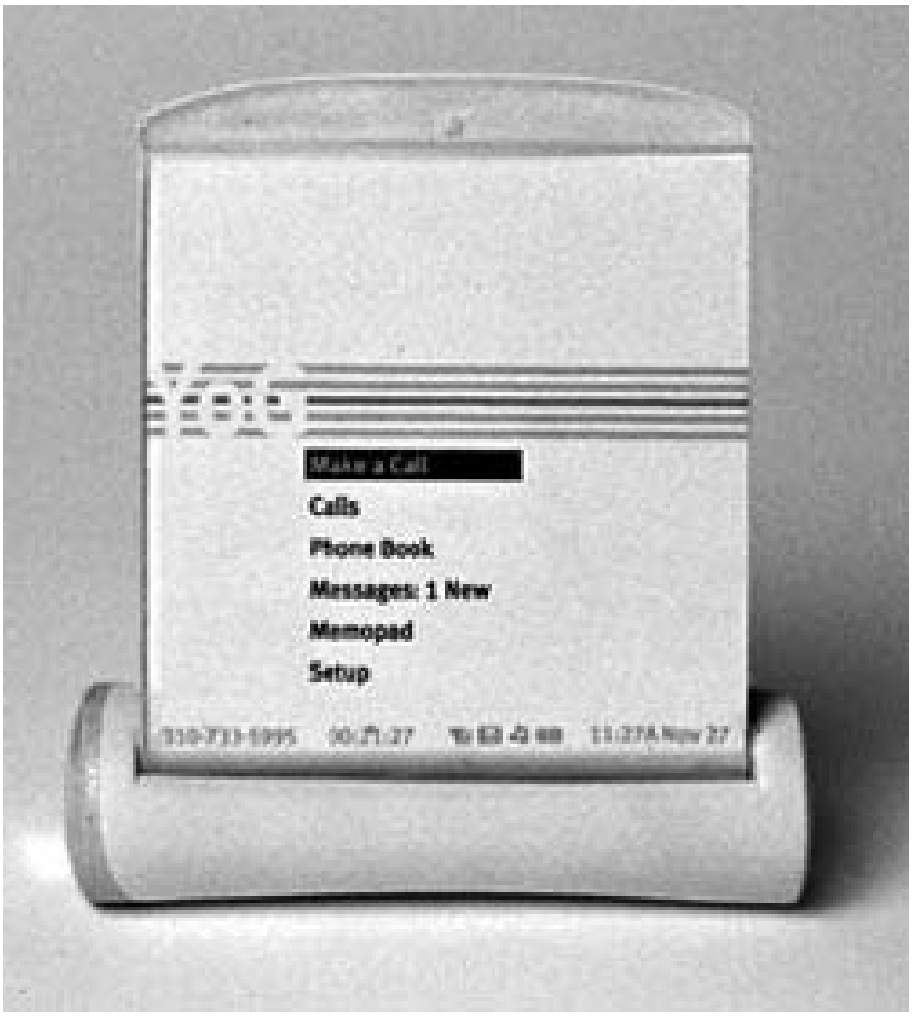


Gesture vs. Traditional Radio

In a controlled comparison of benchmark tasks the gesture interface (red bars) performed as well or better than the traditional interface (blue bars). Further, many users preferred the new gesture interface.



"[I] don't have to reach and touch anything. I could be less precise [with gestures]."



YoG

a 3G mobile communications device for the deaf

YoG

The majority of products for the deaf and hearing impaired are built on the assumption that English is the users' native language and that the goal of the communications device should be to send the text of the conversation (Text Telephones (TTYs), pagers, etc.).

However, for many deaf people their first language is **American Sign Language (ASL)**. For them communicating in English requires an awkward translation. ASL is not simply a different encoding of English. The grammatic structure of ASL, although as rich as English, is different. Many deaf people would prefer to communicate via their native language of ASL.

YoG is a communications device that is optimized for sign language and allows deaf users to **communicate at a distance as easily as the hearing can with a cell phone.**

When together, deaf people can communicate easily

Remote contact is a challenge

Current assistive devices use text

English is their second language

American Sign Language (ASL)

Sender

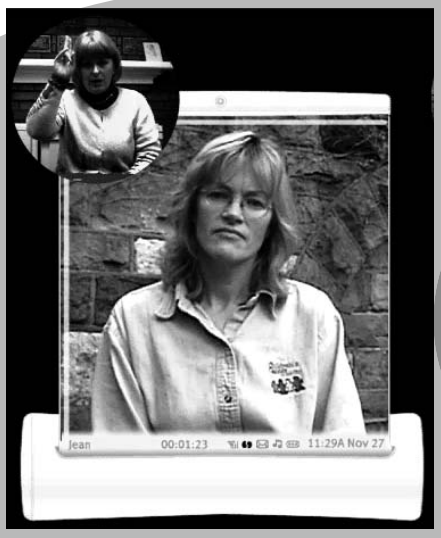
It's Thanksgiving weekend and Pam wants to talk to her sister Jean about her family's celebration.

Pam is hard of hearing
Jean is deaf
Both speak ASL

To speed dial Pam gestures, "YoG, Jean call"

Pam's YoG connects to Jean's. Pam makes sure she fits within the positioning window.

Jean's automated greeting is playing on Pam's YoG while she sets up her device.



Now both Pam and Jean can see each other.

Receiver

Jean's walking down the street when YoG vibrates to get her attention. She stops and looks down at the small screen. She decides to take the call.

Jean presses the green button indicating that she's going to take the call. Her YoG is sending out an automated greeting while she sets up her device.

Jean pulls on the screen and sets it down. Then she gestures YoG, I'm ready.

They start talking about their Thanksgiving.

A Nokia video phone that won't work for deaf users because it requires a hand to hold

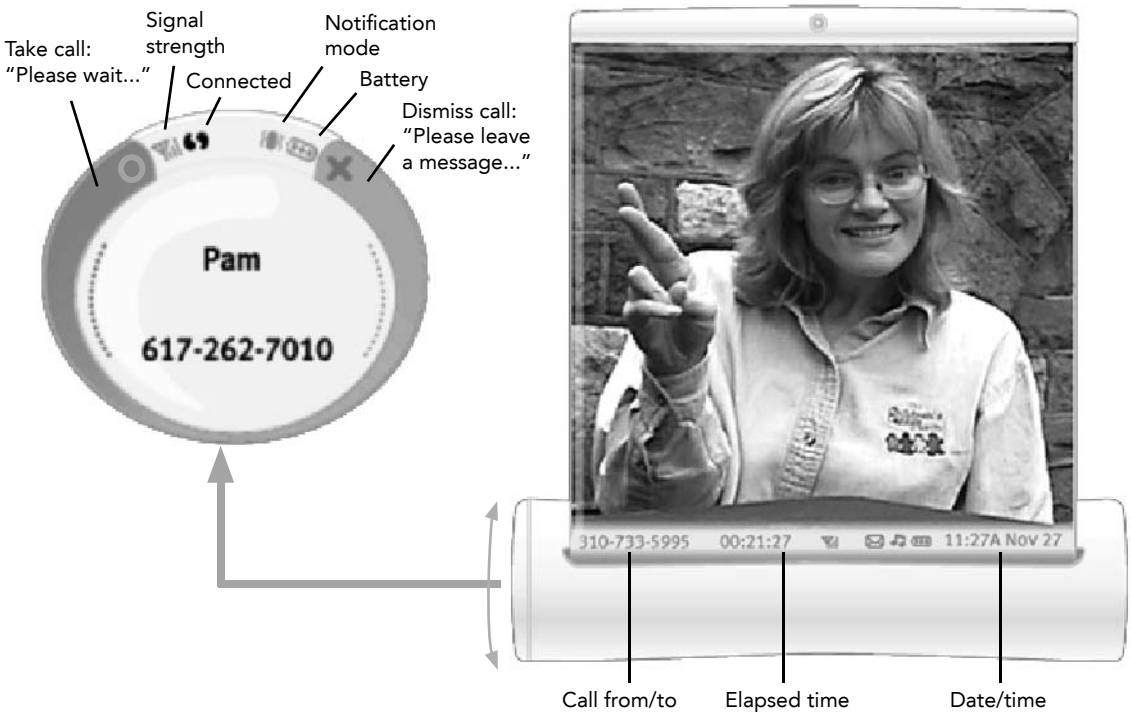
"Signing with one hand is like trying to talk with your mouth full"

- deaf user

Why Video?

ASL is a rich and expressive language involving more than finger position. Sign meaning is a function of the speaker's arms, body, and facial expression as well as the speed and intensity of the sign. **Hand position alone would not be sufficient** to naturally communicate the range and subtlety of meaning.

Instead YoG provides face to face communication that allows two deaf people to speak naturally to one another.



Market Analysis

Too many devices/parts

Not readily compatible

Antiquated

Alienating

Product Opportunity

	Local	Remote
Deaf to Hearing	Interpreter Writing Lip reading	Relay service Pager Chat
Deaf to Deaf	ASL Currently well-achieved	TTY Pager Chat No support for ASL ---> YoG

Voice and text only

No mobile devices

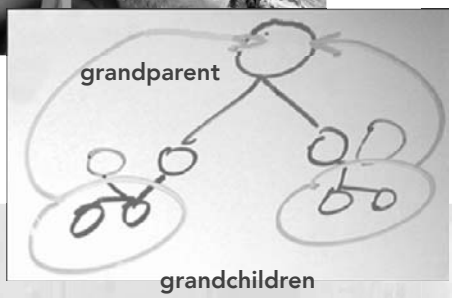
for ASL users

HiBear

Enhancing Family Connections

HiBear

The challenge was to design an electronic device that would improve the lives of the elderly. The main problem we addressed was the elderly's sense of social isolation.



Design Rationale

The elderly often feel lonely

The elderly don't like feeling feeble or "taken care of"

The elderly typically have a lot of free time

Their adult children often don't have enough time for their parents

But their grandchildren do have a lot of free time

No system can change how busy other people are

So the goal of the system should be to connect those with free time

Design Goals

Be an **emotional conduit** between grandparent and grandchildren

Increase **quality of life** -- through strengthened family bonds

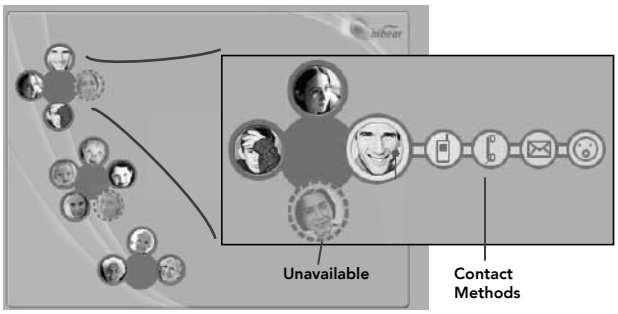
Functionality

Family Presence & Communication

On a single screen the HiBear operator, child or elder, can communicate with friends or family. People are clustered into "**bear paws**" representing a family or social group.

If someone is unavailable to communicate, their image appears grayed out.

If a person's picture is pressed, a list of available communications options is displayed (cell phone, email, work phone). As the elderly person gets older, the interface can be simplified to use the default method.

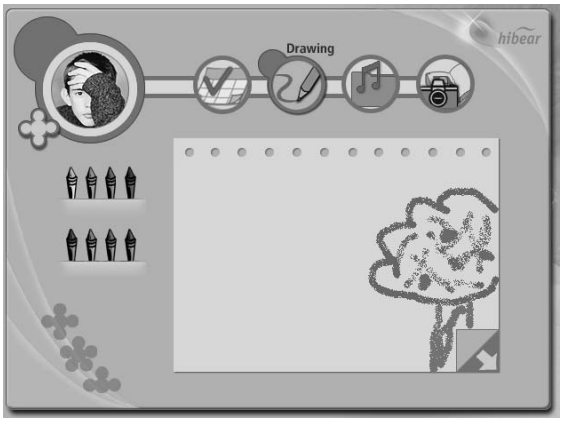


Camera & Photo Album

HiBear has a camera located in its eyes and a photo album that can display all the images sent by the grandchildren.

A picture is taken by tugging on the bear's ear.

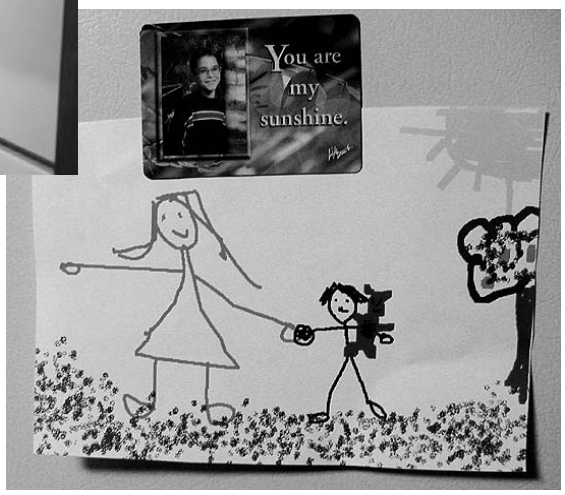
Children can also send audio recordings using the built-in microphone in HiBear's hand.



Drawing

The HiBear has an interactive drawing element that allows both the grandparent and the grandchild to draw at the same time. To draw, a person simply selects a crayon by tapping on it.

HiBear, bringing families together



MobileBus

a mobile service to discover when the next bus is arriving

MobileBus

MobileBus reduces the hassle of mass transit by making arrival and departure times easier to monitor and predict.

Traffic, weather, and mechanical breakdowns can all cause unforeseen variations in published bus schedules. By placing GPS locators on each vehicle the distance and arrival time to each stop can be predicted. This information is valuable to bus operators and passengers.

Mass transit passengers can use a speech or mobile Internet interface to look up arrival/departure times and set departure reminders. With this information passengers can take better control of their schedules and limit their time waiting outside, exposed to inclement weather.

Eliminate wait time

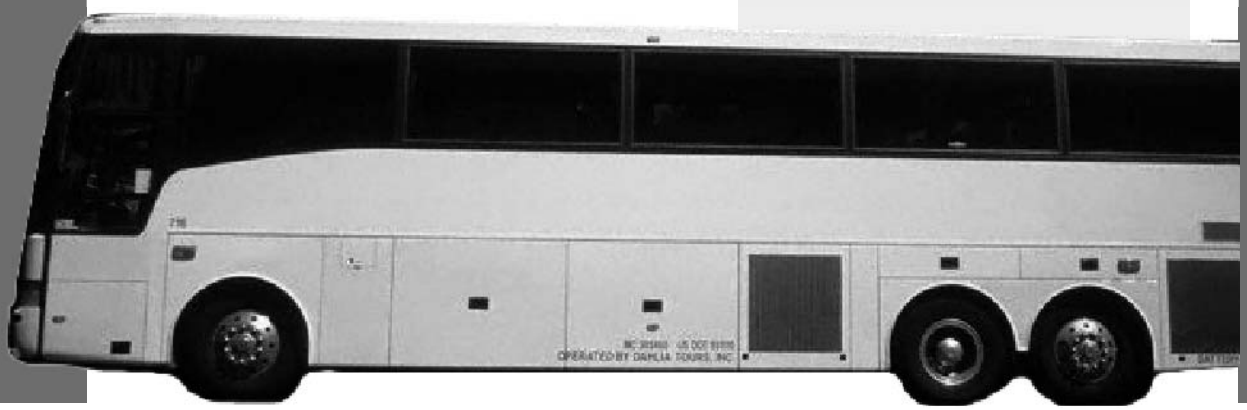
Lessen exposure to weather & crime

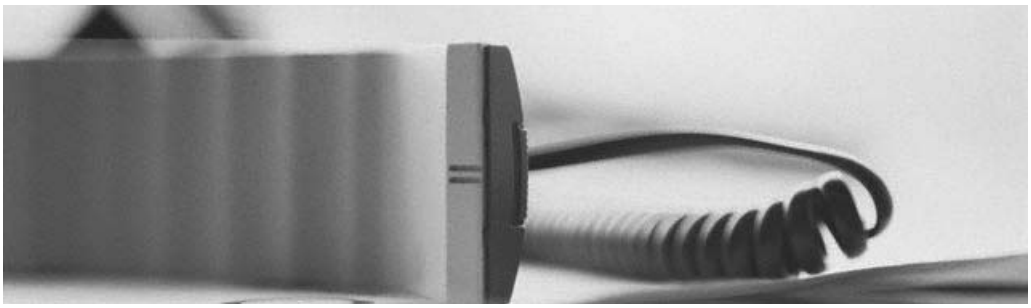
Provide real-time fleet data

Visual Interface (WAP)

User tested with paper prototypes to

- Refine nomenclature
- Minimize user input
- Reduce complexity
- Gauge customer expectations
- Identify key features





Speech Interface (VoiceXML)

Used Wizard of Oz prototyping to

- Refine the prompts
- Minimize memory strain
- Clarify task flow
- Reduce out of vocabulary errors
- Shorten the interaction
- Minimize user input

a sample call

[horn honk earcon]
System:"Welcome to MobileBus"

System: "Say the name of your stop or hold on for Hobart and Murray"

System: "Hobart and Murray. Are you riding toward Pittsburgh or away?"

Caller: "Towards Pittsburgh."

System: "Here are the next few buses that will arrive at Hobart and Murray on their way into town:

The 61c will arrive in about two minutes. The 59u will be here in around six minutes. The 71a will arrive in about ten minutes.

To set a reminder or hear additional arrival times for the 61c, 59u, or 71a, say the bus number."

For passengers

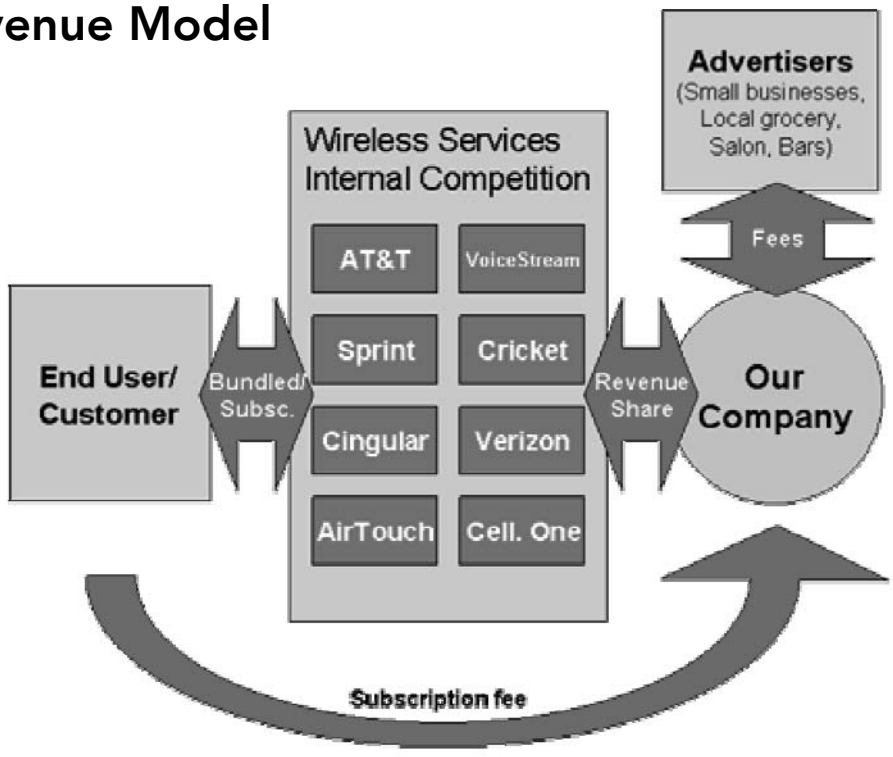
Reduce the frustration associated with public transit

Dramatically lessen exposure to weather and crime

Increase personal control over arrival and departure times

Send an alert when a bus is approaching your home or office

Revenue Model



For transit managers

Provide real-time information on fleet status

Improve planning and logistics

Increase customer satisfaction by keeping them informed as events occur

Increase passenger perception of on-time performance and overall reliability

Financial Projections

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	240,000	960,000	1,920,000	2,400,000	2,880,000
Operating Costs	994,920	1,035,080	1,081,960	1,115,400	1,148,840
Gross Profit	-754,920	-75,080	838,040	1,284,600	1,731,160
Assets	1,170,000	1,170,000	1,170,000	1,170,000	1,170,000
Debt	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000

Annual Operating Cost Breakdown

Utilities	4,800	4,800	4,800	4,800	4,800
Phone	1,800	1,800	1,800	1,800	1,800
Office Expense	3,600	3,600	3,600	3,600	3,600
Manager	260,000	260,000	260,000	260,000	260,000
Rent	30,000	30,000	30,000	30,000	30,000
Equipment leases	12,000	12,000	12,000	12,000	12,000
Taxes	3,120	12,480	24,960	31,200	37,440
Insurance	2,400	9,600	19,200	24,000	28,800
Advertising	100,000	120,000	140,000	160,000	180,000
Telecom (GPRS)	576,000	576,000	576,000	576,000	576,000
Miscellaneous	1,200	4,800	9,600	12,000	14,400
TOTAL	**994,920**	**1,035,080**	**1,081,960**	**1,115,400**	**1,148,840**

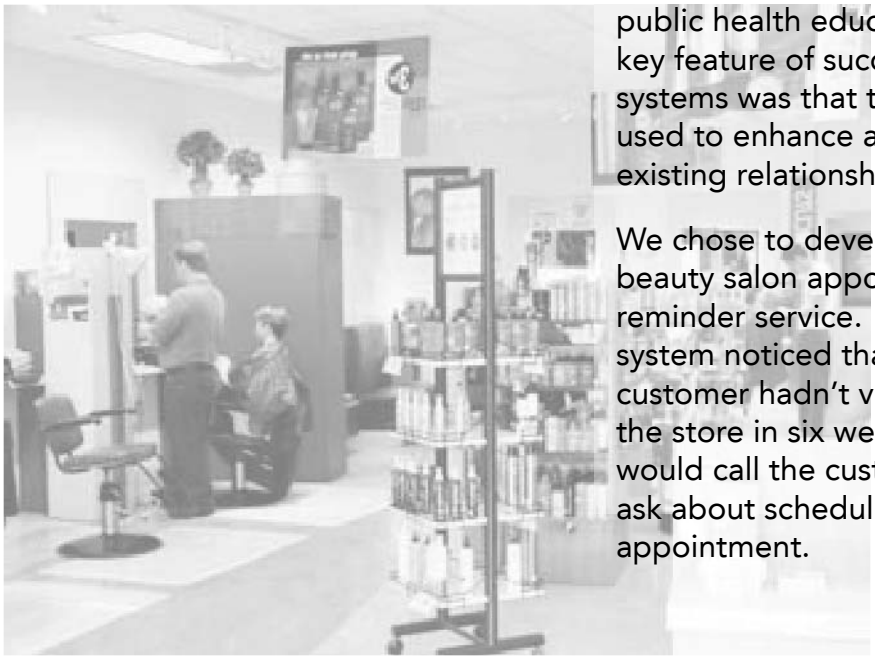
Hair Salon Reminder Service

A system initiated phone-based beauty salon reminder service

Hair Salon Reminder Service

A large number of interactive voice response systems (IVR) have been created that people can call to get information. We created the Hair Salon Reminder Service to explore the idea that a system which needed information could initiate a call itself.

We reviewed existing computer initiated voice applications, including medical prescription reminders, counseling, and public health education. A key feature of successful systems was that they were used to enhance a pre-existing relationship.



We chose to develop a beauty salon appointment reminder service. If the system noticed that a customer hadn't visited the store in six weeks, it would call the customer to ask about scheduling an appointment.

Speech User Interface

Design Process

Understand the product domain

- Interview receptionists at both low-cost and high-end hair salons
- Understand their brand and differentiating factors

Write scenarios for the primary tasks

Complete the dialog tree

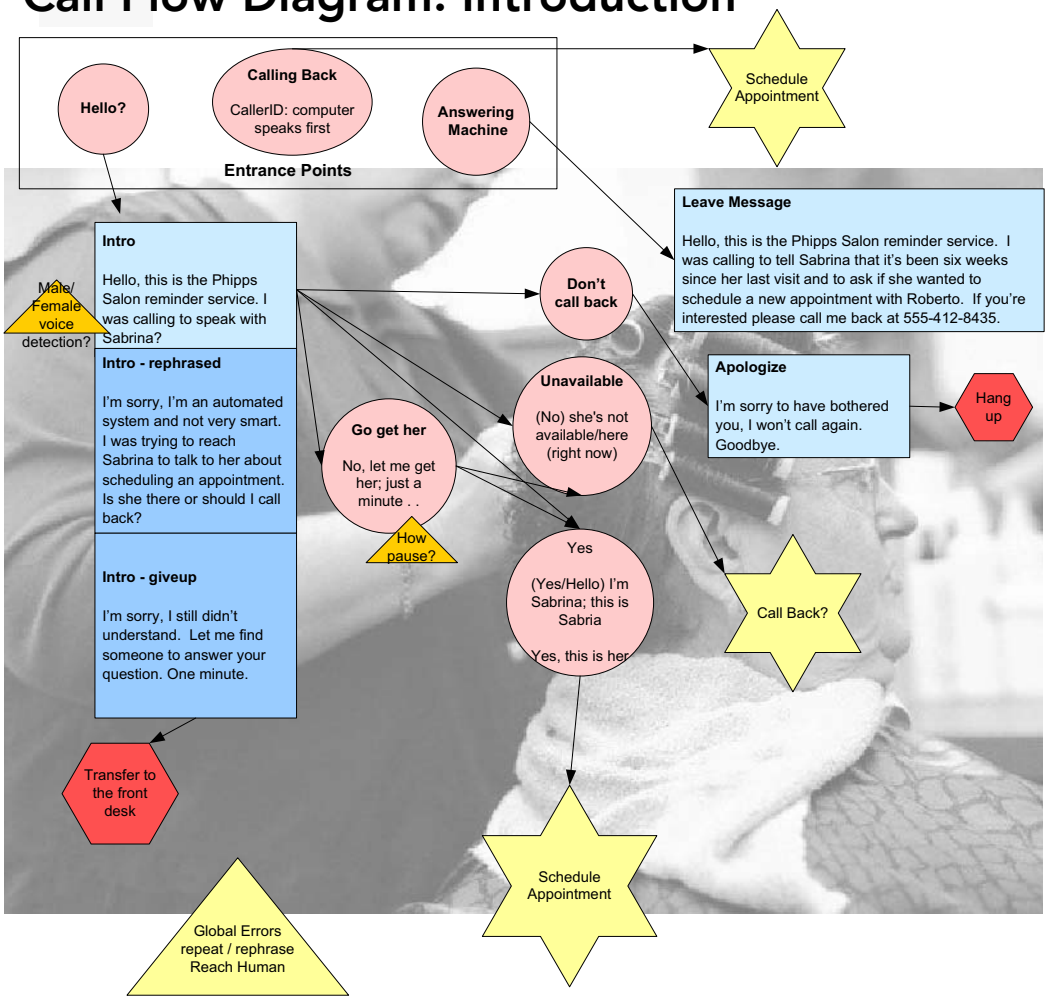
Cast voice talent and provide proper direction

Implementation

a partial prototype was constructed with

a beta version of Microsoft Speech.NET

Call Flow Diagram: Introduction



Speech User Interface Testing Process

User test a sample dialog via Wizard of Oz to

- Identify problems in the flow
- Discover out-of vocabulary errors

User test the working system in a controlled environment

When usability goals are met in the lab, deploy and monitor the call logs

This project was only taken to a prototype stage

Call Flow Diagram: Schedule Appointment