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# Interaction Design Test

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Visibell MessagePhone

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Submitted By: Alex Tam

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## Table of Contents

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INTERACTION DESIGN TEST .....	3
ANALYSIS.....	4
SOMEONE TO DESIGN FOR.....	6
DESIGN – OVERALL LAYOUT.....	7
DESIGN - REVIEWING MESSAGES.....	9
DESIGN - DIRECTORY .....	12
DESIGN – AWAY UNTIL .....	13
DESIGN - MULTIPLE CALLS.....	15
DESIGN - DEFERRED CALL.....	17
MORE EXPERTISE REQUIRED.....	19
“IDEAL SOLUTION” .....	19
APPENDIX - ADDITIONAL SCREENS.....	20

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## Interaction Design Test

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A new, hypothetical client, VisiBell, has asked for your design help. Their engineering department has developed a smart telephone that incorporates a visual interface for managing voice mail. The interface is displayed on a built-in, 4- by 5-inch, color LCD screen with a resolution of 96 dpi, similar to that of a high-resolution computer monitor. VisiBell's marketing department has christened the new product the MessagePhone. However, the product team is unclear about the actual design of the MessagePhone — many of their best ideas remain the subject of heated arguments in the hallways of VisiBell. To resolve this problem, VisiBell has contracted you to provide a comprehensive product design for the MessagePhone. Assume you will be working with a third-party industrial design firm for hardware design and that visual designers will be responsible for the final graphic treatment of the MessagePhone's interface. You get the really tough job, though: actually designing the product, most of which is software. You also have control over hardware.

**Objective** Create a believable, compelling design for the MessagePhone. We're most interested in your conceptual design decisions and how they affect the interaction and interface design of the product. Include only as much detail as you feel necessary to convey your ideas; however, keep in mind we are not looking for a specifications list. Provide enough illustration and written description of your design, in whatever medium you are comfortable, to get your point across. Remember, visual and industrial designers will be responsible for the final aesthetic appearance of the MessagePhone - finished art is not necessary.

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## Analysis

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### A place for voicemail

There are many different communication mediums in common use today and each one has qualities and weaknesses that make it more suited to specific types of information.

Common communication mediums:

Medium	Usage
Face to face	The richest personal medium – often requires scheduling
Phones/cellphones	Personal dialogue – largely impromptu – some scheduling can be involved – less context
Walkie-Talkie	Personal broadcast - an implied dialogue is already open
Text messengers	Less personal, less formal, intermittent burst communications
Email	Impersonal – one way information delivery – often broadcast to multiple people

“Voicemail is, at it’s essence a, necessary response to the failed attempt at trying to start an impromptu personal dialogue.”

There are two scenarios where voicemail is most useful. While you are next to your phone, it is a way of managing interruptions. And, while you are away from your phone, it is a way of leaving behind a personal presence that can provide context about you for people who are trying to reach you.

### Managing Disruptions

People often work better when they are engaged and focused on their tasks. The phone is an interruption. Sometimes it is undesirable to “disengage” from the task at hand. One of voicemail’s strengths is that it can shift time. It is used to take an “attempt to communicate” and screen it, shift it, or defer it to a more appropriate time.

Along the same lines, voicemail can in some cases force a normal dialogue into a one way message. This type of communication then becomes parallel and redundant to an email message. And, email, in many cases, would be more appropriate for this.

### Leaving context behind

There is a common practice for some people to change their voicemail message everyday. This daily message makes the message more personal and provides a virtual presence. More importantly, perhaps, is that it usually provides more details about their day to provide a context for people who are calling them. Many of these users also keep meticulous notes in their digital organizers to manage their time. Much of this “context” management is a duplication of effort.

## Problem - Serial processing

The biggest limitation of current voicemail systems is that it asks the user to process information in a linear, serial, approach. The power of using a visual medium to present information is that the humans can process astonishing amounts of information visually and in parallel. By shifting much of the presentation of information to a visual medium, the information can be processed faster and with much more context.

## Problem – Redundant messages

In many cases, the message is redundant or irrelevant because it simply says. "I want to have a conversation. Call me back." By registering a call with caller ID, much of that information is already recorded and therefore redundant. One of the real challenges is how to manage that impromptu attempt at a call and how to make it easy to review and respond to these attempts.

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## Someone to design for

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Name: Margaret Chalmers

Age: 36

Role: Client Service Manager

Company: Abbot and Johnston Consulting

Goals: Stay on top of things and stay informed. Keep everyone on the same page.

Quote: "It is very difficult to read tone and attitude over email, I prefer the phone"

Quote: "I never want to hear the words 'There was a miscommunication'."

Margaret is responsible for keeping the clients more than happy and providing her own team of consultants ultra informed with the most relevant information. She coordinates communications and information between her teams and the client stakeholders and always keeps an eye out for new opportunities.

Even though Margaret has a desk at the office where she likes to make calls, she spends a large chunk of her time in meetings either in meeting rooms at the office or on-site with the clients.

Margaret spends most of her time talking to people, mapping out the political and corporate landscape, keeping track of projects, drumming up new business from existing clients and finding new clients. It is very important for Margaret to stay informed and timing is often very important. She needs the information at her fingertips so that she can respond even faster.

Margaret would rather talk to people than communicate over email. Voicemail is often a necessity due to her busy work and travel schedule. She often has many people trying to get a hold of her at the same time so she needs to stay on top of communications. While she's traveling, she wants to be as accessible as possible so she can stay in the loop.

## Design – Overall Layout



Physical layout of the face of MessagePhone

## Physical layout

The phone layout comprises a handset, standard phone keys, a touch screen, buttons, volume dial, and a shuttle dial. The message button also contains a light so that it can double as “New Calls” notification. The volume dial is an analog dial. LEDs to the left of the dial provide visual feedback for the volume level.

The physical layout of the phone has the touch screen at a higher angle of 45 degrees so that the screen can be viewed comfortably while either sitting or standing. The handset rests across the top of the phone above the screen to minimize the phone footprint on the desk.

## Shuttle Dial

The shuttle dial, labeled “select” on the interface, is the primary navigation control for the interface. The dial is an analog dial with detents to provide Margaret with tactile feedback. The dial is also meant to be depressed as a selection command. Coupled with the corresponding back button, this allows the Margaret to navigate forward and backward through the application. Changes in background and foreground colors indicate changes in the range of selection and the selection cursor.

## Modes and Events

The design approach uses two primary modes of Messages and Directory accessed by the buttons on the right. Entries in these two modes are controlled by the primary shuttle dial through turning and depressing the dial. Additional contextual commands are provided on the on-screen touch screen. Further more, event-based dialogs are used to address different events and in some cases will leave behind a visual reminder of a status or pending event.

## Subject as the identifier

All callers are prompted for a subject before they deliver a longer message. This allows Margaret to triage her messages. As well, in some cases the subject of the message will be the only thing that the callers leave behind. Message phone also uses automated voice transcription technology to transcribe the subjects so that Margaret can visually look at multiple messages in parallel to get a sense of all of her messages at once.

## Voicemail script

MessagePhone uses a text-to-voice engine that alters the outgoing messages based the context that Margaret has decided to leave behind for her callers. Margaret can also pre-record all of the scripted messages with her own voice to give it a personal touch.

## Context based speakerphone switch

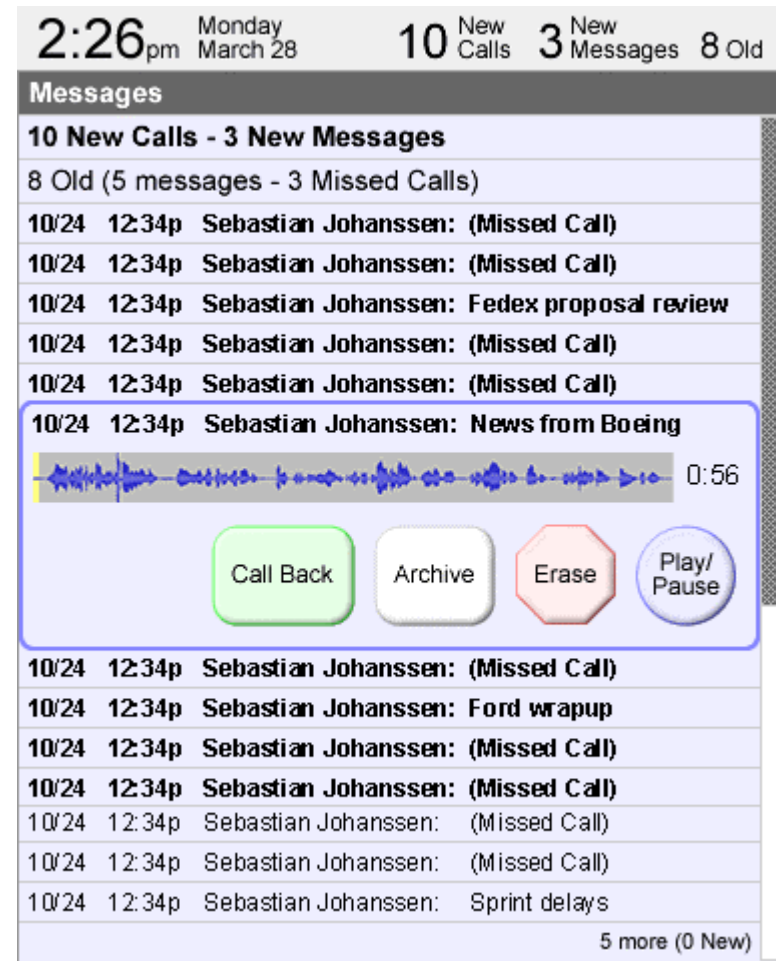
The speakerphone activates based on the context of use in the system. For example when Margaret sees a subject that is of a confidential nature she can pick up the handset. This automatically turns off the speakerphone.

## Design - Reviewing Messages

Reviewing messages uses a zoomed scrolling approach. Scrolling through the list of messages with the shuttle dial “zooms” into the individual messages or a group item to provide more detail and contextually relevant controls. The zooming uses subtle animation to show Margaret which list item is closing and which is opening.



New Calls



Scrolling to an individual message

## Scenario – Checking messages

It's noon on a Wednesday and Margaret is away at a client site for some meetings. At her desk, in her office, the phone flashes but doesn't ring. It's Sally from purchasing calling about client gifts that have arrived.

*Voicemail: You've reached Margaret Chalmers, I'm away at a client site and will be unavailable by phone before 1pm today"*

*Voicemail: Please state a brief subject for your call*

*Sally: Client gifts are in.*

*Voicemail: I've kept a record of a call from "Sally Jessop". If you'd like to leave a more detailed message, please do so now.*

Sally doesn't really have anything to add to the message so she just hangs up.

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At 1 o'clock, Margaret returns to her desk from the offsite meeting. She has a meeting to debrief her project manager soon so she stops by to check some of her messages.

Knowing that she doesn't have much time, she presses. [Play subjects] on the screen in the [New Calls] dialog while she checks her email. Once playback is selected, the blue background on the screen over all the messages shifts to show only a blue background on the [New messages] dialog. The phone begins to dictate.

*Voicemail: James stone, 11:25, missed call.*

*Voicemail: Sally Jessup, 12:14, (Sally's voice) Client gifts are in.*

*Voicemail: Sebastian Johansson, 12:30, message, (Sebastian's Voice) News from Boeing,*

Interested to hear what Sebastian had to say, Margaret presses down the shuttle dial to pause the playback, then hits the [Back] button below the shuttle dial to allow her to select from the full list again. The blue background returns to the full list of messages.

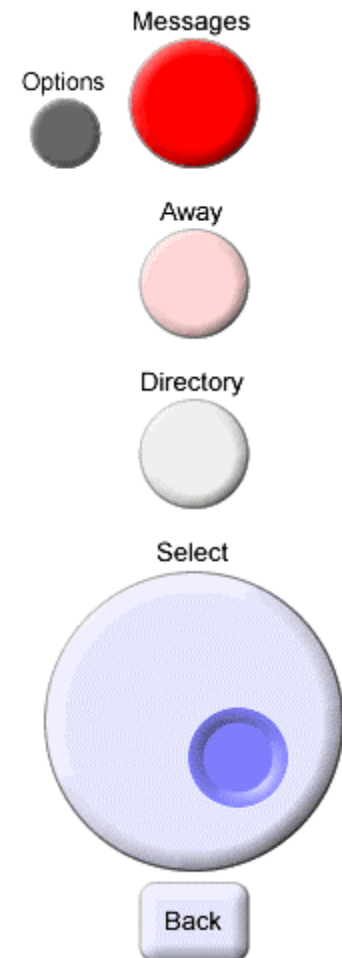
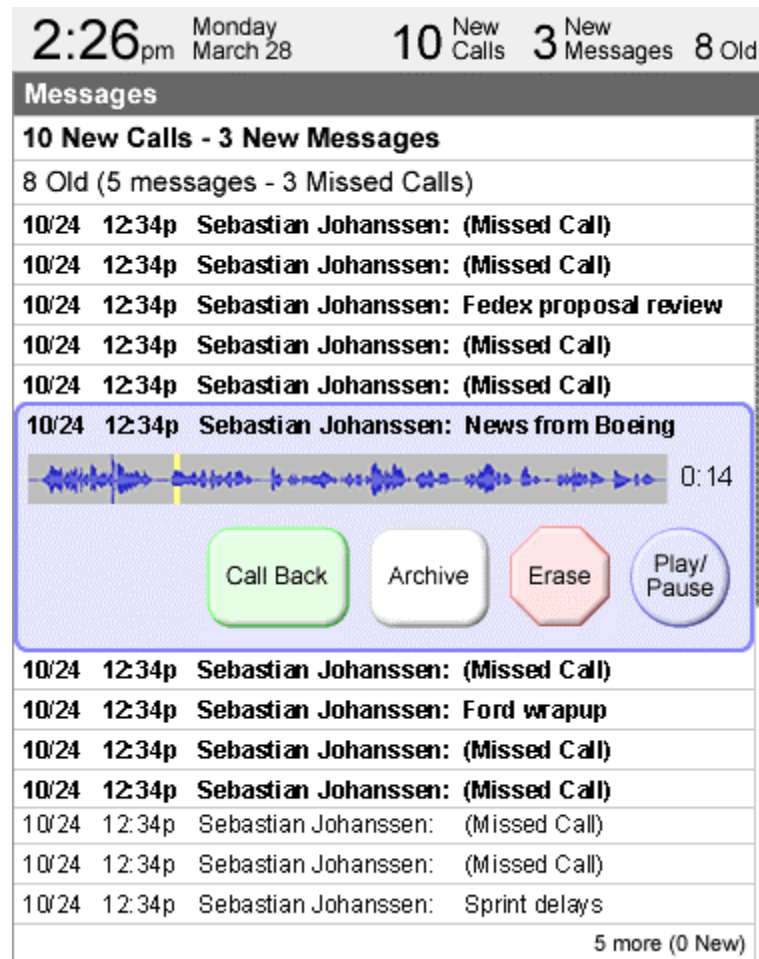
As she turns the shuttle dial, a simple animation shows the [New Calls] collapsing and the [Old] dialog expanding. She continues to turn the dial until she reaches the message from Sebastian, then presses the dial again to start playing the message.

Sebastian was asking Margaret for some numbers and also relaying a contract they won from Boeing. A bit distracted, Margaret turns the shuttle dial backwards to move the time cursor back and replay part of the message that she missed. The voice spectrum display provides some visual clue about how far she needs to go back as she can guess at where sentences start from gaps in the spectrum.

After hearing the message, Margaret presses [Call back] on the screen and the phone begins to dial Sebastian number. She then gives Sebastian the information he needs and quickly congratulates him. After their conversation, she presses erase on the screen to delete the message.

Looking to continue reviewing her messages, Margaret presses the back button and then scrolls back up to [New Calls] the number of new messages has decreased. She presses [Play/Pause] which plays out the rest of her messages in full.

After listening to all her messages and erasing most of them. Margaret decides that she wants to file away some of the messages. She scrolls to the [Old] line and presses [Archive] on the screen. All the remaining old entries are exported to her Microsoft Outlook on her computer. Her messages are now empty.



Individual message playback

## Design - Directory

MessagePhone's directory is pulled directly from Margaret's Microsoft Exchange server. The list is updated based on updates to her address books in Outlook. Entries are selected by using the shuttle dial.

2:26 pm	Monday March 28	10	New Calls	3	New Messages	8	Old
<b>Directory</b>							
A	B	C	D	E	F	G	H I J K L M N O P Q R S T U V W X Y Z
Alan Cooper	(123) 888-2345 x 234	<b>cooper</b>					
Bill Gates	(123) 888-2345 x 234	<b>Microsoft</b>					
Fred Smith	(123) 888-2345 x 234	<b>FedEx.</b>					
Tom Kelley	(123) 888-2345 x 234	<b>IDEO</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
24 more							

Directory List – Selecting Letter

2:26 pm	Monday March 28	10	New Calls	3	New Messages	8	Old
<b>Directory</b>							
A	B	C	D	E	F	G	H I J K L M N O P Q R S T U V W X Y Z
Alan Cooper	(123) 888-2345 x 234	<b>cooper</b>					
Bill Gates	(123) 888-2345 x 234	<b>Microsoft</b>					
Fred Smith	(123) 888-2345 x 234	<b>FedEx.</b>					
Tom Kelley	(123) 888-2345 x 234	<b>IDEO</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Victor Anybody	(123) 888-2345 x 234	<b>SBC</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
Vincent Somebody	(123) 888-2345 x 234	<b>ACME</b>					
24 more							

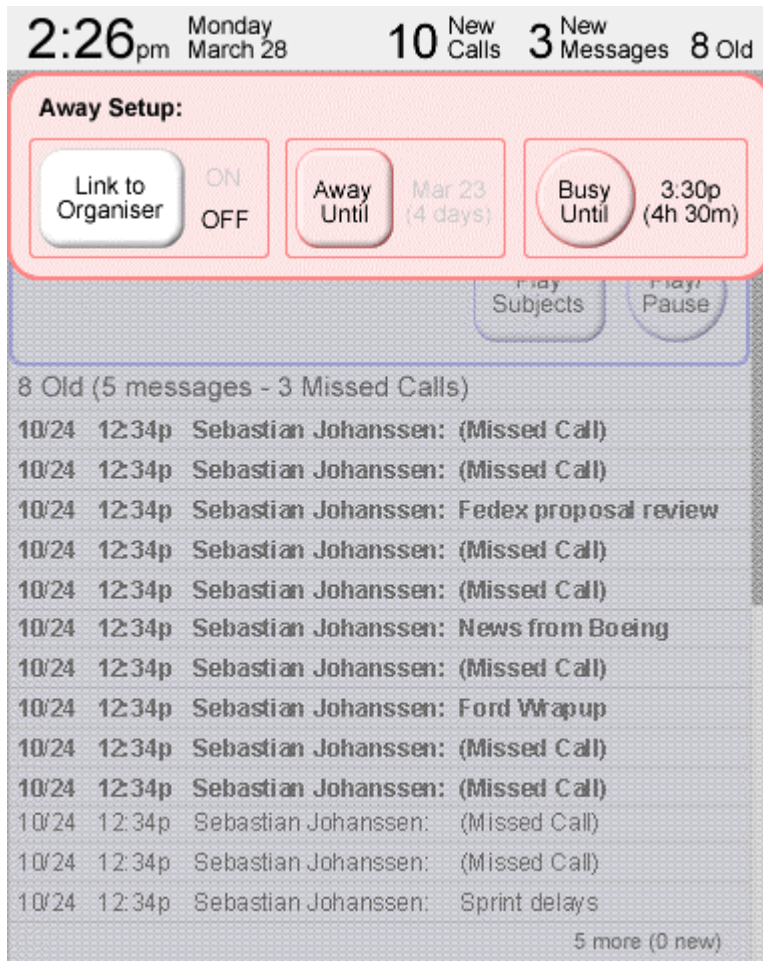
Directory List – Selecting Name

### Scenario – Calling from the directory

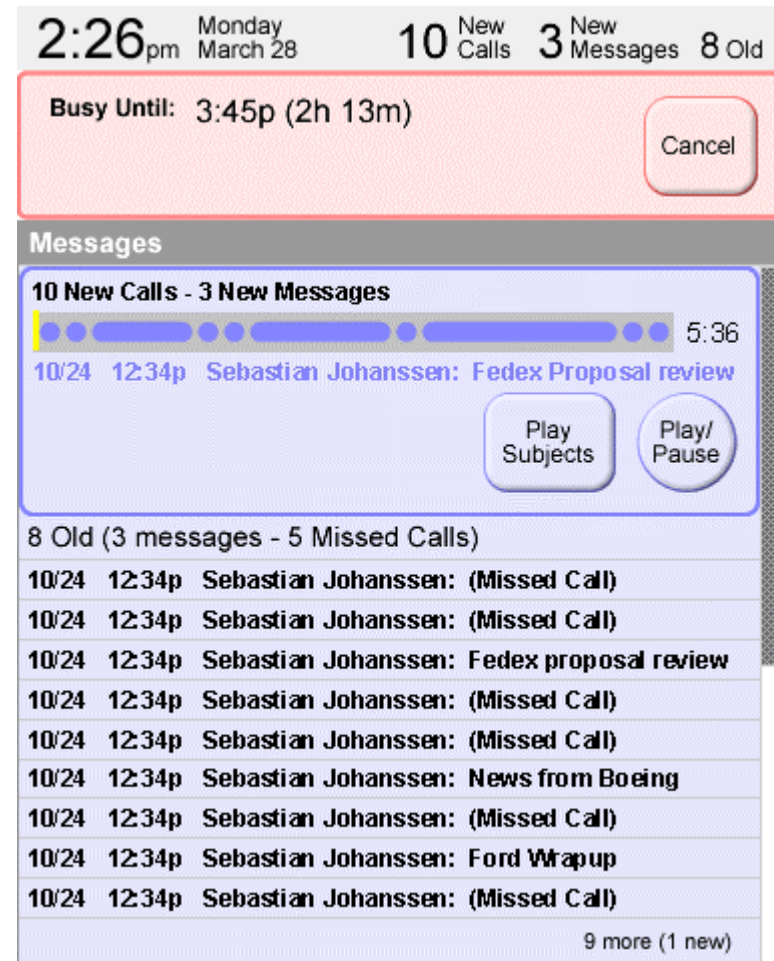
Margaret wants to give Paul, her project manager a call to see if they can start the meeting earlier. She presses the [Directory] button then scrolls to [P] and presses the shuttle dial, the blue background switches from the letters at the top to the list of names. Scrolling the dial again, Margaret selects Paul's name and presses it to call him about the meeting.

## Design – Away until

Voicemail is a tool that is used to manage both time and distractions. Margaret can use this to leave messages that communicate “Away until May 2” or “Busy until 4:00”. This provides context for callers that are trying to get a hold of Margaret. A further option is to link her voicemail to her Outlook calendar and provide even more detailed context about her whereabouts. In an advanced setup, Margaret can decide the level of detail that is communicated.



Away setup



Away indicator to show phone will not ring

## Scenario – No interruptions

Meeting with Paul earlier means a meeting in Margaret's own office for lack of available meeting spaces. To make sure they are not disturbed, Margaret presses the [Away] button and then scrolls the dial to 3:45 to let people calling know she will not be available by phone before that time in case they wanted to connect with her. Pressing the dial again closes the away screen and leaves a bar at the top of her screen saying "Busy until 3:45". She's been known to say "Phone tag is so unproductive and a big waste of time".

During her meeting with Paul, the screen on Margaret's phone flashes with a new caller, Jake, but it doesn't ring. Jake hears the message.

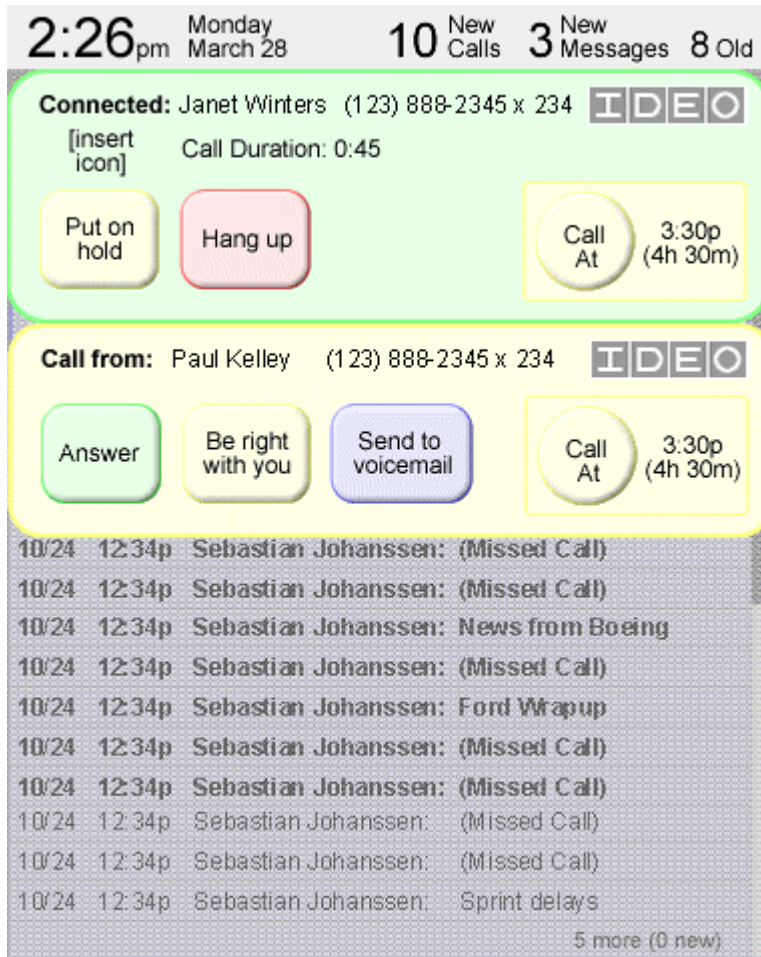
*Voicemail: I'm in the office today but won't be available by phone until after 3:45pm.*

Jake decides not to leave a message and just hangs up.

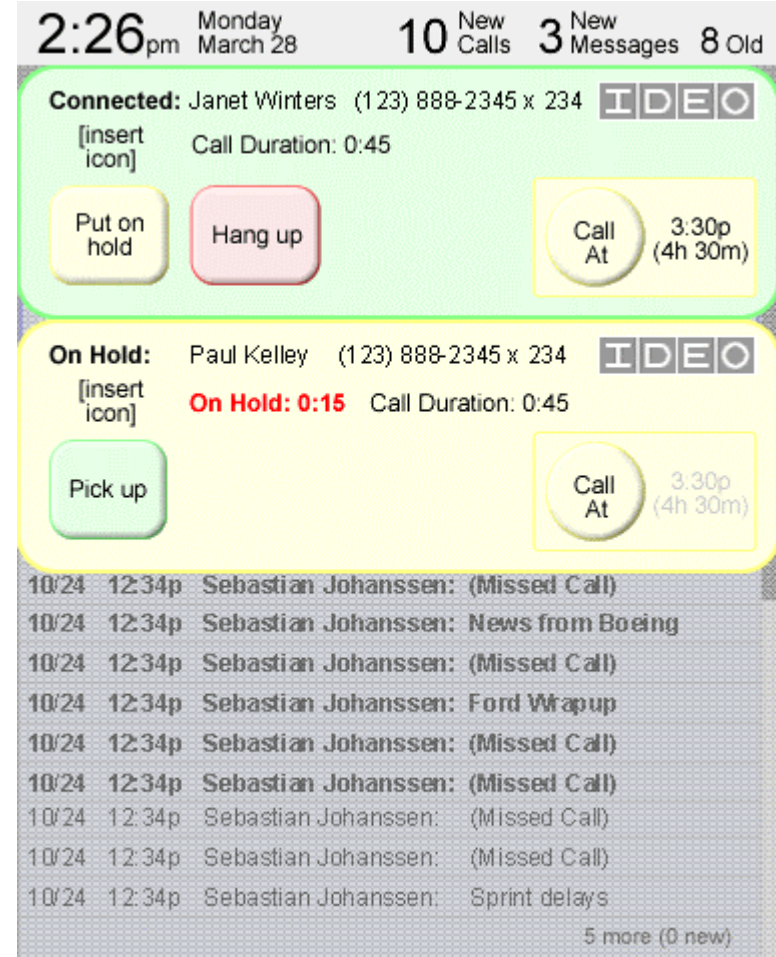
Her meeting was productive and ends right on time. When Paul, her project manager leaves, Margaret looks over to her phone. The [Busy until] bar disappears right at 3:45 and automatically turns the ringer back on in her phone. Jake, who tried to call Margaret earlier, calls again at 4:00 and is able to connect with her this time.

## Design - Multiple Calls

In normal face to face communication, one serendipitous encounter with someone passing by, who would like to talk to you, could have a higher priority over the current conversation already ongoing. In those cases, one conversation can end while the other is beginning in a very seamless fashion. This has not been the case in phone conversations. Call waiting is a powerful tool but not commonly used in business. "Be right with you" helps facilitate the transition between two conversations.



A second incoming call



Finishing with the current caller

### Scenario – Transitioning between conversations

As Margaret walks into her office the next day, she takes a deep breath because she knows it's going to be one of those days. Distractions today would not be welcome.

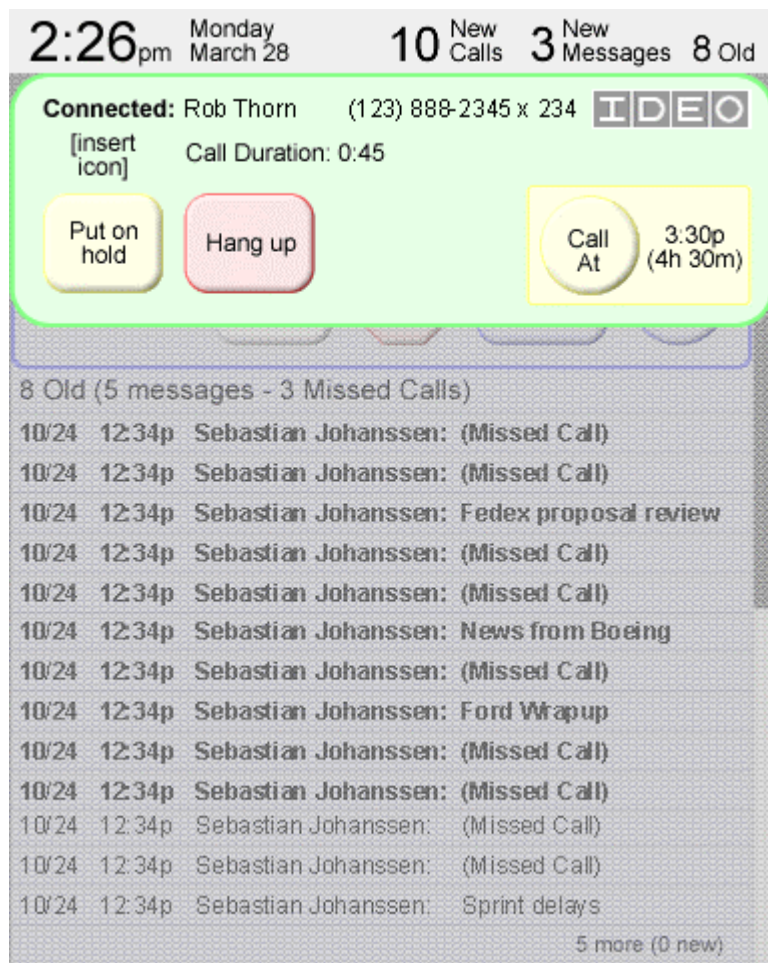
The first thing she does is call Janet, one of the clients, to give her a quick update on the projects that are ongoing. Towards the end of her call, a call comes in from Paul. Margaret needs to make sure she speaks to Paul before a team meeting this morning so she presses the [Be right with you] button on the screen. This connects the call and puts Paul on hold. A timer instantly shows up on the screen indicating how much time Paul has been waiting on the phone. On Paul's end, he hears a pre-recorded message from Margaret saying:

*Voicemail: Hi, I'd like to take this call. Give me a moment to finish off what I'm doing and I'll be right with you.*

Margaret tells Janet she's finished and that they'll catch up in tomorrow's update meeting. She then presses [Hang up] on Janet's call and then [Pick up] on Paul's call to start that conversation.

## Design - Deferred Call

Margaret lives in a world filled with interruptions. She's juggling multiple demands on her time and has to stay on top of everything. Sometimes when Margaret starts digging into a new project she gets completely absorbed and focused. She loves it. However, when there are disruptions, it breaks her focus. She needs to address the interruption and then somehow find her focus again. Deferring a call allows Margaret to shift an interruption to more appropriate time so that she can remain focused.



Picked up call



Deferred call time reminder

### Scenario – Deferring an interruption

Later on that day, Margaret is going over details for a new client. The work seems really promising and there is so much information to go through. As she's deep into some numbers, a call comes in from Rob, one of the team leads on the new project.

As Margaret begins to respond, she stops herself and says to Rob. "You know what, why don't I go over these numbers first and then we can have a more informed discussion. How about I call you around 4:00?" Rob agrees and Margaret presses the [Call at] button on her screen turns the shuttle dial to 4:00 and then presses it to confirm her selection. A [deferred] bar appears on Margaret's phone reminding her to call Rob at 4:00. With that distraction gone and that connection made, she now dives back into her work.

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## More expertise required

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The design that has been presented thus far is a framework for the interaction design of the MessagePhone for Visibell. There remain many details to add finish to the product before the design can be considered complete.

Some outstanding issues:

1. User testing would undoubtedly reveal insights into the success of the design. Iteration would be invaluable.
2. Icons and graphics should be created to support the text and visual design.
3. The zoomed scrolling animation in messages needs to be tuned to provide clear feedback and an efficient interaction.
4. The detent distances on the jog dial need to be flushed out to make it easy to scroll through intermittent items.
5. Audio cues for much of the functionality of the phone can be developed to provide extra feedback and currency.
6. This design automated much of the context information provided by the outgoing message that callers hear. Although not a common activity, recording personal messages can be provided under through the [Options] button. This interface needs to be worked out.
7. Remote Access can be provided by allowing users to dial into their message services as is common practice today. Once the access has been authenticated, Margaret should be allowed to see her message and directory interface from any Visibell MessagePhone in the company.
8. This design only provides a basic layout for the physical design. A proper industrial design effort is required for form finish.

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## "Ideal solution"

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Some of the most interesting new products have come about from focusing on users and ideal design rather than technological limitations. This design is no different in that respect. In order to realize the design, some technological barriers may need to be stretched or even broken.

1. Better text to voice engine: The design requires a powerful text to voice engine to provide callers with clear context in a natural dialogue minimize the sense that the caller is talking to a machine.
2. Automatic voice transcription: The design asks for highly accurate automatic voice transcription for the subject lines. Although, even an imperfect system will still give Margaret some context about the message.
3. Linking an organizer to a phone system: The interface between MessagePhone and products like a Microsoft Exchange server allow for richer context delivery; turning a desktop phone into a dynamic interactive voice response system. This interface connection is also critical for the directory functionality.

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## Appendix - Additional Screens

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### Away Setup

**Away Setup:**

<input type="button" value="Link to&lt;br/&gt;Organiser"/>	ON OFF	<input type="button" value="Away&lt;br/&gt;Until"/>	Mar 23 (4 days)	<input type="button" value="Busy&lt;br/&gt;Until"/>	3:30p (4h 30m)
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### Busy until state

**Busy Until:** 3:45p (2h 13m)

### Away until State

**Away Until:** March 31 (4 days)  
Status: Travelling to New York

New messages review

**10 New Calls - 3 New Messages**

5:36

10/24 12:34p Sebastian Johanssen: Fedex Proposal review

Play Subjects Play/Pause

Old messages review

**8 Old (5 Messages - 3 Missed Calls)**

2:12

10/24 12:34p Sebastian Johanssen: Fedex Proposal review

Archive All Erase All Play Subjects Play/Pause

Individual message review

**10/24 12:34p Sebastian Johanssen: News from Boeing**

0:14

Call Back Archive Erase Play/Pause

Missed call review

**10/24 12:34p Sebastian Johanssen - (Missed Call)**

Call Back Archive Erase Play

Subject only review

**10/24 12:34p Sebastian Johanssen - Fedex Proposal Revision**

Call Back Archive Erase Play/Pause

Incoming Call

**Call from:** Rob Kelley (123) 888-2345 x 234 **IDEO**

Answer Be right with you Send to voicemail

Call At 3:30p (4h 30m)

Connected call

**Connected:** Rob Thorn (123) 888-2345 x 234 **IDEO**

[insert icon] Call Duration: 0:45

Put on hold Hang up

Call At 3:30p (4h 30m)

Person on Hold

**On Hold:** Paul Kelley (123) 888-2345 x 234 **IDEO**

[insert icon] **On Hold: 0:15** Call Duration: 0:45

Pick up

Call At 3:30p (4h 30m)

Calling out

**Calling:** Tom Kelley (123) 888-2345 x 234 **IDEO**

Call At 3:30p (4h 30m)

Deferred call

**Deferred:** Tom Kelley (123) 888-2345 x 234

3:45p (2h 13m)

Call Back Cancel