Today’s Program

• Types of Spoken Output
• Opening Greetings
• Prompt Design
• Interrogative Prompts
• Implied Prompts
• Feedback
• Instructions
• Help
## Types of Spoken Output

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<th>Type</th>
<th>Function</th>
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<td>Prompt</td>
<td>Indicates it is time for user input, and thus serves as a turn-taking cue</td>
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<td>Feedback</td>
<td>Presents the app state that results from user input, allowing the user to compare original intent with result</td>
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<td>Instructions</td>
<td>Provide information about operating the user interface or understanding the task</td>
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<td>Help</td>
<td>Help instructions often adopt a separate mode or state aimed at coaching the user</td>
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<tr>
<td>App Data</td>
<td>Information presented to the user as part of the task: eg weather, stock information, flight times</td>
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Opening Greetings

- Let the user know they are interacting with a computer.
- Identify the system immediately.
- An audio logo makes an excellent greeting.
Opening Greetings

- Users should know that they are not talking to a real person.
  - Avoid: Supreme, Incorporated. May I help you?
    Welcome to Supreme.
  - Use: Welcome to the Supreme speech recognition system.
    You have reached Supreme’s automated travel system.
Prompts

• Prompts are the turn-taking cues within spoken dialogs.
• Prompts have two purposes:
  – cause the user to speak,
  – convey to the user what may be spoken (optionally).
• Prompts should be as distinguishable as possible from
  – instructions
  – feedback, and
  – help.
• Prompts fall along a continuum from implicit to explicit.
Implicit versus Explicit Prompts

• Computer 1: Welcome to ABC Bank. What would you like to do?
• Computer 2: Welcome to ABC Bank. You can check an account balance, transfer funds, or pay a bill. What would you like to do?
• Computer 3: Welcome to ABC Bank. You can check an account balance, transfer funds, or pay a bill. Say one of the following choices: check balance, transfer funds, or pay bills.
Considerations when Recording Prompts

• People tend to perceive male voices as more authoritative
  — "... a male voice is recommended in an emergency situation"
  [Ameritech Phone-based User Interface Guidelines]
• Users often perceive female voices as 'the operator'.
• Some studies report male voices as more intelligible.
• In one study the male voice had slight edge (52%) over female voice for paying bills.
• In the same study the female voice is the choice for transactions such as holiday bookings (82%) and buying tickets (64%).
Considerations when Recording Prompts

- Consider using different voices to signal different modes.
- Consider using different voices for different languages.
- Consider creating a duality:
  - Female Voice: Please select one of the following:
  - Male Voice: News … Sports … Weather
  - Caller: Sports, please
  - Female Voice: Today's sports: …
Synthesized versus Recorded Spoken Output

- Use recorded speech whenever possible.
- Use synthesized speech for unbounded information:
  - yellow and white pages
  - encyclopedia read-back
  - rapidly changing information
  - electronic mail.
- Avoid synthesis for single isolated words.
Timing

• Minimise time between end of prompt and beginning of recognition.
• Trim prompts aggressively if barge-in is not in use.
• Communicate errors quickly.
Voice, Person, Tense and Mood

• Use active voice.
  – Avoid: Your account number is requested.
  – Use: Please enter your account number.

• Use second person.
  – Avoid: The user should now say the name she wants.
  – Use: Please say the name you want.

• Use present tense.
  – Avoid: You will be asked for your ID number.
  – Use: At the tone, please say your ID number.
Voice, Person, Tense and Mood

• Avoid Subjunctive Mood.
  – Avoid: You could …
    Should the city name be incorrect, you may back-up by saying 'Cancel'.
  – Use: You can …
    If the city name is wrong, say 'Cancel'.
Prompt Design

• Make prompts short.
• Precede prompts with instructions.
  Computer: Your plan requires that you select a PIN to use the system. The PIN must be between 5 and 9 digits in length. At the tone, please say your PIN.
• Repeat only the prompt.
  Computer: Sorry, I didn’t understand that. At the tone, please say your PIN.
Prompt Design

• Put key information immediately before expected user speech:
  – if using barge-in, put key information at a phrase boundary,
  – if not using barge-in, put key information before the tone.
Yes/No Interrogative Prompts

• Use interrogative form.

  Avoid: If this is correct please say 'yes' now.
  For another transaction, say 'yes'.
  If you want a quote on BHP, say 'yes'. Otherwise, say 'no'.

  Use: Is this correct?
  Do you want another transaction?
  Did you say BHP?
Yes/No Interrogative Prompts

• Include the verb.
  Avoid: Correct?
  Use: Is this correct?
  The second form evokes 'yes' and 'no' more reliably.

• Reserve imperative form for recovery.
  Use: For more quotations, say 'yes' now.
    Please answer 'yes' or 'no'.
Yes/No Interrogative Prompts

• Avoid compound questions.
  
  Avoid: Are you travelling alone and will you need a rental car? Are the name and address correct?
  
  Use: Is this correct?

• Avoid ambiguous questions.
  
  Avoid: Do you want to cancel or change your order?
  
  Use: To process your order, say one of the following: Confirm ... Cancel ... Change ...
Yes/No Interrogative Prompts

• The way a prompt is spoken may affect how the user responds:
• For example:
  – Are you a member or a provider?  
    may elicit a response of 'yes' while
  – Are you a member? Or a provider?  
    may elicit either the words 'yes', 'no', 'member' or 'provider' as a response.
Other Interrogative Prompts

• Use the interrogative for constrained numeric data.
  Avoid: Please state the selling price now.
  Speak the number of shares you want to buy.
  Use: Sell at what price?
  How many shares?
Other Interrogative Prompts

• Avoid the interrogative for unconstrained data.
  
  Avoid: When were you born?
  What is your age?
  
  Use: Please provide the following personal information.
  The year that you were born?
  The month?
  The day?

• The top two questions tend to evoke responses such as:
  'I was born …' or 'I’m … years old'

• Better: 'July 28th' or 'in 1959'
Implied Interrogative Prompts

• Drop the verb when the interrogative is implied.

  Avoid: What is the security you want quoted?
         What is your PIN?

  Use:   Security?
         PIN?
Implied Interrogative Prompts

- Use short nouns for implied interrogatives.
  
  **Avoid:**  
  What is the name of the fund?  
  What is the name of the person you want to call?  
  What command would you like to perform?  
  
  **Use:**  
  Fund name?  
  Name?  
  Command?

- Use implied interrogatives with recorded speech output only.

- Single words are at least discriminable with speech synthesis.
Verbatim Prompts and Data Prompts

- Verbatim prompts.
  Computer: Say 'At the market'

- Data prompts are aimed at conveying types of data.
  Computer: Please state a limit price.
Verbatim Prompts and Data Prompts

• Use 'say' for verbatim prompts.
  Avoid: Please speak that again.
  Please state one of the following: Sydney, Melbourne or Brisbane.
  Use: Say that again?
  Please say either Sydney, Melbourne or Brisbane.

• Use 'state' for data prompts.
  Avoid: Please, say a price limit.
  Use: Please, state a price limit.
Verbatim Prompts and Data Prompts

• Avoid mixing verbatim prompts and data prompts.
  
  Computer: How many shares would you like to buy?
  Caller: Seventy five shares.
  
  Computer: Say 'At the market' or enter a limit price.
  Caller: Enter a limit price.
  Computer: I'm sorry, I didn't understand.

• Problem here might have been avoided by reversing the VPs.
  Computer: State a limit price or say 'At the market'.
Feedback

• Avoid literal feedback.

Avoid:  Your entry was not seven digits.
        You said 1234967…
        You entered 1234967 …

Use:    The PIN must be exactly seven digits.
        Please repeat your PIN.
        1234967—was that correct?
Feedback

• Replace apology and blame with feedback.
  
  **Avoid:** Sorry, I don't understand.
  You *did something wrong*.

  **Use:** Please repeat.
  Do you want help?
The Relationship between Feedback and Prompts

• Combine feedback with prompts.
  
  Caller: Call.
  
  Computer: Name to call?
  
  Caller: John Doe.

• This is a good way to assure the user that dialog is on-track.

• But it only works when confidence is very high.
The Relationship between Feedback and Prompts

• Uncouple feedback from prompts if confusing.

• Good example (correct recognition):

  Computer:  Stock name?
  Caller:     Microsoft
  Computer:  Shares of Microsoft to sell?
  Caller:     Five thousand.
The Relationship between Feedback and Prompts

- Failed example (recognition error):
  
  Computer: Stock name?
  Caller: Texaco.
  Computer: Shares of PepsiCo to sell?
  Caller: ... umh ... No, that’s wrong ...
Grammatical Forms for Instructions

• Four basic sentence forms:
  – Declarative
  – Interrogative
  – Exclamatory
  – Imperative
Instructions

• Use declarative sentences for instructions.

Avoid: Read one of the fund names from your reference card. Choose from the following list. Check the form: how many digits are in the PIN? The answer is seven.

Use: The fund names are printed on your reference card. You may choose one of these. A PIN must be at least seven digits long.
Instructions

• Make declarative sentences user-centered.
  Avoid: The menu consists of five items.
  Use: You may choose from one of the following.

• Consider replacing ambiguous instructions with questions.
  Avoid: Please have your credit card ready.
  Use: Do you have your credit card ready?
Help

- Empower the user with help availability.
- Let the user know that help is available.
- Let the user know how to get help.
- Once help is declared available, keep it available.
- Return to a logical starting point after help.
- Use examples for help.
• Use different voices in help examples.

〈interrupting help chime〉
Help Coach: State the date like this ...
Prompt Voice: Date of birth? 〈prompt tone〉
Male Voice: Six-eighteen-forty-nine.
Help Coach: Now you try it.
〈closing help chime〉
Prompt Voice: Date of birth? 〈prompt tone〉
Help

- Differentiate between help and application mode.
- Let the user exit the help mode.
- Without user-exit, keep help mode short:
  - Do you want to return to the application?
    Do you want more help?
    Shall we continue?
  - ⟨Help wizard logo⟩
    Remember, when you hear a list of options . . . [some instructional fact]. Now, here's the menu . . .
    ⟨Price menu logo⟩
Take-Home Messages

• Prompts have two purposes:
  – cause the user to speak,
  – convey to the user what may be spoken.
• Clever prompt design maximises usability of speech recognition.
• Usability research has generated guidelines that
  – guarantee natural user-behaviour
  – decrease error rates and
  – raise user satisfaction.