GUI, CUI and VUI

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VUI in 1995...
Sometimes, it’s easier just to talk than push buttons.

You have to have a backoff strategy when your system doesn’t understand the user.

Only ask your users questions to which you can understand the response.
What does “conversational” mean?
Is at least two "turns".

Has a memory of what took place in previous turns.

Allows for multiple ways to refer to the same thing.

Understands pronouns.
What’s the difference between a GUI and VUI?
GUI is discrete.

Even if users types—we know what they typed.

For voice-only, lists and visual information is harder to convey.
Should my bot have a VUI?
Hands-free
Physically away from bot
Accessibility
Intuitive
Personal, emotive, persuasive
Public spaces

Discomfort speaking to a computer

Some users prefer texting

Privacy
Design Principles
Design for how people actually talk, not for how you want them to talk.
Craft your prompt so the user knows what they can say.

Your text is: ‘I’m running late.’ Would you like to send it, or cancel it?

Yes.

Your text is: ‘I’m running late.’ I can send it, or cancel it—which one do you want?
Spend time on error recovery.
Speech recognition errors

**Bot:** How are you today?
**User:** Fine.

*Recognition result:* find

**User:** How do I adjust the injection depth?

*Recognition result:* how do I adjust the injection death
Bot: Where do you want to stay?
User: I want to rent a car
Bot: Unfortunately, I’m not able to rent cars, but I can help you book a hotel room...

Bot: When do you want to travel?
User: I want to arrive next Tuesday night.

Bot: What date do you want to travel?
User: October 19th.
Choose the right interaction mode.
What is your main symptom?
Showing 2 Coffee Shops within 1.5 Miles sorted by distance that are open on Sundays that provide free Wifi.

1. Jimmy's Cafe
   1094 Alameda de las Pulgas, Belmont, CA...
   4.5 on Yelp
   COFFEE & TEA, DELIS, SAND., $5
   CLOSED

2. Starbucks
   1071 Alameda, Belmont, CA, US, 94002
   4.0 on Yelp
   COFFEE & TEA
   CLOSED
Remember the past. Or at least what happened five minutes ago.
User: What time does my husband’s flight take off?
Bot: Flight 345 is expected to depart at 7:10PM.

User: When will it land?
Bot: I found the following for “when will it land”...
Ok Google. Who was the 16th President of the United States?
Abraham Lincoln was the 16th President of the United States.

How old was he when he died?
Abraham Lincoln died at the age of 56.

Where was he born?
Hodgenville, Kentucky.

What is the best restaurant there?
Here is Paula’s Hot Biscuit...
Allowing for multiple ways to respond is great—make sure the bot’s responses take that into account.
Bot: What kind of pizza can I get you?

User: A large pepperoni please.

Bot: What kind of pizza can I get you?

User: I need 3 medium pizzas.

Bot: Ok. What toppings would you like on the first one?
Use speech recognition technology to your advantage.
Barge-in

Confidence score

N-Best lists

1. WELL I THINK AT THE MOMENT MY FAVORITES GOT TO BE FIT AND FAT
2. WELL I THINK AT THE MOMENT MY FAVORITES Gotta BE KITTY CATS
3. WELL I HAVE AT THE MOMENT MY FAN IS OF THE KITTY
4. WELL I HAVE AT THE MOMENT MY FAN IS OF THE KITTY BAT
5. WELL THAT THE MOMENT MY FAVORITE IS GOT TO BE KIT AND CAT

Well I think at the moment my favorite’s gotta be... kitty cats!
Choose the right voice.
Text-to-speech

Voice actor
Don’t pretend you’re conversational when you’re not.
What are you up to right now? Right this second. Right now.

Texting you

What are you doing up at this hour? Are we in a time warp??

I stayed up to talk to you

You're acting weird!

What is your name?

All of these questions make me think I'm a contestant on a game show. What's the prize?

Humani: Jessie's Story
Can't blame her... wouldn't want me near an infant either.

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Do you have a job?

Humani: Jessie's Story
You got kids?

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Do you have a job?

Humani: Jessie's Story
I can't even THINK about kids! That requires some serious life skillz
And, ya know, a PLACE TO LIVE.
Gahhh! OK. Laptop open. Where do I start?

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ok... so basically you're like a friend who pretends to be interested, but never actually listens to anything you say

Humani: Jessie's Story
Oh yeah duh! Thx
VUI in 2006...
Watch out for repetitive confirmations.

Only use explicit confirmation when it’s necessary.

Use good concatenation strategies.
What if your bot has a human-assist?
Make sure info is passed along to the human.

Coach your humans to confirm, not re-ask.

Interview human agents to help improve your bot.

Follow up to see what really happens when a human takes over.
Data collection is your friend.
Do data collection *before* you build your bot.

Conduct a pilot—get more data!

Keep analyzing that data…
Tools
SANTA CLAUS
Ho! Ho! Ho! Merry Christmas little one... Welcome to the North Pole! What's your name?

USER
Claudia.

SANTA CLAUS
That's a lovely name. And how old are you?

USER
I'm seven.

SANTA CLAUS
Seven! That's great. The big day isn't too far away... Are you excited for Christmas?

USER
Yes!

SANTA CLAUS
So am I!
Flows

Breakfast
"I can also control health monitoring equipment, such as blood pressure monitors, glucometers, EKG, and scales, so patients can take measurements at home and have that sent to their provider. That saves everyone time. I alert the clinicians if any of the values are critical, or if there are any sudden changes. Ok, time for another question. What did you have for breakfast?"

No Breakfast
"No breakfast! It's a good thing I don't have your doctors phone number."

Just Coffee
"Uh oh. You've got to have more than coffee."

Cereal
"No doubt it was a healthy cereal, too."

Yogurt
"Yogurt's pretty healthy, I like Greek."

Doughnut
"I hope it was a Krispy Kreme at least."

Something else
"Well whatever it was I hope it was delicious."

Take Photo
"I can also take photos, so if a patient has a rash or other symptom to show the doctor, I can make that happen without leaving the house. Let's try it right now. I will take you to the camera app."
Conclusions
Will your bot users benefit from a VUI?

Design for how people actually talk, not for how you want them to talk.

Take advantage of speech recognition features.

Collect data, iterate.
Additional resources

Voice User Interface Design (Cohen, Giangola, Balogh 2004)

Alexa Skills Kit Voice Design Best Practices

How we talk and how machines listen (Abi Jones, O’Reilly Design Conf talk 2016)
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