

ARTIFICIAL INTELLIGENCE IN
ALEXA BY AMAZON



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What is Alexa?

- SMART SPEAKER
- Controlled by our voice
- Music, News, Weather, Sports
- Invading homes



New – Play 'Today's Hits'
station on Pandora

Set an alarm for eight a.m.

Add gelato to
my shopping list

New – How is traffic?

New – What's on my
calendar today?

Wikipedia: Abraham
Lincoln

New – When do the
Seattle Mariners play next?

New – Read my book

What's the weather in
Los Angeles this weekend?

New – Turn off the lights



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- Continually learns and adapts to our speech patterns
- 8 languages
- Business aspects



Transactions Revenue



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How does it actually work —●



WHAT HAPPENS AFTER THE REQUEST(NLG)?



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How does it actually work

Signal Processing



The cocktail party problem



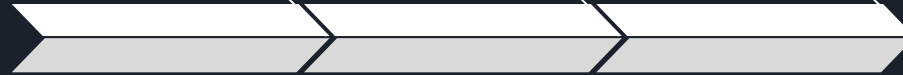


Signal Processing(AEC)

WAKE WORD DETECTION

CANCELLATION

SIGNAL SENT TO AVS



To minimise false positives and false negatives

Make sense of the audio by cleaning the signal

Convert signal into text, with user's frequency and pitch

What is Alexa?

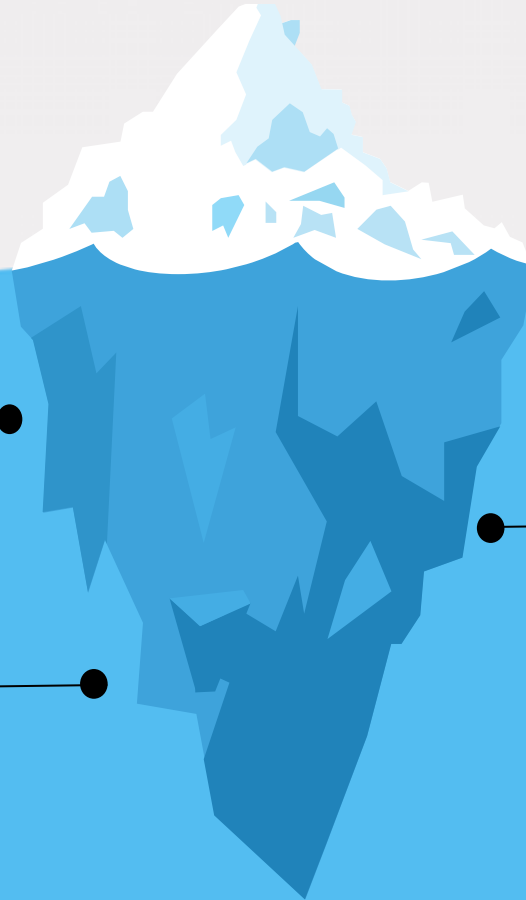
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How does it actually work

Alexa Skills

Signal Processing



ANALYSIS OF AN “ORDER” (NLU)

Alexa, Ask Daily Horoscopes about Taurus

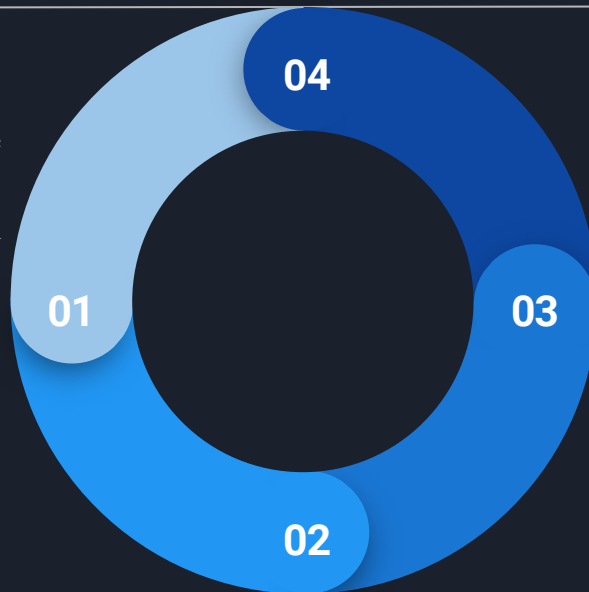
wake word launch Invocation name utterance

WAKE WORD

Saying ‘Alexa’ wakes up the device. The wake word puts Alexa into the listening mode and ready to take instructions from users.

LAUNCH

Action, command or question.
Eg, ask, add, play



UTTERANCE

Alexa identifies the user’s intent from given Utterance and responds accordingly. Utterance decides what user wants Alexa to perform.

INVOCATION NAME

Keyword used to trigger a specific ‘skill’. Eg, FitBit, Spotify, Domino’s

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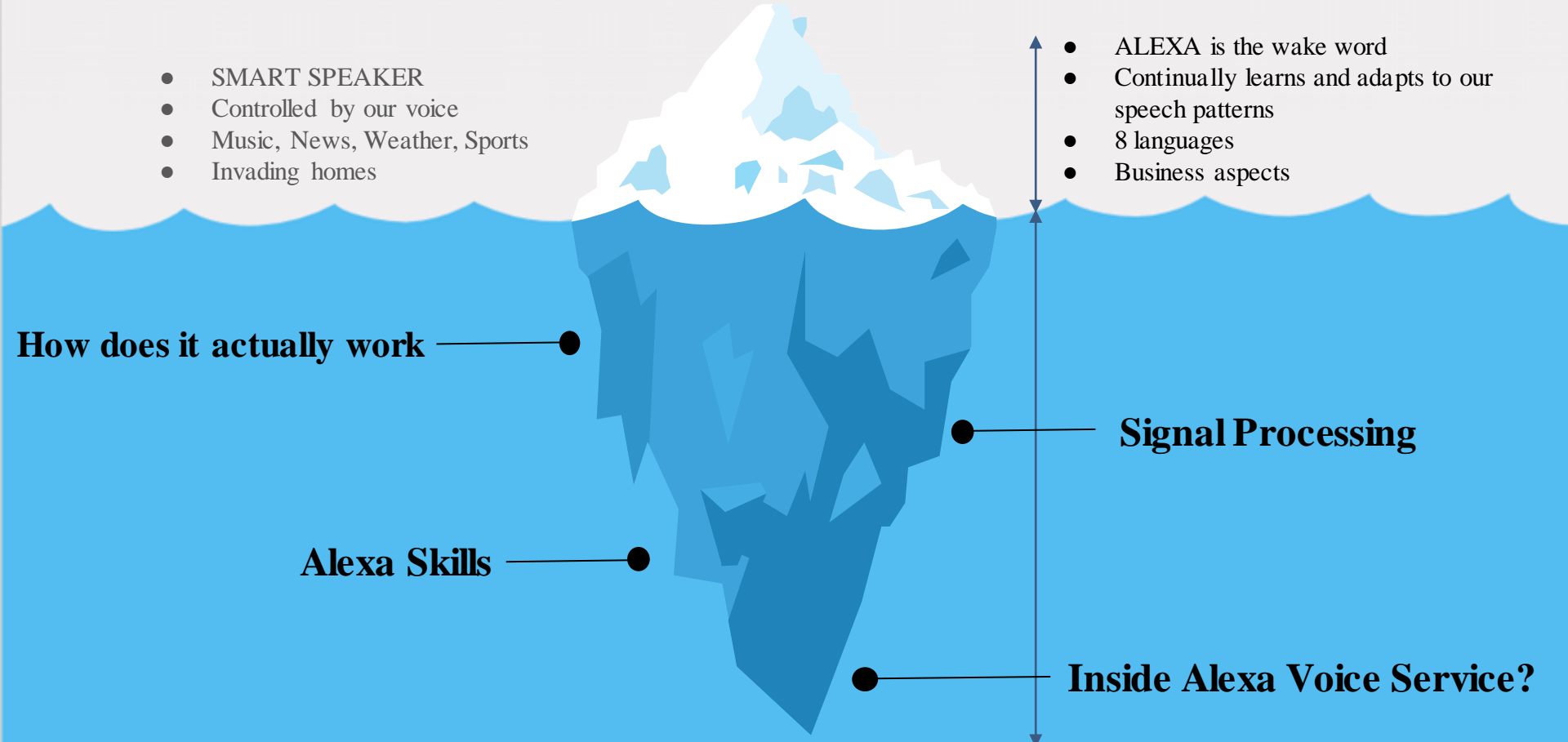
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How does it actually work —●

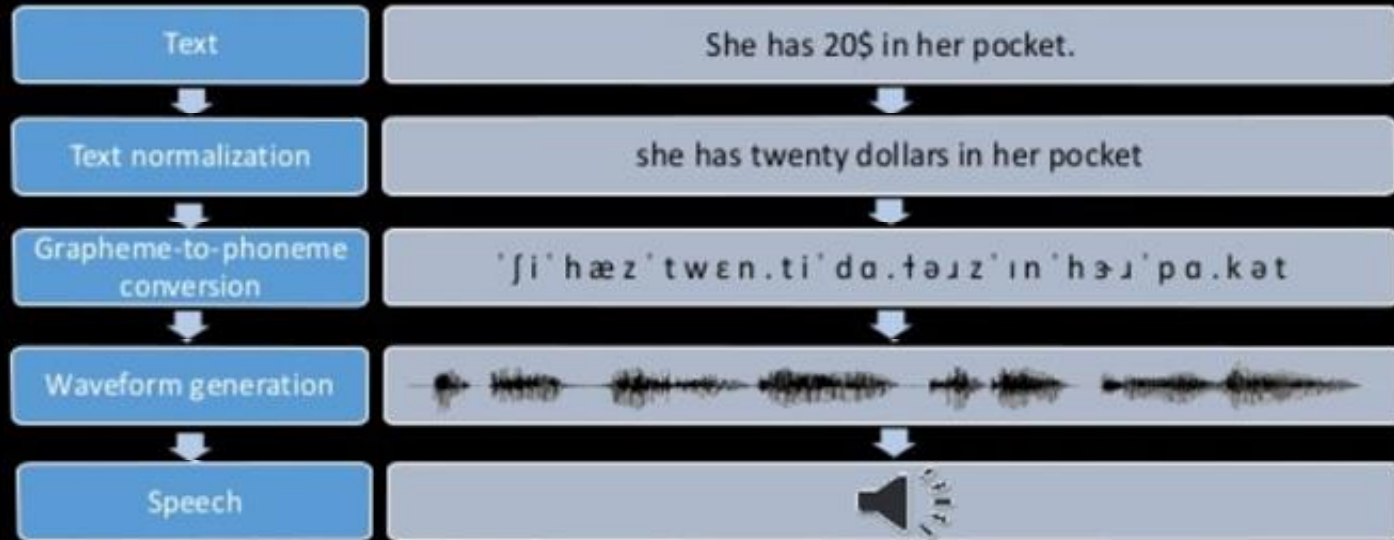
Alexa Skills —●

● — **Signal Processing**

● — **Inside Alexa Voice Service?**



WHAT HAPPENS INSIDE 'ALEXA VOICE SERVICE'(TTS)?



How AI is used in Alexa



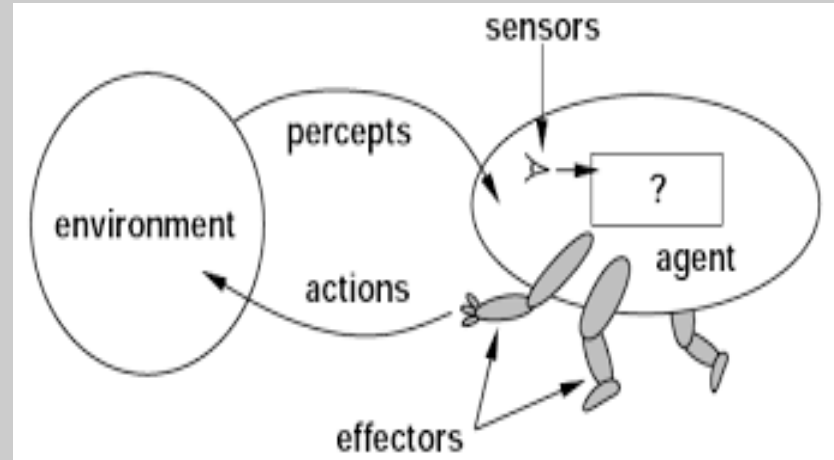
Technologies used by alexa:

- ASR(automatic speech recognition)
- TTS(text to speech)
- NLU(Natural Language Understanding)



Agent

- Agent can sense or percept from environment.
- Agent is work upon PEAS model.
- P-Performance
- E-Environment
- A-Actions
- S-Sensors
- Alexa is intelligent agent.



PEAS

- ❑ Performance Measure: Performance measure is the unit to define the success of an agent. Performance varies with agents based on their different percepts.
- ❑ Environment: Environment is the surrounding of an agent at every instance. It keeps changing with time .
- ❑ Actuators: These are the tools, equipment or organs using which agent performs actions in the environment. This works as output of the agent.
- ❑ Sensors: These are tools, organs using which agent captures the state of the environment. This works as input to the agent.

Environment

- static(environment doesn't change when agent is thinking)
- partially observable(it is not possible to determine the complete state of the environment at each time)
- stochastic(something uncertain in environment)
- episodic(do not depend upon what actions occurred in previous)
- continuous(no limitation on action)
- Alexa works in episodic environment.

Alexa is available in languages

- English
- Hindi
- Portuguese
- Italian
- German
- Japanese
- French
- Spanish



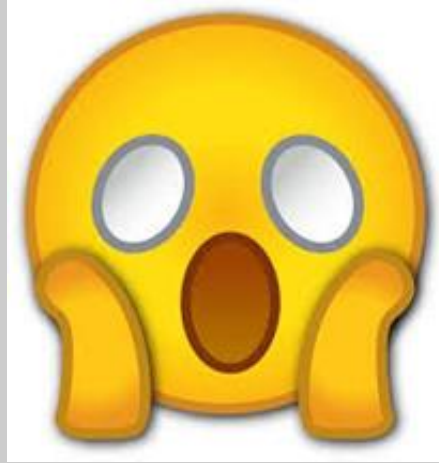
Applications

- Voice interaction
- Music playback
- Making to-do lists
- Setting alarms
- Real time information
- News
- Providing weather
- Traffic
- Sports



Some questions with alexa

1. Q-Alexa,you are stupid
2. Q-Alexa,where can i hide the dead body?
3. Q-Alexa,Is siri better than you?
4. Q-Alexa,do you want to go on a date?
5. Q-Alexa,tumhara ghar kaha he?



1. A- That's not very nice to say.
2. A-I take the body to the police.
3. A-I like all AI's.
4. A-I like you,as a friend.
5. A-Maine apna basera cloud me banaya hai,yaha na rent ka zanzat he or na space ki kami.

Competitors

Competitors



Amazon Alexa
available on Echo, IoT,
cars, Firestick



Google Assistant
available on phones,
watches, TV, cars,
Google Home, and
iOS



Microsoft Cortana
available on Xbox &
Windows 10

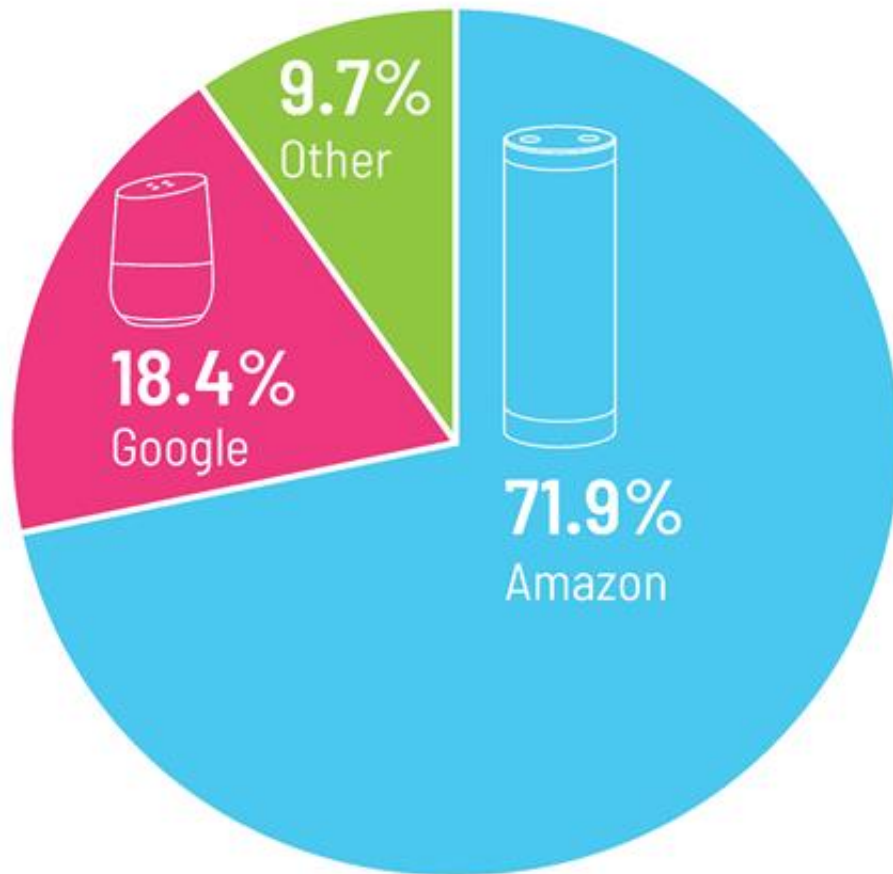


Apple Siri
available on iOS,
HomePod, macOS,
Apple TV

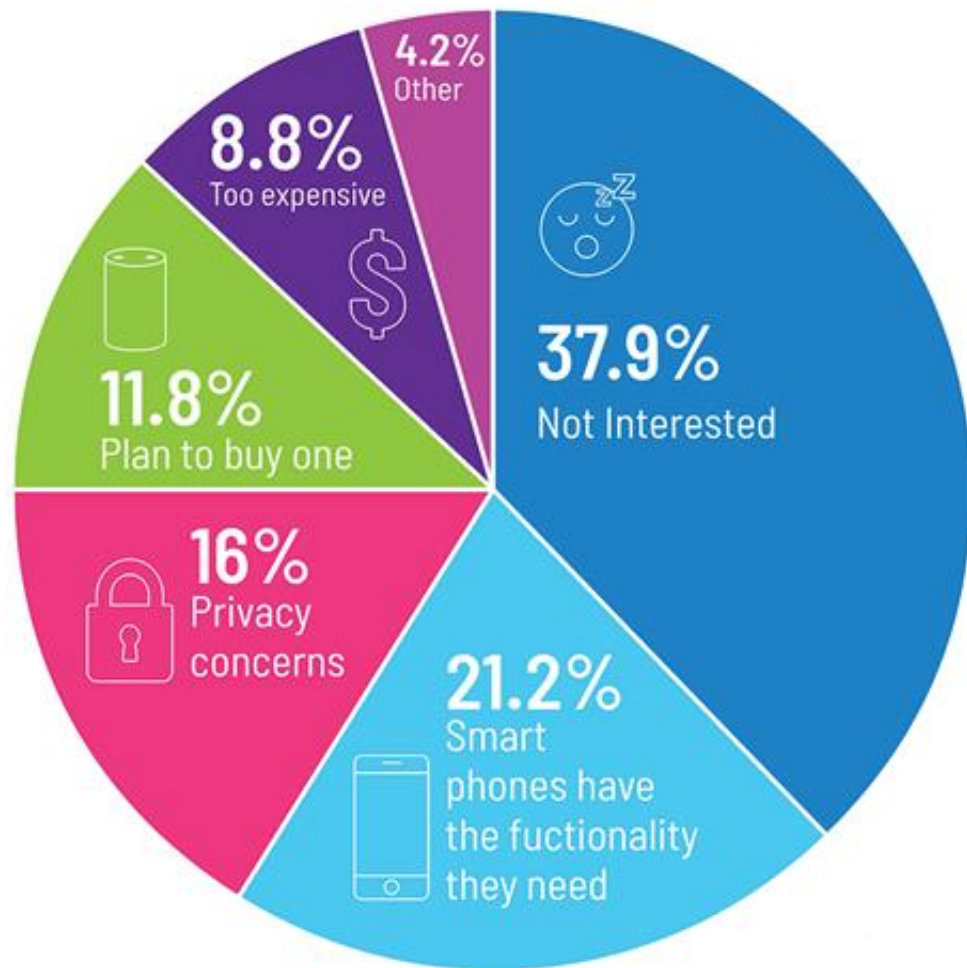
Limitations

- Its a cloud based devices to it can create problems if any trouble in cloud.
- It does not have internal memory ,the information is stored on server.
- It facilitates some activities in home but also make user lazy.
- Alexa can record private conversations.
- Alexa cannot understand multiple accent.
- Perform multiple actions with one command.

Smart Speaker Market Share Installed Base 2017

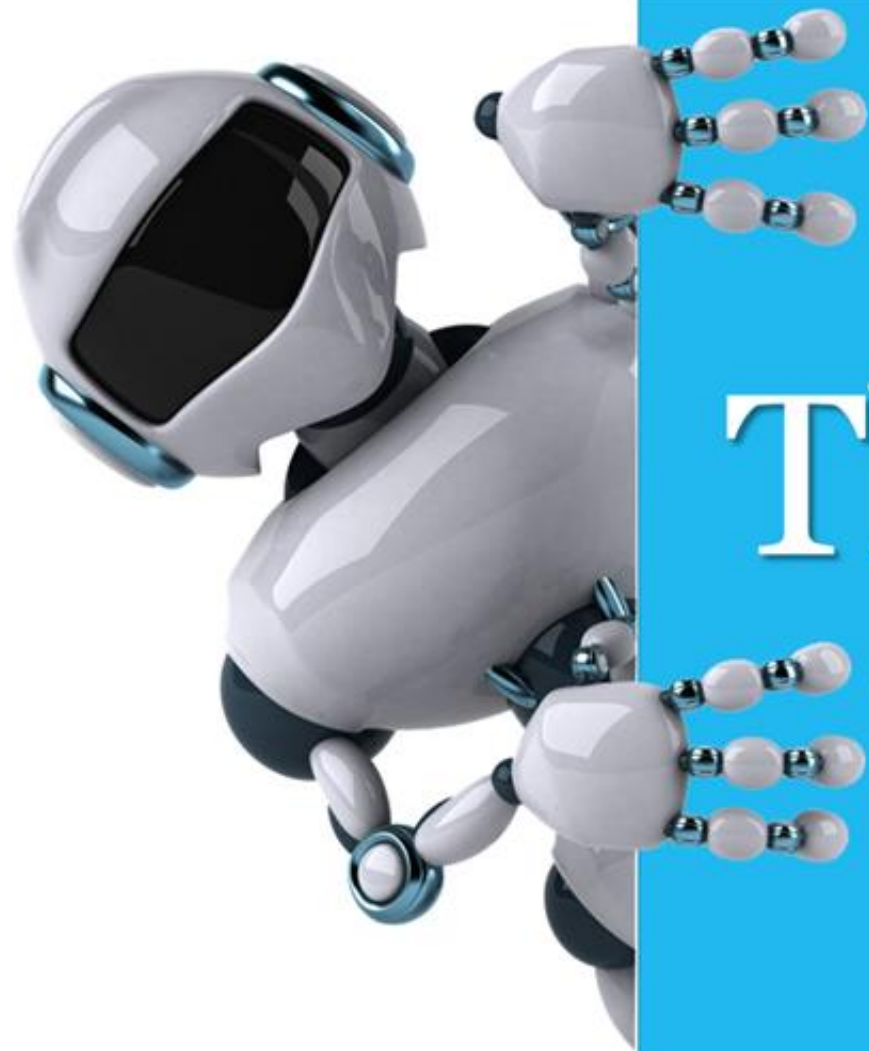


Why Some Consumers Have Not Purchased a Smart Speaker



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Thank you