

Alexa Shopping

Vanessa Murdock, Amazon Research



Frictions (and Amazon)

- What is friction?
 - Friction is any variable that is slowing down (*or entirely halting*) the progression towards a goal.
 - Simple aggravations:
 - ✓ Purchasing a product that is not ready to use out of the box
 - ✓ Overly complicated sign-up processes to buy something
 - ✓ Difficult to navigate menus
 - Errors and inefficient processes add to daily customer aggravations
- Reducing frictions in a transaction → positive snowball effect
 - Business trip → buying luggage → tells you it would qualify as a carry-on, free shipping → customers tell these experiences to others
 - 1-click order, Amazon Prime, Amazon Go,....
- Removing friction is key to customer satisfaction
- Also key to making AI intelligent and useful

Human Interaction with the Physical and Digital World

Human Senses: *sight, hearing, touch*, smell, taste

- The perception of our senses are created and stored in different parts of the brain

Computer 'Senses'

- No sight no hearing (until recently)
- Tactile & motor skill input (from humans)



Gap

- Computers (and backend services) are not yet designed for receiving **voice** input to operate

Problem

- It tethers you to a screen, 'immobilizes' you
➔ Friction!

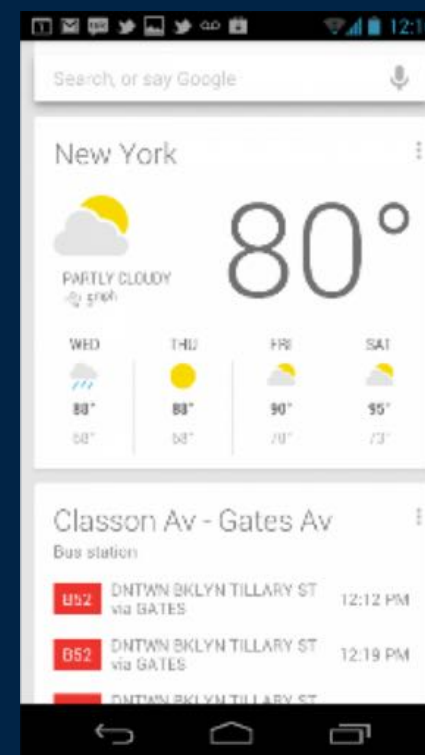
Intelligent Personal Assistants [Ruhi Sarikaya Director of Applied Science, Alexa]

- Meta layer of intelligence
 - Sits on top of other services and applications
 - Performs actions or serves content using services/apps to fulfill the user's intent
 - Natural language interface
 - Relies on
 - machine learning, AI, speech recognition, natural language understanding, dialog management, ranking, inference, personalization, etc..
- Major IPAs in the Market

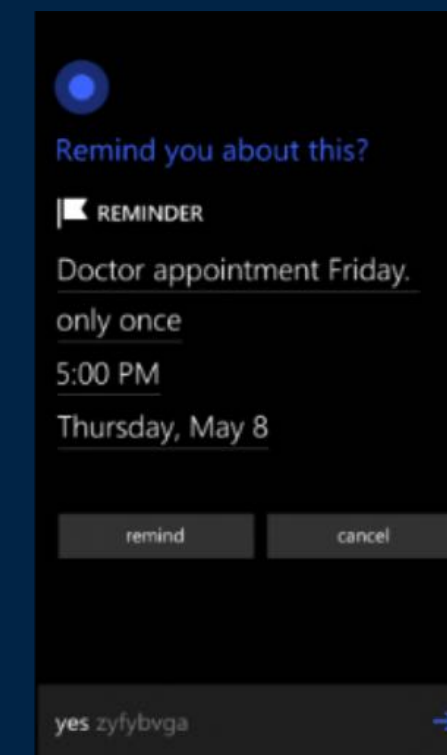
Siri (2011)



Google Assistant (2012)



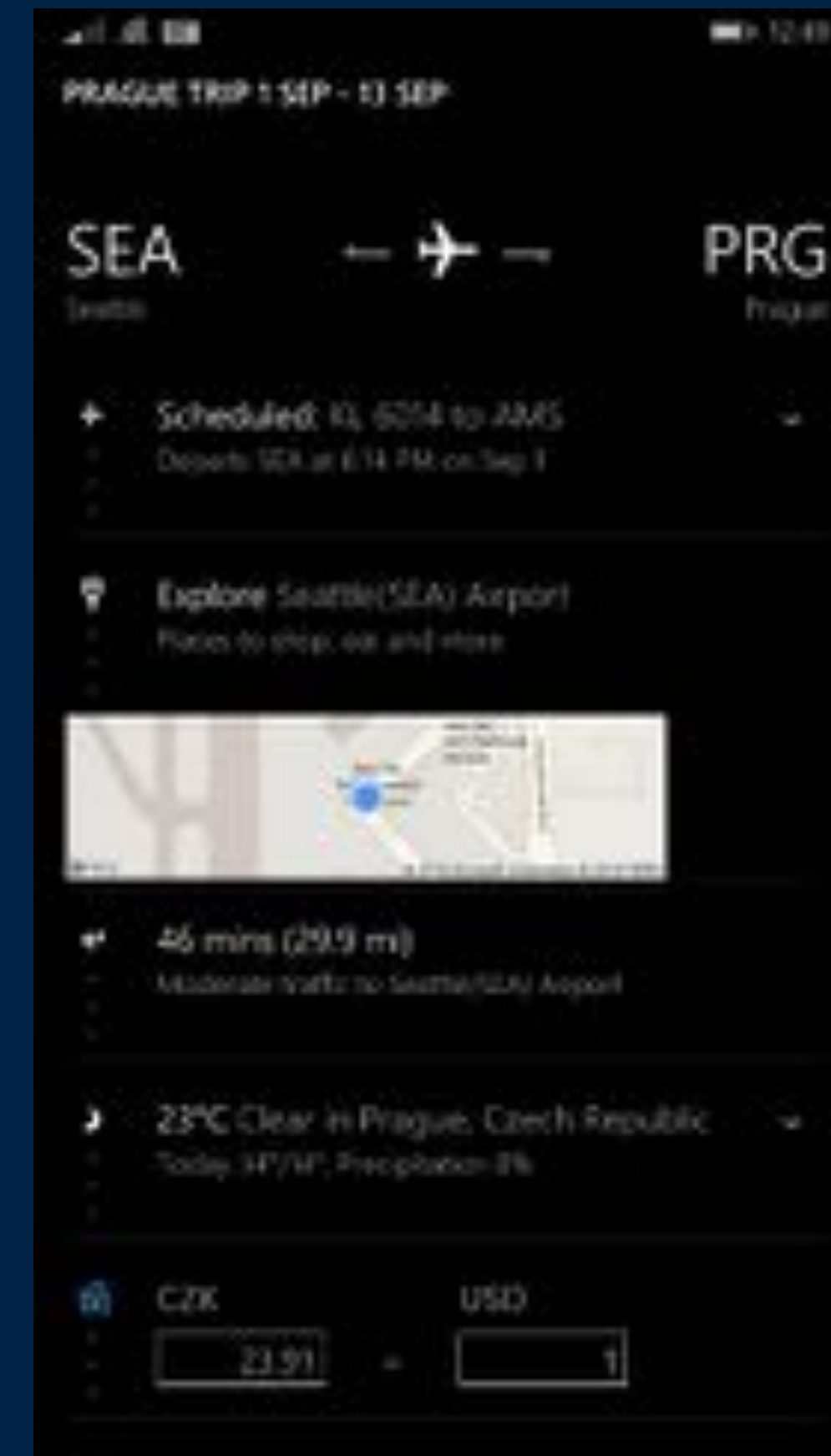
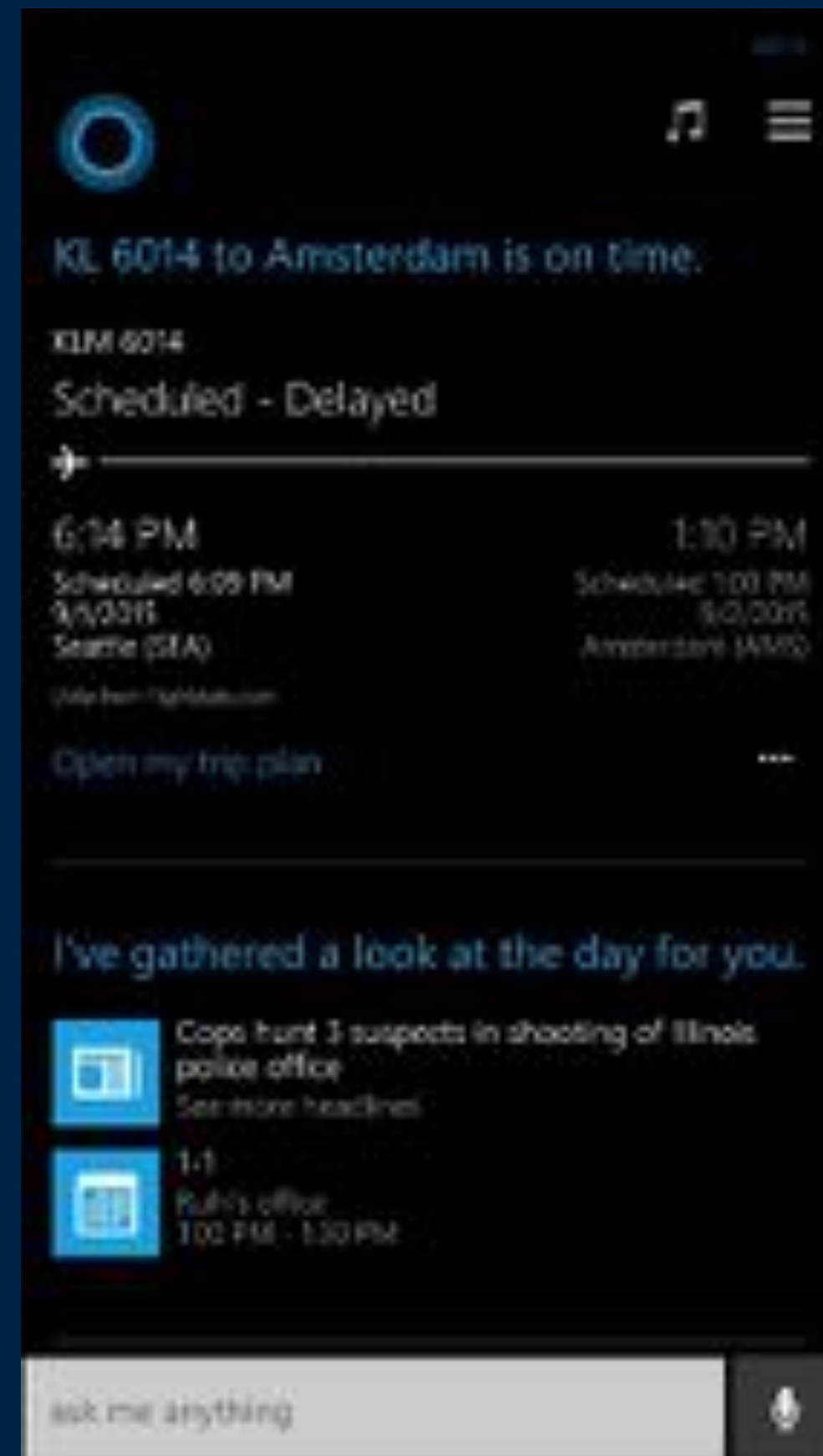
Cortana (2014)



Alexa/Echo (2014)



Intelligent Personal Assistants [Ruhi Sarikaya Director of Applied Science, Alexa]



- A real example scenario: "flight card on your phone"
 - IPA scans (1) your email and extracts (2) the flight information and stores (3) it
 - Computes (4) your current location (GPS) and checks (5) the traffic conditions to the airport
 - Tells (6) you when to leave for the airport at the day of travel
 - Checks (7) the flight status and updates (8) you with that
- Stitching together these steps can potentially mark a breakthrough in removing the cognitive friction!

Natural Way to Interact with Personal Assistants: Voice Input

- Limited information flow into smartphones/devices with typing/touch
- People can speak up to 4 times faster than they can type
- Speech is expected to replace touch/typing as the primary input form
 - Pushed deeper into platforms (e.g. Siri on iOS, Cortana on Windows 10, Google Now is integrated into Google Search App)
 - By 2018 30% of all interactions with devices will be voice based (Gartner)
 - By 2020 50% of all searches will be voice searches ([comScore](#))
 - By 2020 about 30% of searches will be done without a screen ([Mediapos](#))
- Deep Learning had a tremendous impact on speech recognition accuracy
 - Google: WER for recognizing words in a mobile apps < 8%
 - Practical alternative to entering text in a box
 - IBM/Microsoft: Speech recognition is on the verge of super-human accuracy (2017)
 - Amazon Alexa: entirely voice driven and adoption and usage keeps increasing

How does Conversational AI Work?

Wake Word

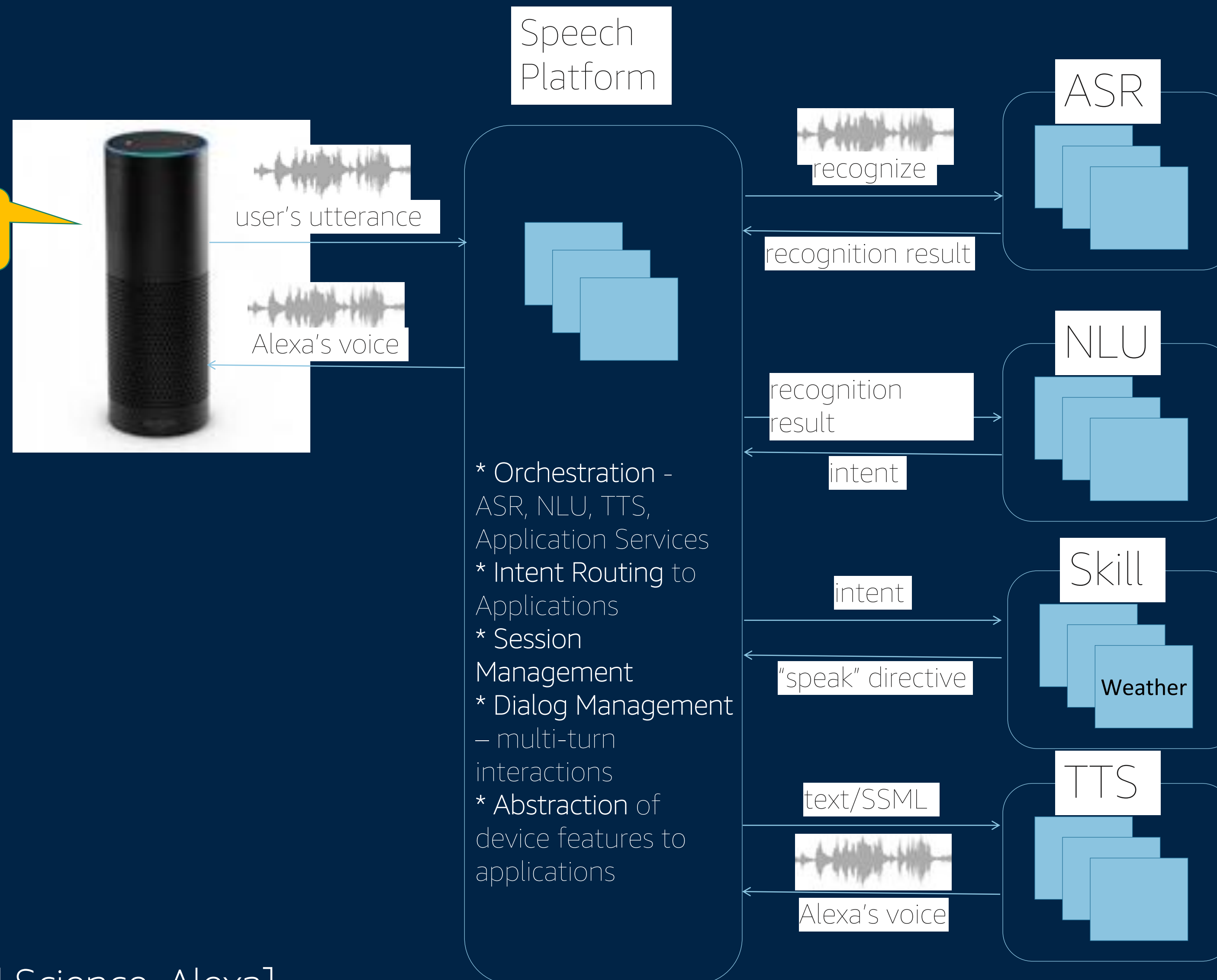


“Alexa, what is the weather?”

Utterance

More specifically...

Alexa, what is the weather?



Alexa Shopping

research





"Alexa, buy..."





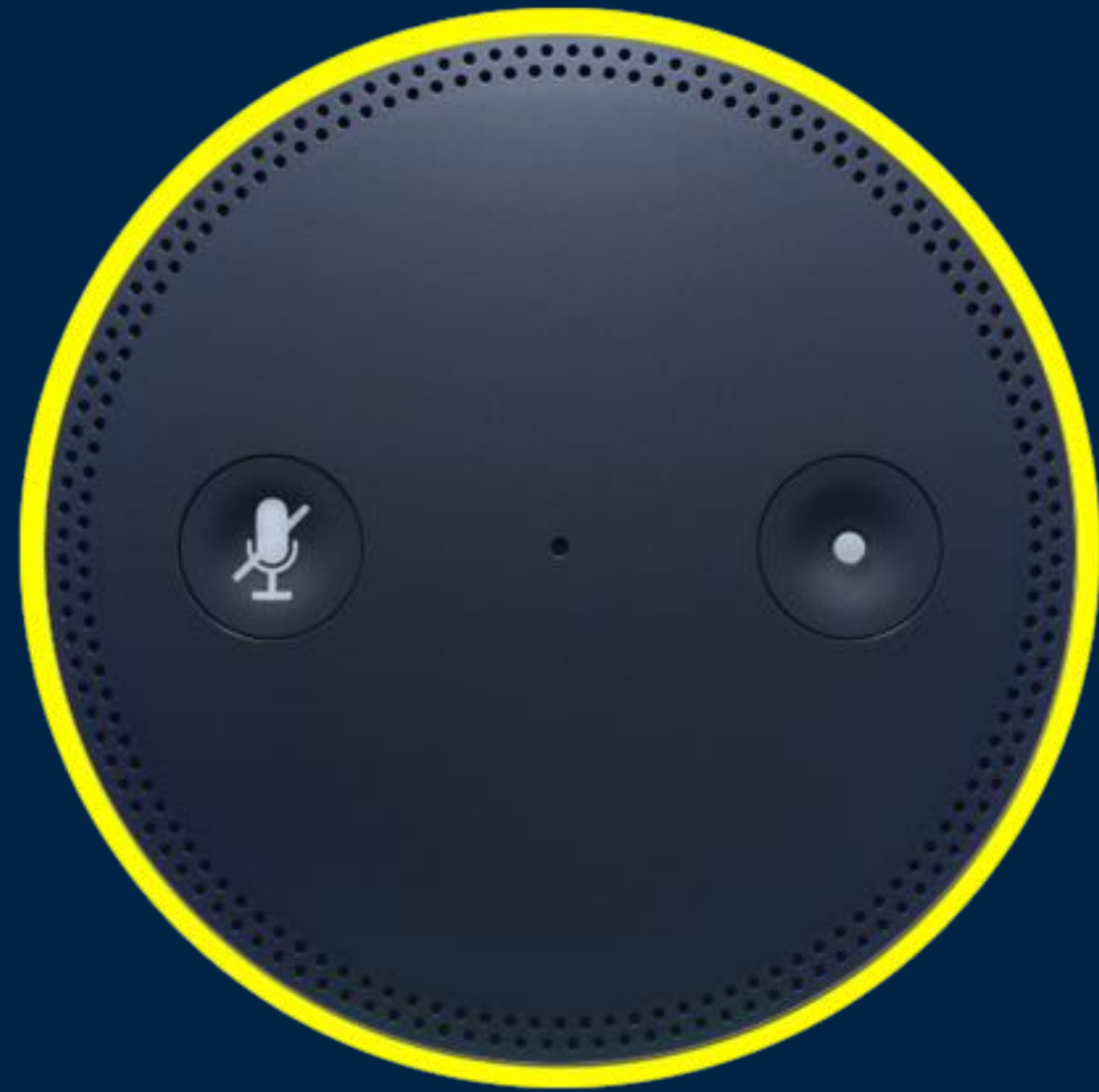
“Alexa, reorder paper towels”





"Alexa,
where's my
stuff?"





"Alexa,
what are my
notifications?"



Working Backward



MR HAPPY CUSTOMER

Voice Interaction without Friction

- Identify purchase intent from the query
 - Re-orders “Alexa, I need more paper towels”
 - Low-consideration items to purchase directly
“Alexa, buy triple A batteries”
 - Recognize perishables
 - Amazon Fresh has a delivery charge, and a time bound
 - Add to cart rather than purchase directly
- Resolve anaphora
- Disambiguate words
- Recognize named entities

“Alexa, buy coffee.”



“Alexa, play music by Nas?”



*“Alexa, **buy** coffee.”*



*“Alexa, play music **by** Nas?”*



“Buy two”



“Two”



2x



48-pack



Forty 8-packs

Entity Resolution



Fitbit



my Fitbit



my "Fitbit"

**“Please tell me if my
Fitbit’s waterproof.”**

**“My Fitbit,
waterproof is it?”**

“Is *it* waterproof?”



amazon.com: Fitbit Flex 2, Black (US Version) | Amazon

NEW & INTERESTING FINDS ON AMAZON EXPLORE

amazon.com Health, Household & Baby Care

Departments - Shopping History - Justin's Amazon.com Today's Deals DR Cards Registry Sell Help

Health & Personal Care Household Supplies Vitamins & Diet Supplements Baby & Child Care Health Care Sports Nutrition Sexual Wellness Health & Wellness Medical Supplies & Equipment Sales & Special Offers Subscribe & Save

GET THIS PRODUCT FREE 2-hour delivery prime now

Back to search results for "fitbit"

Fitbit Flex 2, Black (US Version) Visit

★★★★☆ 1,293 customer reviews | 793 answered questions **Get Prime** in Activity Trackers

Price: **\$59.95** with Prime **FREE Same-Day**

Note: Available at a lower price from other sellers, potentially without free Prime shipping.

In Stock. Ships from and sold by Amazon.com.

4 Colors Black

About the product

- Track steps, distance, calories burned and active minutes
- Ultra-thin, removable tracker hides in bands, pendants and bangles
- **Swim-proof for tracking swimming, life-proof for wear in the ocean, shower, pool and beyond**
- SmartTrack automatically recognizes select workouts and records them to your Fitbit app; Get call and text notifications on your wrist with unique vibration patterns and

More

Other Sellers on Amazon **Lowest Price \$59.94**

\$59.92 • Free Shipping **add to cart**

About the product

- Track steps, distance, calories burned and
- Ultra-thin, removable tracker hides in bar
- Swim-proof for tracking swimming, life-proof for wear in the ocean, shower, pool and beyond
- SmartTrack automatically recognizes select workouts and records them to your Fitbit app. Get call and text notifications on your wrist with unique vibration patterns and color-coded LED lights.

From the manufacturer



Standout Features

- Swim-Proof**
Track swimming
- Interchangeable Accessories**
- SmartTrack™**
Auto Exercise Recognition
- Reminders to Move**
- Call & Text Notifications**

Essential Features

- All-Day Activity**
- Auto Sleep Tracking**
- LED Display**
Shows progress to you
- Long Battery Life**
Up to 5 days*

For wherever life takes you.

- Swim-Proof**
Track swimming automatically & see your exercise summary in the Fitbit app. Plus, never worry about making a splash.
- Call & Text Notifications**
When you get calls and texts, Flex 2 vibrates and the discreet LED display flashes with coded lights.



Customer questions & answers

Q: waterproof

Don't see what you're looking for? [Ask the Community](#)

Most Relevant Search Results

Question: Is this **waterproof**?

Answer: Yes it is! Just got mine & I love it!
By Cheryl Adams on November 3, 2016

Question: Is this **waterproof**?

Answer: Yes it is I swim and shower in mine just take it off after swimming so it shows you've stopped swimming
By jennylin on June 4, 2017
[See all 2 answers](#)

Question: Is this **waterproof**?

Answer: It says you can swim with it. The instructions say that if you swim or shower, dry it thoroughly after. They also say wear it a bit loosely. I wore it in shower and got sweat between skin and band. Good to go.
By Flowerman on November 28, 2016

Review:  **Waterproof**

...Does appear to be **waterproof**. [See more](#)
By Human on April 21, 2017

Review:  **Waterproof**

...Fully **waterproof** which is perfect for the summer at the pool... [See more](#)
By Shannon S. on October 25, 2017

Review:  **Waterproof**

...I like the idea to **waterproof**. [See more](#)
By Andrea S. on January 13, 2017

Customer reviews

 1,291

3.8 out of 5 stars *



Show your thoughts with other customers

[Write a customer review](#)



Ad Network

Customer reviews

★★★★☆ 3,203

3.8 out of 5 stars



Show your thoughts with other customers

[Write a customer review](#)

[See all 3,203 customer reviews](#)

Read reviews that mention



Showing 1-8 of 283 reviews with "waterproof". [Clear filter](#)

★★★★★ Great all-around device!

By Catherine I. on November 21, 2016

Color: Black [Verified Purchase](#)

...getting the Flex 2 or the Alta, but chose the Flex 2 for its slim profile, **waterproof** design, and lower price point. I have yet to incur water damage, and the flex-light design is very minimalist yet informative. One of the main reasons for purchasing a Fitbit was for the silent alarms, as my alarm would annoy both my roommate and me in the mornings. Although I at first set backup alarms on my phone, I turned them off as I realized the Flex 2 had very strong vibrations that have never failed to wake me up in nearly a month's use. A common complaint is the press-on design of the band, and at first, I was disappointed at how difficult it was to put this on. However, after use, it became much more comfortable to put it on, but not to the point where I felt it was in danger of falling off by itself. Finally, I love the Fitbit software, whether online or on mobile. I like the social aspect, particularly the friendly competitions and challenges. Although this model lacks a heart rate monitor, I use my Samsung Galaxy S7's heart rate sensor in conjunction with my Fitbit to track my exercise statistics. [Read more](#)

Comment: 1,118 people found this helpful. Was this review helpful to you? Report abuse

★★★★★ Love this thing because I never have to worry about ...

By Dale Zagba on September 5, 2017

Color: Black [Verified Purchase](#)

...with the challenge. I wish I got the heart rate monitoring features and the elevation but more worth it to me for it to be **waterproof**. Will probably upgrade when they come out with a **waterproof** watch. [Read more](#)

Comment: Was this review helpful to you? Report abuse

★★★★★ I really love the new slimmer design

By Kalle J. on January 15, 2017

Color: Black [Verified Purchase](#)

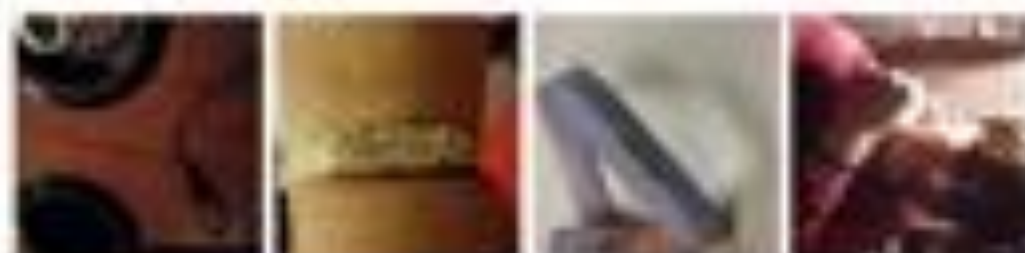
...found it far more useful than the original flex, and on top of all that, it's **WATERPROOF**. The clasp for this Flex is way tighter, so I don't have to worry about it unwrapping while I'm going about my day, which was an issue I had with the old Flex after a few months of wear. All in all, I would totally recommend you Original Flex users to go ahead and **UPGRADE**. [Read more](#)

Comment: Was this review helpful to you? Report abuse



[Add feedback](#)

Customer images



[See all customer images](#)

Search customer reviews

“Do Bose cancel background noise?”



Bose



Bows



Bows

Thinking of Alexa's Voice Interface...

- Multi-turn dialog
 - How can the device recognize follow on conversation without listening all the time?
 - How much dialog will a user tolerate?
 - In search, users typically do not want to engage in prompts for disambiguation
 - In real life, people will often talk at length to a salesperson
 - Why the difference?
 - How do shopping multi-turn dialogs differ from other kinds of dialogs?
- How much personalization?
 - Recognize different accents and languages
 - Recognize colloquialisms, regional expressions, slang
 - Identify your reading level and adjust?
 - Speak to you like you speak?

High Consideration Purchases

- How should high-consideration items be handled?
 - Will users want an extended dialog?
 - Are these purchases better served multi-modally?
- When does the user need to see the item?
 - Should it be sent to the user's phone?
 - Added to cart for viewing on the web later?
 - Viewed on the Echo Show?

Question answering

- Which utterances are questions?
- Which questions are general “chit-chat”?
- Which questions are about a specific product?
- How do we distinguish questions from requests to buy?
- ...And then there is actually answering the question

“How long is the third Harry Potter?”



448 pages



142 minutes

“Alexa, how big is the Eiffel Tower?”

1-16 of over 50,000 results for **"eiffel tower"**



prime | FREE One-Day
Get FREE One-Day Shipping on
qualifying orders over \$25

Show results for

Tools & Home Improvement
Wall Stickers & Murals
Novelty Lighting

Home & Kitchen
Collectible Figurines
Home Décor Products
Statues
Tea Light Candle Holders
Party Favors
See more

Toys & Games
Toy Building Sets
Figure Model Kits
Jigsaw Puzzles
Brain Teaser Puzzles
3-D Puzzles
See more

Kitchen & Dining
Silverware

Books

Shop by Category



Home & Kitchen



Health & Household



Toys & Games



Women's Fashion
Scarves



Key Chains & Key
Rings



SiCoHome The Eiffel Tower 12inch Bronze Tall Eiffel Tower Paris France Vintage Replica for Cake Topper, Gifts, Party and Home Decoration

by SiCoHome

\$14.99 Prime

Only 10 left in stock - order soon.

More Buying Choices

\$12.14 (1 used offer)

★★★★★ 142

Product Features

Eiffel Tower



Eiffel Tower Nightlight Desk Bedroom Decoration LED Lamp Colorful Paris Fashion Style Acrylic 10 Inch Cake Topper Decoration Gift

Understanding User Intent

The image shows a screenshot of the Amazon website search results for the query "best selling tents". The search bar at the top contains the text "best selling tents", which is highlighted with a red box. Below the search bar, the results are sorted by "Suggested". The main heading for the results is "Best Sellers in Camping Tents", also highlighted with a red box. Three product listings are visible:

- Sundome 4 Person Tent (Green and Navy color options) by Coleman:** Price range \$487.99 - \$429.00, Prime, 4.5 stars, 2,214 reviews.
- Happy Camper Two Person Tent by Wakeman Outdoors by Happy Camper:** Price range \$137.99 - \$45.15, Prime, 4.5 stars, 888 reviews.
- Coleman Montana 8-Person Tent by Coleman:** Price range \$114.99 - \$726.74, Prime, 4.5 stars, 1,771 reviews.

On the left side of the page, there is a sidebar with the Amazon Prime logo and a "FREE One-Day" shipping offer. Below that, it says "Show results for" followed by categories like "Patio, Lawn & Garden", "Raised Beds & Plant Support Structures", "Gazebos", and "Canopies, Gazebos and Pergolas".

In a commerce setting this often reflects the intended use of the product



Tech Support Definition
Shirt-Funny Computer Nerd Gift
Shirt

\$17⁹⁹ ✓prime

★★★★☆ v 1



Under Armour Women's Tech
Twist T-Shirt

\$12¹⁶ - \$45⁰⁰ ✓prime

★★★★☆ v 40



Old Varsity Brand NCAA womens
NCAA Juniors Football T-Shirt

\$1⁸⁴ - \$22⁰¹ ✓prime

★★★★☆ v 10

Personalization

- Understanding your preferences
 - What attributes do you care about? No wool? Gluten free? Size M?
- Interacting with you in the way you interact
 - Your vocabulary, your accent, your language
 - Your habits and preferences
- Understand local quirks
 - Beecher's cheese, Stumptown Coffee
 - Ford Bronco Decal vs Denver Broncos Decal
- Personalize the AI
 - She tells jokes that are appropriate for you (age, context)
 - She knows when you are engaging in chit-chat
 - She speaks your language
 - She recognizes your face, your voice

A Few Practical Concerns...

- Training data quality really matters
- Much of the technology is derived from web data, because it is abundant and well-understood
 - Should it be used for voice?
 - Are there other ways to bootstrap data?
- Voice data is highly sensitive
 - Privacy: **ALWAYS**
 - Ethical use of the data: **ALWAYS**

Thinking of Amazon's vast catalog...

- What other skills can Alexa have that help people with shopping?
 - Product comparisons
 - Question answering about purchased products
 - Gift recommendations
 - Collaborative lists (shopping lists)
 - What about collaborative purchases?
- Are there category-specific skills that would be useful?
 - Reviews from the NY Review of Books
 - Show me similar titles, authors, artists, directors
 - How is grocery purchasing different than clothing, books, electronics?

Thinking of Amazon's vast catalog...



It's Day One.

We Are Hiring!