BOTS, AI, AND JAVASCRIPT

Future of the Web with  Conversational Interface

#IndexConf

Tomomi Imura (@girlie_mac)

tomomi imura

- advocate open web & technology
- code JavaScript & Node.js
- write & speak about tech
- hack useless stuff
- A cat lady of the InterWeb
- dev relations at Slack

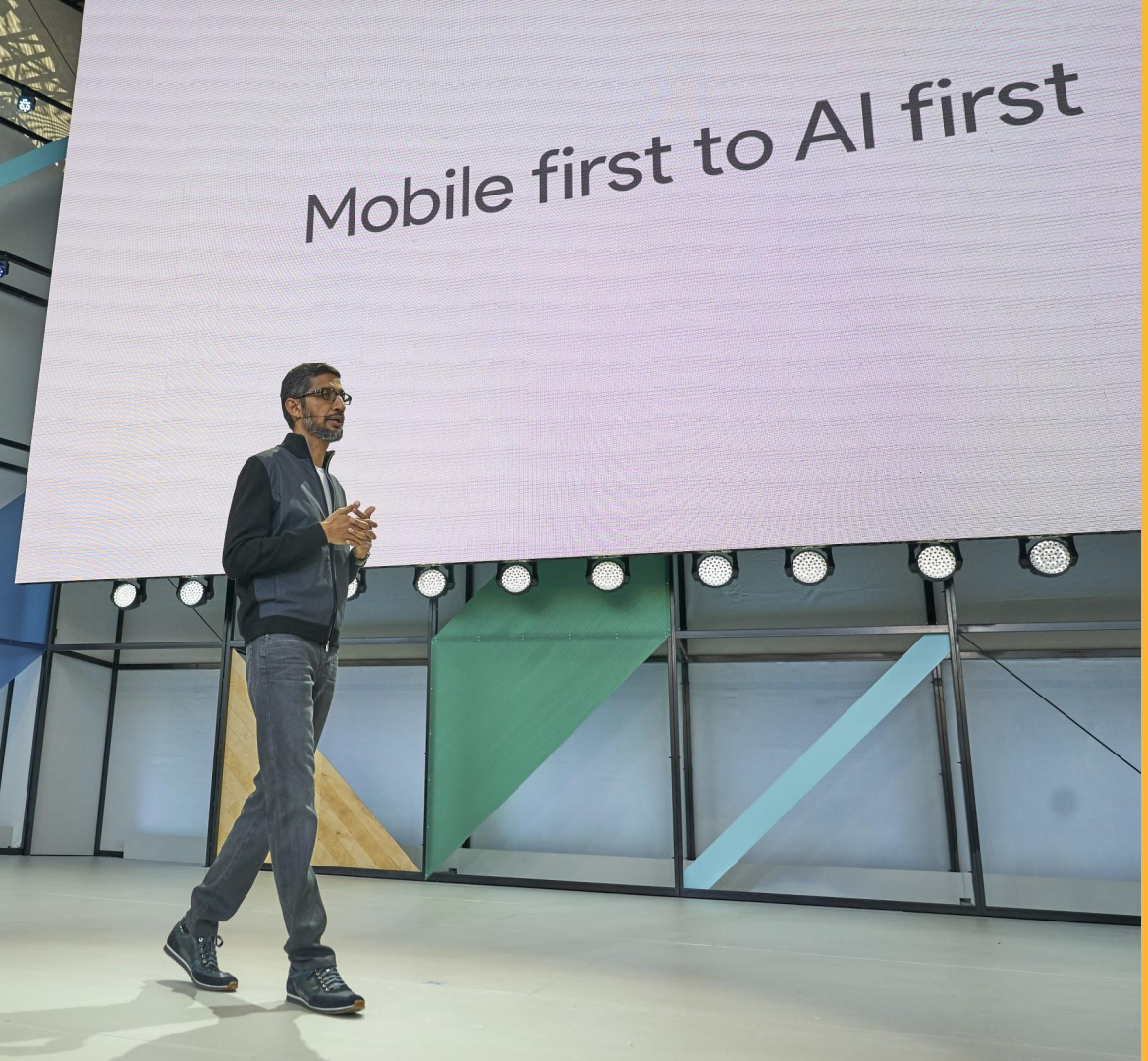
@girlie_mac

Talking to non-human

Photo by Jeopardy Productions, Inc.

"Bots are like new applications that you can converse with. "

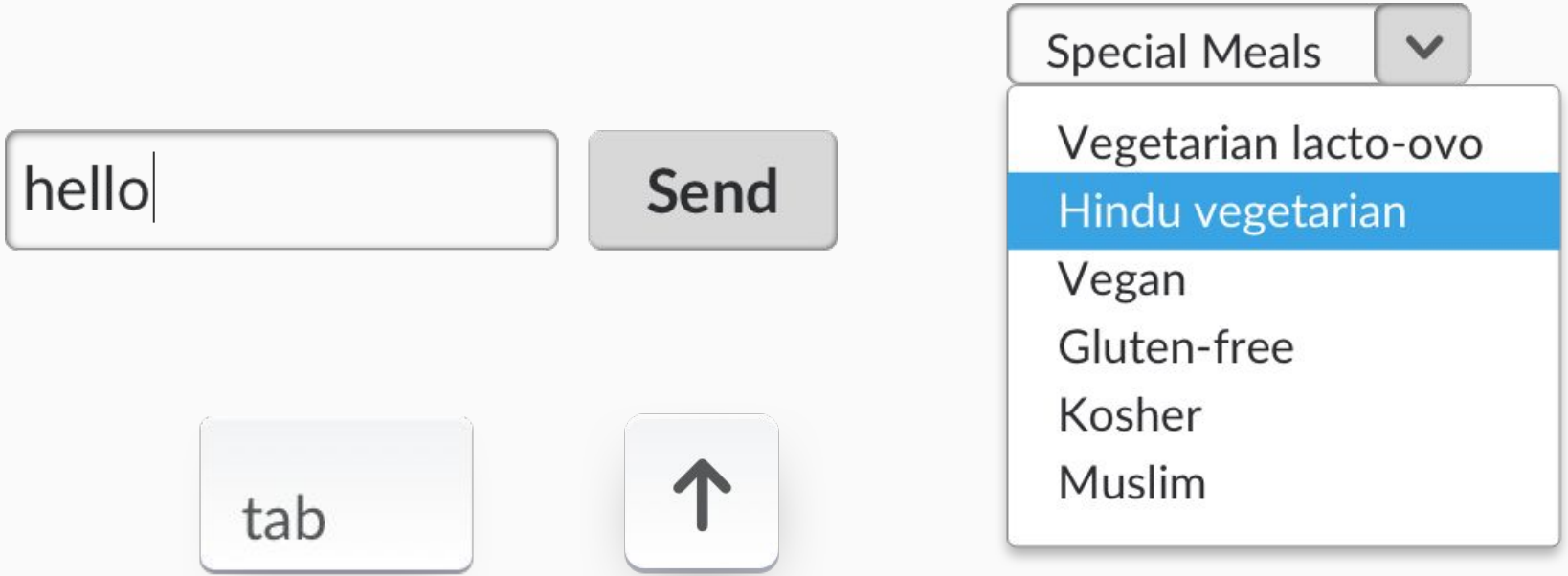
-- Satya Nadella, Microsoft



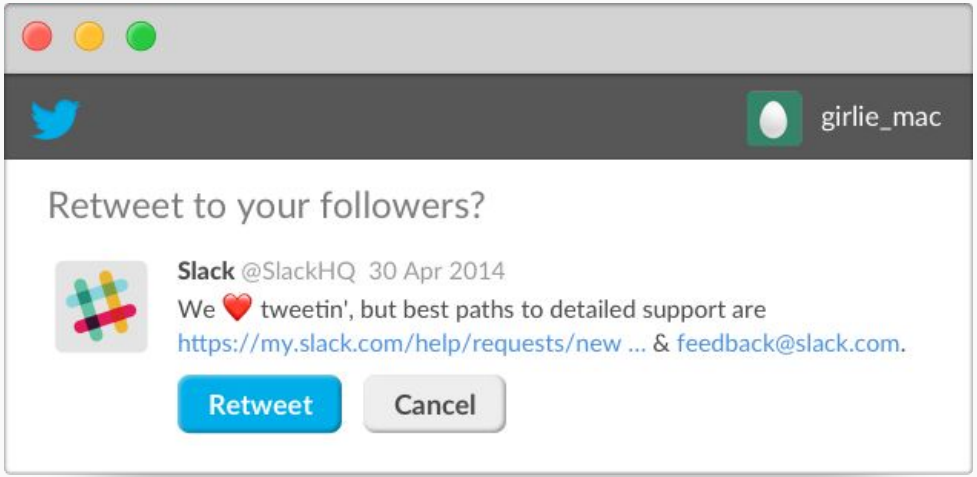
“We will evolve in computing from a mobile first to an AI first world.”

-- Sundar Pichai, Google

Traditional Web & App Interactions



Modern Web & Apps with Social Interactions



Conversational User Interactions: Siri and Alexa (Voice Assistants)

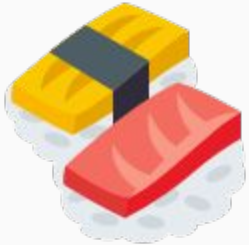
In various form-factors

Conversational User Interactions for Kids - with Voice

- Tell Jokes
- Answer Questions
- Play Games
- Make Stories

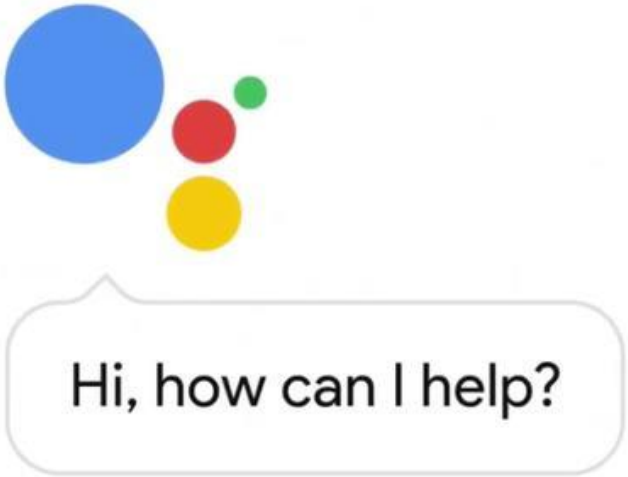
CogniToys Dino - https://cognitoys.com

Conversational User Interactions in a robot shape - with Voice



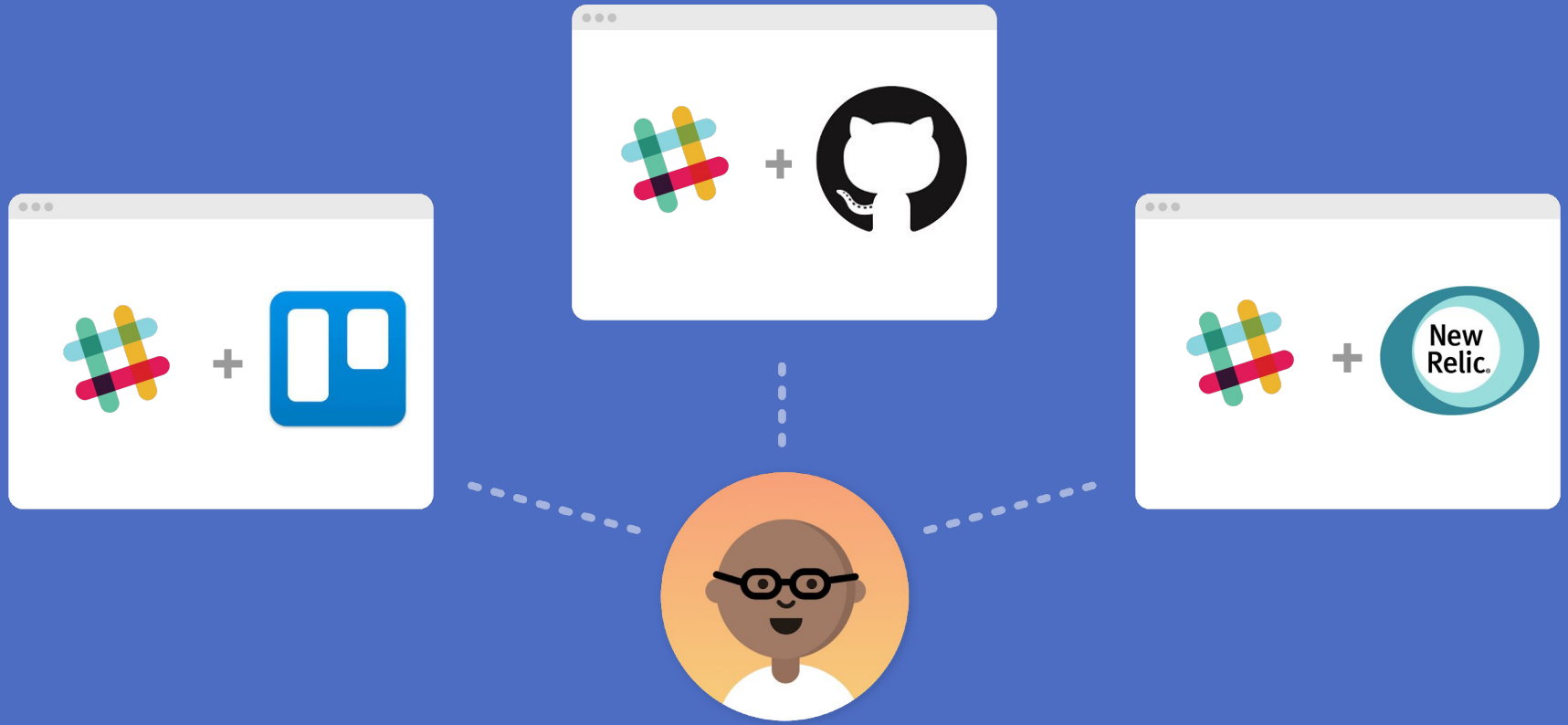

はま寿司
HAMAZUSHI
従業員呼び出し
いらっしゃいませ
受付ボタンをタッチして次に進んでね！
タッチ
受付（発券）

Conversational User Interactions: Google Assistant (Voice & Text)



Conversational User Interactions: Slack Bots (Text)

Slack Integrations & Bots for Better Productivity

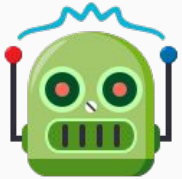


Graphic Interface to Conversational Interface

Deliver me a large margherita pizza!

What kind of crust do you want?

1. Regular crust
2. Thin crust
3. Gluten free crust



cha ching!

Thin crust

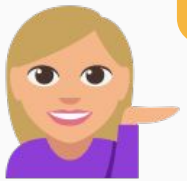
Conversational Interface achieves:

Natural user interactions with a minimal visual interface.

No UI Clutter.
Less Time Spent.

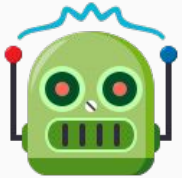
Come over to my place!

Where is the address of your home?



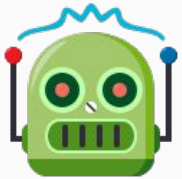
It’s 325 Ruby Street.

`Request a ride`



Yes, get me a ride now

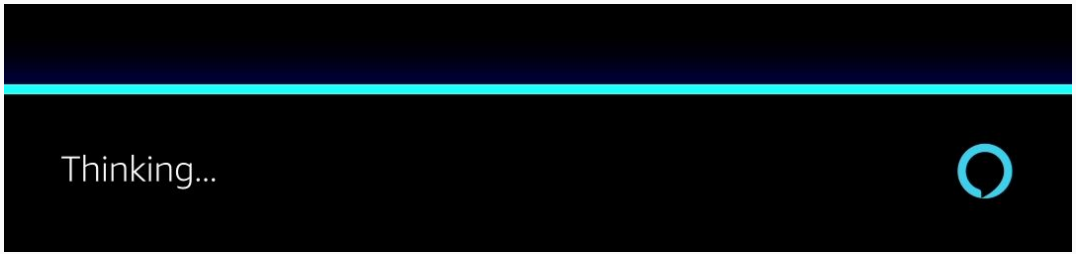
Your driver, Sam will pick you up in 6 minutes. Look for the red Toyota Prius!



Alexa UX (“Voice Chrome” Examples)

Listening

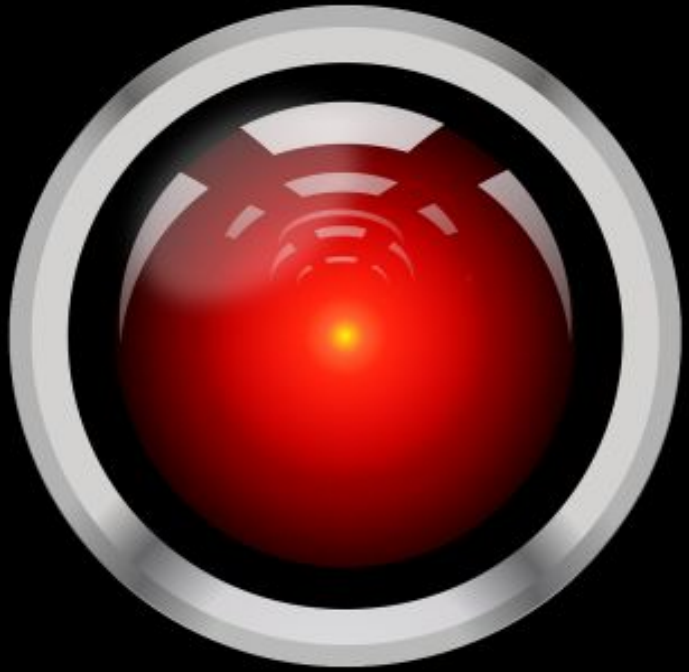
Speaking



https://developer.amazon.com/docs/alexa-voice-service/ux-design-overview.html

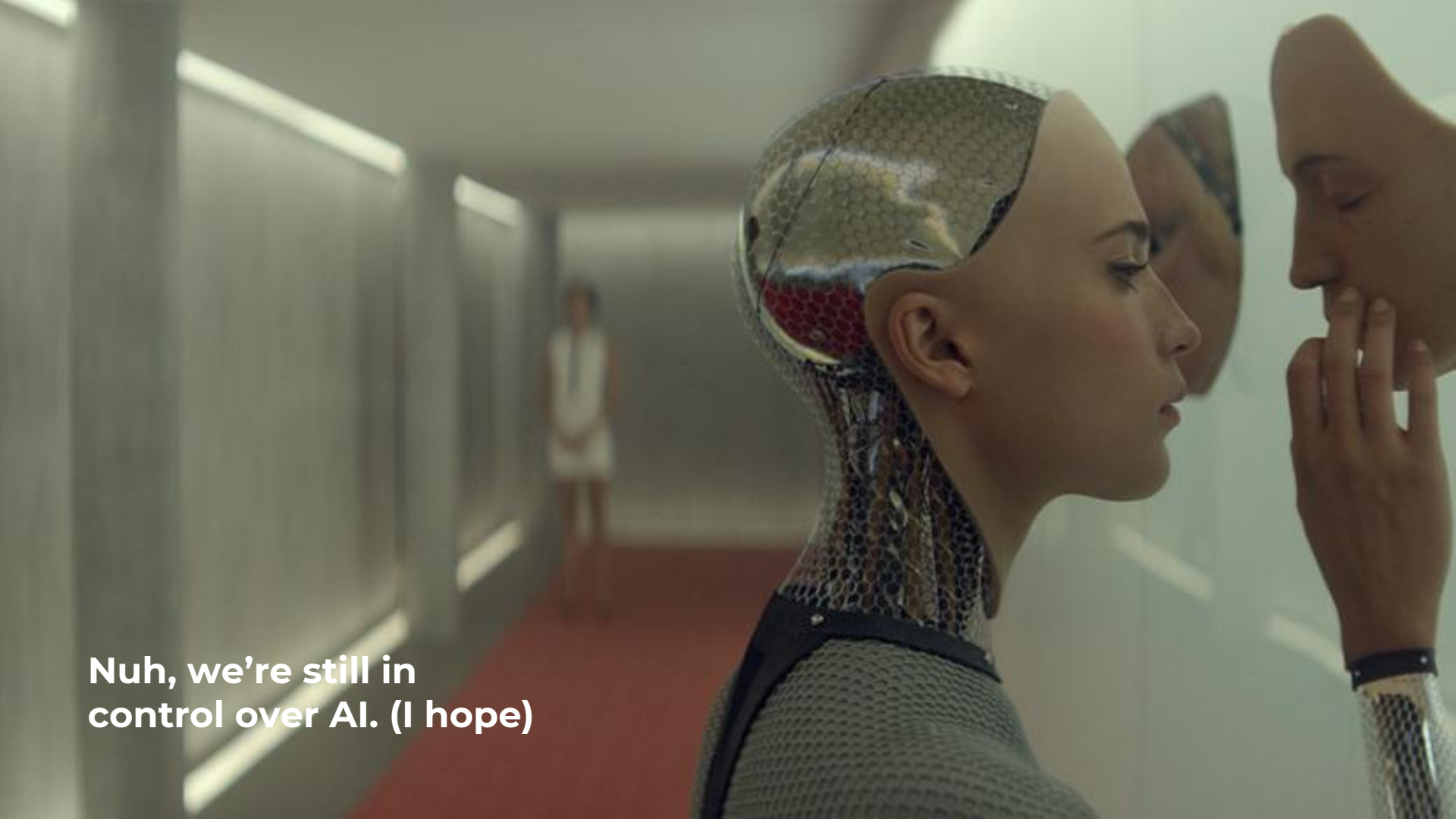
Old concepts.

Technology caught up with the ideas.



HAL9000: “I'm sorry Dave, I'm afraid I can't do that”

Siri: “I'm sorry Dave, I'm afraid I can't do that”


Nuh, we’re still in
control over AI. (I hope)

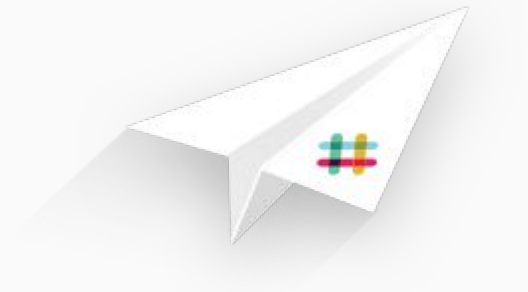
Conversational Interface is:

- Intuitive
- Accessible
- Productive

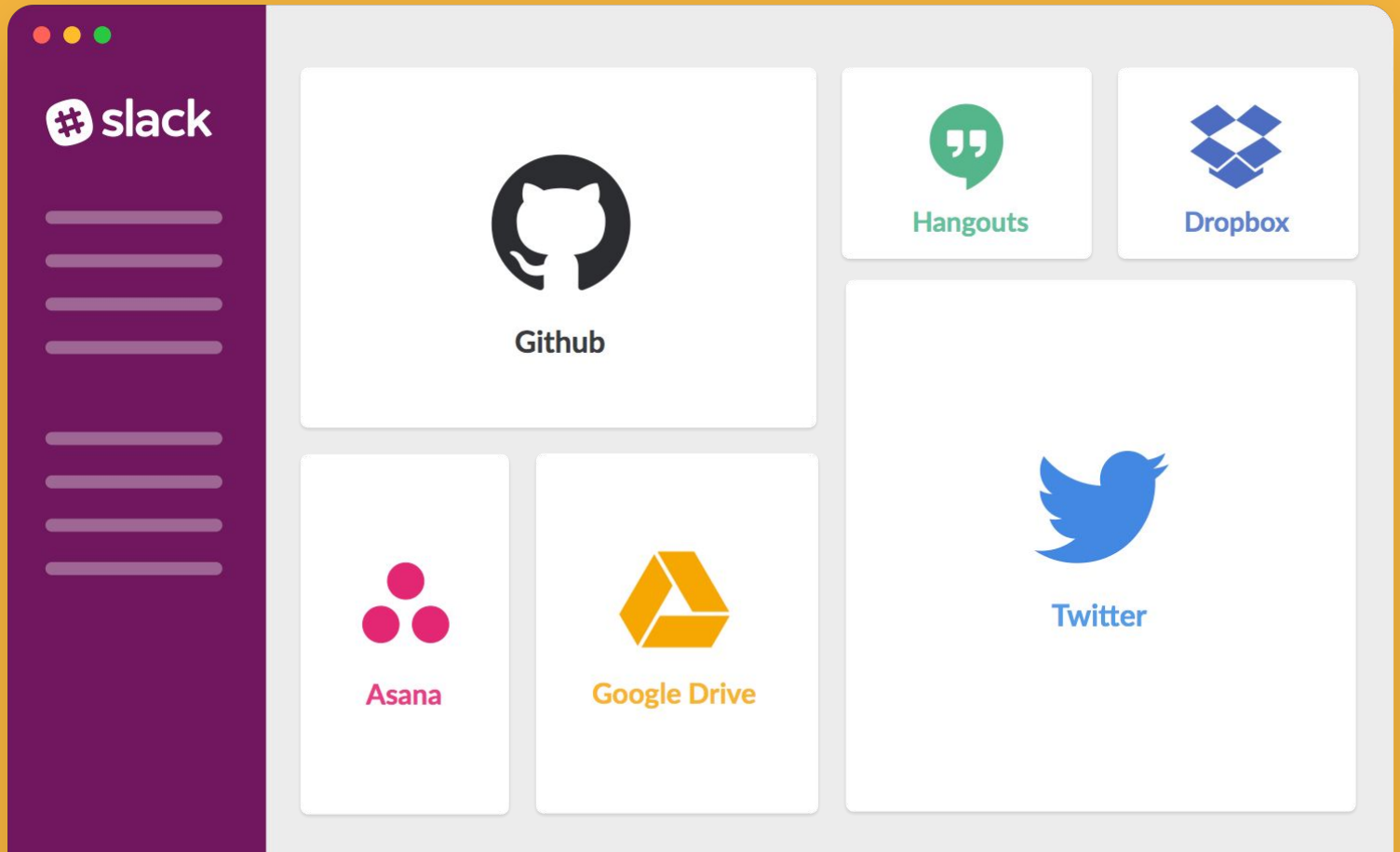
Messaging Platforms

- Slack
- Facebook Messenger
- Telegram
- WeChat
- Kik
- Viver
- LINE

etc.



Messaging + Bots for More Interactive Communications



Stage Chicken APP 12:56 PM
Your code is being staged by dhruv in stage 125545

> PR #66713 from apidocs_misc_bugs - timura

Deploy Chicken APP 1:00 PM
Your code is being deployed by kevin in deploy 125546

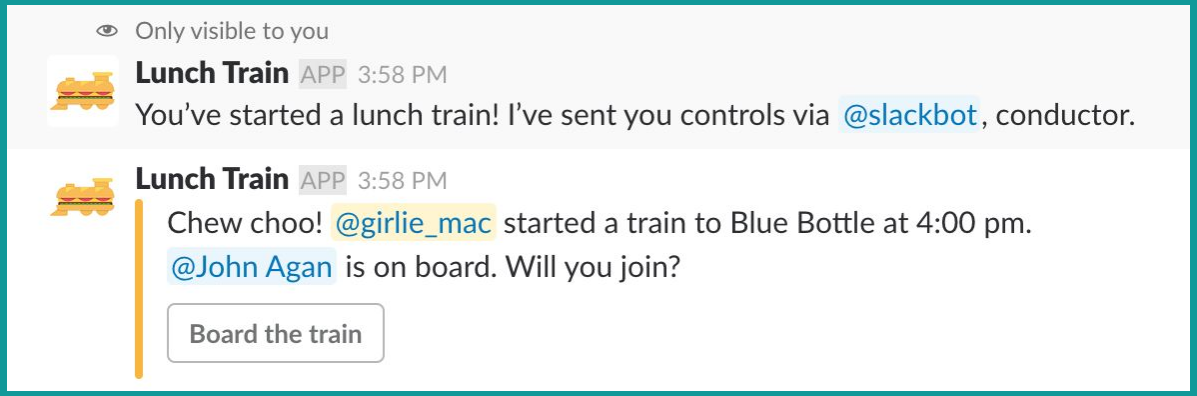
> PR #66713 from apidocs_misc_bugs - timura

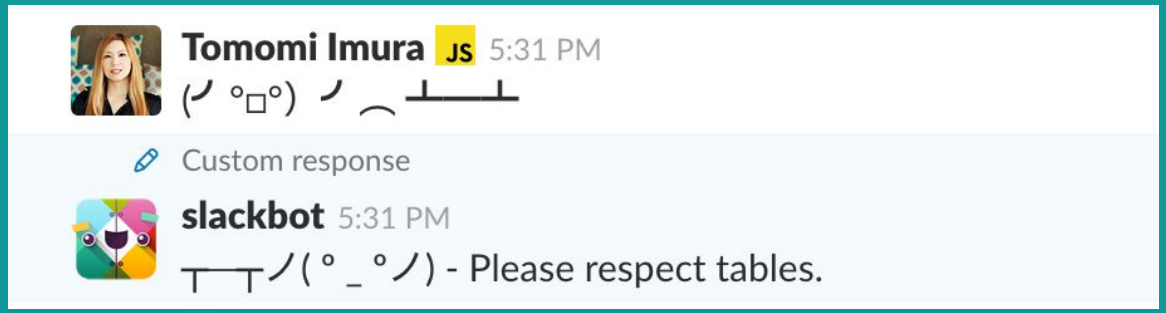
Slack bots at 

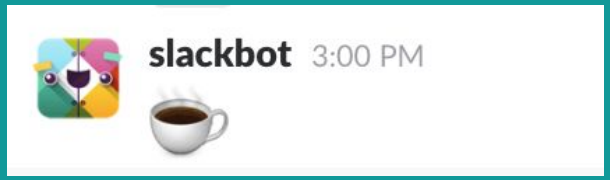
JIRA Bot APP 2:05 PM
PFA-489 updated by brenda:
Create documentation for new conversations.* endpoints

> **Epic Link** changed from `PFA-128` to `PFA-694`
> **Status** changed from `In Development` to `Done`
> **Resolution** changed to `Fixed`

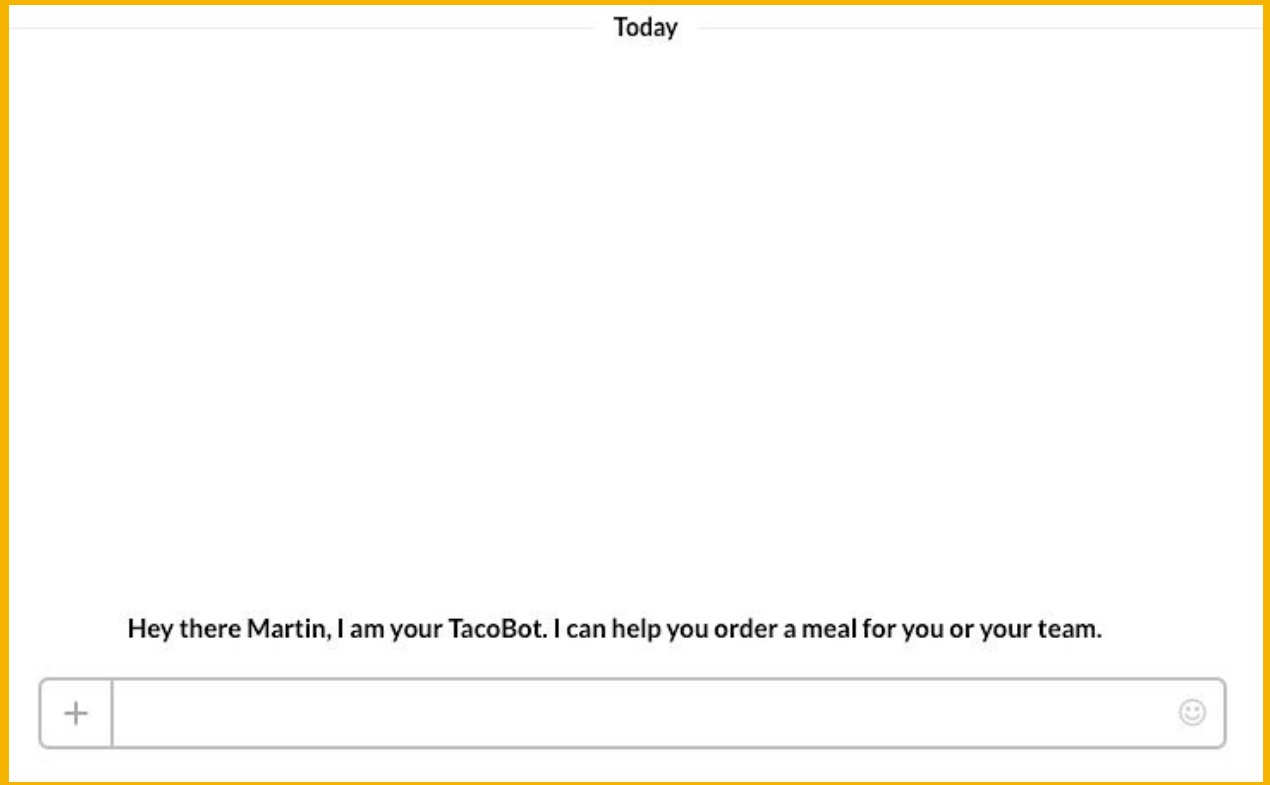
Slack bots at







TacoBot by Taco Bell



https://www.tacobell.com/feed/tacobot

Natural Conversation APIs

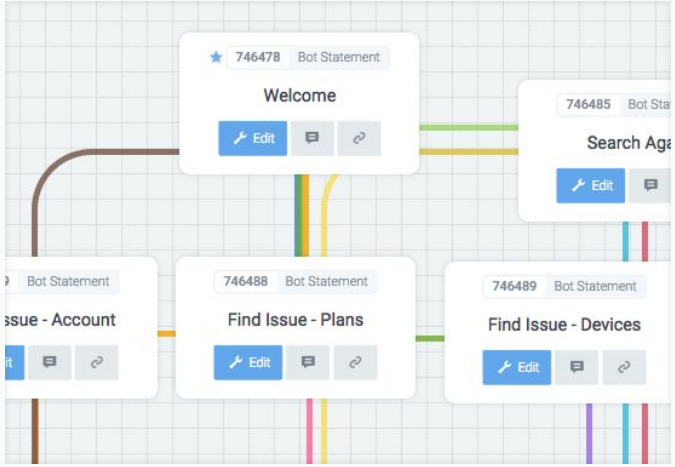
- DialogFlow (API.ai /Google)
- Wit.ai (Facebook)
- Microsoft Bot Framework
- Motion.ai
- Chatbots.io
- Converse AI
- Recast.ai
- Flow XO
- ManyChat
- Fluent.ai (Voice UI)

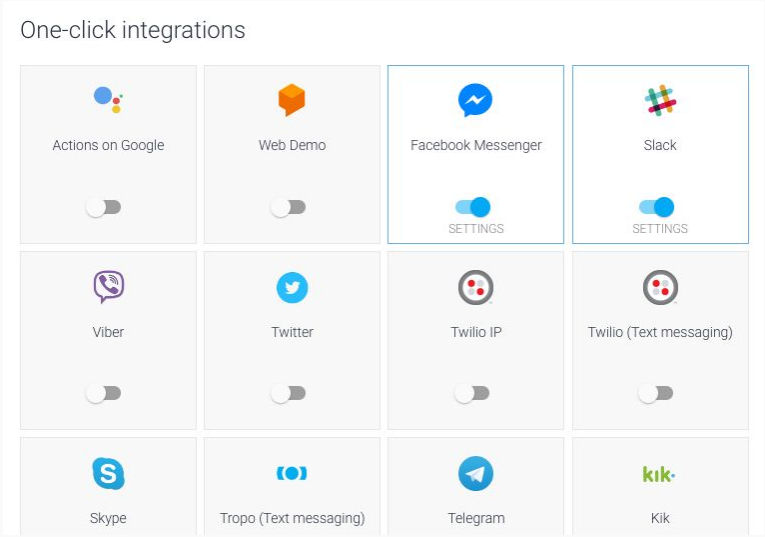
etc.

AIaaS

Artificial Intelligence as a Service 🤓

Motion.ai





DialogFlow (API.ai)

Hi,
I want to book a flight!

Hi Linda! Are you flying from San Francisco, as usual?

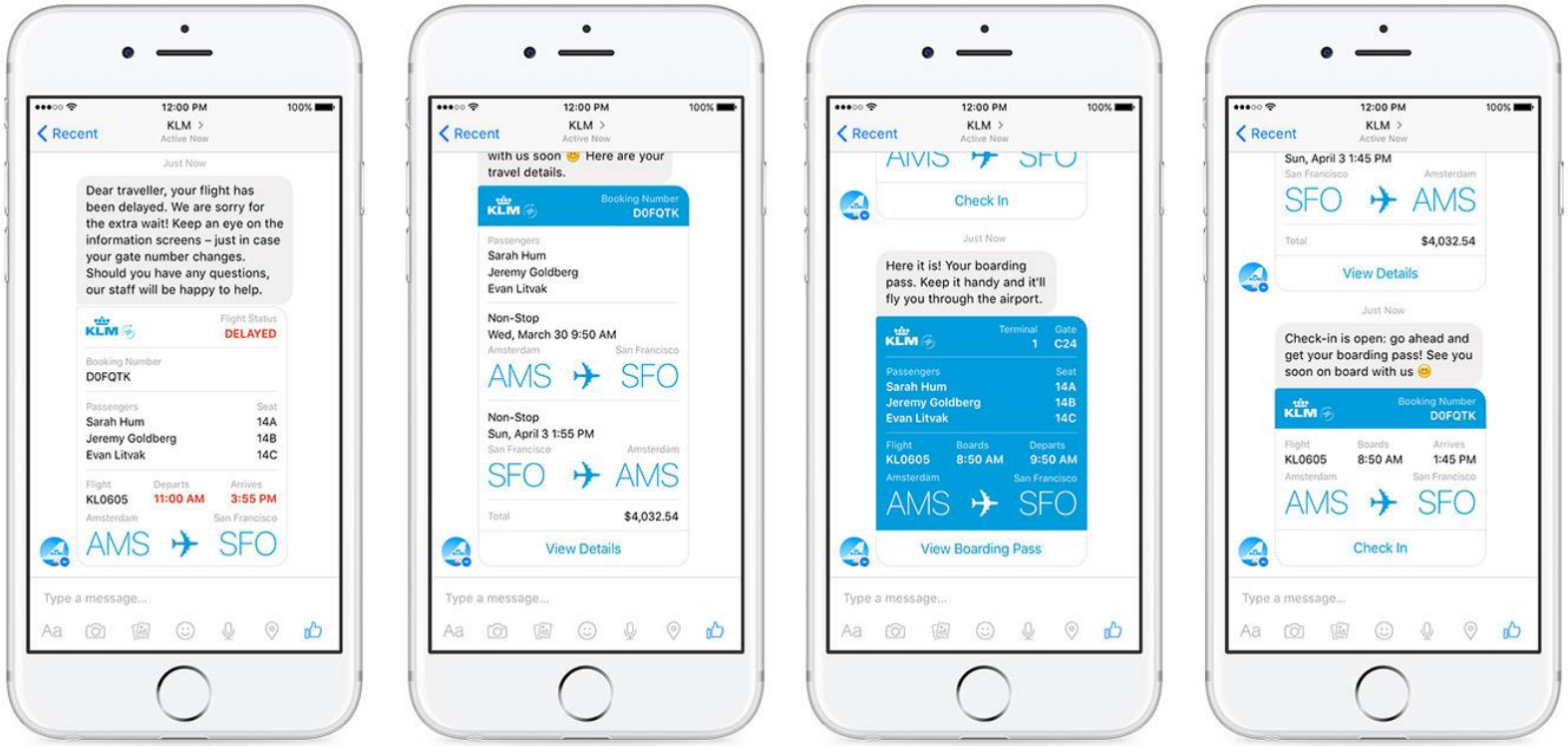
Yes, from SFO.

Where are you flying to?

London

An airline customer service bot

Linda may not know she is talking to a bot!


12:00 PM
100%
Recent
KLM
Active Now
Just Now
Dear traveller, your flight has been delayed. We are sorry for the extra wait! Keep an eye on the information screens – just in case your gate number changes. Should you have any questions, our staff will be happy to help.
Flight Status
DELAYED
Booking Number
D0FQTK
Passengers
Seat
Sarah Hum
14A
Jeremy Goldberg
14B
Evan Litvak
14C
Flight
Departs
Arrives
KL0605
11:00 AM
3:55 PM
Amsterdam
San Francisco
AMS
SFO
Type a message...
with us soon 😊 Here are your travel details.
Booking Number
D0FQTK
Passengers
Sarah Hum
Jeremy Goldberg
Evan Litvak
Non-Stop
Wed, March 30 9:50 AM
Amsterdam
San Francisco
AMS
SFO
Non-Stop
Sun, April 3 1:55 PM
San Francisco
Amsterdam
SFO
AMS
Total
$4,032.54
View Details
Type a message...
Check In
Just Now
Here it is! Your boarding pass. Keep it handy and it'll fly you through the airport.
Terminal
Gate
1
C24
Passengers
Seat
Sarah Hum
14A
Jeremy Goldberg
14B
Evan Litvak
14C
Flight
Boards
Departs
KL0605
8:50 AM
9:50 AM
Amsterdam
San Francisco
AMS
SFO
View Boarding Pass
Type a message...
Sun, April 3 1:45 PM
San Francisco
Amsterdam
SFO
AMS
Total
$4,032.54
View Details
Just Now
Check-in is open: go ahead and get your boarding pass! See you soon on board with us 😊
Booking Number
D0FQTK
Flight
Boards
Arrives
KL0605
8:50 AM
1:45 PM
Amsterdam
San Francisco
AMS
SFO
Check In
Type a message...

NLP Platforms / APIs

Natural Language Processing & Cognitive platforms:

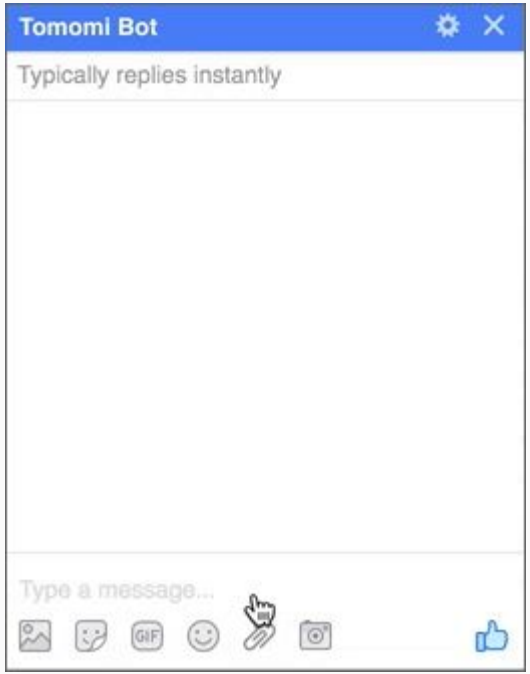
- IBM Watson
- Google Cloud Natural Language API
- Microsoft LUIS
- Amazon Lex
- Baidu UNIT

Build Your Own Conversational Interface

...with JavaScript

The APIs are mostly accessible with JS

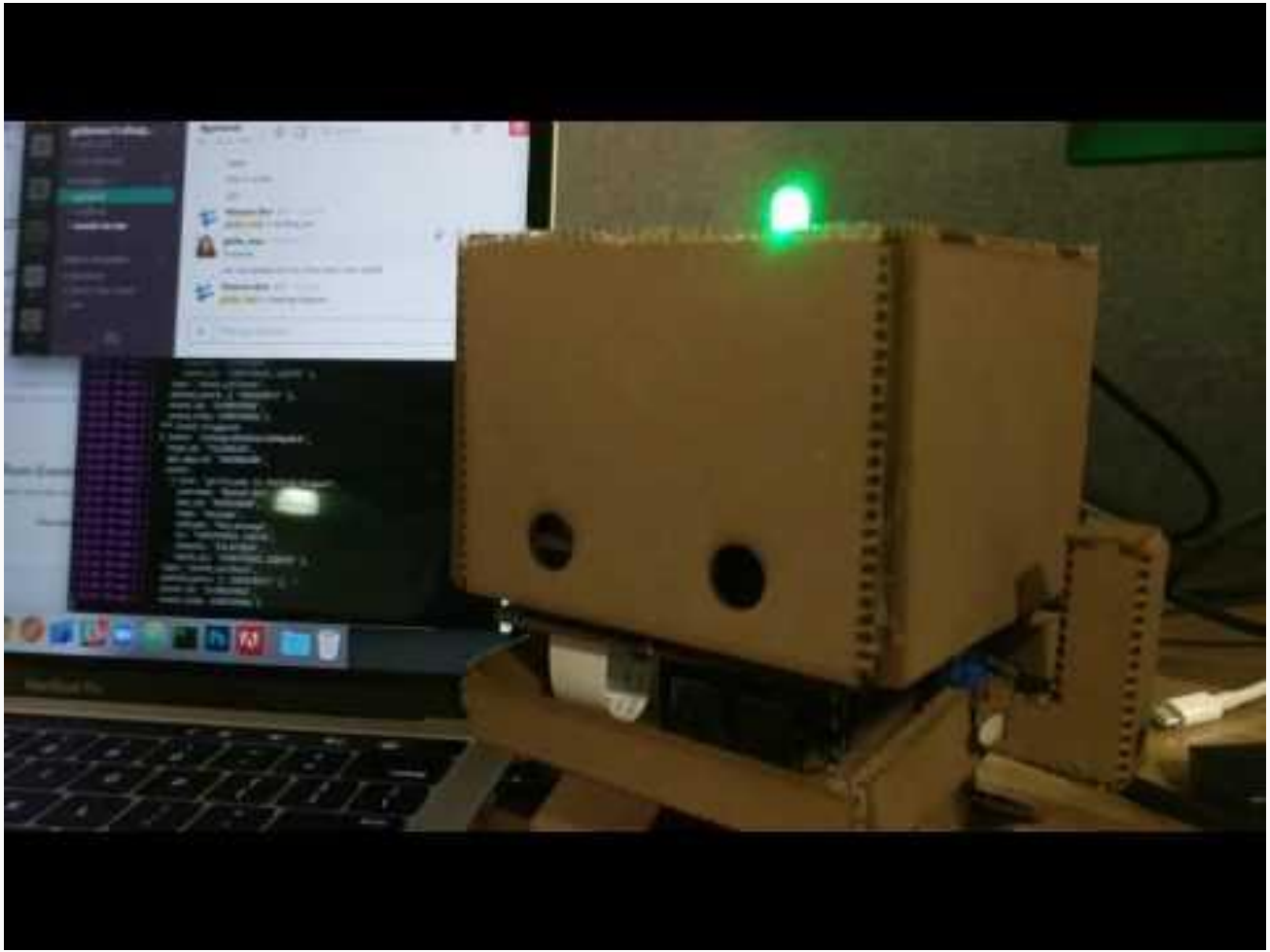
Example: API.ai + FB Messenger




```
const app = require('apiai')(CLIENT_ACCESS_TOKEN);

function sendMessage(event) {
 let sender = event.sender.id;
 let text = event.message.text;

 let ai = app.textRequest(text, {
   sessionId: SESSION_STRING });

 ai.on('response', (response) => {
   // Got a response. Let's POST to Facebook Messenger
 });
 ai.end();
}
```

API.ai Node.js SDK

Example: IBM Watson + Slack



Example: IBM Watson + Slack

The bot workflow:

1. Read each message on a Slack channel
2. Send the message to IBM Watson for examination
3. If the likelihood of an emotion is above the given confidence threshold post the most prominent emotion

Example: IBM Watson + Slack

HTTP POST using ExpressJS

```
app.post('/events', (req, res) => {
 let q = req.body;

 if (q.type === 'event_callback') {
   if(!q.event.text) return;
   analyzeTone(q.event);
 }
});
```

Use Slack Events API to grab the text when a user post a message

Pass the text data to Watson to analyze

Example: IBM Watson + Slack

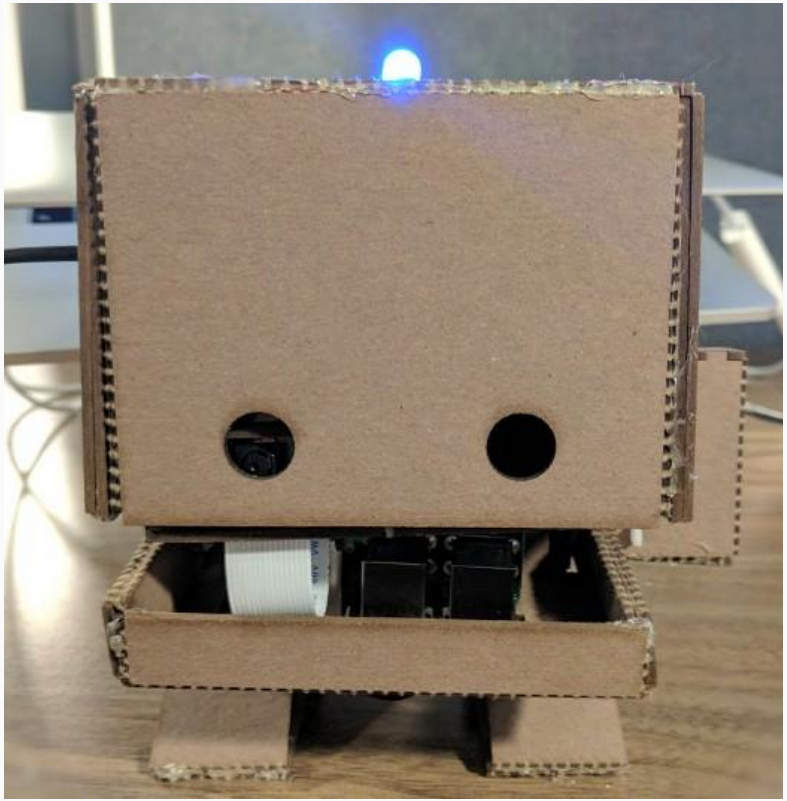
```
const watson = require('watson-developer-cloud');
let tone_analyzer = watson.tone_analyzer({
 username: process.env.WATSON_USERNAME,
 password: process.env.WATSON_PASSWORD,
});

const confidencethreshold = 0.55;
tone_analyzer.tone({text: text}, (err, tone) => {
 tone.document_tone.tone_categories.forEach((tonecategory) => {
   if(tonecategory.category_id === 'emotion_tone'){
     tonecategory.tones.forEach((emotion) => {
       if(emotion.score >= confidencethreshold) {
         postEmotionOnSlackChannel(emotion);
       }});
   }});
});
```

Just initializing it w/ your API credentials

Returns emotions score in 0 to 1

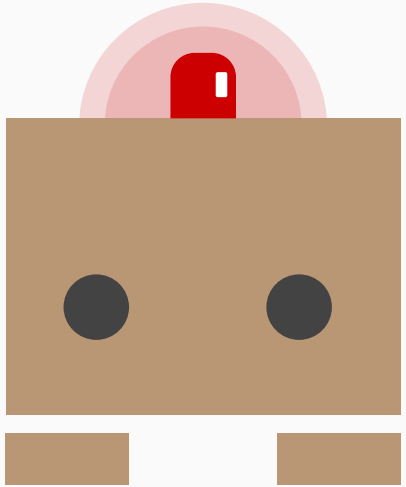
Post the result on Slack

Example: IBM Watson + Slack + Raspberry Pi (for fun)

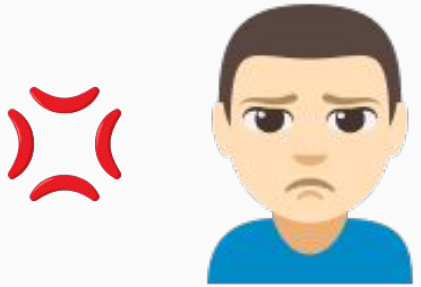


```
function colorEmotion(emotion) {
 if (emotion.tone_id === 'anger') {
   setLED(red);
 } else if(emotion.tone_id === 'joy') {
   setLED(yellow);
 } else if(emotion.tone_id === 'fear') {
   setLED(purple);
 } else if(emotion.tone_id === 'disgust') {
   setLED(green);
 } else if(emotion.tone_id === 'sadness') {
   setLED(blue);
 }
}
```

Change the LED color to match the emotion



Ack, this sucks! I want my money back!



An angry customer detected. Connect the customer with a human!

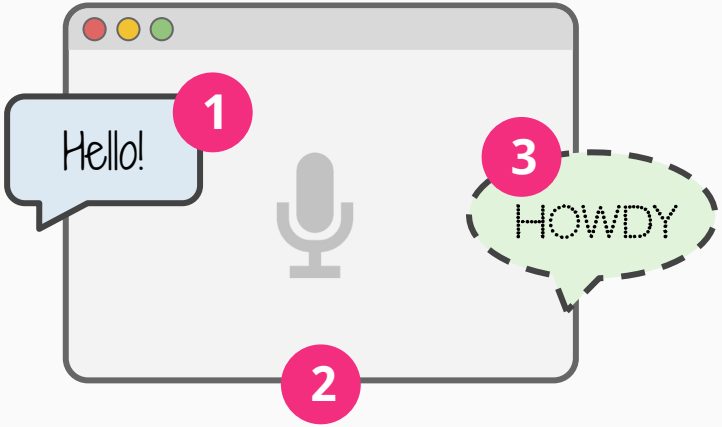
Conversational Interface with Voice in Browser?

Project: Artificial Voice Chat

1. User talk to browser

Voice command:

Voice -> Text



Text

2. Generate Artificial reply

Using the 3rd party API

3. Browser speaks back

Text -> Synthetic Voice

Web Speech API

1 Speech Recognition & 3 Speech Synthesis

http://caniuse.com/#feat=speech-recognition
http://caniuse.com/#feat=speech-synthesis

Web Speech API: Speech Recognition

```
const SpeechRecognition =
window.SpeechRecognition || window.webkitSpeechRecognition;
```

In the current Chromium, it is still prefixed

```
const recognition = new SpeechRecognition();
```

Get an instance of the SpeechRecognition, the controller interface

Web Speech API: Speech Recognition (Cont'd)

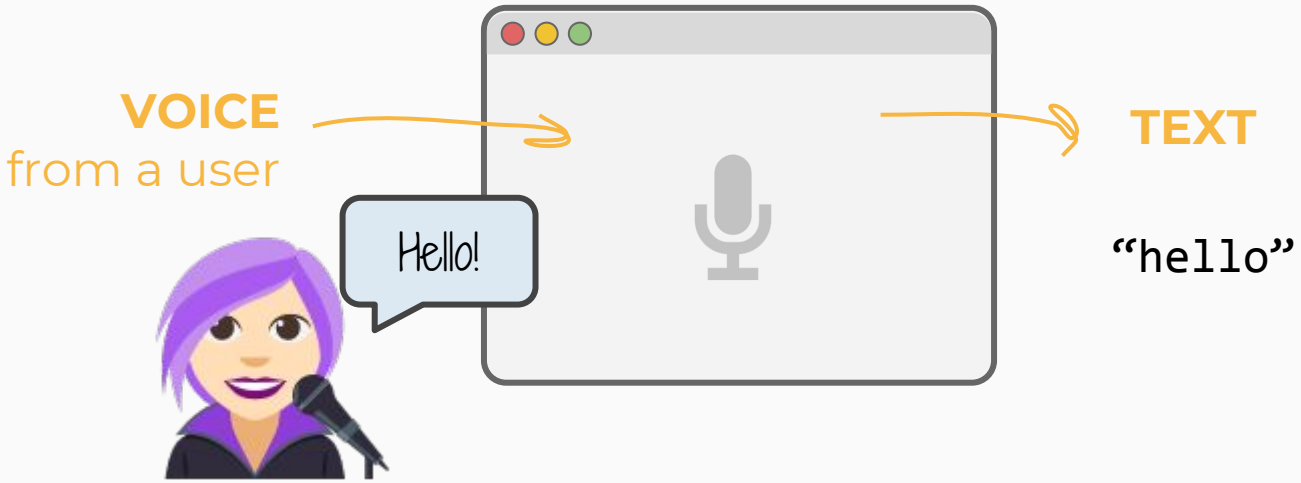
```
recognition.lang = 'en-US';
recognition.interimResults = false;

recognition.start();

recognition.addEventListener('result', (e) => {
  let last = e.results.length - 1;
  let text = e.results[last][0].transcript;
});
```

Some properties

Methods: start(), stop(), abort()

Events: onresult, onerror, onaudiostarted, onaudioend, etc.

Web Speech API: Speech Recognition



Web Speech API: Speech Synthesis

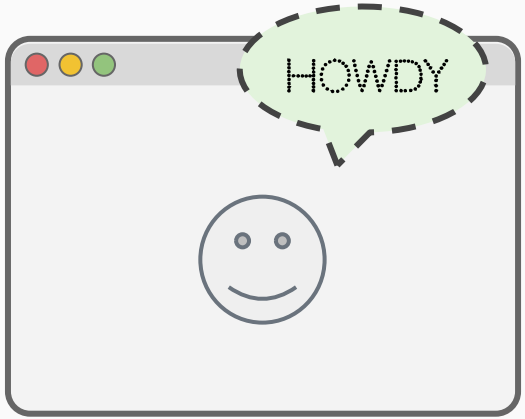
```
const synth = window.speechSynthesis;
const utterance = new SpeechSynthesisUtterance();

utterance.text = 'I am a robot';
utterance.pitch = 1.5;
utterance.voice = 'Alex';

synth.speak(utterance);
```

No vendor prefix 😊

Properties of the SpeechSynthesisUtterance interface

Get available voices with synth.getVoices() method

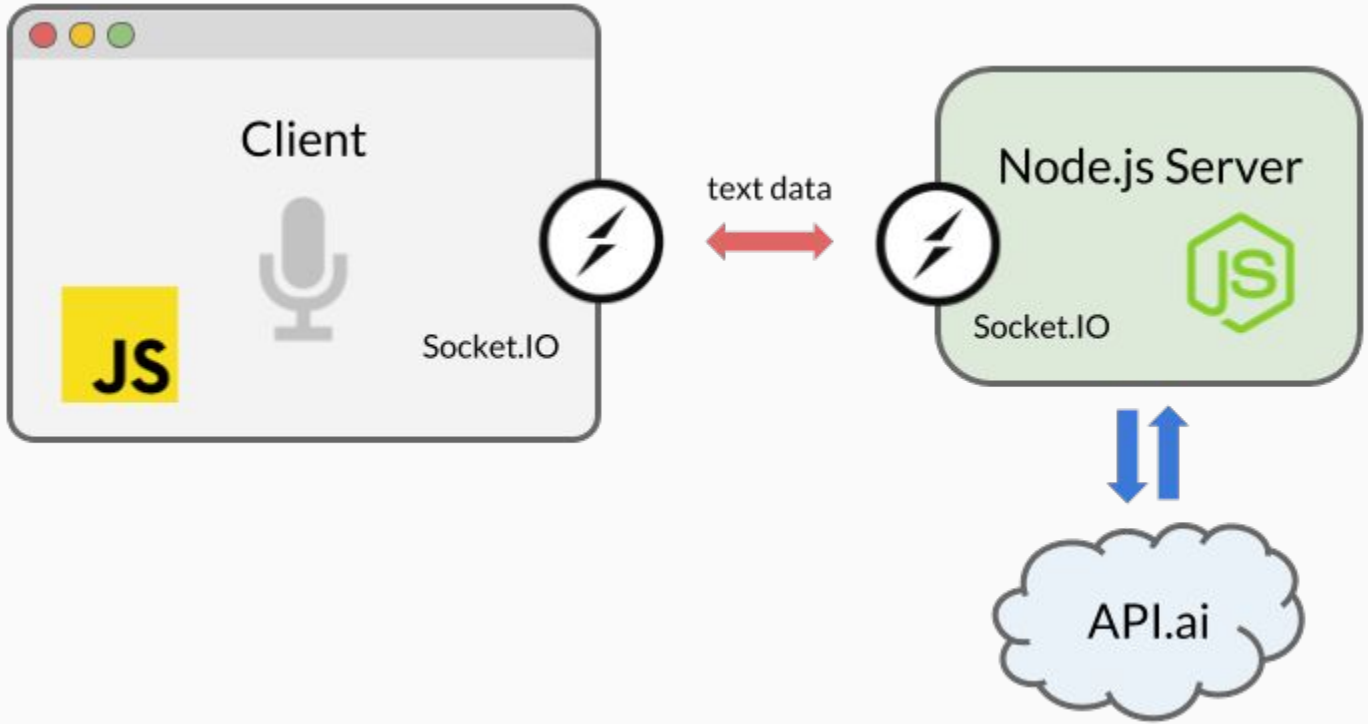
Web Speech API: Speech Synthesis



TEXT to VOICE

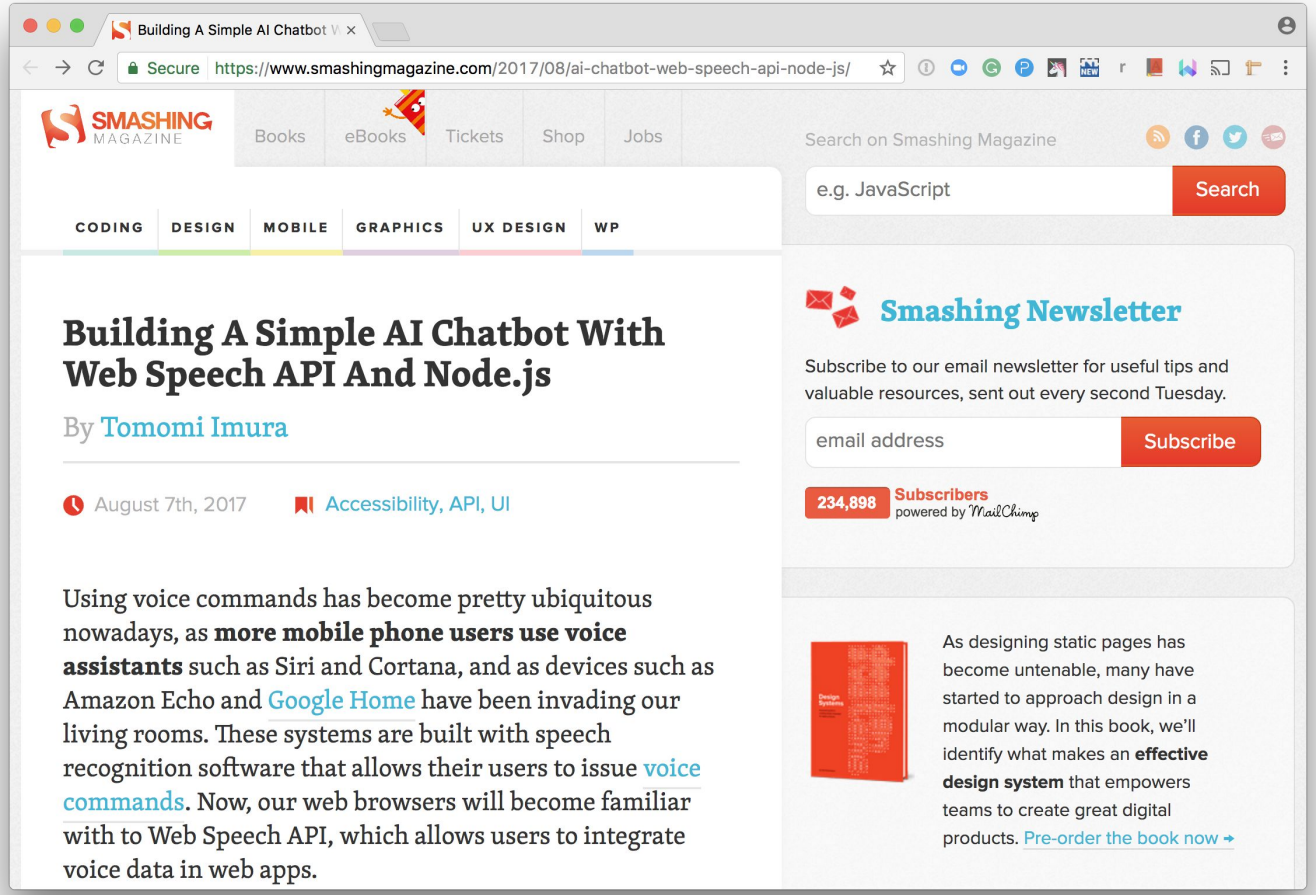
“howdy”

(voice by Alex or whoever browser is)


Client
JS
Socket.IO
text data
Node.js Server
Socket.IO
API.ai

Demo on Chrome

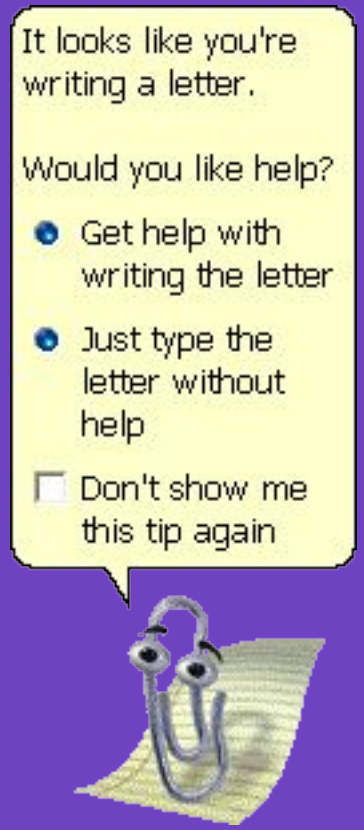
https://webspeech.herokuapp.com/



https://www.smashingmagazine.com/2017/08/ai-chatbot-web-speech-api-node-js/

Conversational Interface is for human.

A bots interface really is a human interface.



Remember me?

Clippy 1997 - 2007

Thank you!

@girlie_mac

girliemac.com

github.com/girliemac

speakerdeck.com/girlie_mac

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