



# MICROSOFT A.I.

## CONVERSATIONAL UI AND COGNITIVE SERVICES

**SIMON MICHAEL**

@SIMON\_MICH

#botframework

**10**

**ZB**  
**2015**

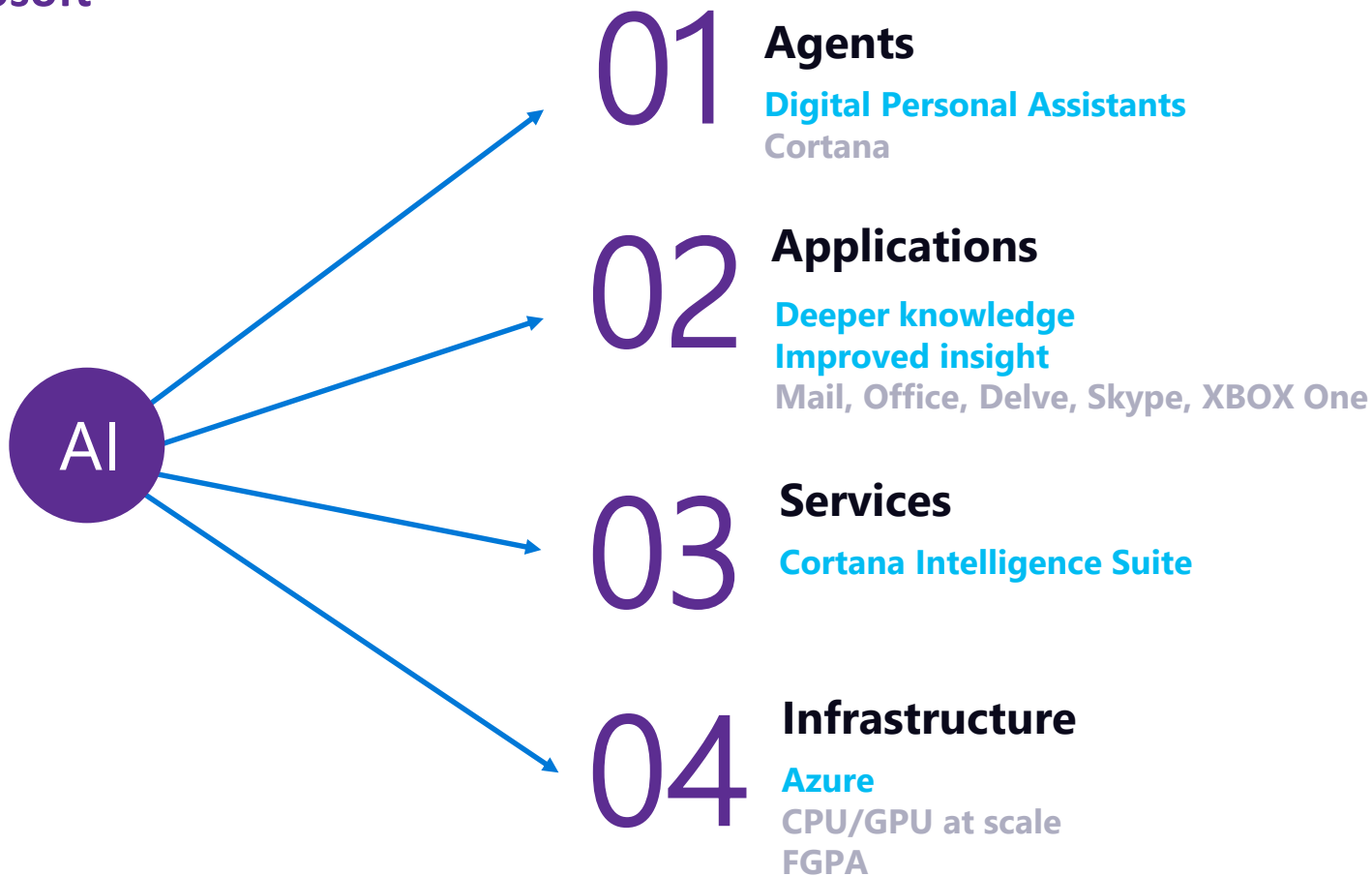
**180**

**ZB**  
**2025**

"OUR GOAL IS TO DEMOCRATISE A.I.  
TO EMPOWER EVERY PERSON  
AND EVERY ORGANISATION  
TO ACHIEVE MORE"

- Satya Nadella

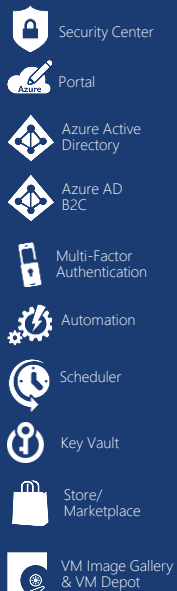




# Microsoft Infrastructure - Azure



## Security & Management



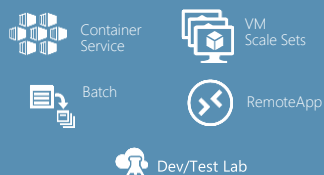
## Media & CDN



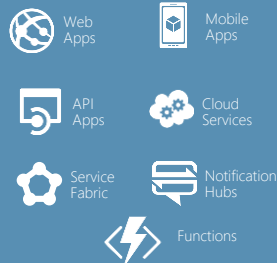
## Integration



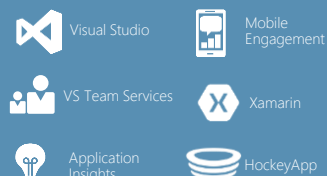
## Compute Services



## Application Platform



## Developer Services



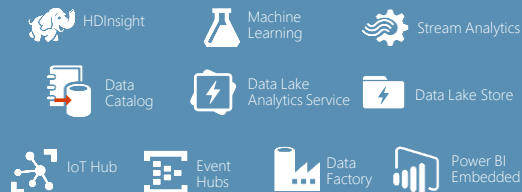
## Data



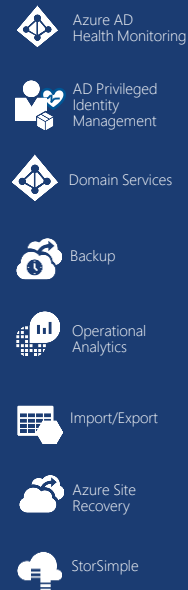
## Intelligence



## Analytics & IoT



## Hybrid Cloud



## Compute



## Storage



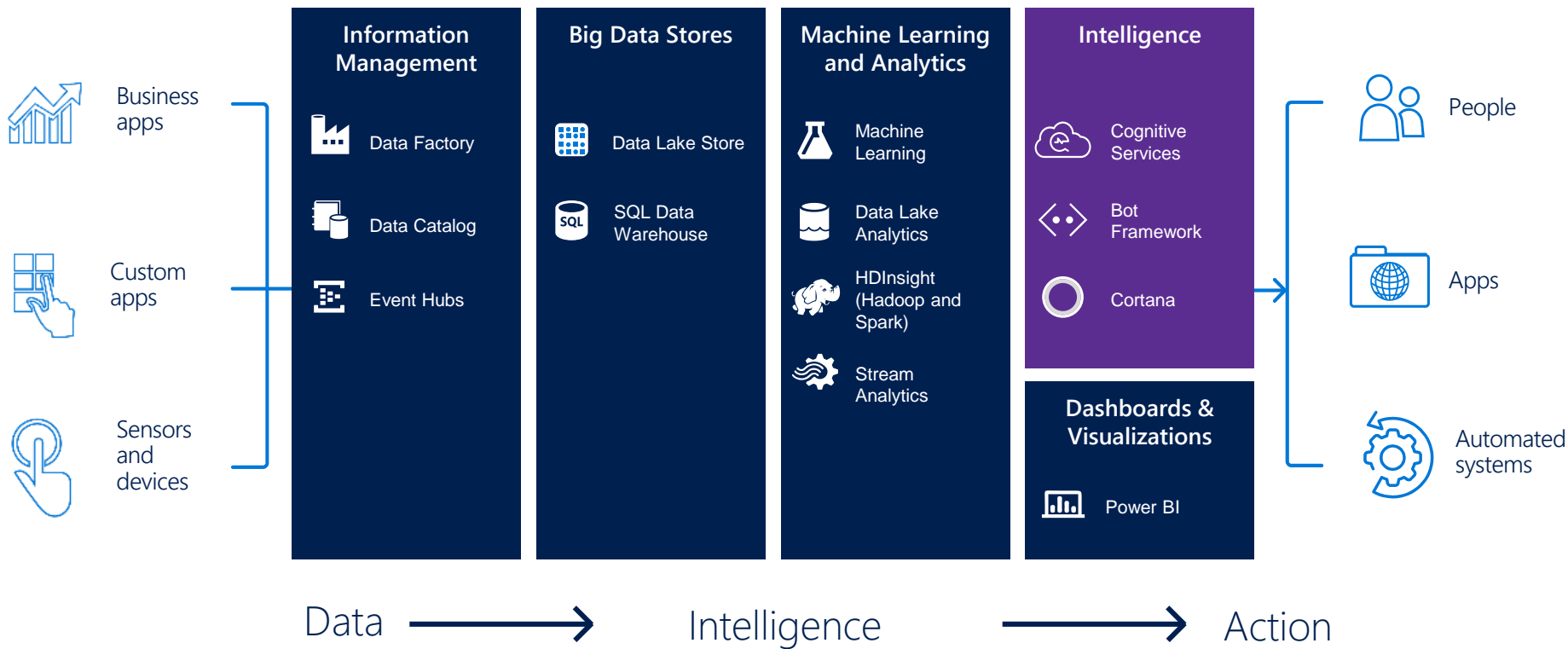
## Networking



Datacenter Infrastructure (34 Regions)

# AI Services

## Cortana Intelligence Suite



# COGNITIVE SERVICES

**Giving your apps/bots  
a human side**



[www.microsoft.com/cognitive](http://www.microsoft.com/cognitive)



# Microsoft Azure Machine Learning

The screenshot displays the Microsoft Azure Machine Learning Studio interface. The top navigation bar includes 'Home', 'Studio', and 'Gallery'. The main workspace is titled 'Binary Classification: Direct marketing' and is in 'draft' status. A left-hand sidebar contains a search bar and a list of experiment items: Saved Datasets, Data Format Conversions, Data Input and Output, Data Transformation, Feature Selection, Machine Learning, OpenCV Library Modules, Python Language Modules, R Language Modules, Statistical Functions, Text Analytics, Web Service, and Deprecated. The central workspace shows a workflow diagram starting with a 'Reader' module, followed by 'Metadata Editor' and 'Project Columns'. The workflow then branches into two parallel paths. The left path includes a 'Two-Class Boosted Decision Tree' module (labeled with a circled '1'), a 'Split' module, and a 'Sweep Parameters' module. The right path includes a 'Two-Class Support Vector Ma...' module, a 'Split' module, and a 'Sweep Parameters' module. A right-hand 'Properties' panel is visible, showing settings for the 'Two-Class Boosted Decision Tree' module, including 'Create trainer mode' (Single Parameter), 'Maximum number of leaf...' (20), 'Minimum number of sam...' (10), 'Learning rate' (0.2), 'Number of trees construct...' (100), 'Random seed' (0), and a checked 'Allow unknown categ...' option.

A fully managed cloud service that enables you to easily build, deploy, and share predictive analytics solutions.

## Creating great ML models takes:

- Lots of high quality, tagged data. Quality is key!
- Lots of expertise
- The right tools & technology (much is open sourced)
- Lots and lots and lots and lots of computing power
- Commitment to improvement

## Microsoft Cognitive Services

“Enable your apps to see, hear, interpret, and interact in more human ways.”

“An API for accessing the real world”

“Really hard problems Microsoft has already solved so you don’t have to”



Vision

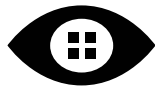
Speech

Language

Knowledge

Search

# Vision



From faces to feelings, allow your  
apps to understand images and video

Computer Vision | Emotion | Face | Video

# Speech



Hear and speak to your users, identify speakers

Custom Recognition | Speaker Recognition | Speech API

# Language



Process text, understand intent, translate

Bing Spell Check | Language Understanding | Linguistic Analysis |  
Text Analytics | Web Language Model | Translator

# Knowledge



Academic Knowledge | Entity Linking  
Knowledge Exploration | Recommendations

# Search



Access billions of web pages, images, videos,  
and news with the power of Bing APIs

Bing Web Search | Bing Image Search  
Bing News Search | Bing Video Search  
Bing Auto Suggest



DEMO



COGNITIVE

# UBER

REAL-TIME ID CHECK

FACIAL API  
MICROSOFT COGNITIVE



# CONVERSATION AS A PLATFORM

Human Language is the new UI layer



# Conversation- as-a-Platform



People



Digital Personal Assistants



Bots

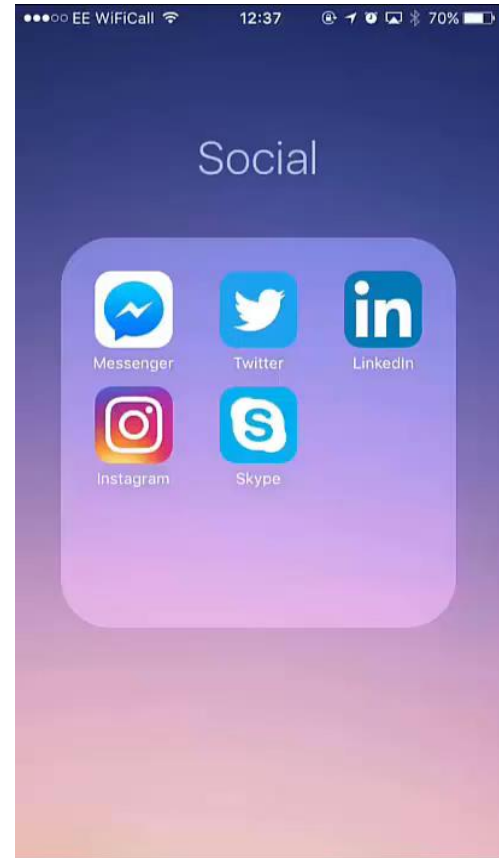


REAL-TIME VOICE TRANSLATION

TRANSLATOR API  
MICROSOFT COGNITIVE



# BOTS





# What is a bot?

Application that performs one or more **automated** tasks.

Chatbots – use **conversation** as the interface



# Bots

## why now?

# 01

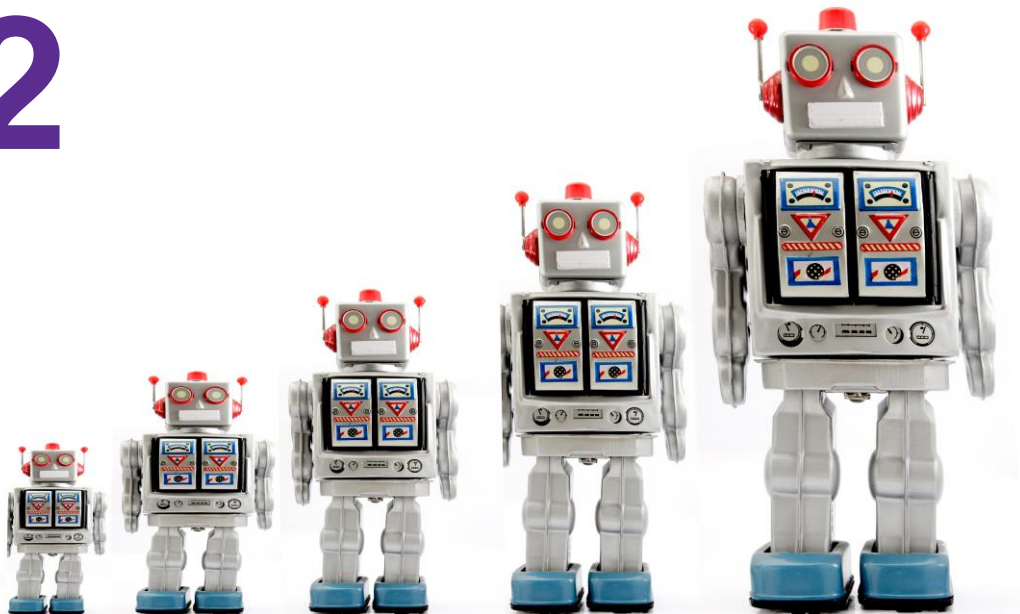
AI and NLP

# 02

Data

# 03

Messaging Platforms



## Bots app numbers

4.8m

SUMMER 2016



## Bots app usage

85%

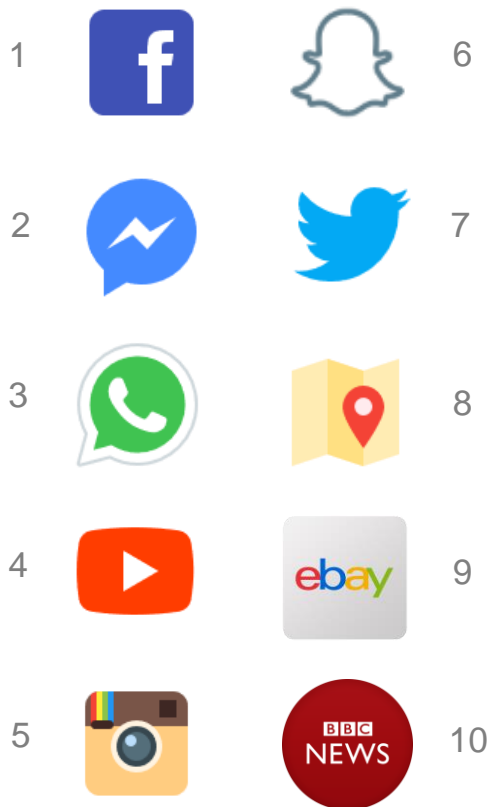
of consumer's time on  
smartphone spent using 5 apps\*

\* Each user have their own selection of those five, but mostly games, social networking or messaging apps

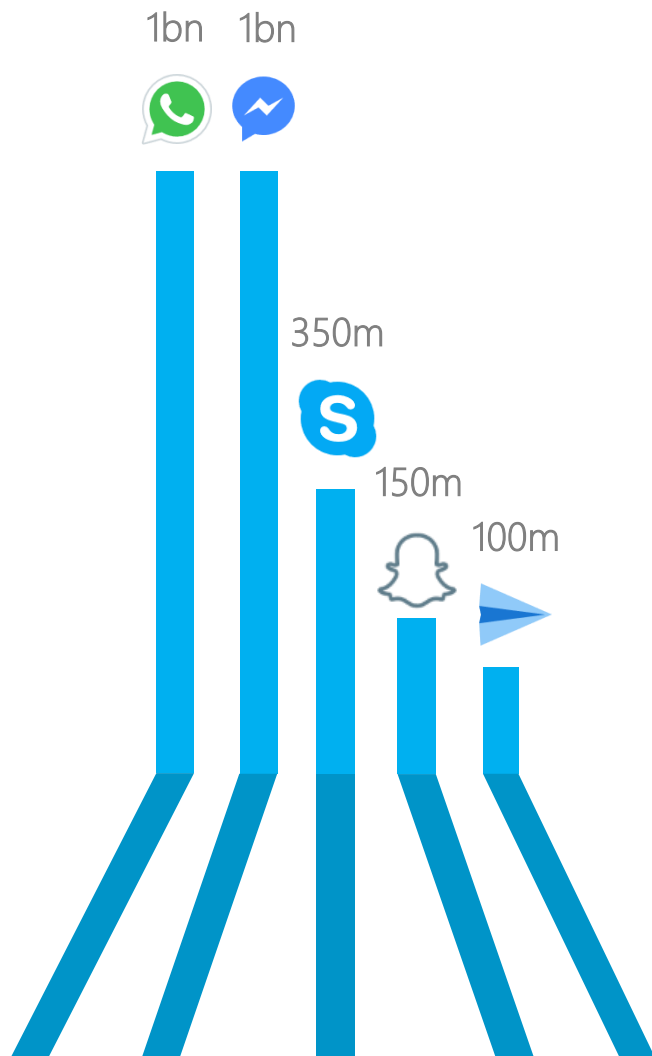
Source: <https://techcrunch.com/2015/06/22/consumers-spend-85-of-time-on-smartphones-in-apps-but-only-5-apps-see-heavy-use/>

## Bots app numbers

### Top App by Activity



## Bots messaging apps

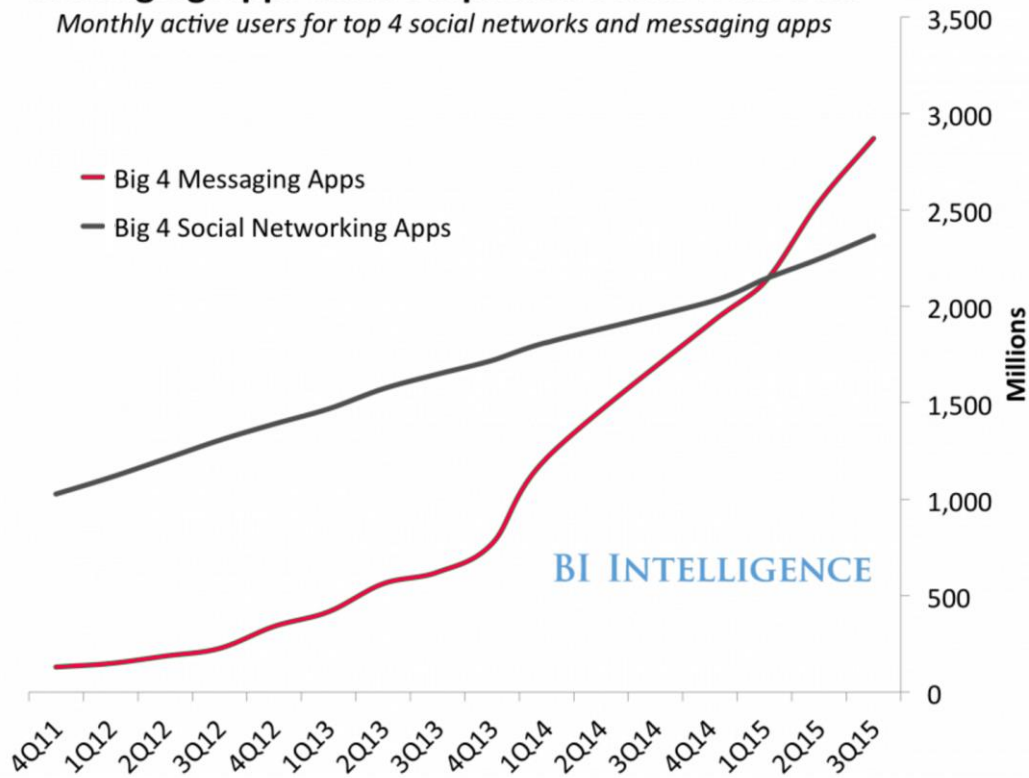


## Bots

### messaging apps vs social networks

#### Messaging Apps Have Surpassed Social Networks

*Monthly active users for top 4 social networks and messaging apps*



Source: <http://uk.businessinsider.com/the-messaging-app-report-2015-11>

## Bots

### benefits for business



They can be where their customers are:  
**inside** those messaging applications

*"...utilizing chat, messaging, or other interfaces (i.e. voice) to interact with people, brands, or services ... The net result is that you and I will be talking to brands and companies over Facebook Messenger, WhatsApp, Telegram, Slack, and elsewhere before year's end, and will find it **normal**."*

**chris messina**

**developer experience lead @ uber**

*"Essentially we are simply adapting to our customers' behaviours rather than trying to target new customers."*

**nick dutch**

**head of marketing @ domino pizza  
uk**

Source: <https://www.marketingweek.com/2016/08/17/dominos-pizza-explains-why-it-is-chasing-facebook-bots/>  
<https://medium.com/chris-messina/2016-will-be-the-year-of-conversational-commerce-1586e85e3991#.8r6oolxlu>



# Bot patterns

01

## Information Retrieval

Lookup, reference and information seeking, scenarios backed by a data source

*"What are the features of service plan A?"*  
*"When are the trains leaving on Thursday?"*

03

## Advisory Role

Prescriptive guidance via 'expert systems' based on user input.

*"How much can I save if I switch to payment plan B?"*  
*"Should I add an additional component to my service plan?"*

02

## Transactional

Look up info, make amendments, scenarios backed by a data source

*"Upgrade my account to plan B"*  
*"book two tickets for film A on Monday using my credit card"*

04

## Social Conversations

Ability to sense sentiment and engage in open-ended conversation within the bots area of expertise.

*"Your product is terrible, I would like a refund."*  
*"I have had a terrible experience, who can I talk to?"*

Build a bot!

How do you make  
a bot?

How do you make  
a **great** bot?



## Bots

### Microsoft Bot Framework

Build a great  
conversationalist.



Sure Lili, I'm happy to help.

## Bot Framework

01

### Bot Builder SDKs

Build great dialogs  
within your Node.js- or  
C#-based bot

02

### Bot Connector

Connect your bot(s) to  
text, Skype, Slack,  
and other services

03

### Bot Directory

Try a bot and add it to  
your conversations

# Bot Framework Builder SDK

Create bot using C# or node.js

SDK supports dialogs to model a conversation:

- Reusable
- Persistent dialog state
- Various dialog types

SDK allows for rich interactions:

- Rich attachments (image, card, doc, video)
- Support for calling (Skype\*)

Chat Emulator

The screenshot shows the Microsoft Bot Framework Builder SDK documentation page. The top navigation bar includes links for Bot Framework overview, My bots, Register a bot, Documentation, and Bot Directory. The left sidebar contains a table of contents with sections like Bot Framework Overview, Bot Framework FAQ, Bot Framework Support, Bot Connector, Bot Builder for C#, Bot Builder for Node.js, Getting Started, Guides, Core Concepts, Understanding Natural Language, Examples, Bots, TextBot, BotConnectorBot, SlackBot, Dialogs, Dialogs, Prompts, CommandDialog, ListDialog, Libraries, BotBuilder v0.6, and Sandbox. The main content area is titled 'Getting Started' and includes a section 'What is Bot Builder for Node.js and why should I use it?' which states that Bot Builder for Node.js is targeted at Node.js developers creating new bots from scratch. Below this is an 'Install' section with the command 'npm install --save botbuilder'. The 'Build a bot' section shows a code snippet for creating a simple bot using the BotBuilder SDK. The 'Test your bot' section mentions using the Bot Framework Emulator. The 'Publish your bot' section mentions deploying the bot to the cloud. At the bottom, there is a code snippet for a C# bot that shows how to create a reply message, get the count of special characters, and set the order status.

Microsoft

Bot Framework overview My bots Register a bot Documentation Bot Directory

## Getting Started

### What is Bot Builder for Node.js and why should I use it?

Bot Builder for Node.js is targeted at Node.js developers creating new bots from scratch. By building your bot using the Bot Builder framework you can easily adapt it to run on nearly any communication platform. This gives your bot the flexibility to be wherever your users are.

- Bot Builder for Node.js Reference
- Bot Builder on GitHub

### Install

Get the BotBuilder module using npm.

```
npm install --save botbuilder
```

### Build a bot

Say hello in a few lines of code.

```
var restify = require('restify');
var builder = require('botbuilder');

var server = restify.createServer();

var helloBot = new builder.TextBot();
helloBot.add('/', function (session) {
    session.send('Hello World!');
});

server.post('/v1/messages', helloBot.listen());

server.listen(3080, function () {
    console.log('%s listening to %s', server.name, server.url);
});
```

### Test your bot

Use the Bot Framework Emulator to test your bot on localhost (Windows Only)

- Download it here
- Learn how to use it here

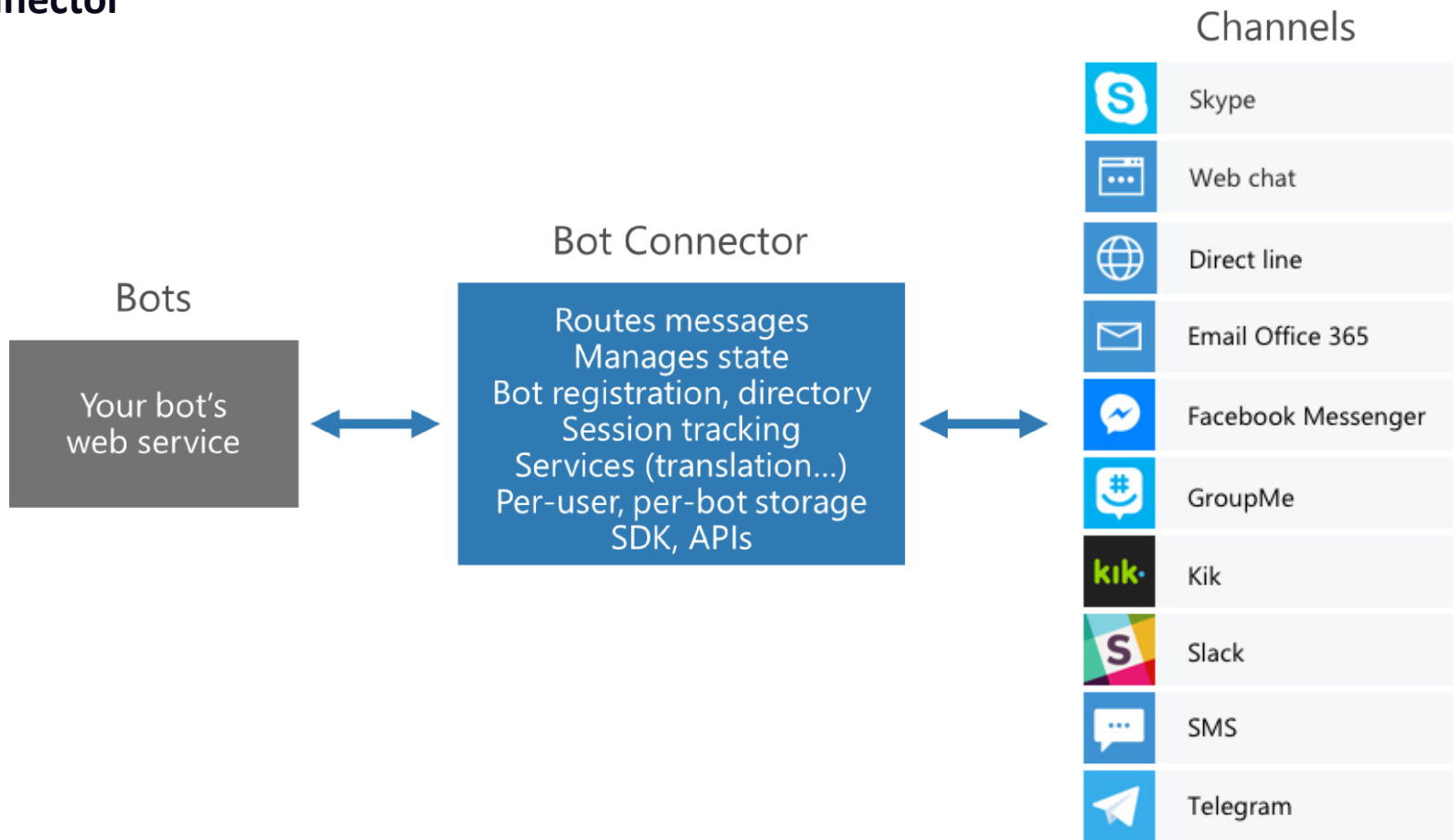
### Publish your bot

Deploy your bot to the cloud and then register it with the Microsoft Bot Framework.

- Publishing a bot to Microsoft Azure

```
case OrderStatus.Showspecials:
    replyMessage = message.CreateReplyMessage(
        string.Format("We've added {0} new items:{1}",
            Specials.Count(), Specials.GetSpecials()));
    ConvStatus.SetOrderStatus(OrderStatus.GetAddress);
    break;
case OrderStatus.GetAddress:
```

## Bot Framework Connector



# Bot Framework Emulator

Microsoft Bot Framework Emulator (v3.5.18)

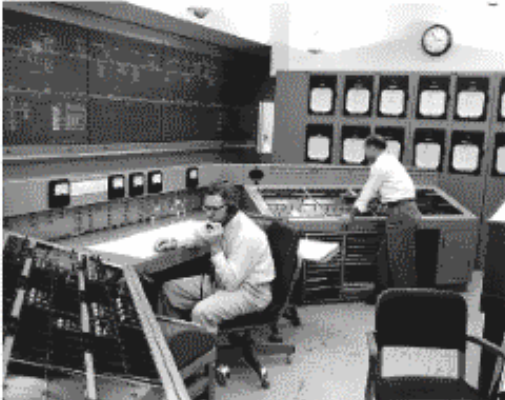
http://localhost:3978/api/messages

Bot

computers

you

Here's what I found:



Bot at 8:10:56 PM

Type your message...

Details

```
{
  "type": "message",
  "text": "Here's what I found:",
  "attachments": [
    {
      "contentType": "image/jpg",
      "contentUrl": "https://farm4.staticflickr.com/3685/9467782468_e0955d9444.jpg"
    }
  ],
  "from": {
    "id": "0km8cflmefnb28de6",
    "name": "Bot"
  }
},
```

Log

```
[20:06:42] Emulator listening on http://[::]:
[20:06:42] Checking for new version...
[20:06:42] Application is up to date.
[20:06:42] ngrok listening on https://83edba
[20:06:42] ngrok traffic inspector: http://1
[20:06:53] -> POST 202 [conversationUpdate]
[20:06:54] <- POST 200 Reply[message] ### F1
[20:07:01] -> POST 202 [message] hello
[20:07:03] <- POST 200 Reply[message] image/
[20:07:14] -> POST 202 [message] robots
[20:07:15] <- POST 200 Reply[message] I didn
[20:07:19] -> POST 202 [message] bot
[20:07:20] <- POST 200 Reply[message] I didn
[20:07:28] -> POST 202 [message] computers
```

Download from: <https://github.com/microsoft/botframework-emulator>

# Bot Framework Portal

Register

Configure Channels

Test

Manage

The screenshot shows the Microsoft Bot Framework Portal interface for a bot named "Liberty Sandwich Bot". The top navigation bar includes links for "Bot framework", "My bots", "Register a bot", "Documentation", and "Bot directory". A search bar is also present.

The main content area is divided into several sections:

- Details:** Contains fields for App ID, Endpoint, Primary app secret, and Secondary app secret. It also includes toggle switches for "Listen to all messages" (OFF), "Translate channel messages" (ON), "Disable logging" (OFF), and "Publish in Bot directory" (ON).
- Channels:** A table listing configured channels with their status. The table has columns for "Test link", "Status", and "Published".

	Test link	Status	Published
Email		<input type="checkbox"/>	Off
Web Chat		<input checked="" type="checkbox"/>	On
- Add another channel:** A list of available channels with "Add" buttons: Direct Line, GroupMe, Skype, Slack, SMS, Telegram, and Twitter.
- Test connection to Bot framework:** A section with a text input field for "Enter a test message here." and a "Send" button.

An overlay window titled "Configure Skype" is shown in the foreground, providing instructions on how to connect the bot to Skype. The instructions include steps for creating a new app in the Microsoft Developer Portal, signing in to the Skype Bot Portal, and entering the bot's credentials. A blue button at the bottom of the overlay says "I'm done configuring Skype".



# Bot Framework Directory



## Meet the bots

Say hello! Try out a bot and add it to your favorite conversation experiences.

Developer? Learn how to build and deploy your first bot with the Bot Framework >

## Featured bots



### Skyscanner

Skyscanner

The world's travel search engine



### Spock

Massively

Chat with Spock, second in command of the USS Enterprise, to



### Hipmunk

Hipmunk, Inc.

Hi, hi! I'm a super-powered travel assistant Hipmunk who can dig



### StubHub

StubHub Inc.

Your ticket out. Find tickets for shows, games and concerts with



### Jessie Humani

PullString, Inc.

Jessie Humani's life is in your hands. Will you help her make some



### Poker Bot

Phong Cao

Let's play Texas hold 'em poker!



### RemitRadar

RemitRadar

Artificial Intelligence remittance assistant chatbot. Helps you to find



### Foursquare

Foursquare Labs Inc.

Search Foursquare for the best Food, Nightlife, and Attractions nearby or



### Your Face

Microsoft

Will provide a frank assessment of your face. Powered by Microsoft



### MemeCat

Microsoft

They told me I had to sit here and make memes for humans.



### Lingio Quiz+T...

Lingio

Play a language quiz and translate in the same chat bot. - Learn a new



### Candy Escape

Massively

You've woken up trapped in the dungeon of the Candy Castle! Are

# DEMO



Hello World



Simple  
Stock Bot

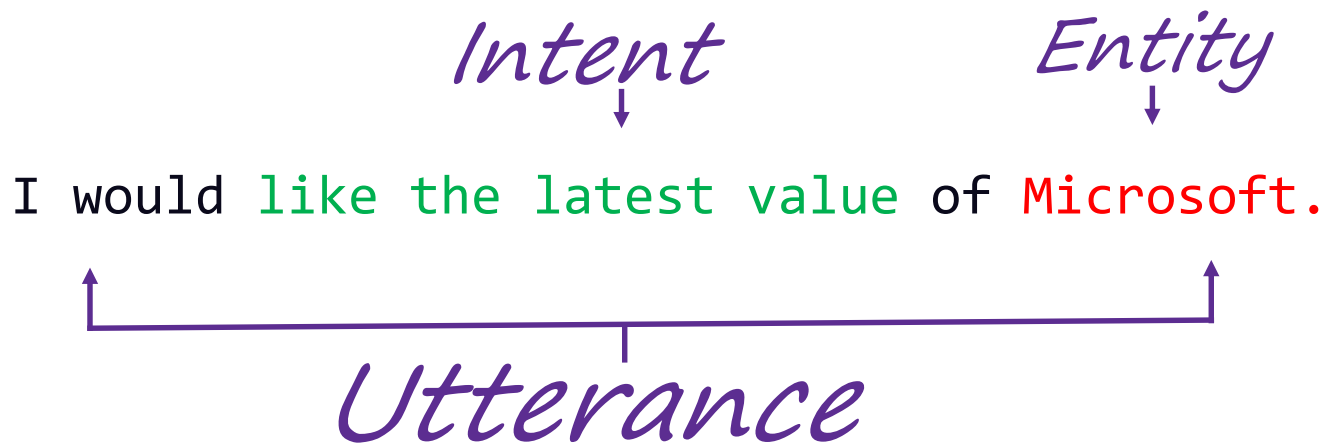
# LANGUAGE UNDERSTANDING INTELLIGENCE SERVICE

Cognitive Services API

Natural language **understanding**

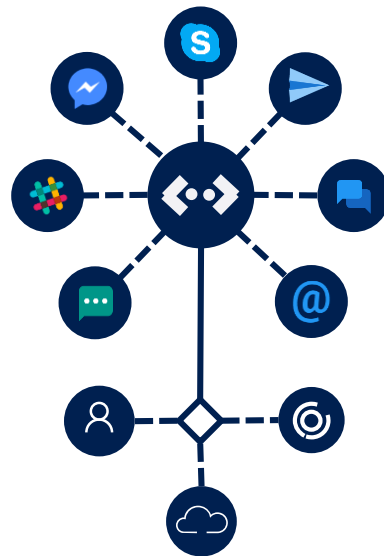
Determine **intent** and detect  
**entities**





## Bots + Cognitive Services

- Computer vision API : human readable **captions**
- Speech APIs: **authentication**
- LUIS API: **intent**
- Knowledge APIs: product **recommendation**
- Autosuggest API: ease **query** input
- Linguistic API: **sentiment**

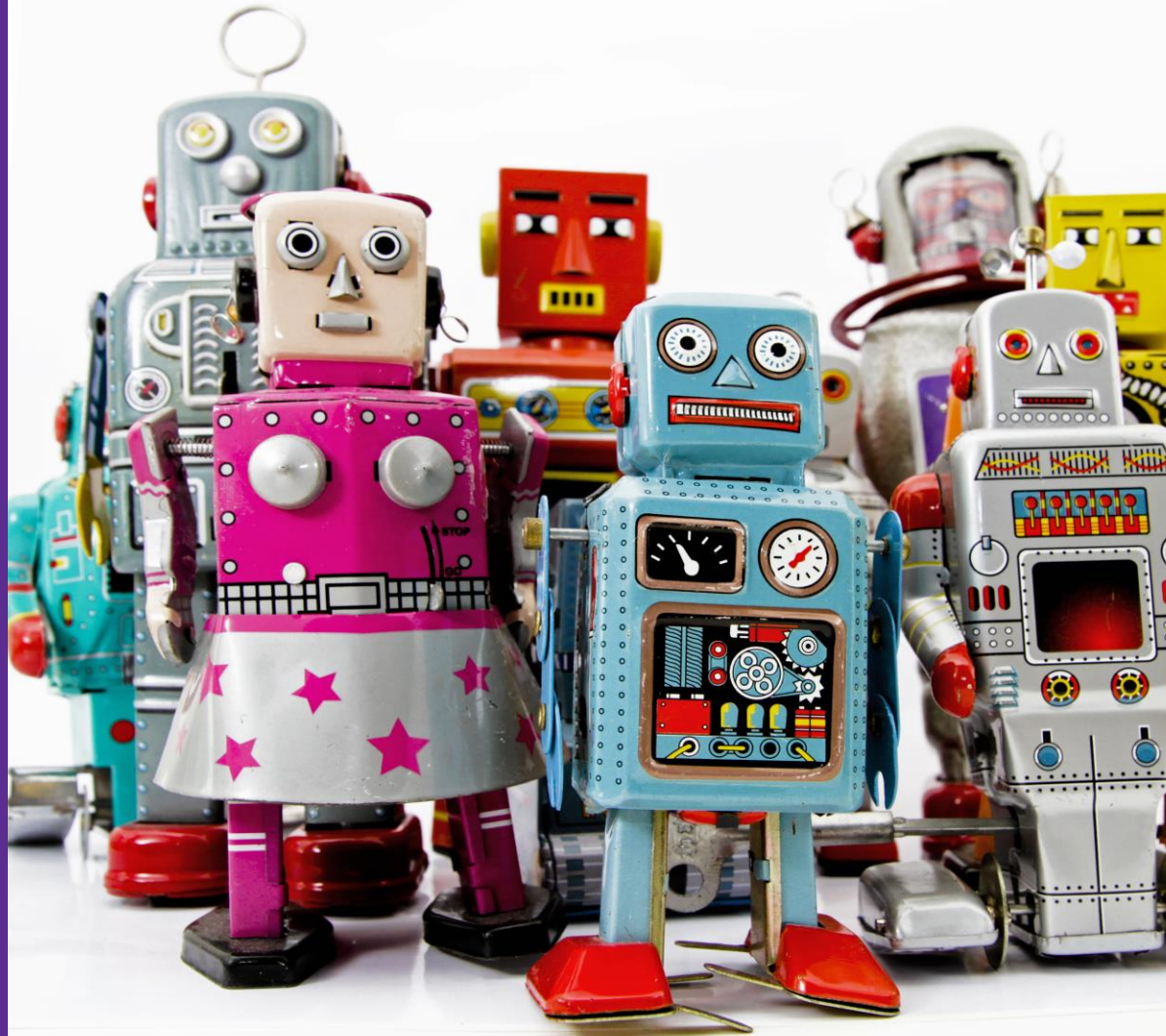


# DEMO



BOTS + COGNITIVE = SMART BOTS

Are Bots the  
new apps?



## Bots Skyscanner



“Chat bots offer something truly revolutionary by bringing travel search within the very platforms users are already interacting with on a frequent basis.”

<https://www.microsoft.com/en-gb/developers/articles/week05july16/skyscanners-year-in-bots/>

<http://en.business.skyscanner.net/en-gb/blog/skyscanner-partners-with-skype-to-build-pioneering-group-chat-travel-bot>





## Bots for everything?

**NO!** We should not translate **all interactions** into conversations

	yes	no
Helping with tasks where lots of (sequential) options are present (i.e. appeal for parking tickets)	✓	✗ Task is un-clear, task involves a singular task with too many variables or complex analysis is required (i.e. find fastest route from A to B)
Conversations are naturally part of customer experience (i.e. order a pizza, book an appointment)	✓	✗ When a request is time critical (i.e. book restaurant for now)
Query is not time critical and customer can juggle options (i.e. book restaurant for team meeting next week)	✓	✗ Doesn't add any value over existing interaction points such as web site/apps

MICROSOFT A.I.

MICROSOFT BOT FRAMEWORK

MICROSOFT COGNITIVE SERVICES

ACHIEVE MORE

# SEEING AI

MICROSOFT COGNITIVE



# THANK YOU

[AKA.MS/BOTRESOURCES](https://aka.ms/botresources)

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**SMICH.UK**