

2017

Global **Azure** **BOOTCAMP**



AzureHeads

 autoexec.gr

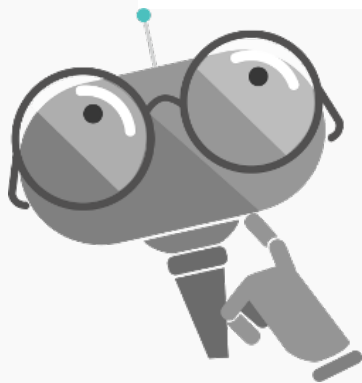
 SQLschool.gr



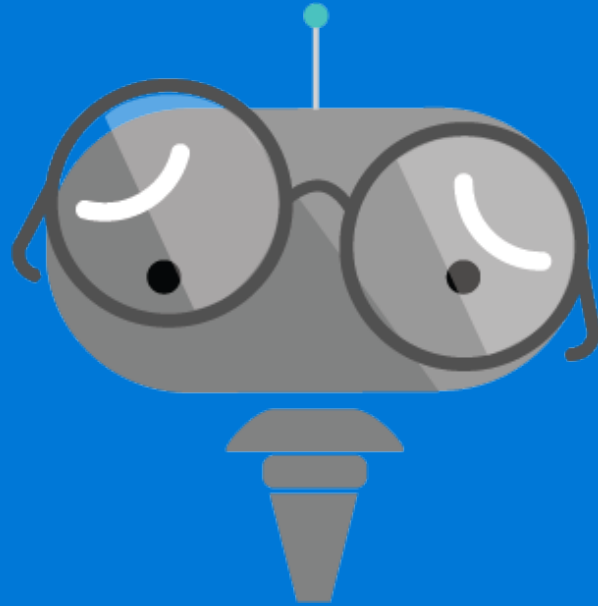
Conversations as a Platform: Bots and AI powered by Cloud



Sophie Chanielaki
Technical Evangelist @ Microsoft Hellas



"This bot thing is nothing but a hype: It makes no sense"



Right?

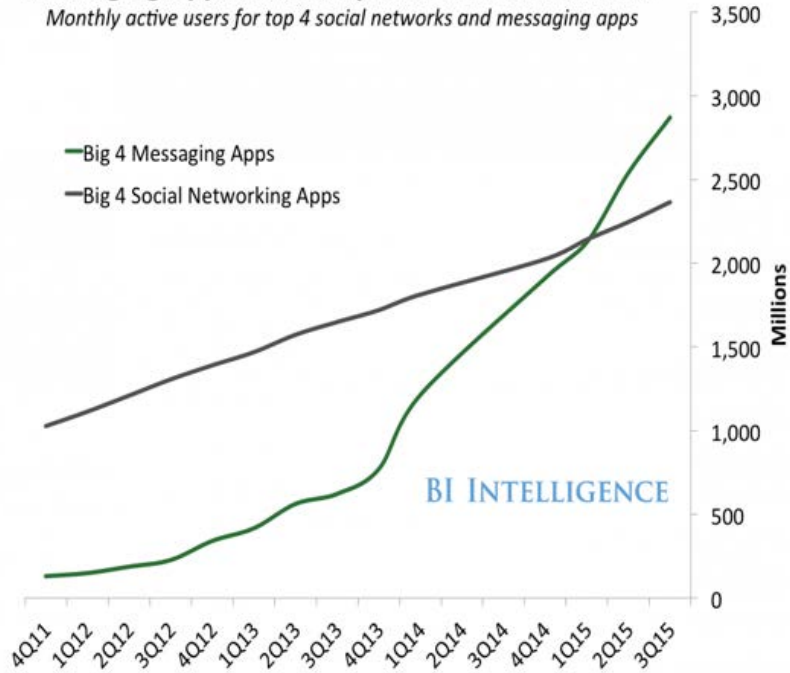
Conversational UI is the next wave in computing



Messaging is the dominant platform

Messaging Apps Have Surpassed Social Networks

Monthly active users for top 4 social networks and messaging apps



Messaging apps have surpassed social networks



Surpassed

The daily session frequency is higher than the average app by



5x

Messaging volume in 2018 is predicted to grow to



74T messages

Some people say I'm
a dreamer...



Meet
Murphy



Build a bot with a clear purpose

Only choose technologies and APIs that clearly serve that purpose.
Focus every design decision into driving that goal.

Where can bots most help businesses?



Engaging younger users?



Lowering cost to serve?



Improving team collaboration?



Making legacy enterprise apps
more accessible?



Something else?

CaaP users

Australian Government
Department of Human Services



Rockwell
Automation

DHS leverages Cortana, using ML and cognitive services, to build expert systems to **respond faster to citizen queries**.

Expedia Bot on Skype, providing helps to **manage travel itineraries**—including booking, cancelling, or updating plans.

Built bot Shelby that **monitors production** more efficiently and lets managers know the **status of their operations**

Conversations as a Platform



People



Digital
assistants



Bots

Conversations as a Platform



People

Human language is the new UI



People are Digital apps;
digital assistants are meta apps



Bots

Intelligence infused into all interactions

Why Microsoft

1



Publish anywhere using **Bot Framework**

2

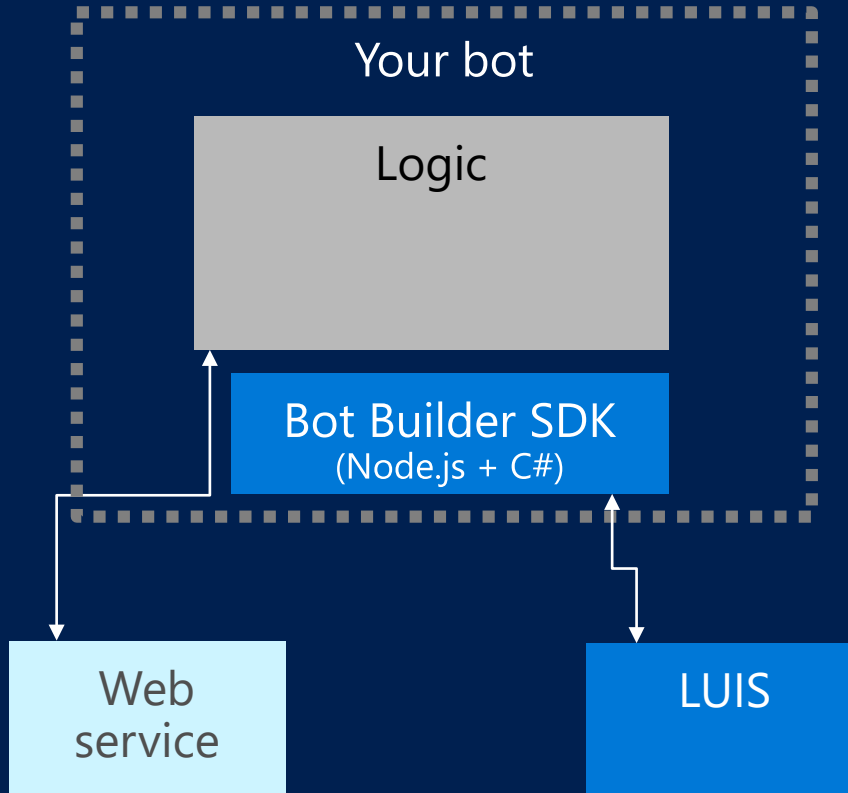


Smarter bots with **Cognitive Services** and tools

3



Solve complex problems with **Azure AI**



Microsoft Bot Framework 101

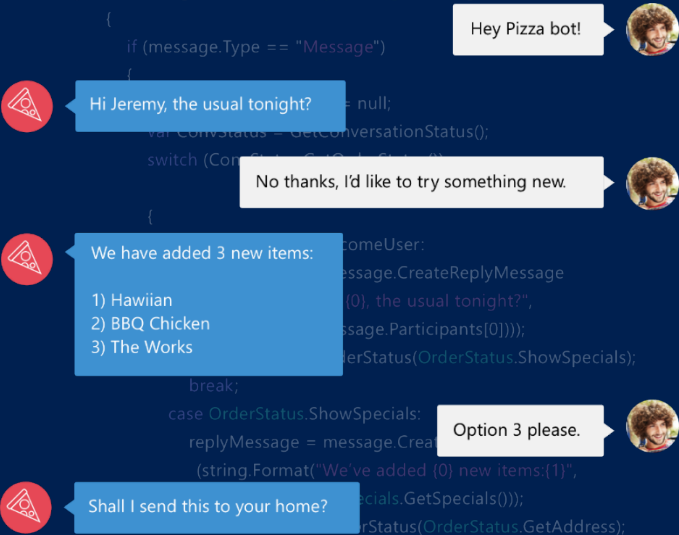
Bot Framework

Bot Framework is a Microsoft-operated service and an SDK.

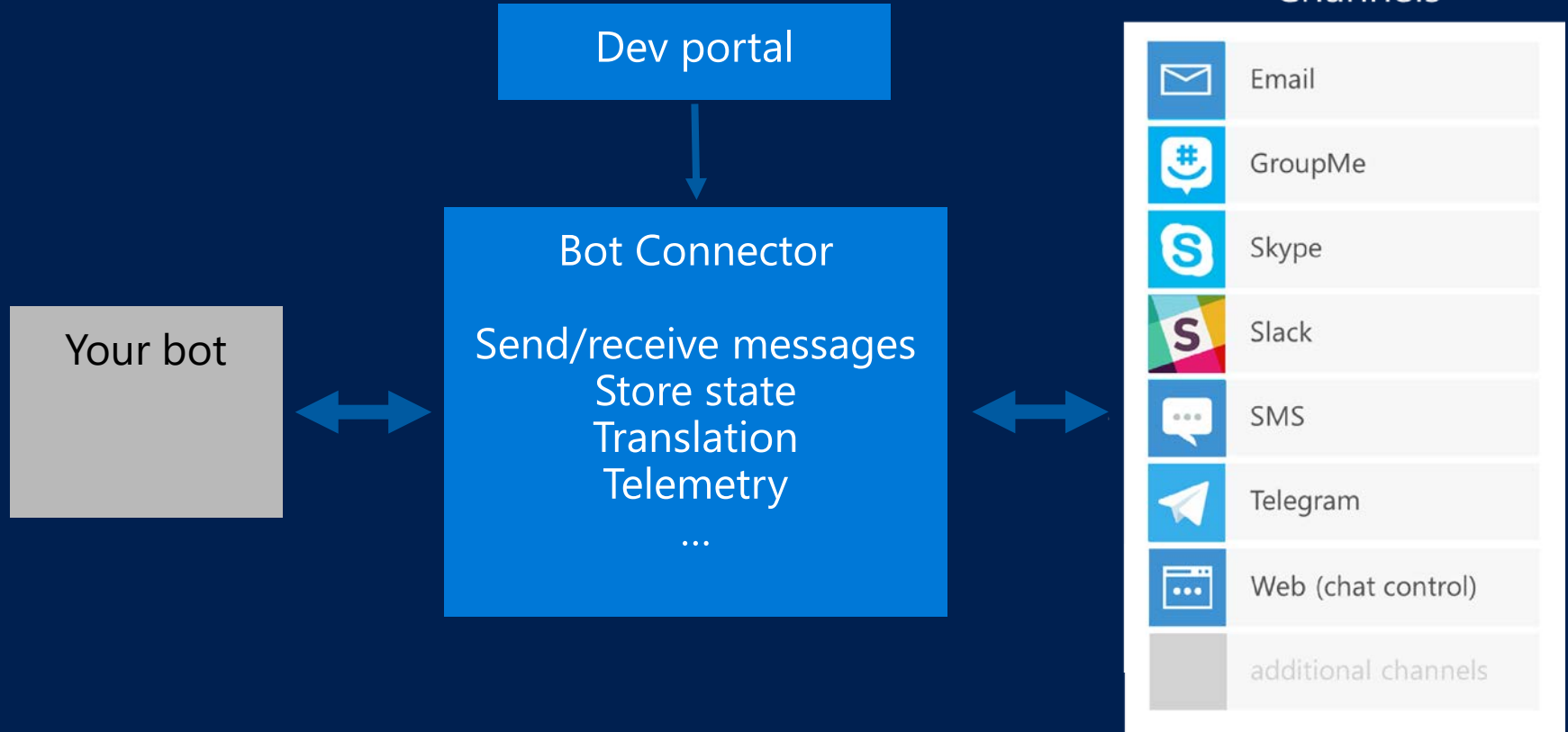
Bot Framework is one of many tools Microsoft offers for building a complete bot.

Others include: LUIS, Speech APIs, Azure, more

```
public Message Post([FromBody]Message message)
{
    if (message.Type == "Message")
    {
        if (message.From == null)
        {
            var ConversationStatus = GetConversationStatus();
            switch (ConversationStatus)
            {
                case ConversationStatus.New:
                {
                    var User = message.From;
                    message.CreateReplyMessage(
                        User, "Hi Jeremy, the usual tonight?",
                        message.Participants[0]);
                    ConversationStatus(OrderStatus.ShowSpecials);
                    break;
                }
                case OrderStatus.ShowSpecials:
                {
                    replyMessage = message.CreateReplyMessage(
                        User, string.Format("We've added {0} new items: {1}",
                            specials.GetSpecials().Count, specials.GetSpecials()));
                    ConversationStatus(OrderStatus.GetAddress);
                    break;
                }
                case OrderStatus.GetAddress:
                {
                    // ...
                }
            }
        }
    }
}
```



Bot Connector





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



Vision Bot

Kik Interactive Inc

Vision Bot for image based search, insight and suggestions that uses



Summarize

Microsoft

No time to read an entire web page? Just send a link to the Summarize



Bing Image Bot

Bing

Search the web for memes, gifs, stickers, and other images.



MurphyBot

Microsoft

Bring "what if" scenarios to life. Some questions can't be answered



Bing News Bot

Bing

Search the web for the latest news using Bing.



CaptionBot

Microsoft

I can understand the content of any image and I'll try to describe it as



BuildBot

Microsoft

BuildBot can help you navigate the Microsoft Build conference from

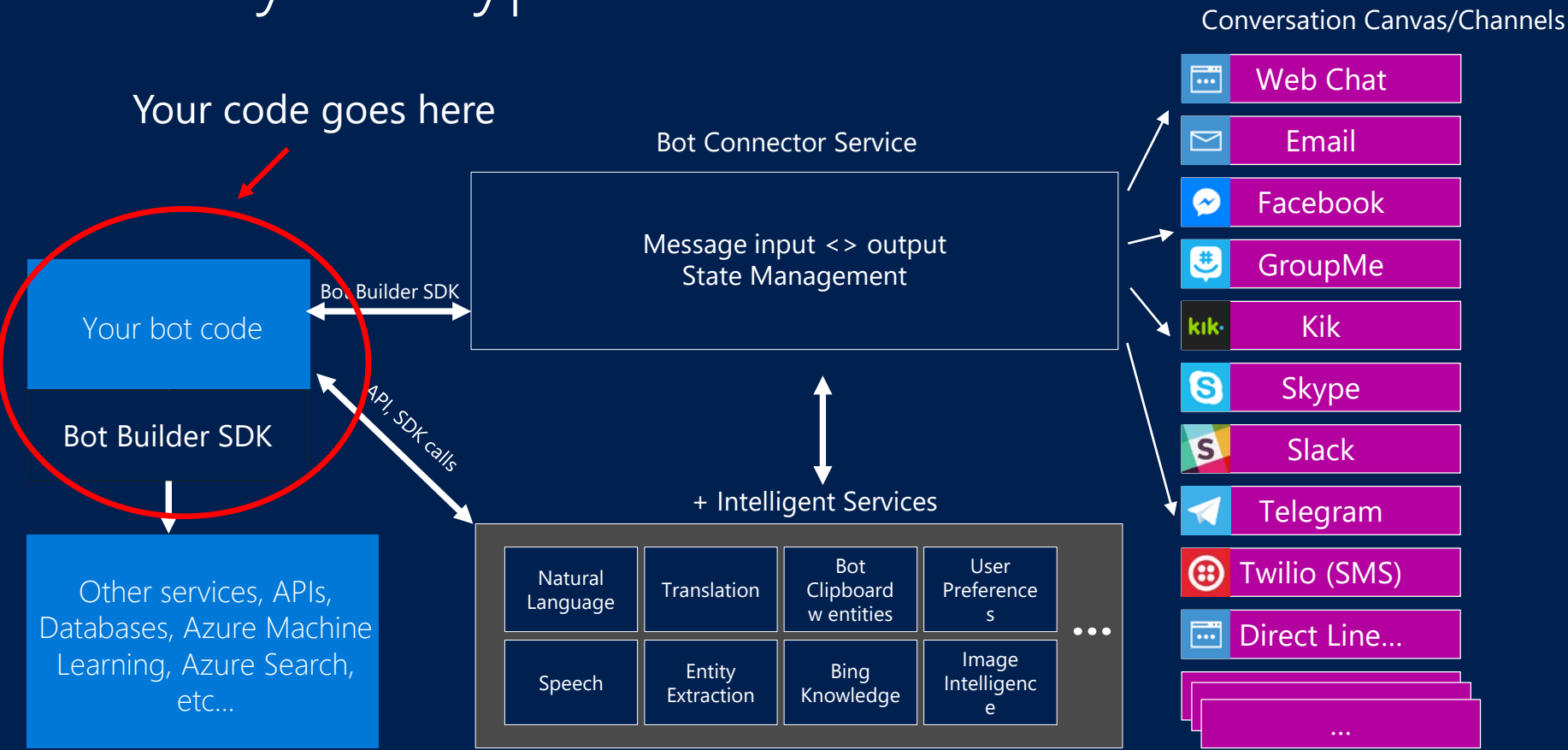


Bing Music Bot

Bing

Search the web, including popular sites like YouTube, Vevo, LyricFind,

An x-ray of a typical bot



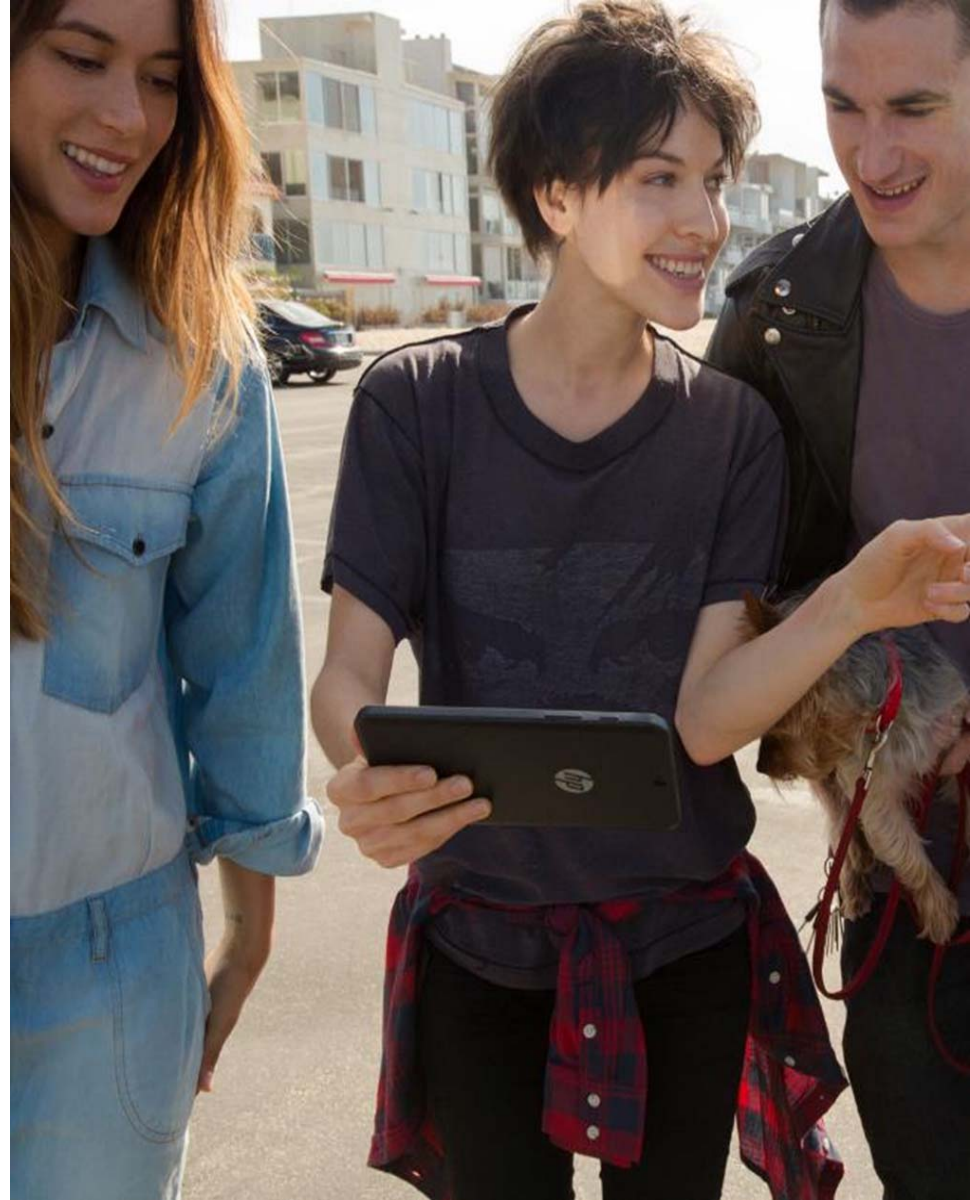
A Bare Minimum Bot Code – C#

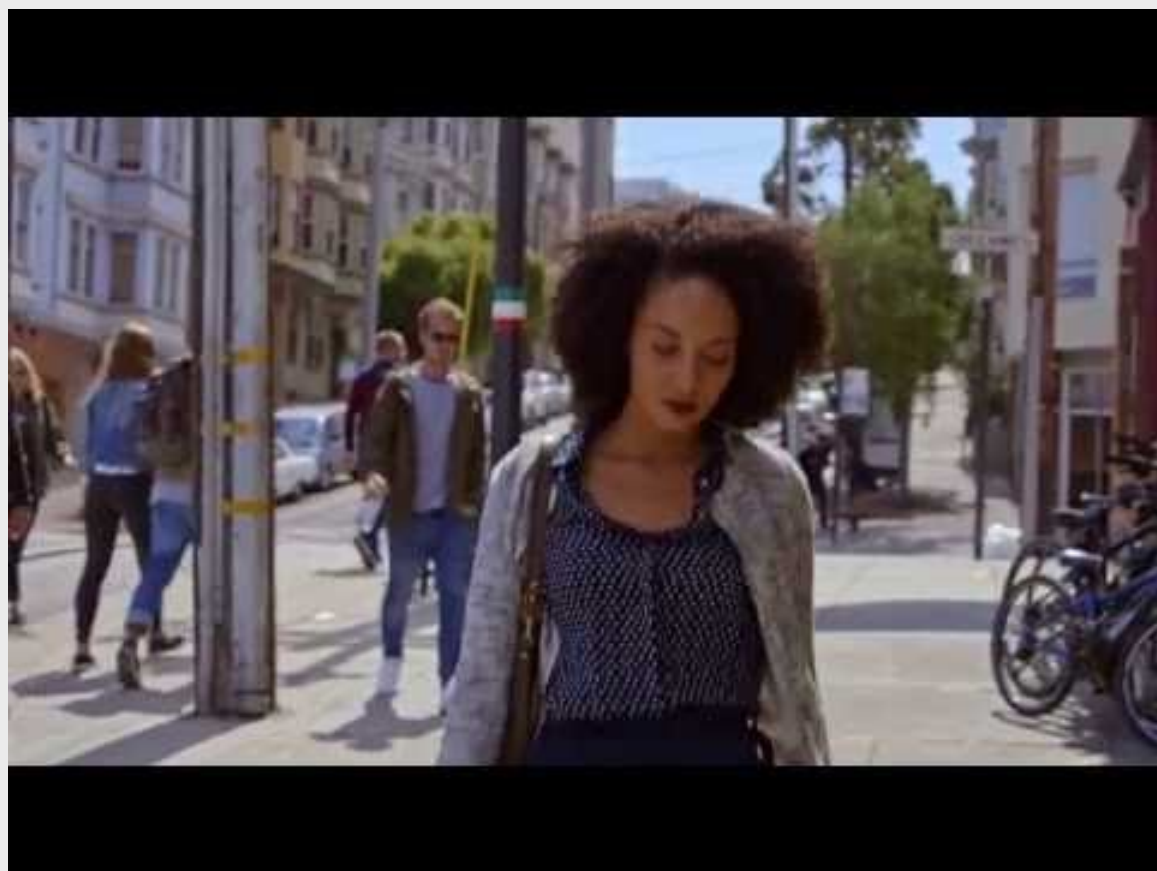
```
public async Task<HttpResponseMessage> Post([FromBody]Activity activity)
{
    if (activity.Type == ActivityTypes.Message)
    {
        ConnectorClient connector = new ConnectorClient(new Uri(activity.ServiceUrl));
        int length = (activity.Text ?? string.Empty).Length;
        Activity reply = activity.CreateReply($"You sent {activity.Text} which was {length} characters");
        await connector.Conversations.ReplyToActivityAsync(reply);
    }
    else
    {
        HandleSystemMessage(activity);
    }
    var response = Request.CreateResponse(HttpStatusCode.OK);
    return response;
}
```

A Bare Minimum Bot Code – Node

```
var builder = require('../..core/');  
var connector = new builder.ConsoleConnector().listen();  
  
var bot = new builder.UniversalBot(connector, function (session) {  
    session.send("%s, I heard: %s", session.userData.name, session.message.text);  
});
```

Demos





Microsoft Cognitive Services

Give your apps
a human side

Cognitive Services



Vision

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



Speech

Hear and speak to your users by filtering noise, identifying speakers, and understanding intent



Language

Process text and learn how to recognize what users want



Knowledge

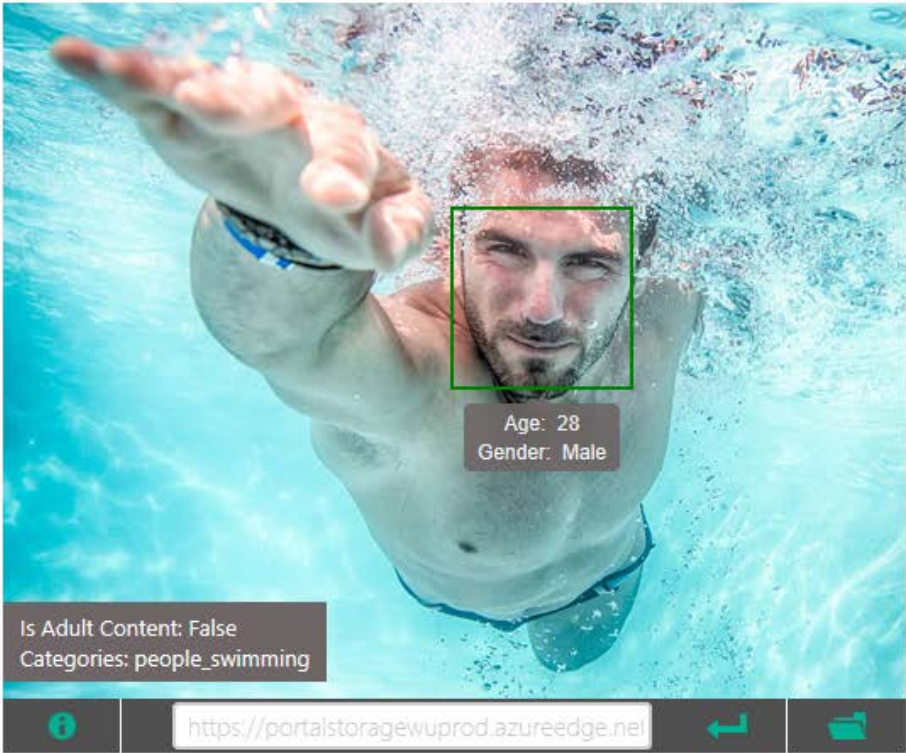
Tap into rich knowledge amassed from the web, academia, or your own data



Search

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

Computer Vision API

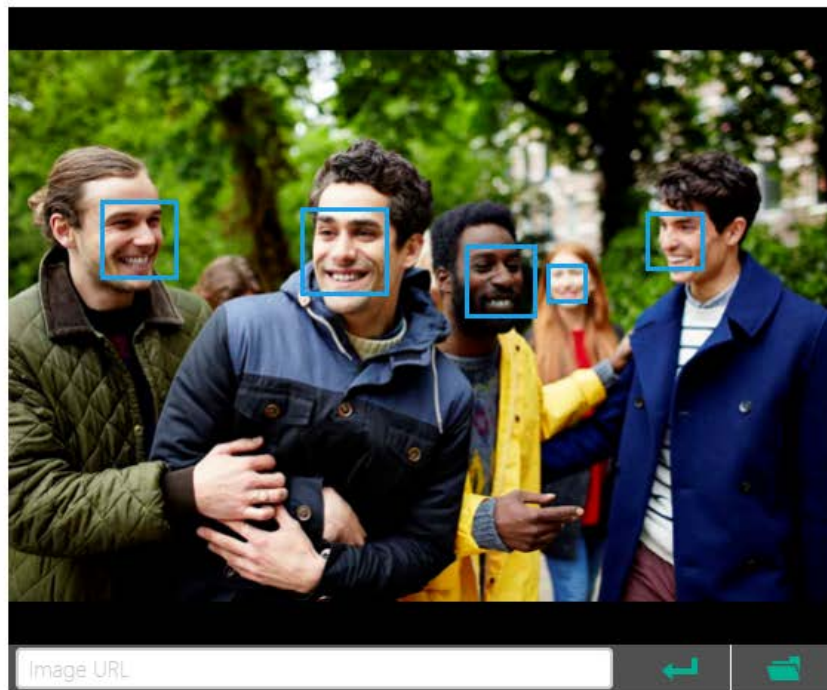


Features:

| Feature Name | Value |
|---------------------|--|
| Description | { "type": 0, "captions": [{ "text": "a man swimming in a pool of water", "confidence": 0.7850108693093019 }] } |
| Tags | [{ "name": "water", "confidence": 0.9996442794799805 }, { "name": "sport", "confidence": 0.9504992365837097 }, { "name": "swimming", "confidence": 0.9062818288803101, "hint": "sport" }, { "name": "pool", "confidence": 0.8787588477134705 }, { "name": "water sport", "confidence": 0.631849467754364, "hint": "sport" }] |
| Image Format | jpeg |
| Image Dimensions | 1500 x 1155 |
| Clip Art Type | 0 Non-clipart |
| Line Drawing Type | 0 Non-LineDrawing |
| Black & White Image | False |

0.974: "A cow standing on top of a lush green field"

0.965: "A large brown cow standing on top of a lush green field"



Detection Result:
5 faces detected

JSON:

```
[
  {
    "faceRectangle": {
      "left": 488,
      "top": 263,
      "width": 148,
      "height": 148
    },
    "scores": {
      "anger": 9.075572e-13,
      "contempt": 7.048959e-9,
      "disgust": 1.02152783e-11,
      "fear": 1.778957e-14,
      "happiness": 0.9999999,
      "neutral": 1.31694478e-7,
      "sadness": 6.04054263e-12,
      "surprise": 3.92249462e-11
    }
  },
  {
    {
```



[Browse all the APIs](#)

Language Understanding Models




"News about flight delays"

```
{
  "entities": [
    {
      "entity": "flight_delays",
      "type": "Topic"
    }
  ],
  "intents": [
    {
      "intent": "FindNews",
      "score": 0.99853384
    },
    {
      "intent": "None",
      "score": 0.07289317
    },
    {
      "intent": "ReadNews",
      "score": 0.0167122427
    },
    {
      "intent": "ShareNews",
      "score": 1.0919299E-06
    }
  ]
}
```

How LUIS.ai works

LUIS.ai

- Language Understanding Intelligence Service
- Identify entities and intents of messages
- Train through GUI or programmatically
- Built in LUIS intent handling in bot framework

Create a pet named Mobi 

create a pet named **mobi**

createPet ▼

Which entity is this?

petName

Submit

Cancel

```
//Intent Handlers
dialog.matches('createPet', [
  function (session, args, next) {
    console.log("In create pet dialog");
  }
]);
```

Language Understanding Models

- Reduce labeling effort with interactive featurizing
- Seamless integration to Speech API
- Deploy using just a few examples with active learning
- Supports 5 languages (English, Chinese, Italian, French, Spanish)

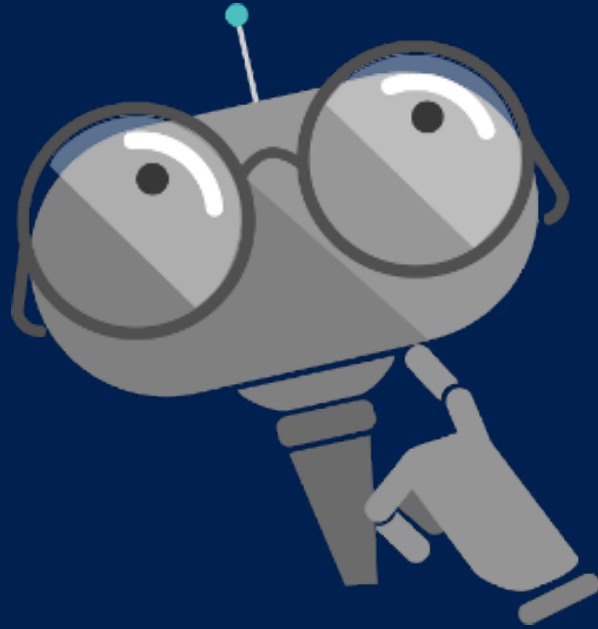


Accessing the APIs

1. Obtain API subscription key from microsoft.com/cognitive
2. Call REST endpoint, and pass API key via special header

```
GET https://bingapis.azure-api.net/v5/search?q=nasa HTTP/1.1
OCP-Apim-Subscription-Key: <API KEY>
```

Facts of life of building bots... (lessons from the battlefield)



Fact #1: New bot developers tend to abuse NLP

A bot with a single dialog using 100 LUIS intents is a bad design:



Hello user! How can I help you?

One question

100 LUIS intents, * 100 different utterances per intent = 10000 different things users may say (plus the other 90000 possibilities you didn't predict)

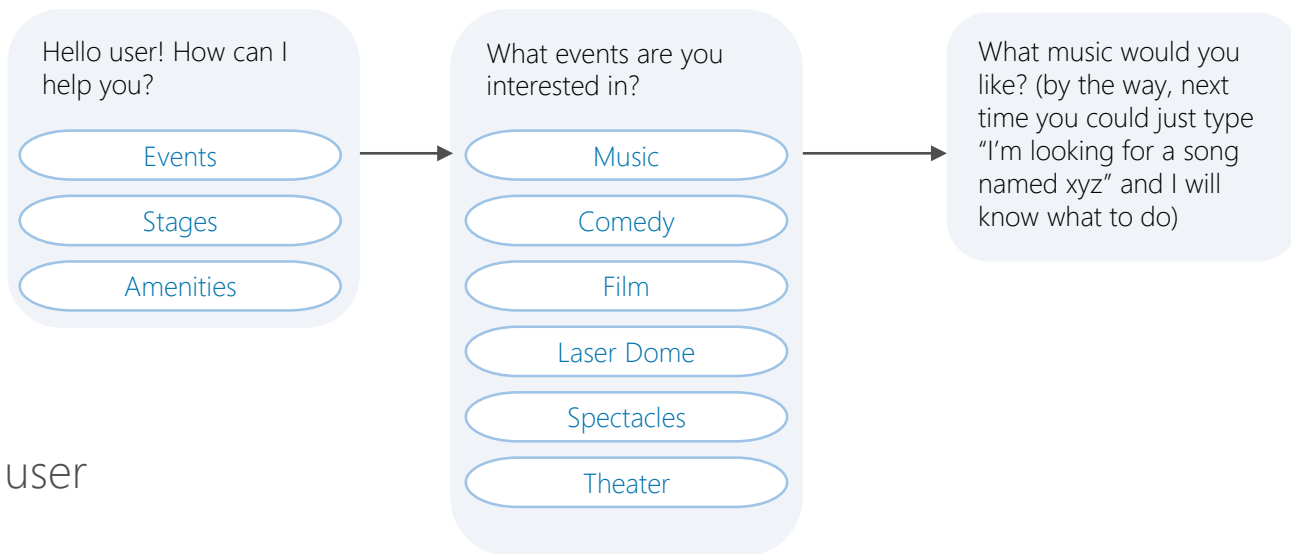
100 different things your bot can do

Users will only guess 3 or so

So you just wasted 97% of your code

Fact #1: New bot developers tend to abuse NLP

So instead:



- Guide the user
- Save time
- Help the user discover what your bot can do

Fact #2: Just text or just voice are NOT natural experiences

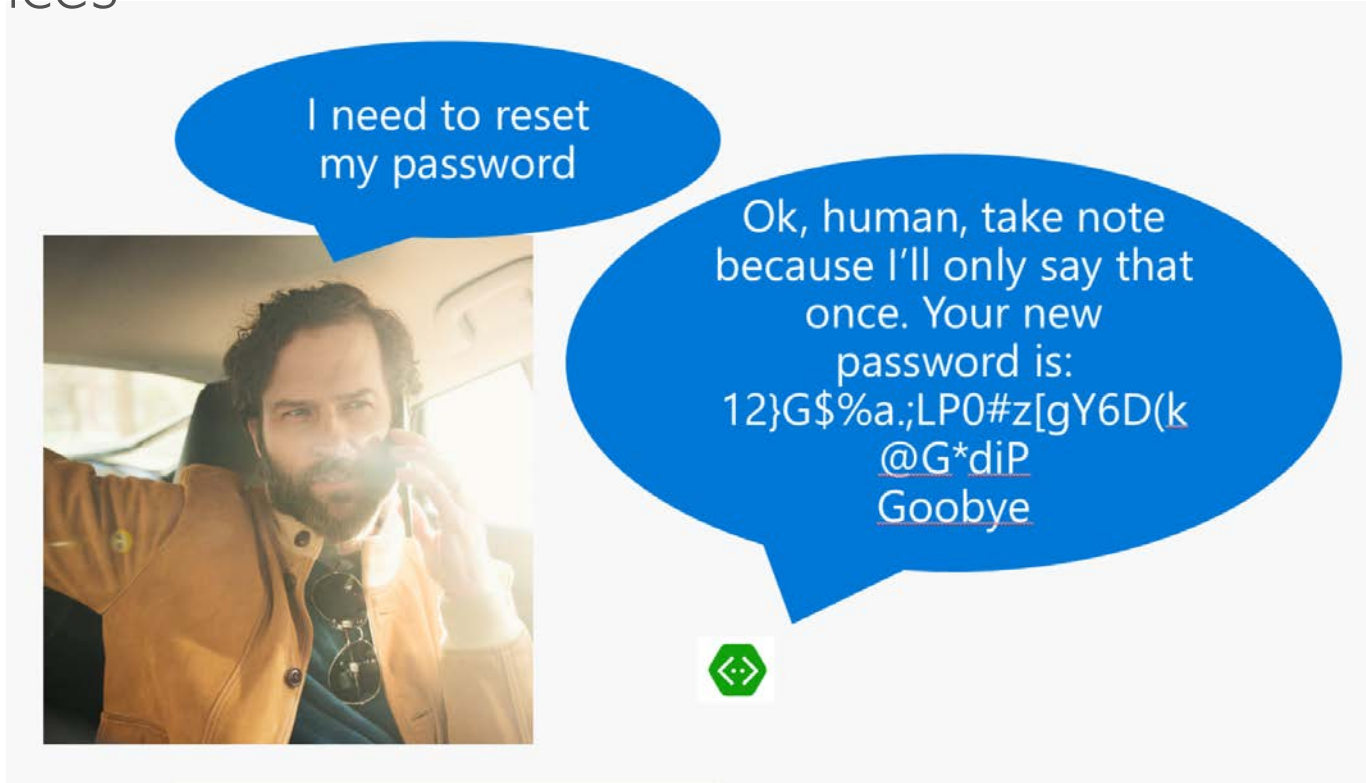
Can you describe
this chart on the
phone to me?



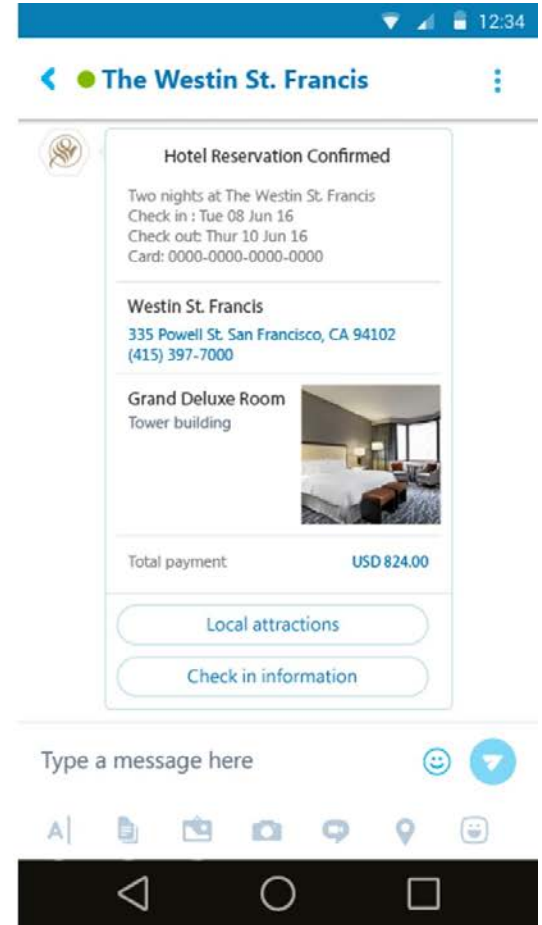
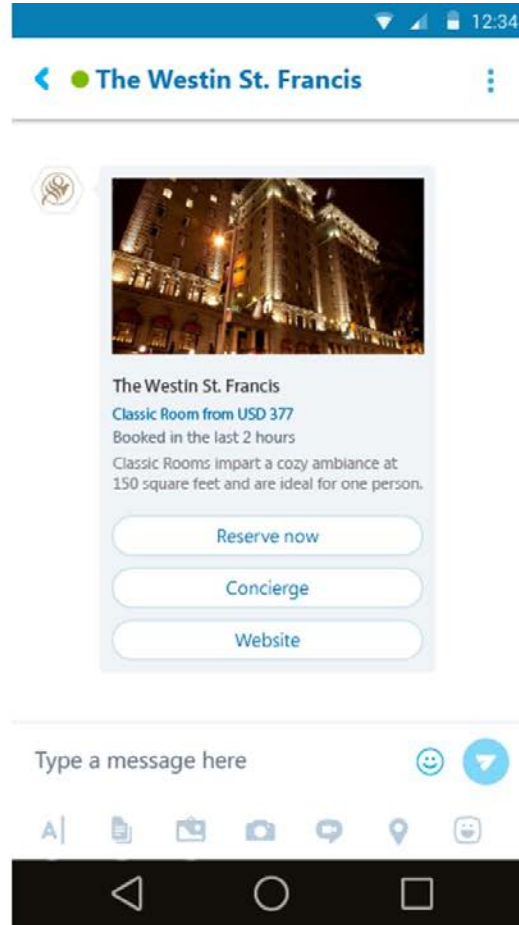
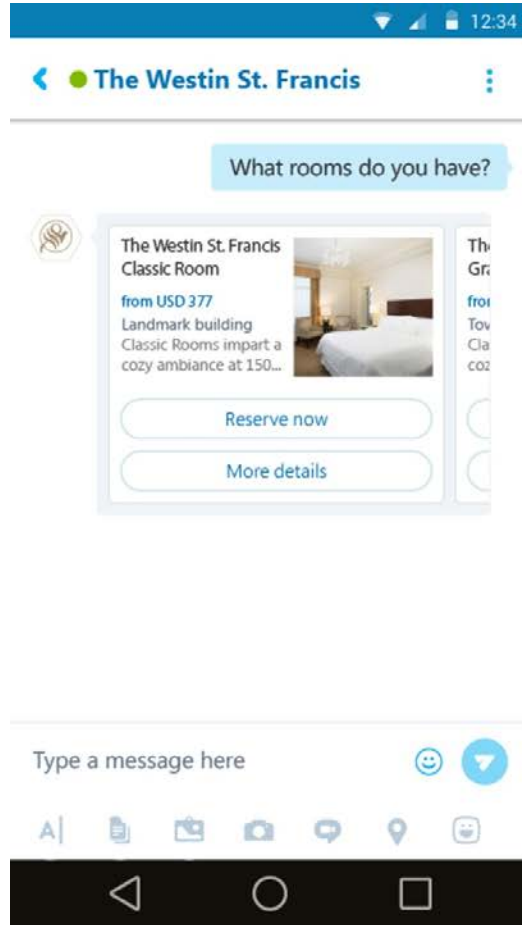
Hang on, what
about I just share
my screen instead?



Fact #2: Just text or just voice are NOT natural experiences



Fact #3: Users love buttons



Fact #4: Users never say things the way you expect

"I want to find a house for sale that has 3 or 4 bedrooms, priced between \$300 and \$350 with a large garden, about 2000 square feet, preferably green, within 10 miles from my work which is in the city center, with a large garage and a backyard with a pool"

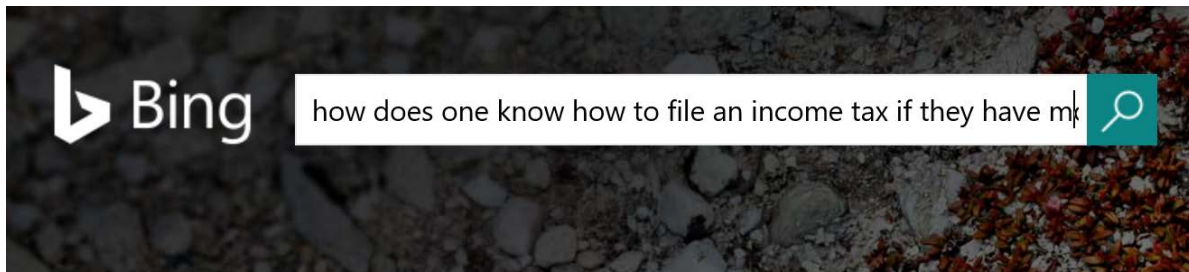
-Said nobody, ever

"I want to find a house"

-Said everybody else

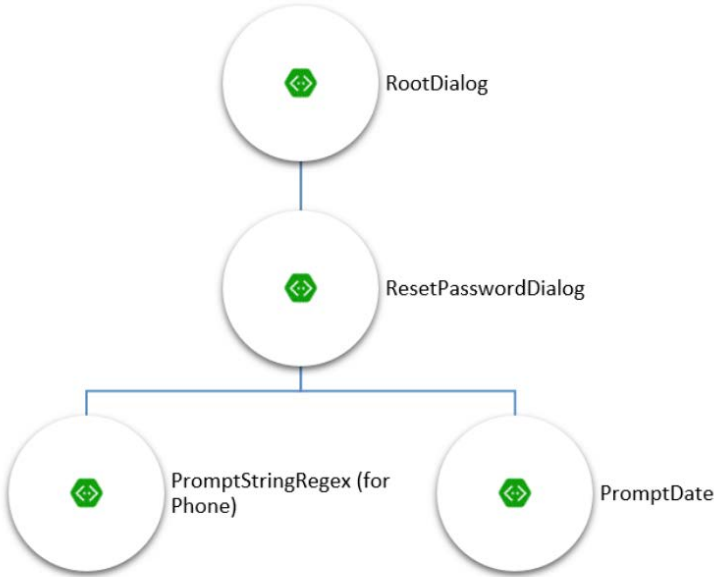
Fact #5: Search can do wonders for bots

- Users are often terrible at using search on web



- Add search to a bot and now you have a great tool to guide the user into refining their search
- Knowledge base, informational, Q&A bots are great scenarios. They typically use [QnA Maker](#) and [Azure Search](#) for it

Fact #6: Not all bots need to have conversations



4.1. RootDialog

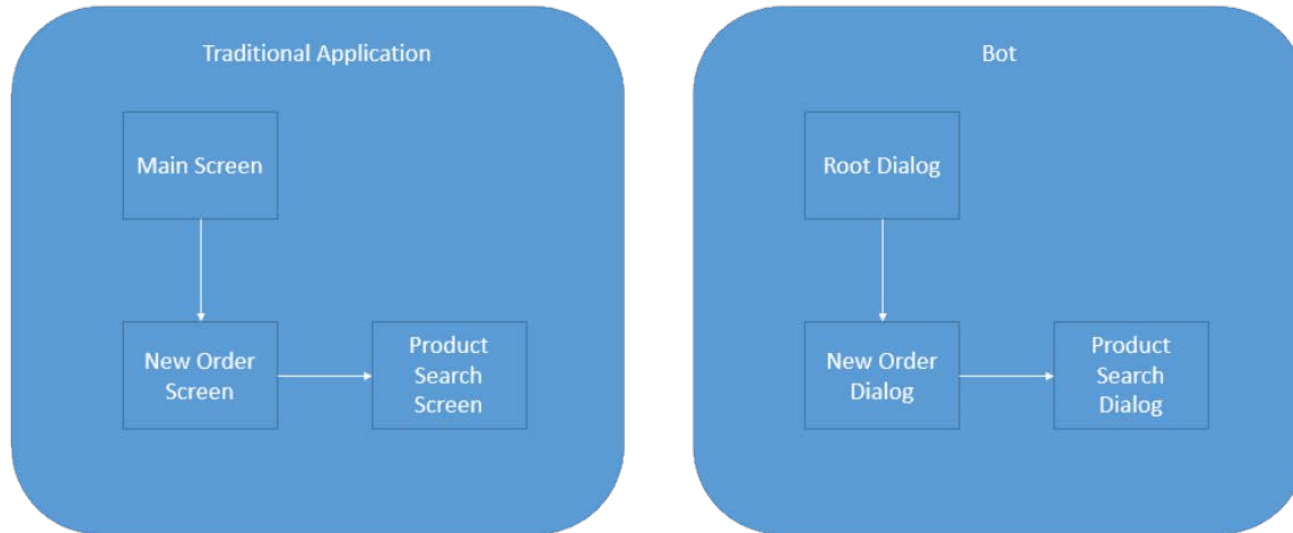
| Event | Description | Notes | | | | | | |
|---------------------|---|--|--------|-------------------|--|------------------|------------------------------|--|
| On Start: | <div>Dialog initiates with the following message:</div> <div><div>What do yo want to do today?</div><div><div>Change Password</div><div>Reset Password</div></div></div> | On Start is what initially happens when the dialog is invoked | | | | | | |
| User Input: | <div>User will be allowed to click at one of the buttons above (or type one of those options on channels that don't support buttons):</div> <table><tr><th>Action</th><th>Effect</th></tr><tr><td>"Change Password"</td><td>Flow not implemented. Send a message to the user</td></tr><tr><td>"Reset Password"</td><td>Call to ResetPassword dialog</td></tr></table> | Action | Effect | "Change Password" | Flow not implemented. Send a message to the user | "Reset Password" | Call to ResetPassword dialog | |
| Action | Effect | | | | | | | |
| "Change Password" | Flow not implemented. Send a message to the user | | | | | | | |
| "Reset Password" | Call to ResetPassword dialog | | | | | | | |
| Invalid user input: | <div>In case of an invalid user input:</div> <div><div>I am sorry but I didn't understand that. I need you to select one of the options below</div><div><div>Change Password</div><div>Reset Password</div></div></div> | Assuming the user types something else and no scorable picks that up, we will reject the input and retry the question. | | | | | | |
| Exit Criteria: | This is the root dialog and therefore it never exits. | Root dialogs shouldn't exit. | | | | | | |
| | | They are the very entry point where the whole experience starts. | | | | | | |

Fact #7: No UI is impossible with bots

- Even if standard channels can't do it, you can always build your own UI/App/Web
- Think richer UIs with bots. It is all possible

Fact #8: Dialogs are for bots like screens are for apps

They separate concerns and organize flows, exactly the same way:



Invoking a Dialog – C#

```
public class MessagesController : ApiController
{
    public async Task<HttpResponseMessage> Post([FromBody]Activity activity)
    {
        //controller redirects to RootDialog
        await Conversation.SendAsync(activity, () => new RootDialog());
    }
}
```

Invoking a Dialog – Node

```
var server = restify.createServer();
server.listen(process.env.port || process.env.PORT || 3978, function () { });

var connector = new builder.ChatConnector({
  appId: process.env.MICROSOFT_APP_ID,
  appPassword: process.env.MICROSOFT_APP_PASSWORD
});

var bot = new builder.UniversalBot(connector);
server.post('/api/messages', connector.listen());

// Root dialog
bot.dialog('/', ...
```

Fact #9: Dialogs are serialized into stacks



This is how we know how to navigate "back"

Redirecting to a Dialog – C#

```
public virtual async Task MessageReceivedAsync(IDialogContext context, IAwaitable<IMessageActivity>
result)
{
    var message = await result; //We've got a message!
    if (message.Text.ToLower().Contains("order"))
    {
        //User said 'order'. Let's invoke the New Order Dialog and wait for it to finish
        //Then, we will call the ResumeAfterNewOrderDialog
        await context.Forward(new NewOrderDialog(), this.ResumeAfterNewOrderDialog, message,
CancellationToken.None);
    }
    //User typed something else so for simplicity we will just ignore
    //and keep waiting for the next message
    context.Wait(this.MessageReceivedAsync);
}
```

Redirecting to a Dialog – Node

```
bot.dialog('/', new builder.IntentDialog()  
//Did the user type 'order'?  
.matchesAny([/order/i], [  
  function (session) {  
    //Let's invoke then the new order dialog  
    session.beginDialog('/newOrder');  
  },  
  
  function (session, result) {  
    //This will get us whatever the new order dialog decided to return to us  
    var resultFromNewOrder = result.response;  
  
    session.send('New order dialog just told me this: %s', resultFromNewOrder);  
    //We are now done with the root dialog  
    session.endDialog();  
  }  
])
```

If you can build an app, you can build a bot

Like an app, bots ...

- Solve a problem
- Exist in different channels
- Exist across platforms

Unlike apps, bots are ...

- Easier to build
- Quicker to publish
- Live in existing messaging canvas



AzureBot

Microsoft

Be more productive with your own Microsoft Azure subscriptions using



ZoBot

Microsoft

Social chatbot engaging the same way you would interact with a friend



WhoBot

Microsoft

Team bot that draws on conversation history, relationships and content.

Bot Framework Resources & Videos

Bot Framework Home Page

<https://dev.botframework.com/>

Bot Builder SDK on GitHub

<https://github.com/Microsoft/BotBuilder>

Bot Framework Blog

<https://blog.botframework.com/>

//Build Reaction - Cortana and the Bot Framework

<https://channel9.msdn.com/Blogs/raw-tech/Build-Reaction-Cortana-and-the-Bot-Framework>

Cloud Cover Ep. 206: Bot Framework with Mike Hall

<https://channel9.msdn.com/Shows/Cloud+Cover/Episode-206-Bot-Framework-with-Mike-Hall>

Bot Framework Demos

Bot Framework Template for Visual Studio

<http://aka.ms/bf-bc-vstemplate>

Bot Framework Samples in GitHub

<https://github.com/Microsoft/BotBuilder>

The Maker Show Bot

<https://github.com/ActiveNick/TheMakerShowBot>

A person is captured mid-jump from a wooden dock into a calm lake. The person is shirtless, wearing red and black swim trunks, with their arms and legs spread wide in a 'V' shape. The background features a dense line of green trees on the far shore under a bright blue sky with scattered white clouds. The water is still, reflecting the sky and the surrounding greenery.

Let's get started!

Bot Framework

<https://dev.botframework.com/>

Cognitive Services

<https://microsoft.com/cognitive>

Let's Keep In Touch!



Sophie
Chanielaki



sofie_hn



Sophie
Chanielaki



sochania@microsoft.com

Thank You

