Microsoft

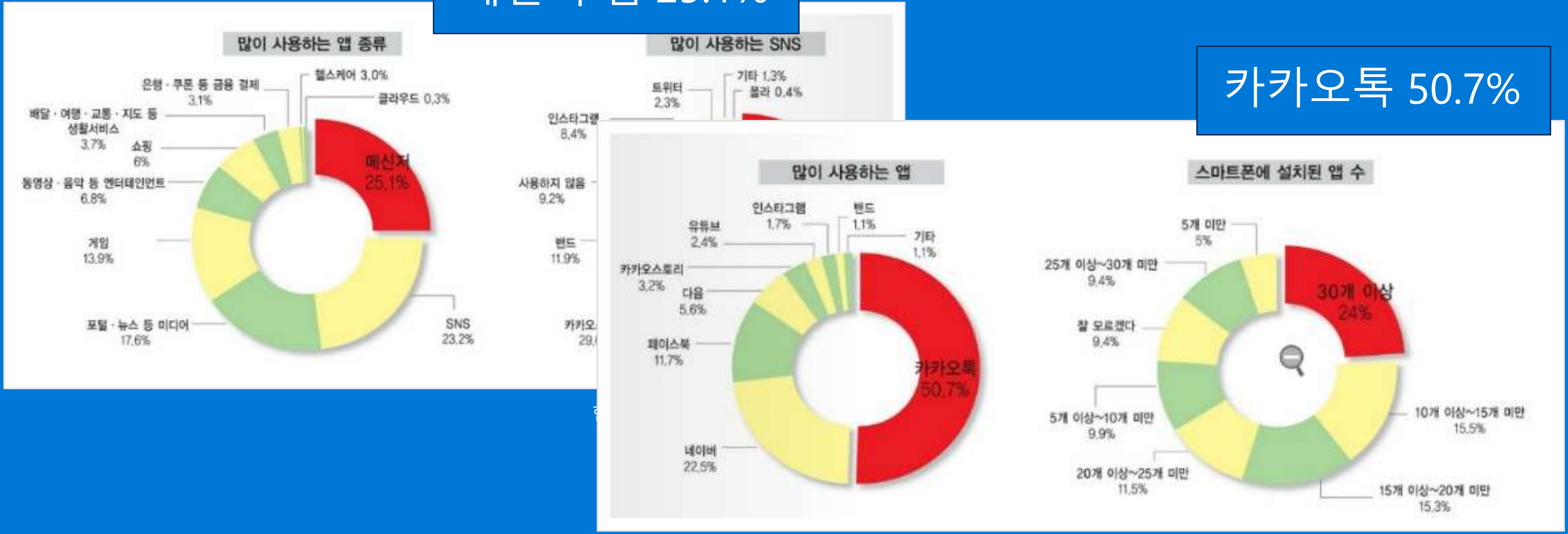
이제는 챗봇 시대!
인텔리전트 챗봇 개발의 모든 것

The age of Chatbot

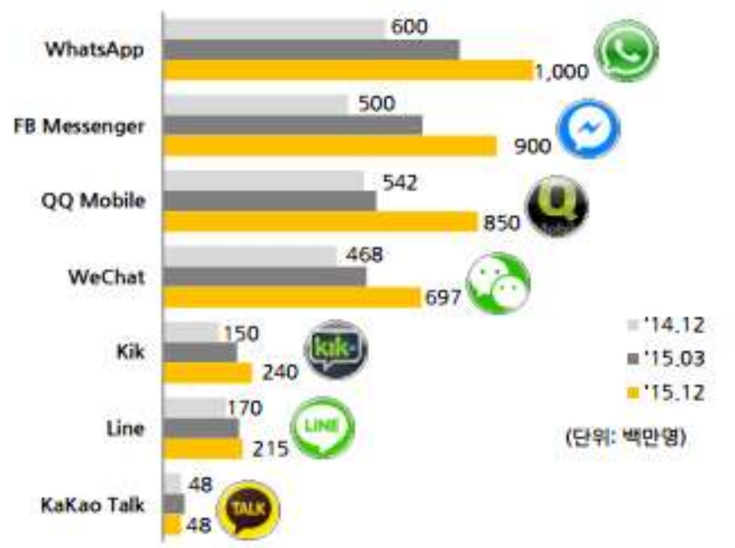
김영욱 부장
Technical Evangelist / DX
Blog://YoungWook.com
youngwook@outlook.com

메신저 앱 25.1%

카카오톡 50.7%

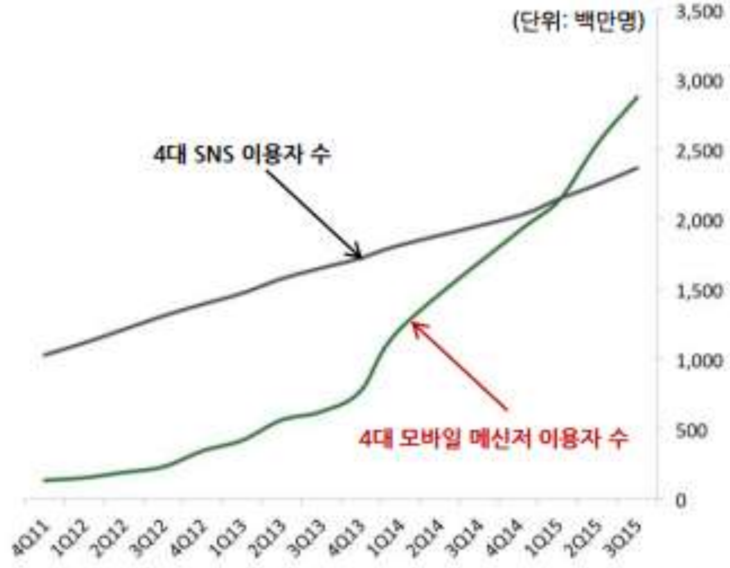


[그림1] 주요 모바일 메신저 이용자 수(MAU)

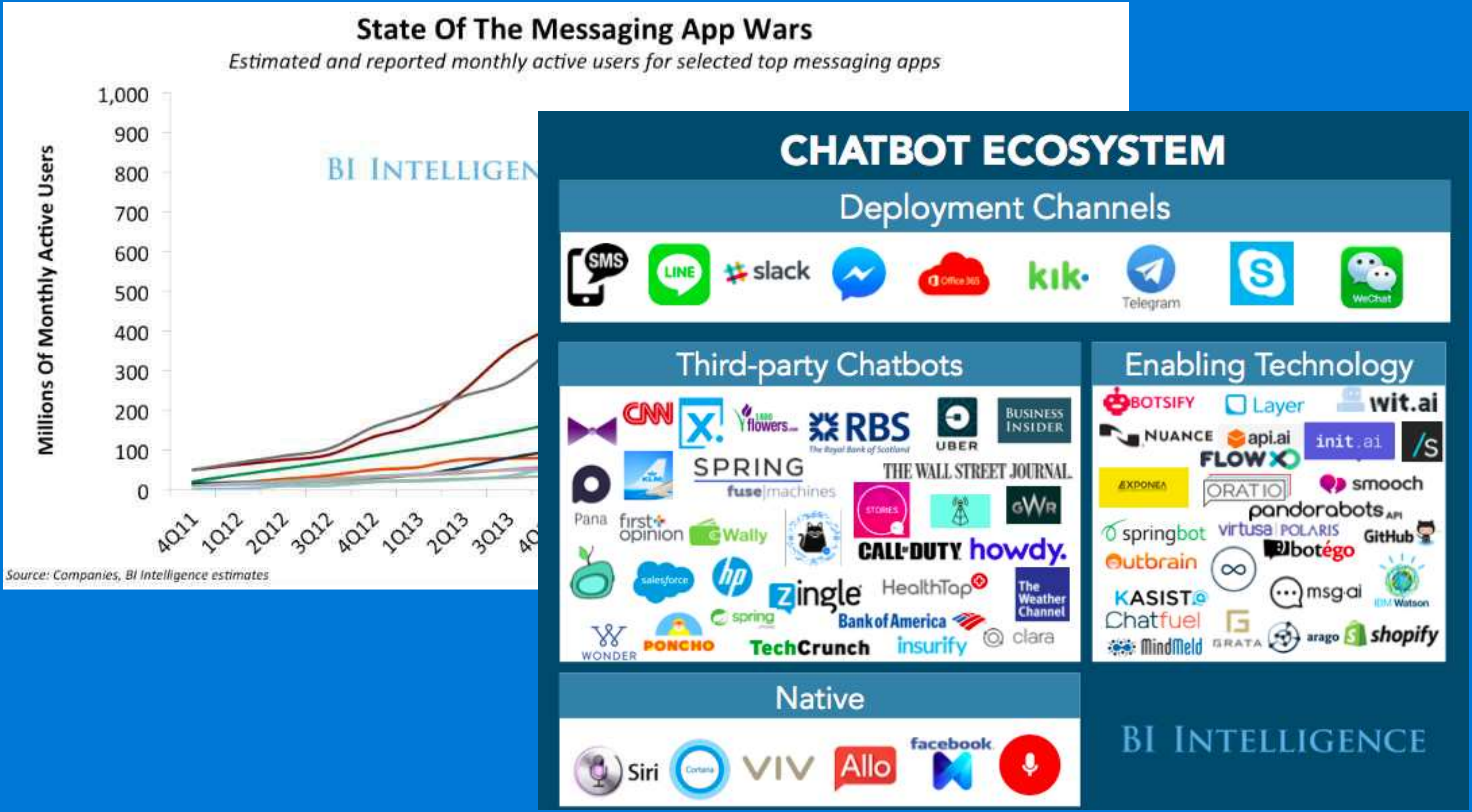


자료: Digieco 및 각사 발표자료 업데이트

[그림2] 4대 SNS vs. 메신저 이용자 수



주: 2015년 3분기 기준 (이용자 수 단순 합계)
자료: Business Insider (2015.11)



State Of The Messaging App Wars

Estimated and reported monthly active users for selected top messaging apps

Source: Companies, BI Intelligence estimates

CHATBOT ECOSYSTEM

Deployment Channels

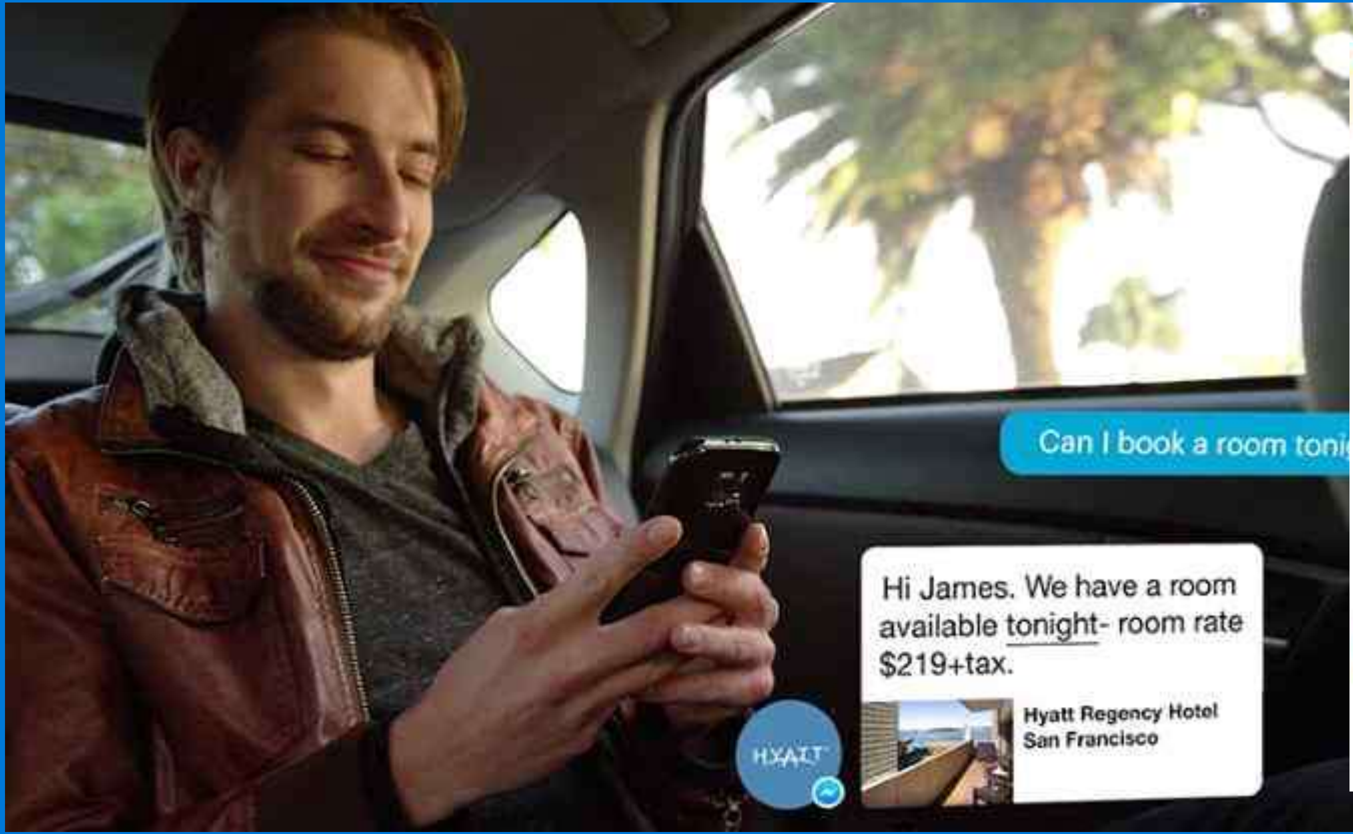
Third-party Chatbots

Enabling Technology

Native

BI INTELLIGENCE

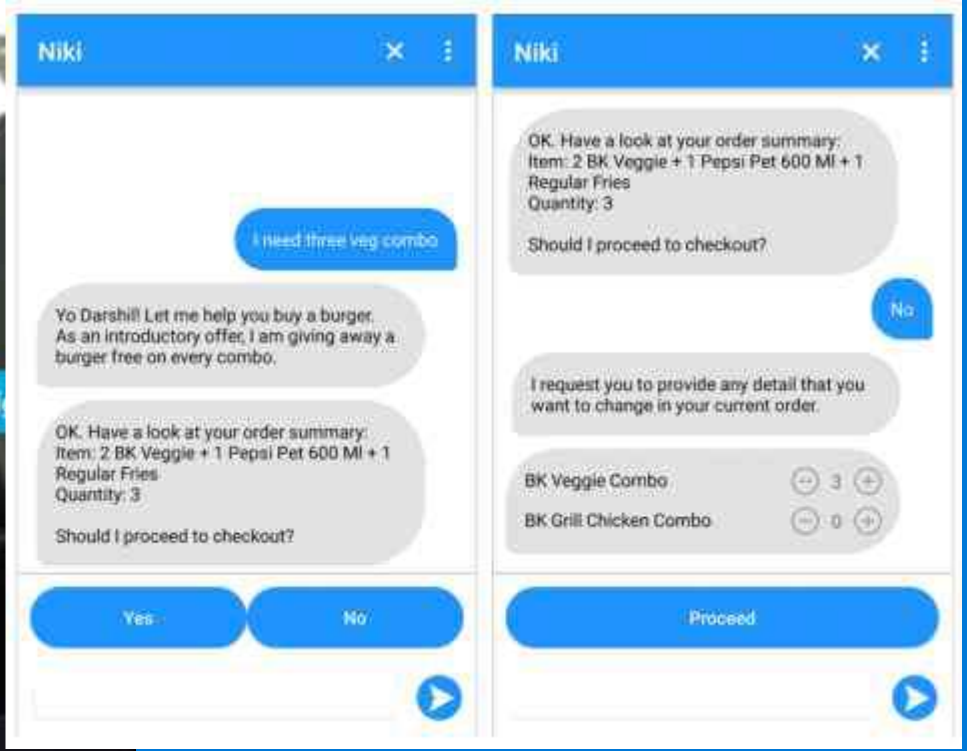
Chatbot.



Can I book a room toni

Hi James. We have a room available tonight- room rate $219+tax.

Hyatt Regency Hotel San Francisco



I need three veg combo

Yo Darshil! Let me help you buy a burger. As an introductory offer, I am giving away a burger free on every combo.

OK. Have a look at your order summary:
Item: 2 BK Veggie + 1 Pepsi Pet 600 Ml + 1 Regular Fries
Quantity: 3

Should I proceed to checkout?

OK. Have a look at your order summary:
Item: 2 BK Veggie + 1 Pepsi Pet 600 Ml + 1 Regular Fries
Quantity: 3

Should I proceed to checkout?

No

I request you to provide any detail that you want to change in your current order.

BK Veggie Combo	3
BK Grill Chicken Combo	0

텍스트 기반 챗봇 주요 핵심 기술

관련 기술	주요내용
패턴인식 (Pattern Recognition)	기계에 의하여 도형, 문자, 음성 등을 식별하는 것
자연어처리 (natural Language Processing)	인간이 보통 쓰는 언어를 컴퓨터에 인식시켜 처리하는 일 정보검색 질의 응답, 시스템 자동 번역, 통역 등이 포함됨
시멘틱 웹 (Symantic Web)	컴퓨터가 정보 자원의 뜻을 이해하고 논리적 추론까지 할 수 있는 차세대 지능형 웹
텍스트 마이닝 (Text Mining)	비정형 텍스트 데이터에서 새롭고 유용한 정보를 찾아내는 과정 또는 기술
상황인식 컴퓨팅 (Context Aware Computing)	가상공간에서 현실의 상황을 정보화하고 이를 활용하여 사용자 중심의 지능화된 서비스를 제공하는 기술.

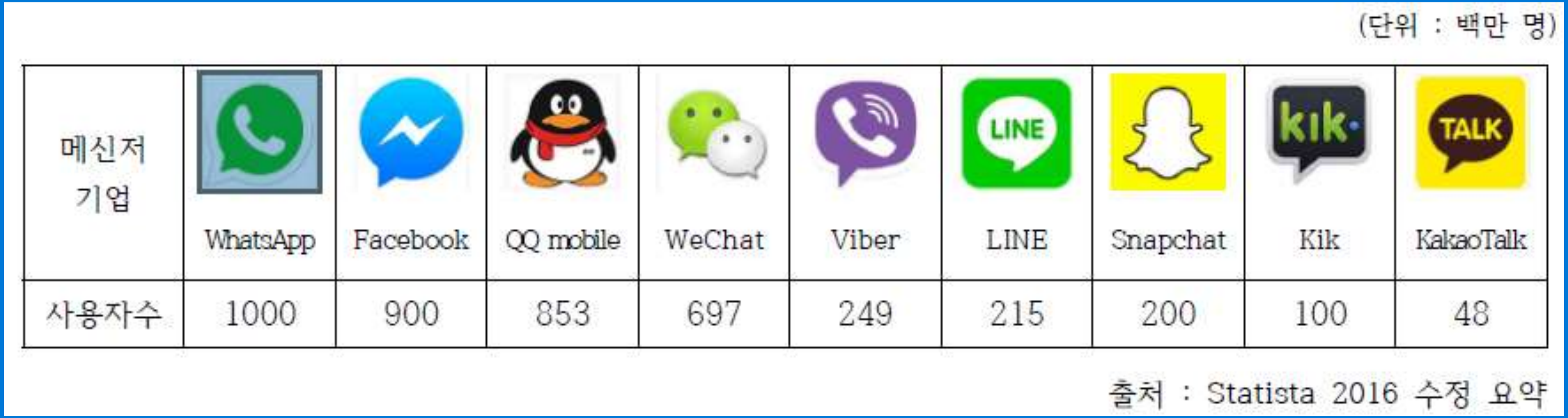
출처 : 한국정보화진흥원, ‘모바일시대를 넘어 AI시대로’

기업 현황 – 해외

업체	플랫폼	주요내용
페이스북	Facebook Messenger	F8 2016에서 Facebook Messenger에 인공지능을 적용한 챗봇 공개. 40개 내외 업체들이 참여 예정
텐센트	WeChat	인공지능 기반의 챗봇 전환을 통해 메시지를 통해 대화 하며 호텔, 병원, 영화등의 예약 기능 제공
텔레그램	Telegram	Bot API 공개로 개발자들에게 챗봇 개발 지원. 대화창에서 바로 이용이 가능한 Inline Bots를 추가
킥	Bot Shop	화장품/의류업체 등이 참여한 '봇샵(Bot Shop)' 오픈을 통해 챗봇 서비스 제공
구글	Allo	인공지능 챗봇 기술 적용된 메신저 플랫폼 준비 중

출처 : Digieco, KB경영연구소, 언론기사 참조

기업 현황 – 해외



(단위 : 백만 명)

메신저 기업	WhatsApp	Facebook	QQ mobile	WeChat	Viber	LINE	Snapchat	Kik	KakaoTalk
사용자수	1000	900	853	697	249	215	200	100	48

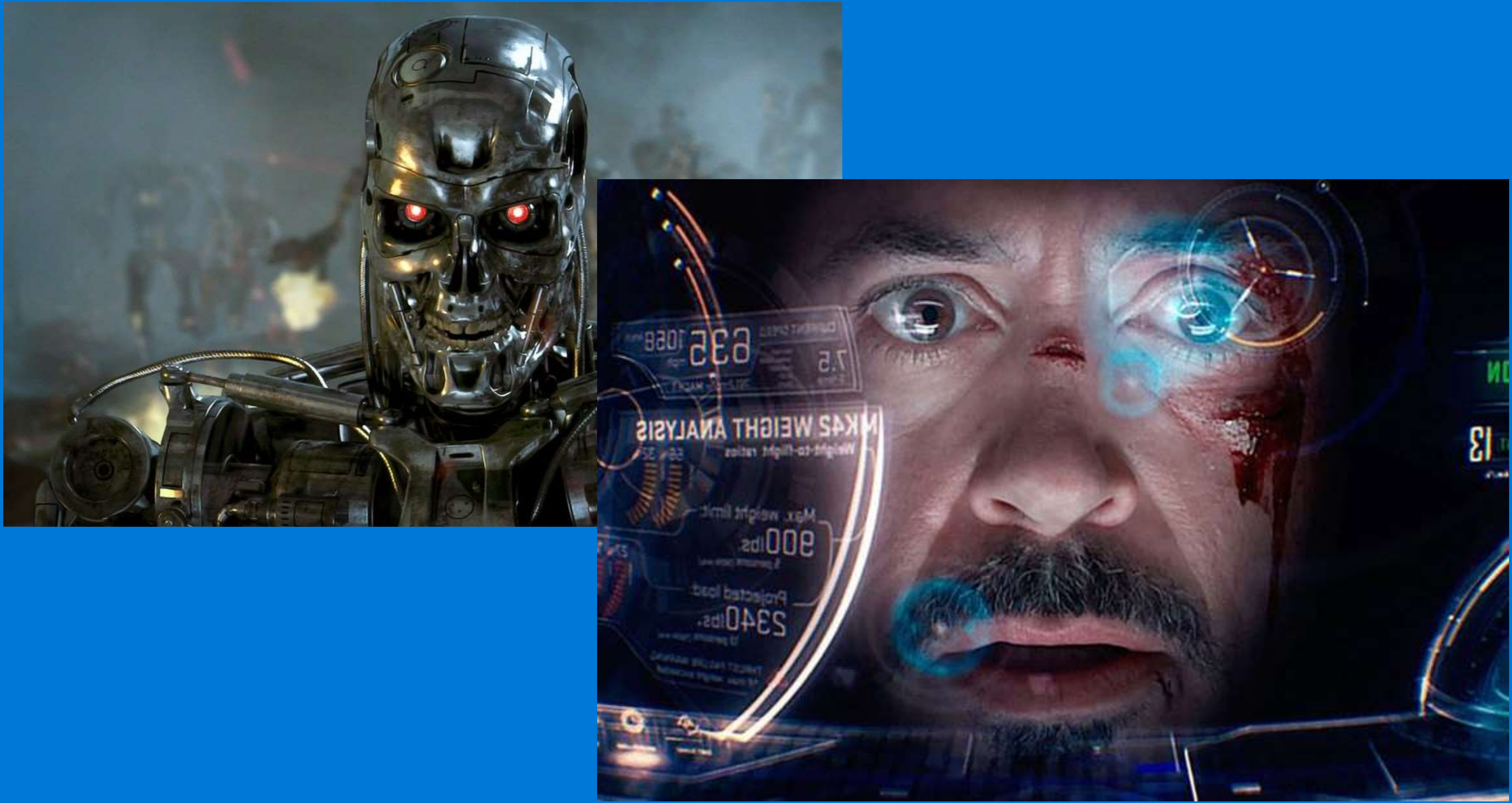
출처 : Statista 2016 수정 요약

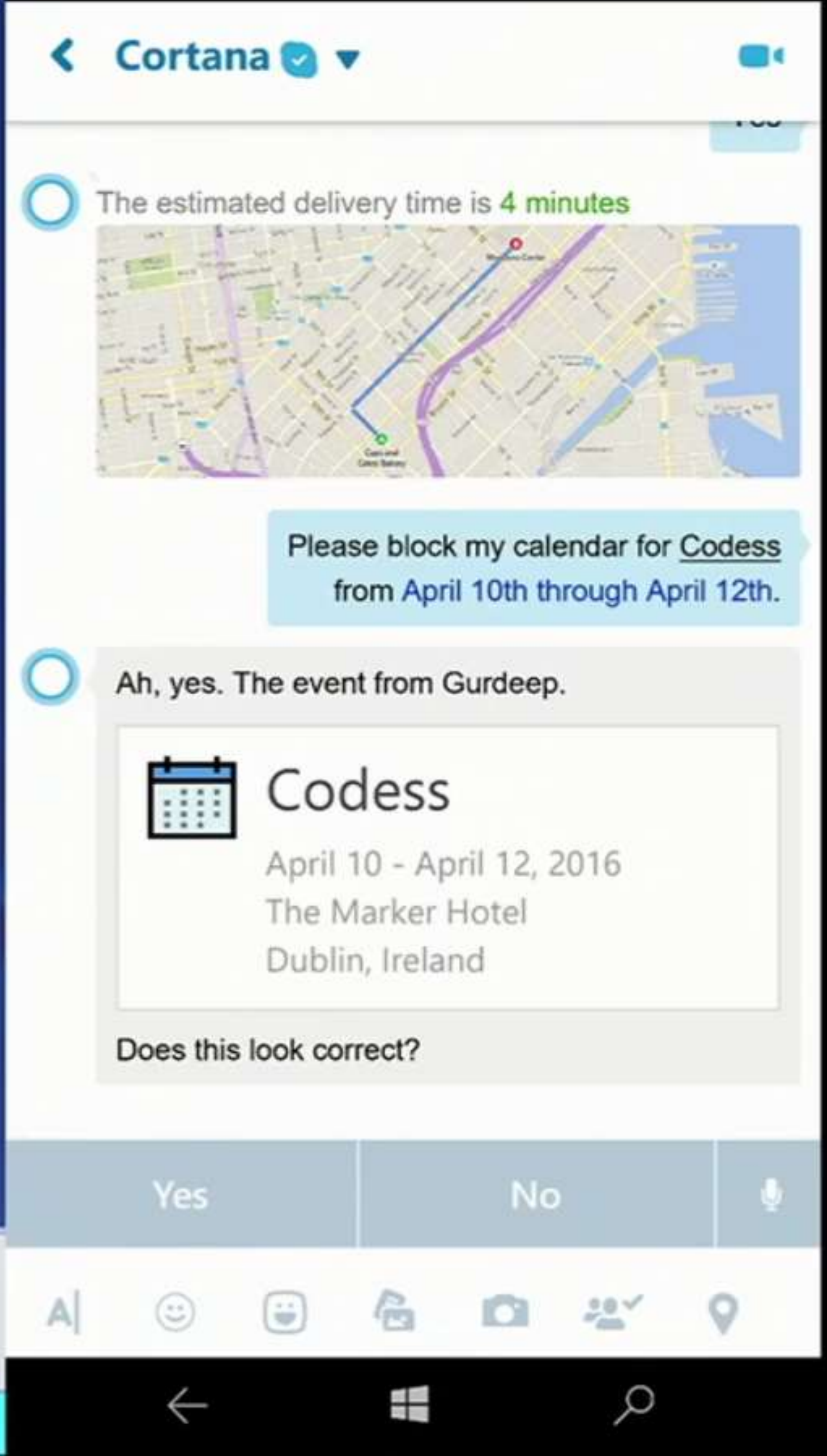
출처 : Statista 2016 수정 요약

Microsoft Chatbot.

14:22

Enjoy your meal! Please leave your comment: 🍴 https://botdlyatelegram.ru/url/3:2w08qp 14:22


1058
635
7.5
MK42 WEIGHT ANALYSIS
Weight-to-flight ratios
Max. weight limit
900lbs
Projected load
2340lbs
13



The estimated delivery time is 4 minutes

Please block my calendar for Codess from April 10th through April 12th.

Ah, yes. The event from Gurdeep.

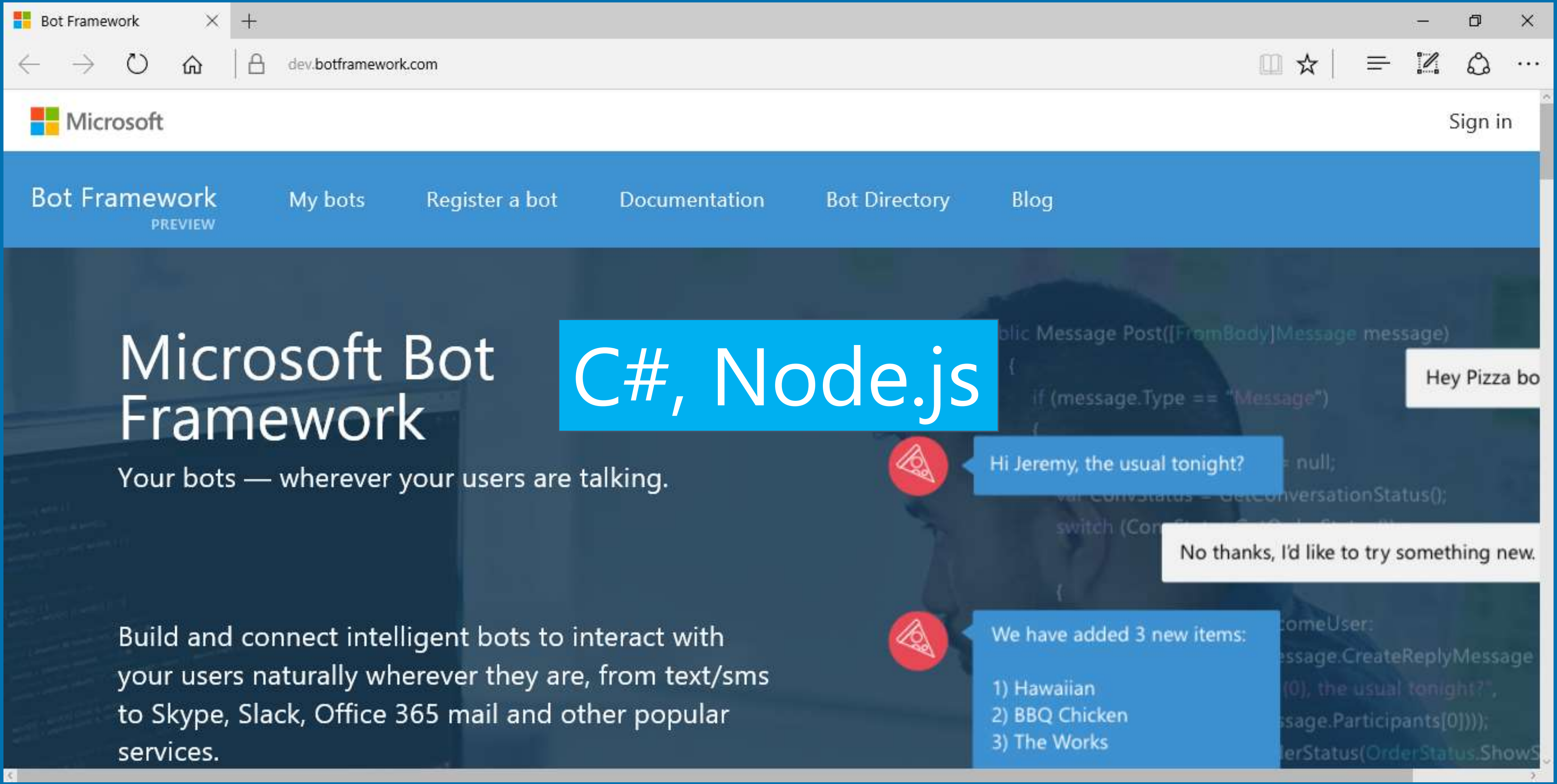
Codess

April 10 - April 12, 2016
The Marker Hotel
Dublin, Ireland

Does this look correct?

MS Bot Framework

https://dev.botframework.com



C#, Node.js

Microsoft Bot Framework

Your bots — wherever your users are talking.

Build and connect intelligent bots to interact with your users naturally wherever they are, from text/sms to Skype, Slack, Office 365 mail and other popular services.

Hey Pizza bo

Hi Jeremy, the usual tonight?

No thanks, I'd like to try something new.

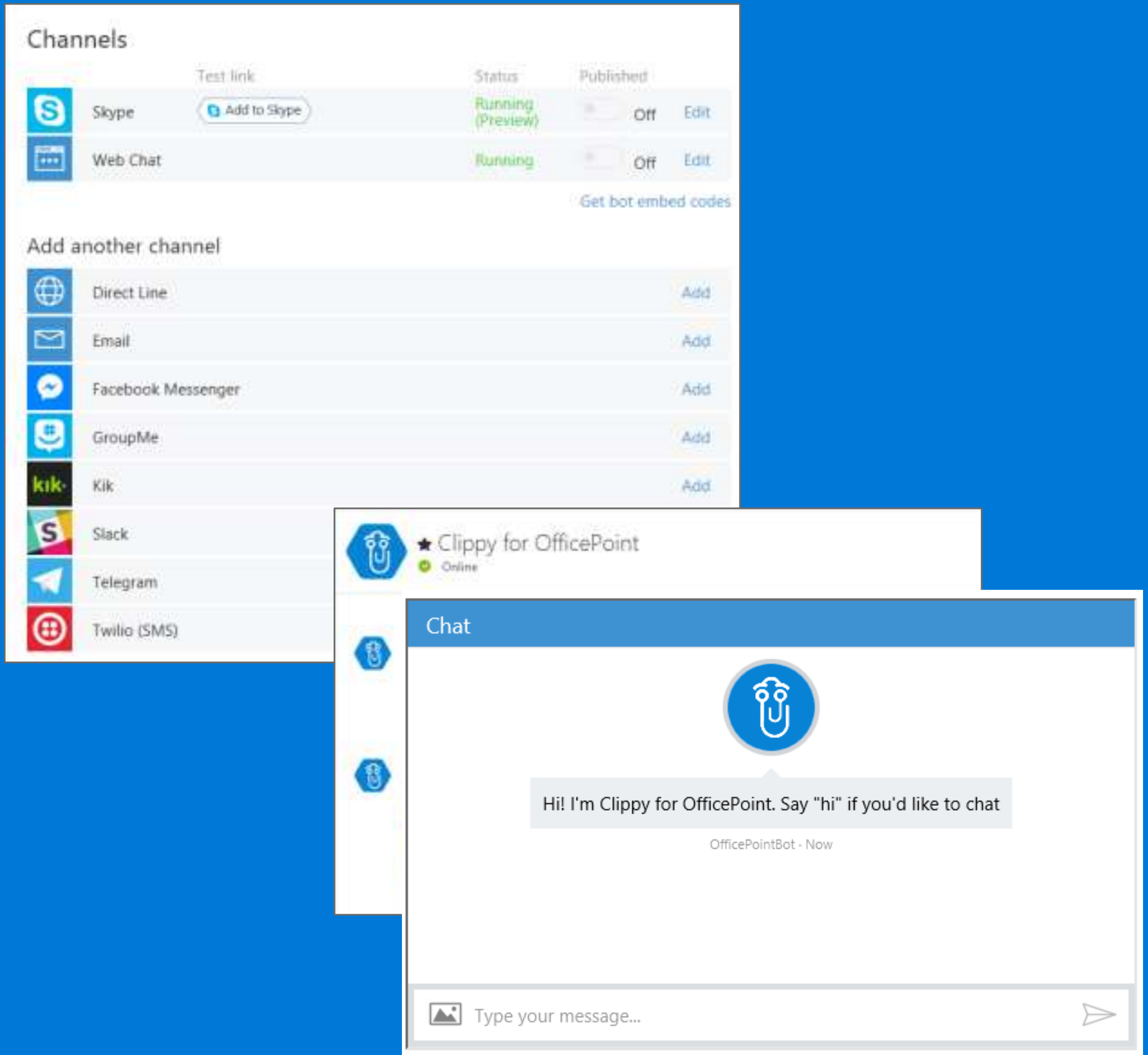
We have added 3 new items:

1) Hawaiian
2) BBQ Chicken
3) The Works

```
blic Message Post([FromBody]Message message)
{
    if (message.Type == "Message")
    {
                           null;
        var ConvStatus = GetConversationStatus();
        switch (Con
        {
                           omeUser:
                           ssage.CreateReplyMessage
                           (0), the usual tonight?",
                           ssage.Participants[0]));
                           erStatus(OrderStatus.ShowS
```

MS Bot Framework

Skype,
Web, email,
Facebook,
GroupMe,
Kik,
Slack,
Telegram,
Twilio,
direct line app integration.



Channels

	Test link	Status	Published	
Skype	Add to Skype	Running (Preview)	Off	Edit
Web Chat		Running	Off	Edit

Get bot embed codes

Add another channel

Direct Line	Add
Email	Add
Facebook Messenger	Add
GroupMe	Add
Kik	Add
Slack	
Telegram	
Twilio (SMS)	

★ Clippy for OfficePoint
Online

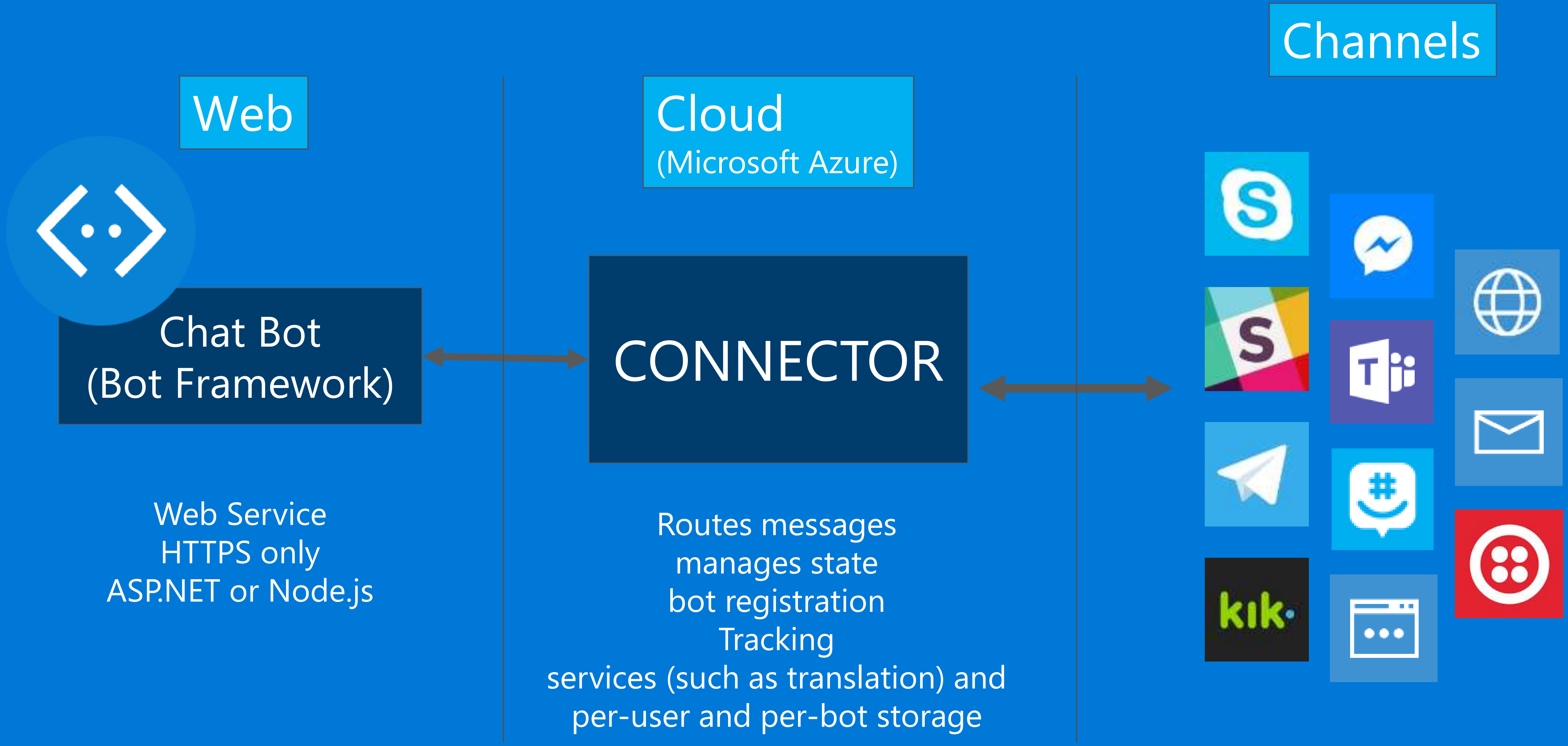
Chat

Hi! I'm Clippy for OfficePoint. Say "hi" if you'd like to chat

OfficePointBot · Now

Type your message...

Connector Service Flow.



Web

Chat Bot
(Bot Framework)

Web Service
HTTPS only
ASP.NET or Node.js

Cloud
(Microsoft Azure)

CONNECTOR

Routes messages
manages state
bot registration
Tracking
services (such as translation) and
per-user and per-bot storage

Channels

Installing Tools

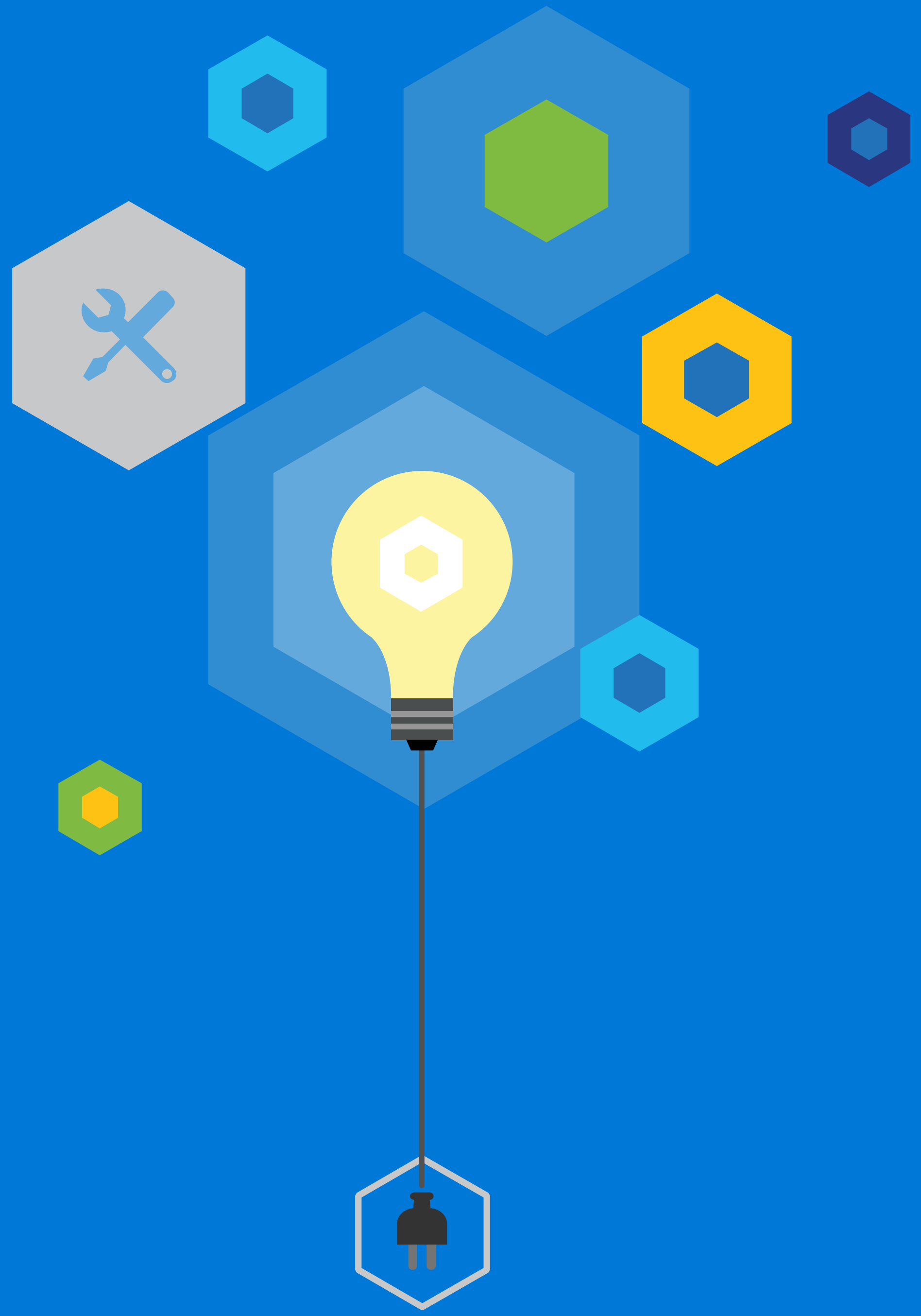
- **Visual Studio 2015 or higher**
  http://www.visualstudio.com
- **Get the Visual Studio Bot Project Template**
  http://aka.ms/bf-bc-vstemplate
- **Get the Bot Emulator**
  https://download.botframework.com/botconnector/tools/emulator/publish.htm

자세한 내용은 Github

http://github.com/KoreaEva/Bot

DEMO

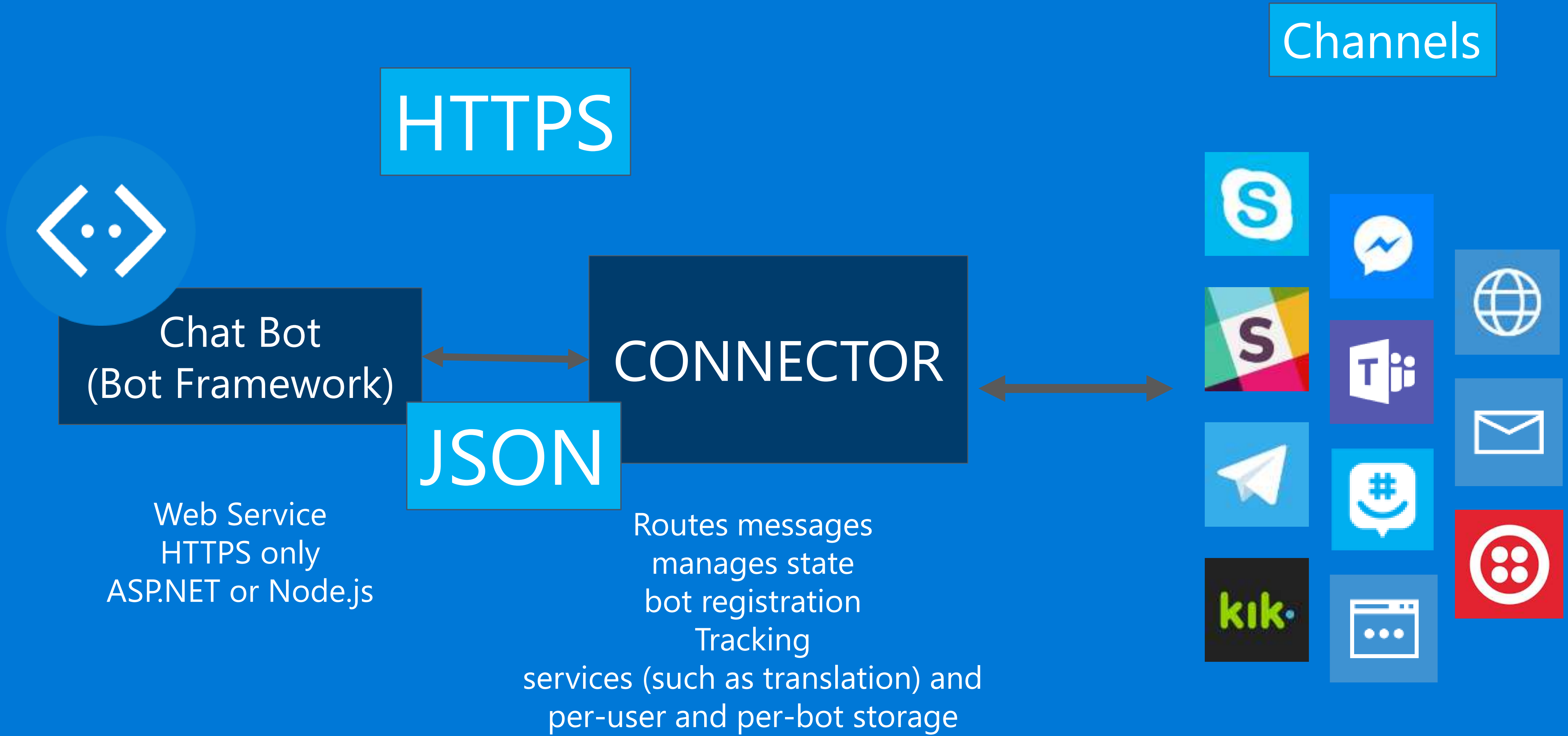
Hello Bot



Connector, Activities & Messages

Connector	The Connector (or Connector Service) handles all communication, conversations, state, and authorization for all activities between a Bot and Users.
Activity	An Activity is a specific event that occurs between a Bot and Users, such as an actual message, or conversation notification.
Message	A Message is an overt (typically visible) communication between a Bot and Users, such as a User asking a question, or a Bot responding with a reply.

Connector Service Flow.



Channels

HTTPS

Chat Bot
(Bot Framework)

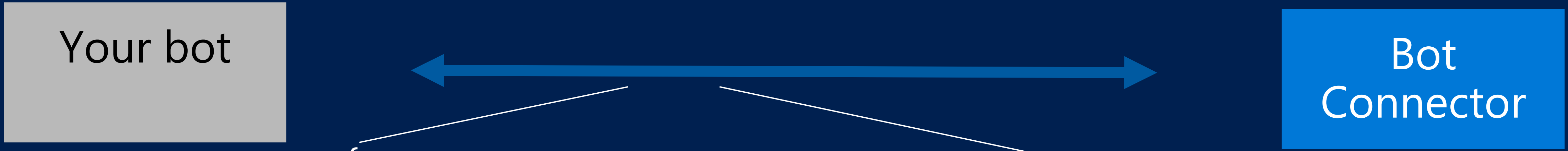
CONNECTOR

JSON

Web Service
HTTPS only
ASP.NET or Node.js

Routes messages
manages state
bot registration
Tracking
services (such as translation) and
per-user and per-bot storage

Bot Connector messages



```
{
  "type": "Message",
  "id": "68YrxgtB53Y",
  "conversationId": "DphPaFQrDuZDKyCez4AFGcT4vy5aQDje1lLGIjB8v18MFtb",
  "language": "en",
  "text": "You can say \"/order\" to order!",
  "attachments": [ ],
  "from": {
    "name": "+12065551212",
    "channelId": "sms",
    "address": "+12065551212",
    "id": "Ro52hKN287",
    "isBot": false
  },
  "channelData": { SMS data here },
  "botUserData": { your data here },
  ...
}
```

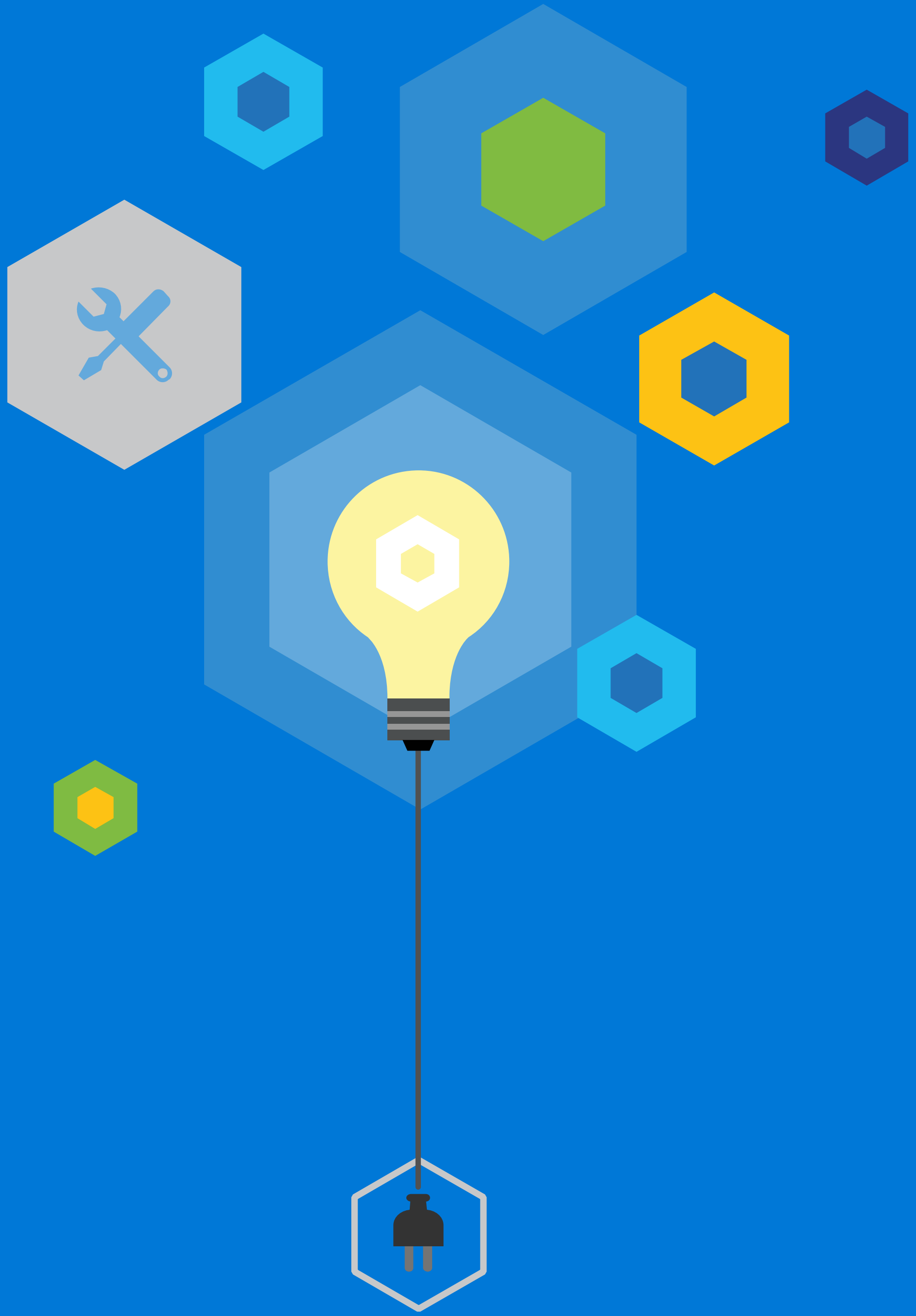
Connector

Namespace: Microsoft.Bot.Connector

```
ConnectorClient connector = new ConnectorClient(
                                 new Uri(activity.ServiceUrl));

string message = string.Format("{0}을 주문 받았습니다. 감사합니다.",
                                       activity.Text);

// return our reply to the user
Activity reply = activity.CreateReply(message);
await connector.Conversations.ReplyToActivityAsync(reply);
```

DEMO

Connector Activities & Messages



Types of Activities

Activity Type	Description
Message	Sent when general content is passed to or from a user and a bot
Conversation Update	Sent when the conversation's properties change, for example the topic name, or when user joins or leaves the group
Contact Relation Update	Sent when bot added or removed to contact list
Delete User Data	Send when user is removed from a conversation
Typing	Sent when a user is typing
Ping	Send when a keep-alive is needed

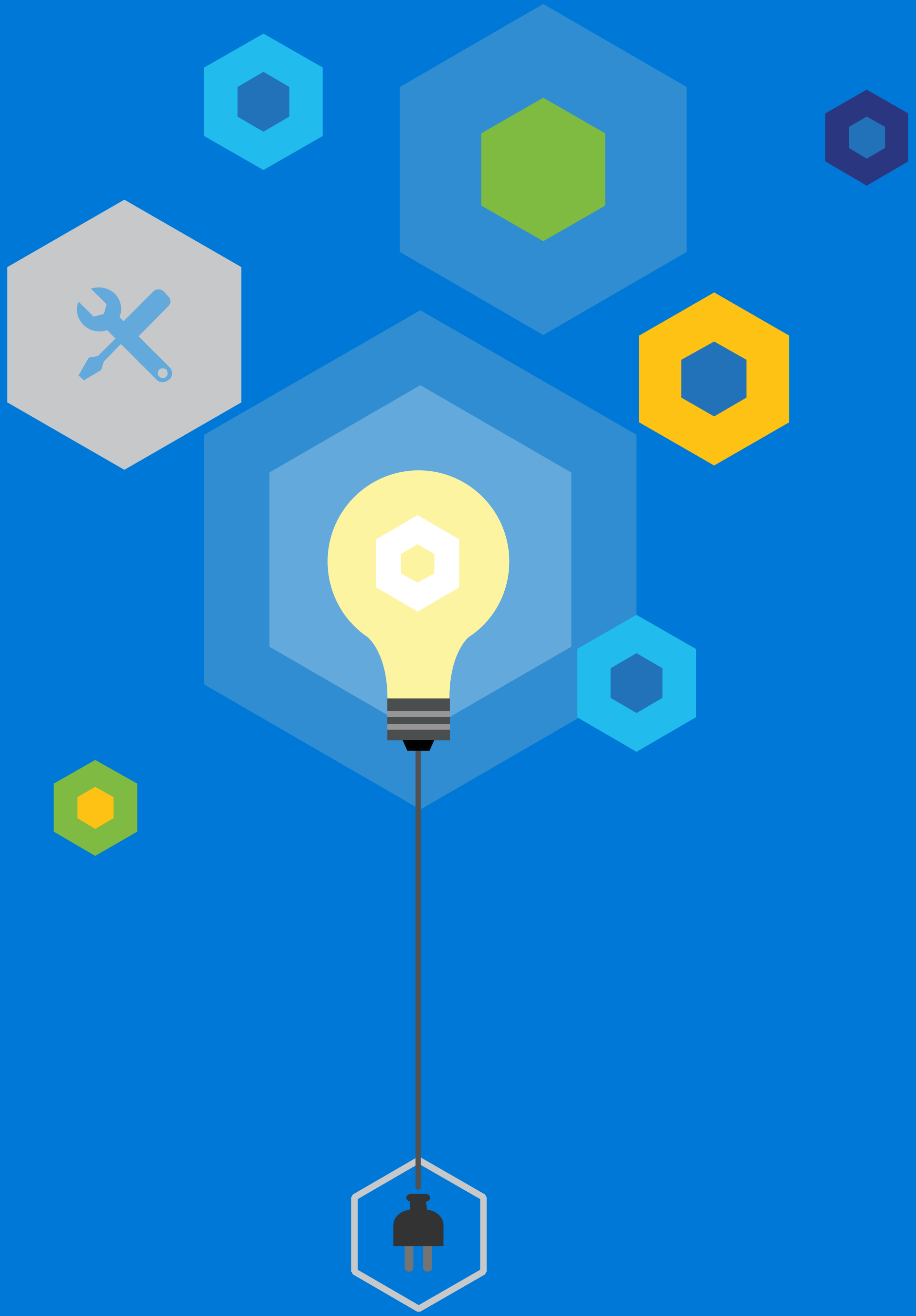
Activities Types

```
switch (activity.GetActivityType())
      {
           case ActivityTypes.Message:

                 message = string.Format("{0}을 주문 받았습니다. 감사합
                 reply = activity.CreateReply(message);
                 await connector.Conversations.ReplyToActivityAsync(r

                 break;

           case ActivityTypes.ConversationUpdate:
                 message = string.Format("안녕하세요 만리장성 봇 입니다.

                        reply = activity.CreateReply(message);
```

```
    case ActivityTypes.ConversationUpdate:
        message = string.Format("안녕하세요 만리장성 봇 입니다. 주문하실

        reply = activity.CreateReply(message);
        await connector.Conversations.ReplyToActivityAsync(reply);

        break;

    case ActivityTypes.ContactRelationUpdate:
    case ActivityTypes.Typing:
    case ActivityTypes.DeleteUserData:
    default:
             break;
}
```

DEMO

Type of Activities

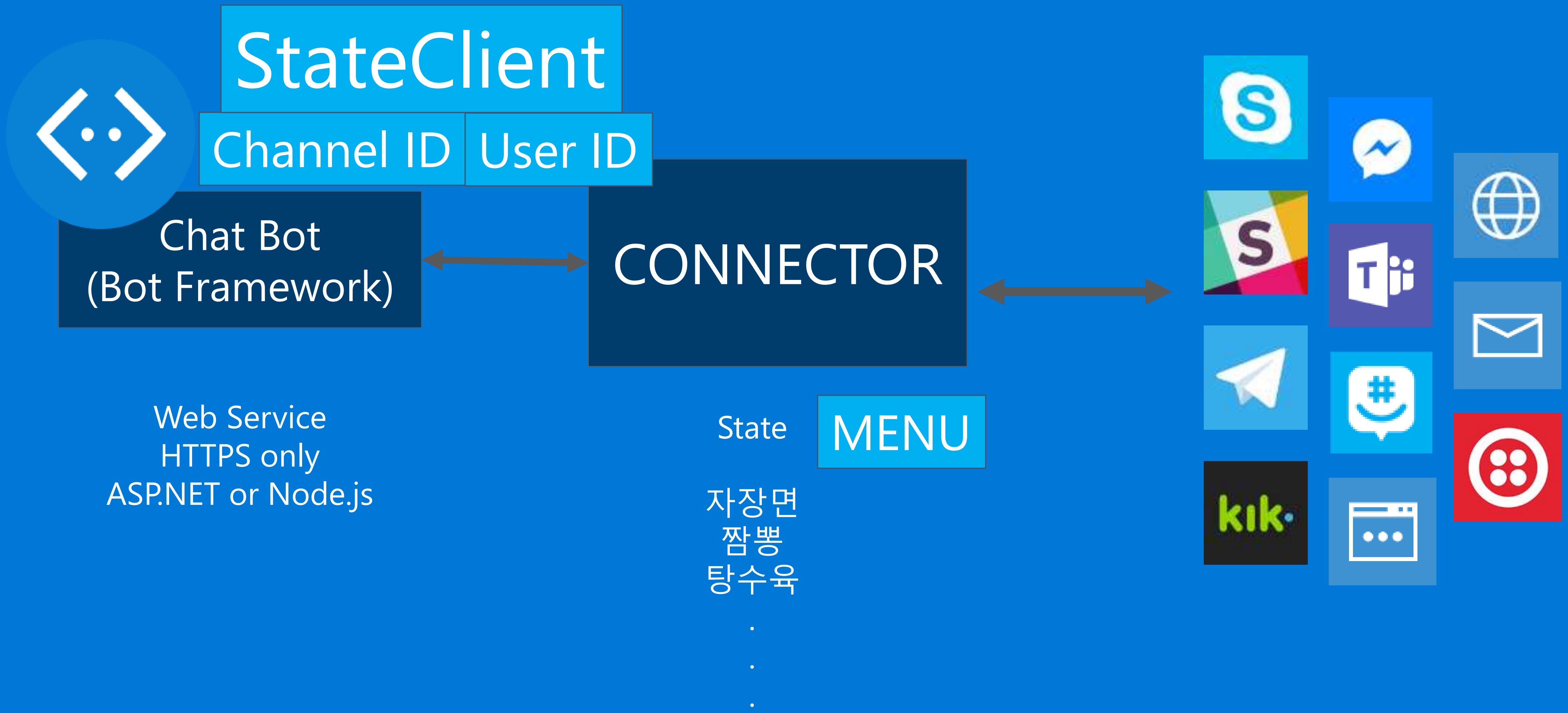


Managing State

Not all Bots require state management outside of what the Connector provides inherently, however if you need to manage state, there are various methods.

- Custom storage methods, such as a remote database
- Class-specific logic at runtime
- Implicitly during a Dialog or Form process
- The Bot Framework State Client

Connector Service Flow.



StateClient

Channel ID | User ID

Chat Bot
(Bot Framework)

CONNECTOR

Web Service
HTTPS only
ASP.NET or Node.js

State MENU

자장면
짬뽕
탕수육
.
.
.

StateClient

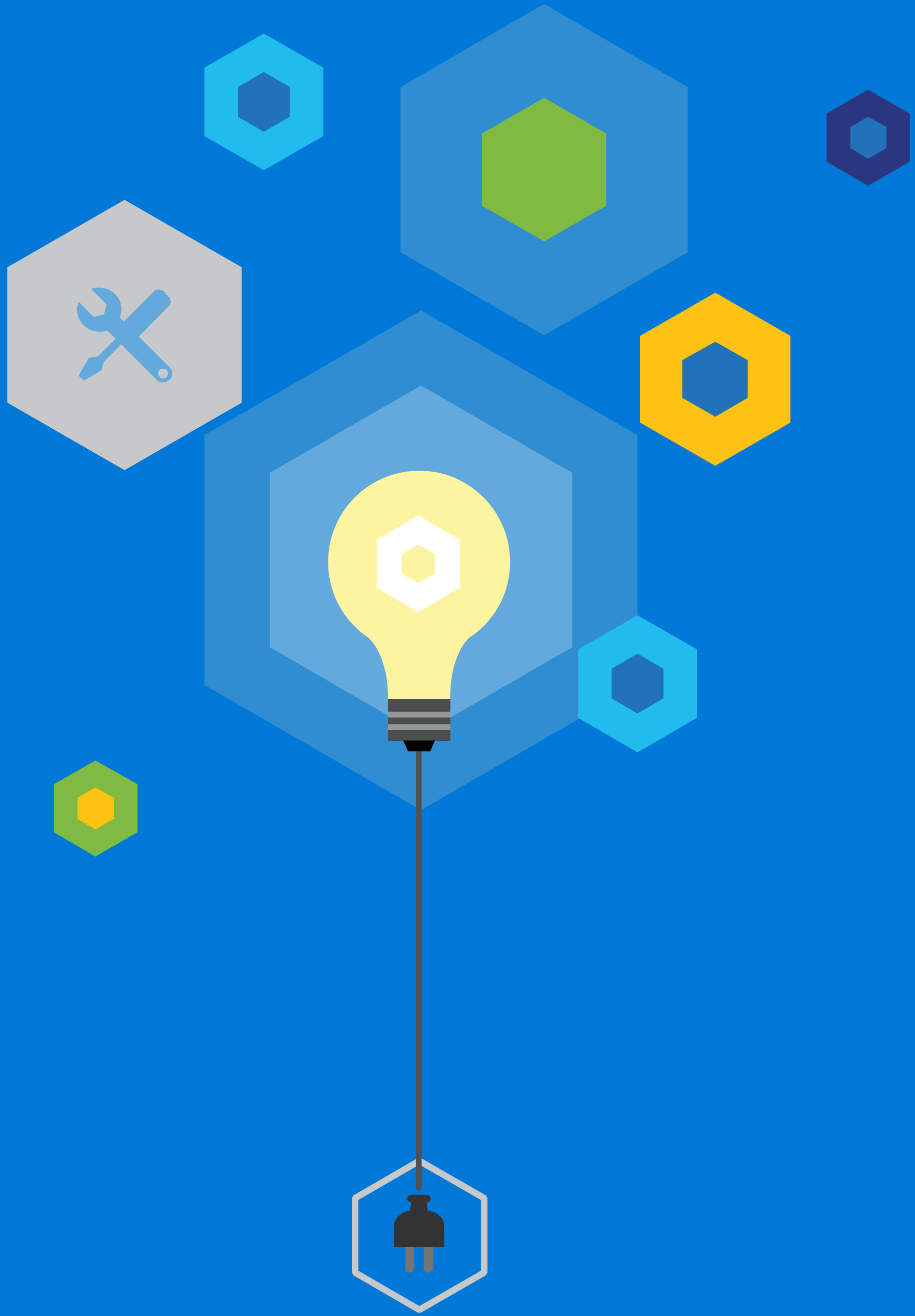
```
StateClient stateClient = activity.GetStateClient();
BotData userData = await stateClient.BotState.GetUserDataAsync(
                            activity.ChannelId, activity.From.Id);

string menu = activity.Text;
menu += userData.GetProperty<string>("MENU") + ",";

userData.SetProperty<string>("MENU", menu);
await stateClient.BotState.SetUserDataAsync(
                 activity.ChannelId, activity.From.Id, userData);

reply = activity.CreateReply("주문내역:" + menu);
await connector.Conversations.ReplyToActivityAsync(reply);
```

StateClient

```
case ActivityTypes.DeleteUserData:
   await stateClient.BotState.DeleteStateForUserAsync
                      (activity.ChannelId, activity.From.Id);

   break;
```

DEMO

State Client

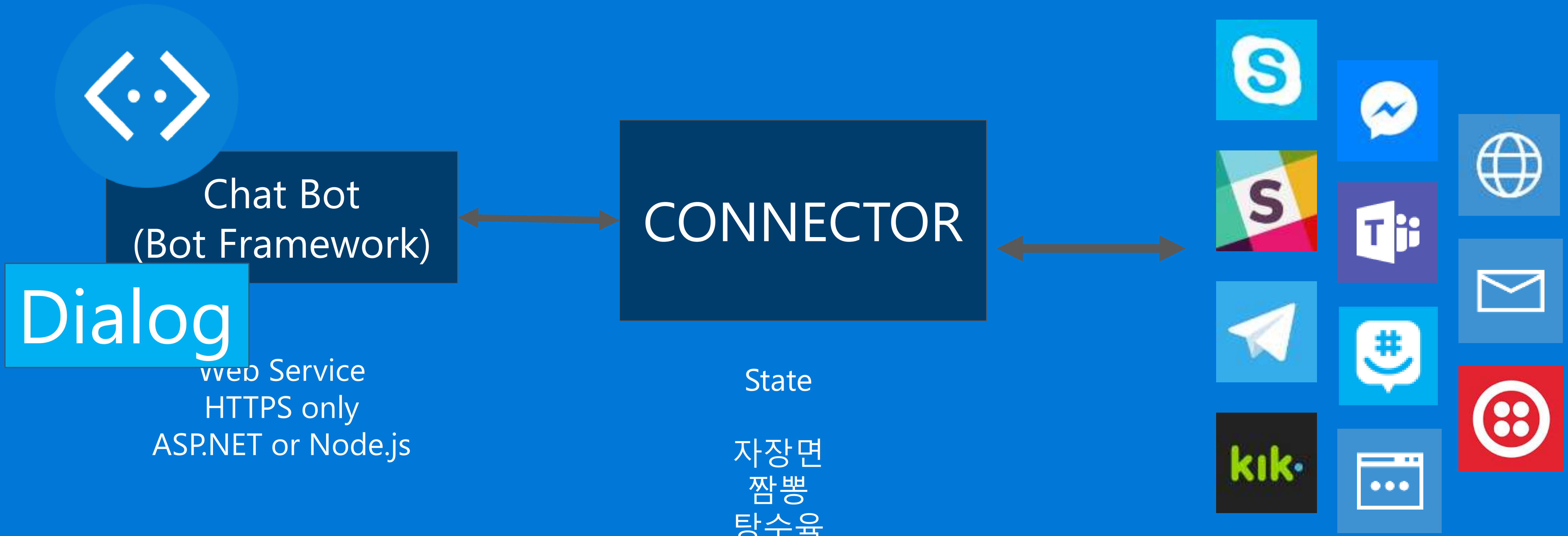


Using Dialogs

Dialogs are a way of wrapping an entire “experience” into an easily managed interaction based on a “chained” and “conversational” paradigm.

- Send information to a User
- Prompt a User for more information or confirmation
- Provide conditional logic
- Provide “as you need it” content
- Dialogs can contain or forward to other Dialogs.

Connector Service Flow.



Chat Bot
(Bot Framework)

Dialog

Web Service
HTTPS only
ASP.NET or Node.js

CONNECTOR

State

자장면
짬뽕
탕수육
.
.
.

Dialog

Namespace: Microsoft.Bot.Builder.Dialogs

```
[Serializable]
public class EchoDialog : IDialog<object>
{
      public async Task StartAsync(IDialogContext context)
      {
            context.Wait(MessageReceivedAsync);
      }
      public async Task MessageReceivedAsync(IDialogContext context,
     {
            context.Wait(MessageReceivedAsync);
      }
```

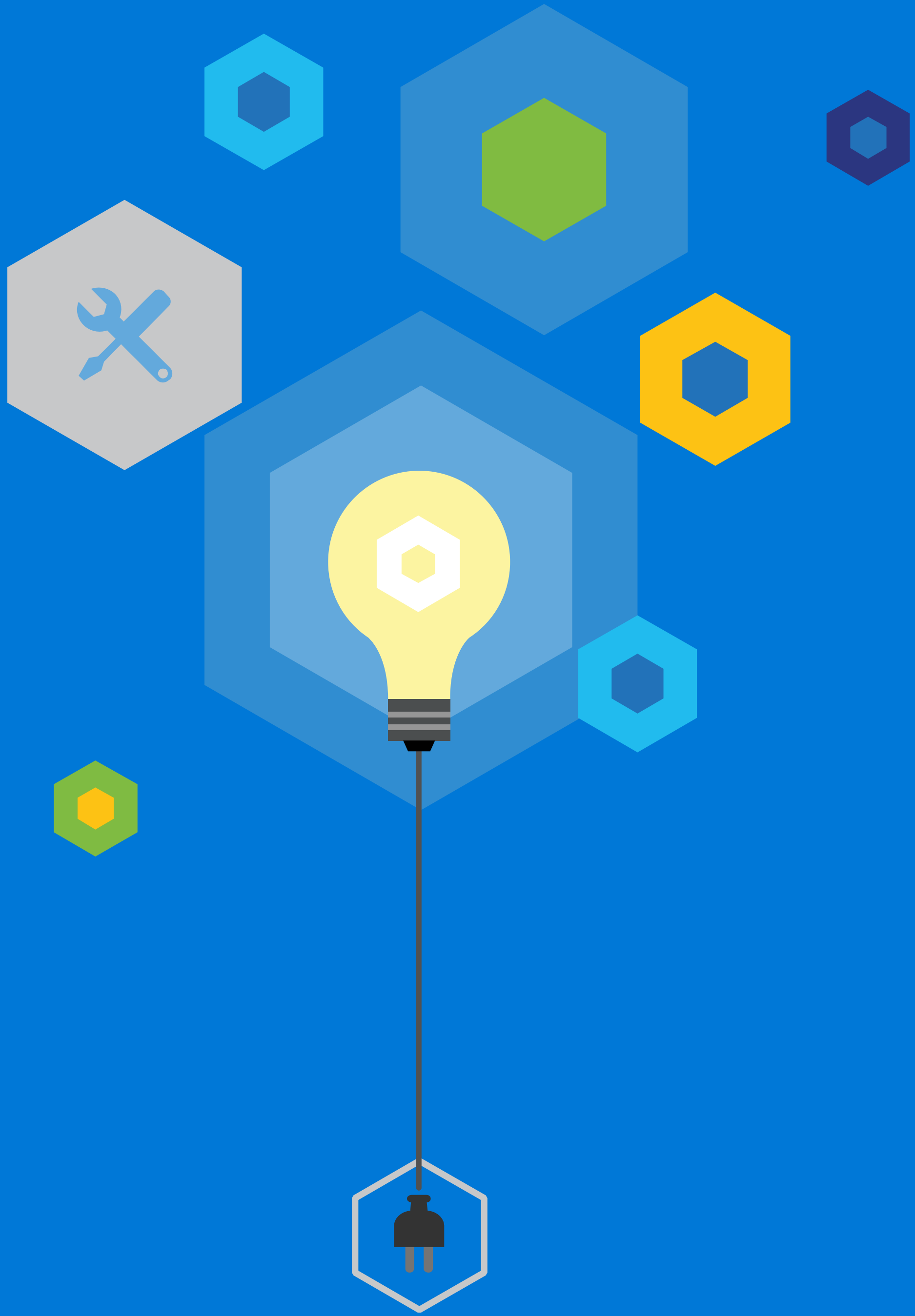
Dialog

Namespace: Microsoft.Bot.Builder.Dialogs

```
[Serializable]
public class EchoDialog : IDialog<object>
{
      public async Task StartAsync(IDialogContext context)
      {
           context.Wait(MessageReceivedAsync);
      }
      public async Task MessageReceivedAsync(IDialogContext context,
     {
           context.Wait(MessageReceivedAsync);
      }
```

DEMO

Using State, Authentication & Debugs

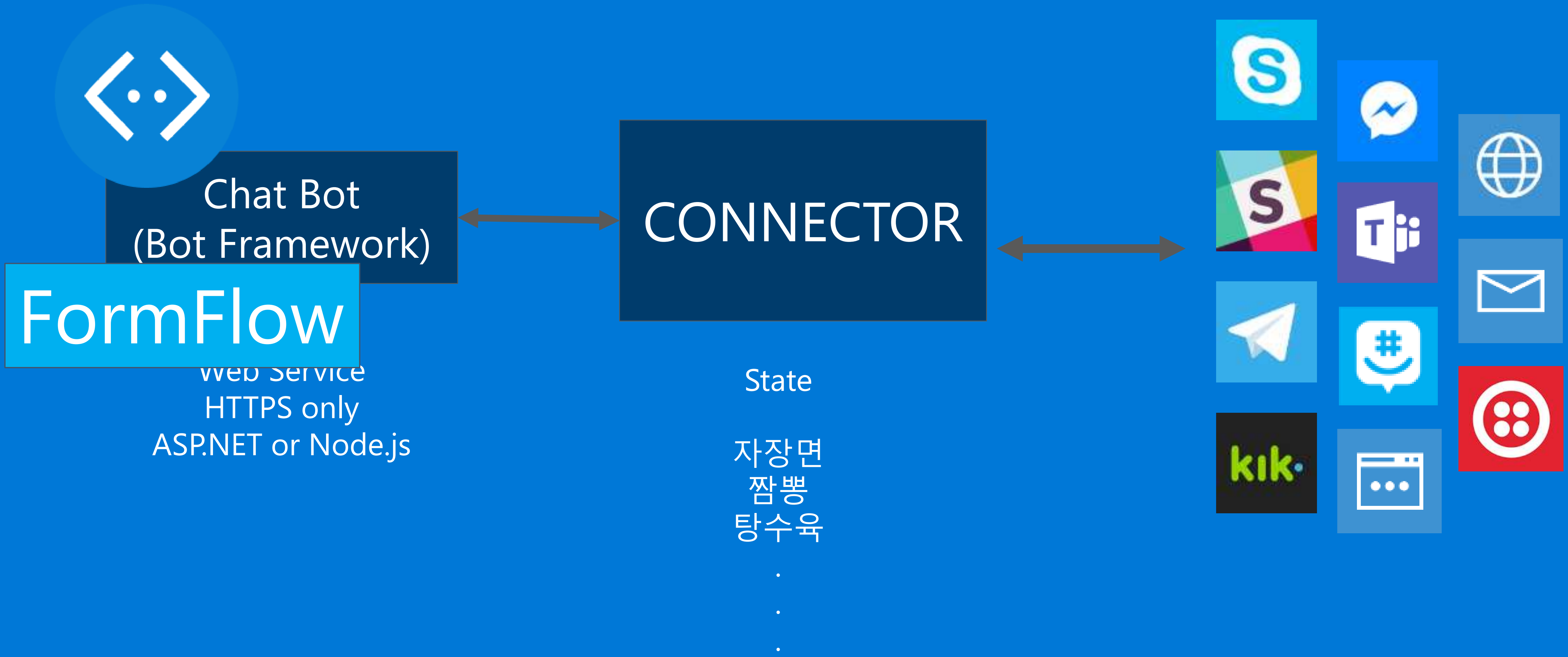


Using Forms with FormFlow

Although Dialogs are the basic building block of a conversation, it’s difficult to create a “guided” conversation. FormFlow creates Dialogs and guides a User through filling in a “form” while providing help and guidance along the way.

- Super smart based on enumerations and properties
- Provide content for various scenarios, such and not understanding, clarification, and confirmations
- Easily provide optional conversation paths based on previous choices

Connector Service Flow.



Chat Bot
(Bot Framework)

FormFlow

Web Service
HTTPS only
ASP.NET or Node.js

CONNECTOR

State

자장면
짬뽕
탕수육
.
.
.

FormFlow

Namespace: Microsoft.Bot.Builder.FormFlow

```
[Serializable]
public class FoodOrder
{
      public FooldOptions? Food;
      public LengthOptions? Length;

      public static IForm<FoodOrder> BuildForm()
      {
           return new FormBuilder<FoodOrder>()
                 .Message("만리장성에 오신 여러분을 환영합니다.")
                 .Build();
      }
```

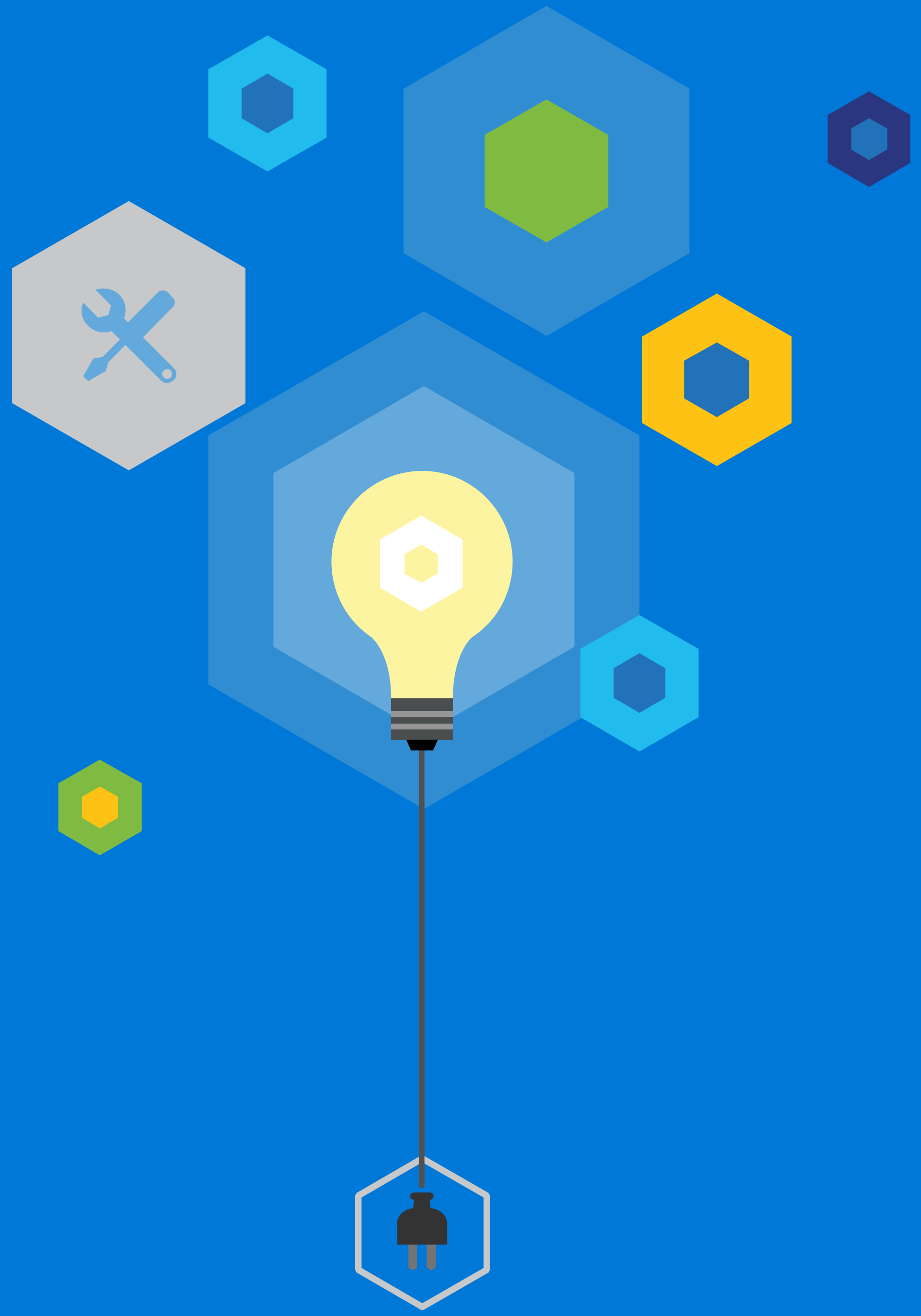
FormFlow

Namespace: Microsoft.Bot.Builder.FormFlow

```
public enum FooldOptions
{
        자장면, 짬뽕, 탕수육, 기스면, 란자완스
};

public enum LengthOptions { 보통, 곱배기};
```

DEMO

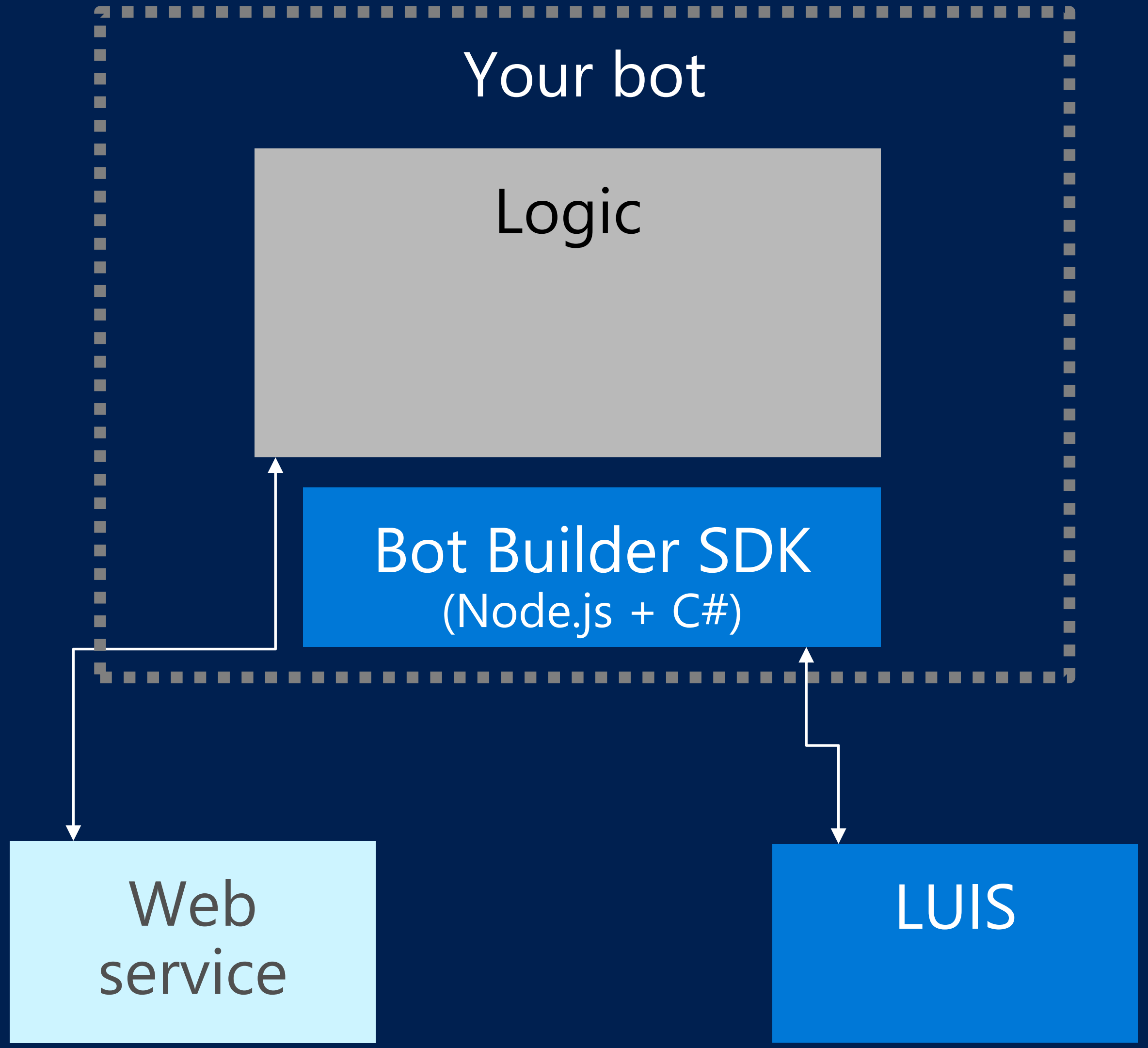
Using Forms with FormFlow and Bot Deployment



Integrating Language Understanding Intelligence Services

LUIS is part of Microsoft Cognitive Services offering and can be used for any device, on any platform, and any application scenario.

- Essentially what Cortana uses on the backend for language and sematic interpretations
- Provides "built in" logic that can be leveraged "out of the box"
- Natural, adaptable, conversational intelligence
- Model-based via intents and entities



Your bot

Logic

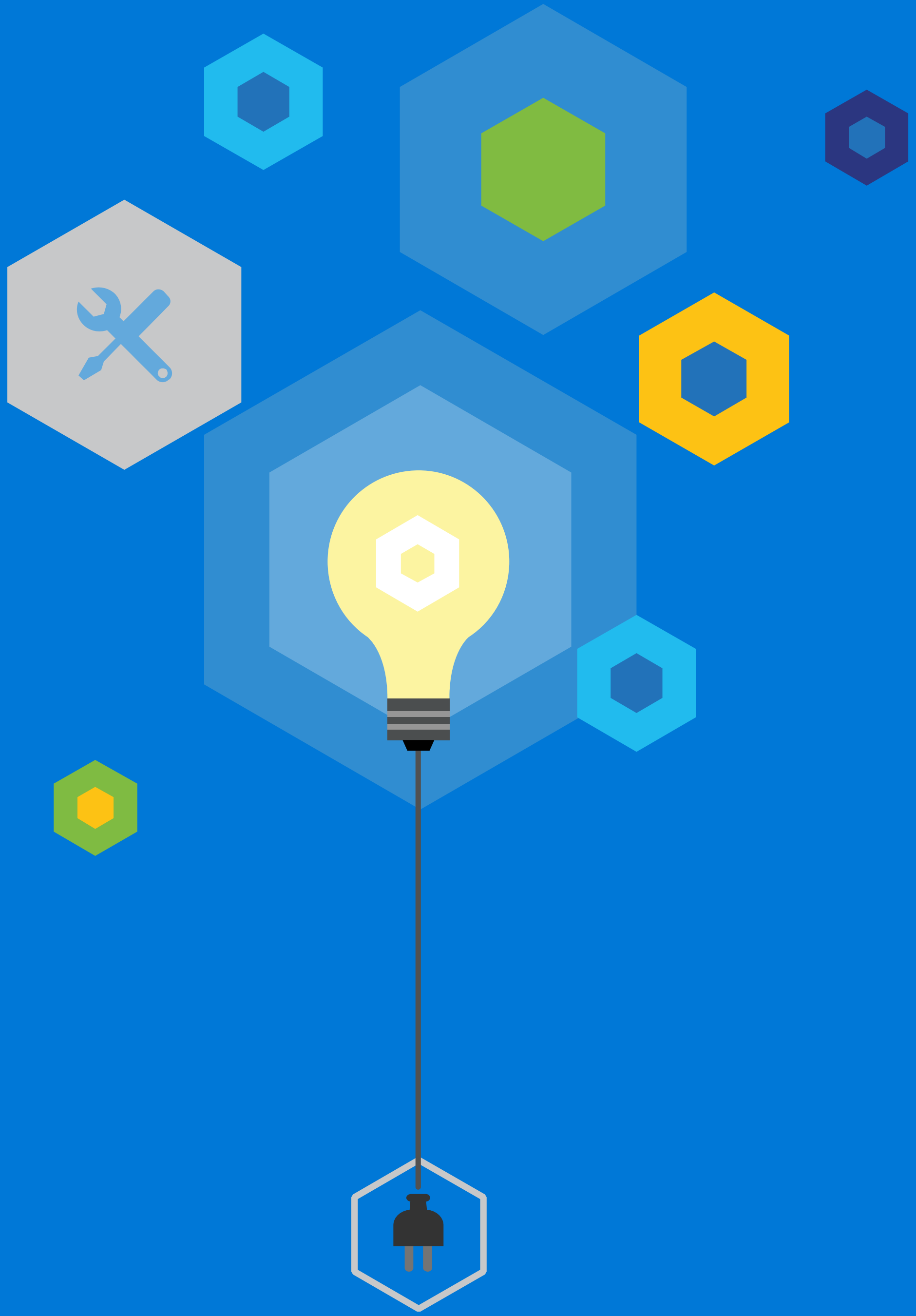
Bot Builder SDK
(Node.js + C#)

Web
service

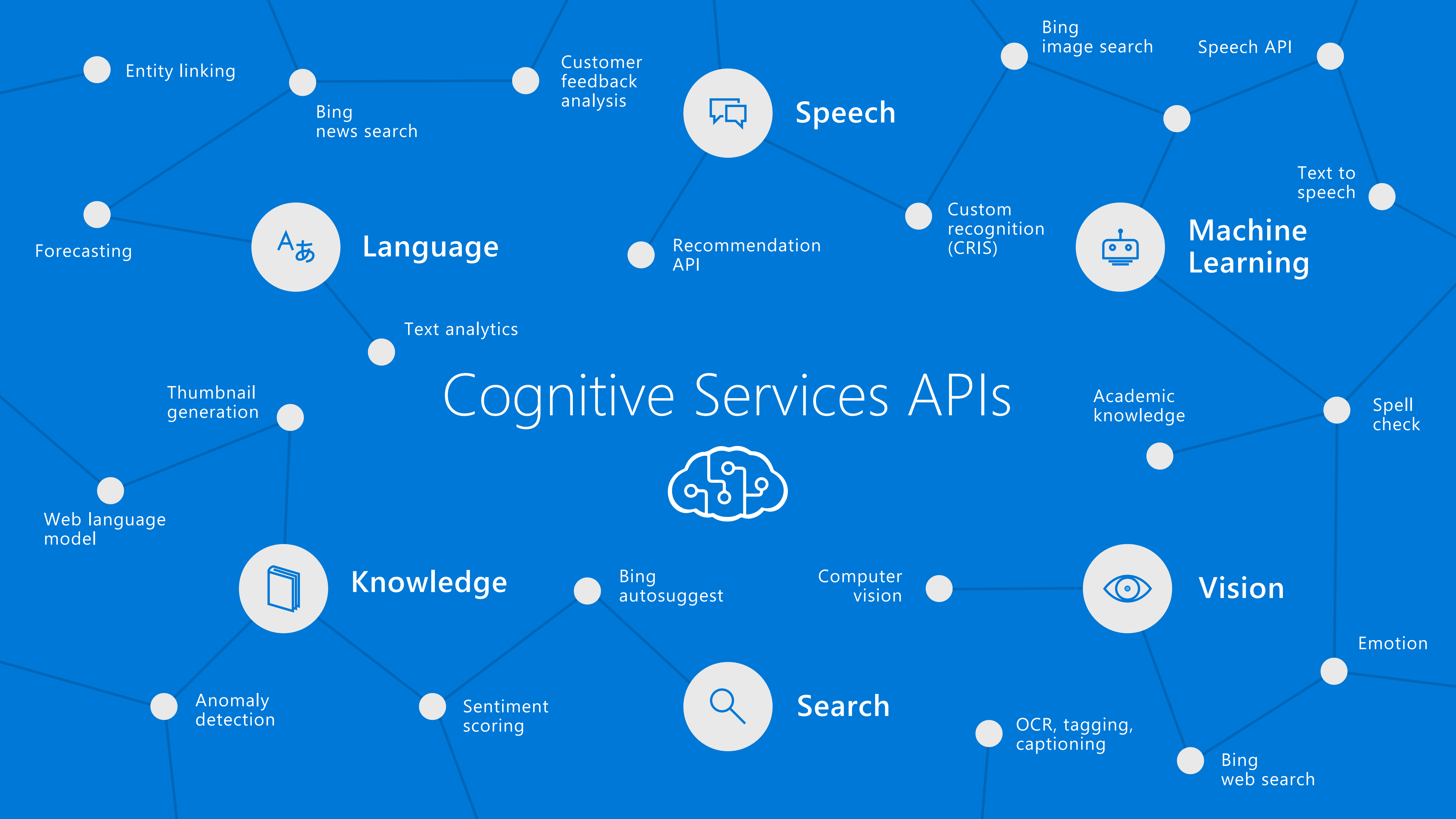
LUIS

DEMO

LUIS



Cognitive Services APIs



Entity linking

Bing news search

Customer feedback analysis

Speech

Bing image search

Speech API

Text to speech

Forecasting

Language

Recommendation API

Custom recognition (CRIS)

Machine Learning

Text analytics

Thumbnail generation

Academic knowledge

Spell check

Web language model

Knowledge

Bing autosuggest

Computer vision

Vision

Emotion

Anomaly detection

Sentiment scoring

Search

OCR, tagging, captioning

Bing web search

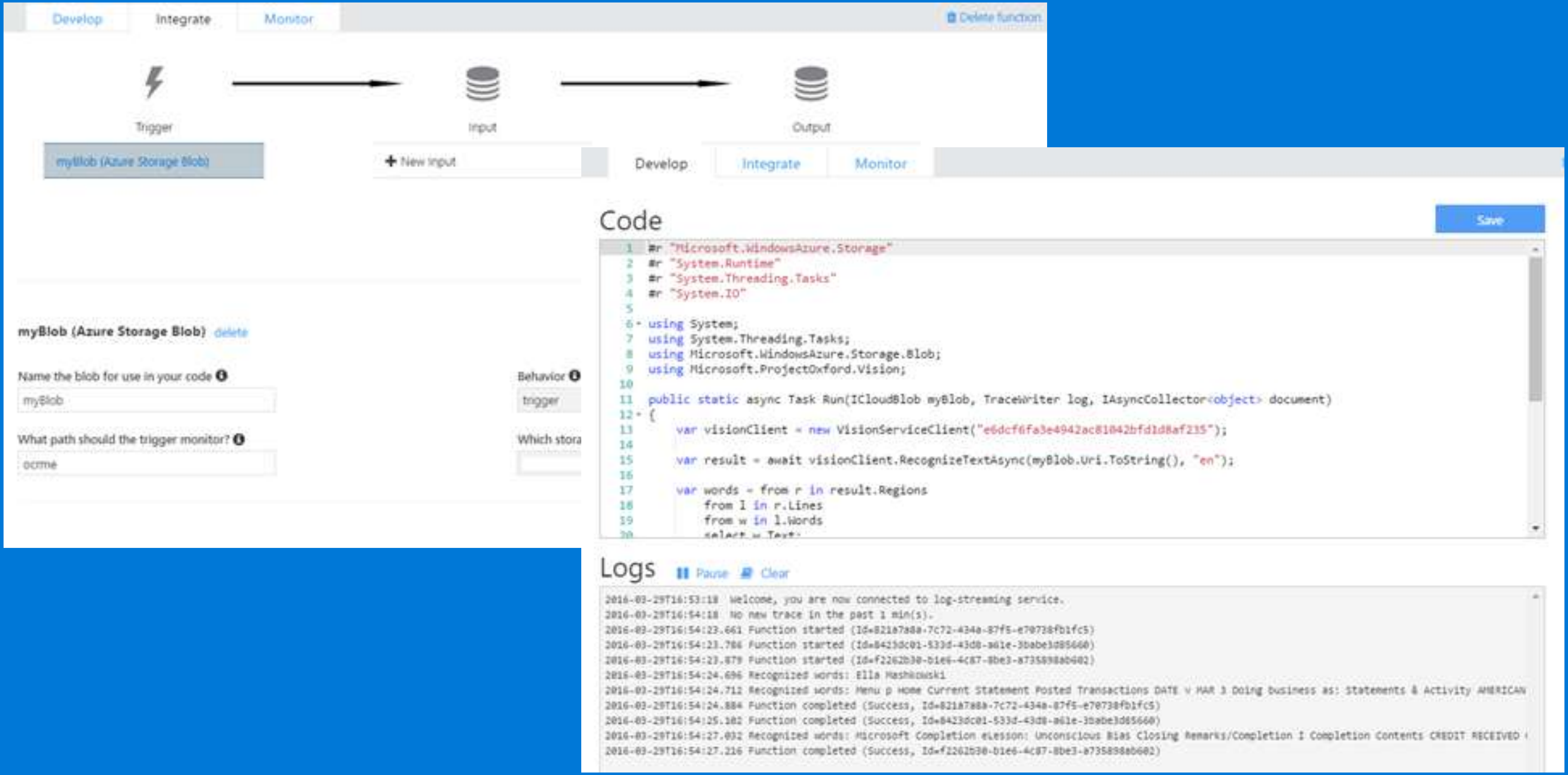
Cognitive Services

microsoft.com/cognitive

Vision	Speech	Language	Knowledge	Search
Computer Vision	Custom Recognition	Bing Spell Check	Academic Knowledge	Bing Web Search
Emotion	Speaker Recognition	Linguistic Analysis	Entity Linking	Bing Image Search
Face	Speech	Language Understanding	Knowledge Exploration	Bing Video Search
Video	Translator	Text Analytics	Recommendations	Bing News Search
		WebLM		Bing Autosuggest

https://www.microsoft.com/cognitive-services/

Azure Function



myBlob (Azure Storage Blob) delete

Name the blob for use in your code: myBlob

What path should the trigger monitor?: ocrme

Behavior: trigger

Which stora

Code

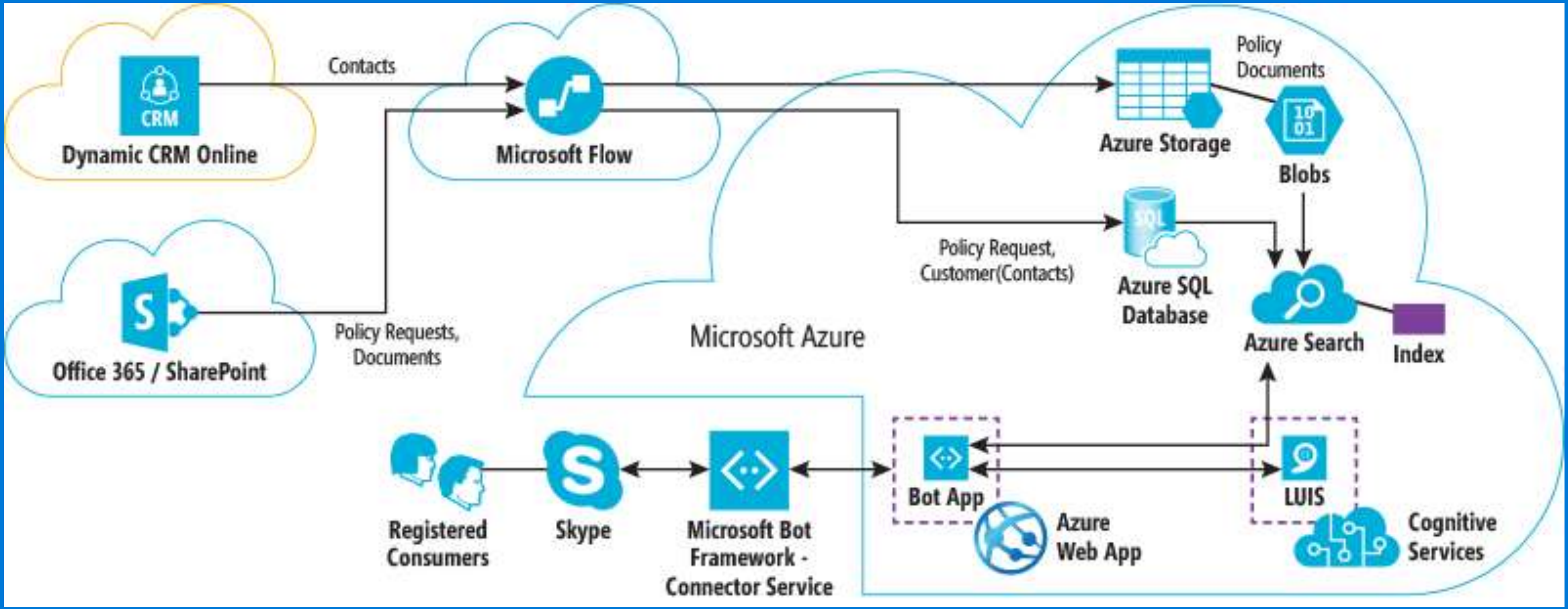
```
#r "Microsoft.WindowsAzure.Storage"
#r "System.Runtime"
#r "System.Threading.Tasks"
#r "System.IO"

using System;
using System.Threading.Tasks;
using Microsoft.WindowsAzure.Storage.Blob;
using Microsoft.ProjectOxford.Vision;

public static async Task Run(ICloudBlob myBlob, TraceWriter log, IAsyncCollector<object> document)
{
    var visionClient = new VisionServiceClient("e6dcf6fa3e4942ac81042bfd1d8af235");

    var result = await visionClient.RecognizeTextAsync(myBlob.Uri.ToString(), "en");

    var words = from r in result.Regions
        from l in r.Lines
        from w in l.Words
        select w.Text;
```

Logs

Pause Clear

```
2016-03-29T16:53:18  Welcome, you are now connected to log-streaming service.
2016-03-29T16:54:18  No new trace in the past 1 min(s).
2016-03-29T16:54:23.661 Function started (Id=821a7a8a-7c72-434a-87f5-e70738fb1fc5)
2016-03-29T16:54:23.786 Function started (Id=8423dc01-533d-43d8-a61e-3babe3d85660)
2016-03-29T16:54:23.879 Function started (Id=f2262b30-b1e6-4c87-8be3-a735898ab602)
2016-03-29T16:54:24.696 Recognized words: Ella Mashkowski
2016-03-29T16:54:24.712 Recognized words: Menu p Home Current Statement Posted Transactions DATE v MAR 3 Doing business as: Statements & Activity AMERICAN
2016-03-29T16:54:24.884 Function completed (Success, Id=821a7a8a-7c72-434a-87f5-e70738fb1fc5)
2016-03-29T16:54:25.102 Function completed (Success, Id=8423dc01-533d-43d8-a61e-3babe3d85660)
2016-03-29T16:54:27.032 Recognized words: Microsoft Completion eLesson: Unconscious Bias Closing Remarks/Completion I Completion Contents CREDIT RECEIVED (
2016-03-29T16:54:27.216 Function completed (Success, Id=f2262b30-b1e6-4c87-8be3-a735898ab602)
```

Azure Search

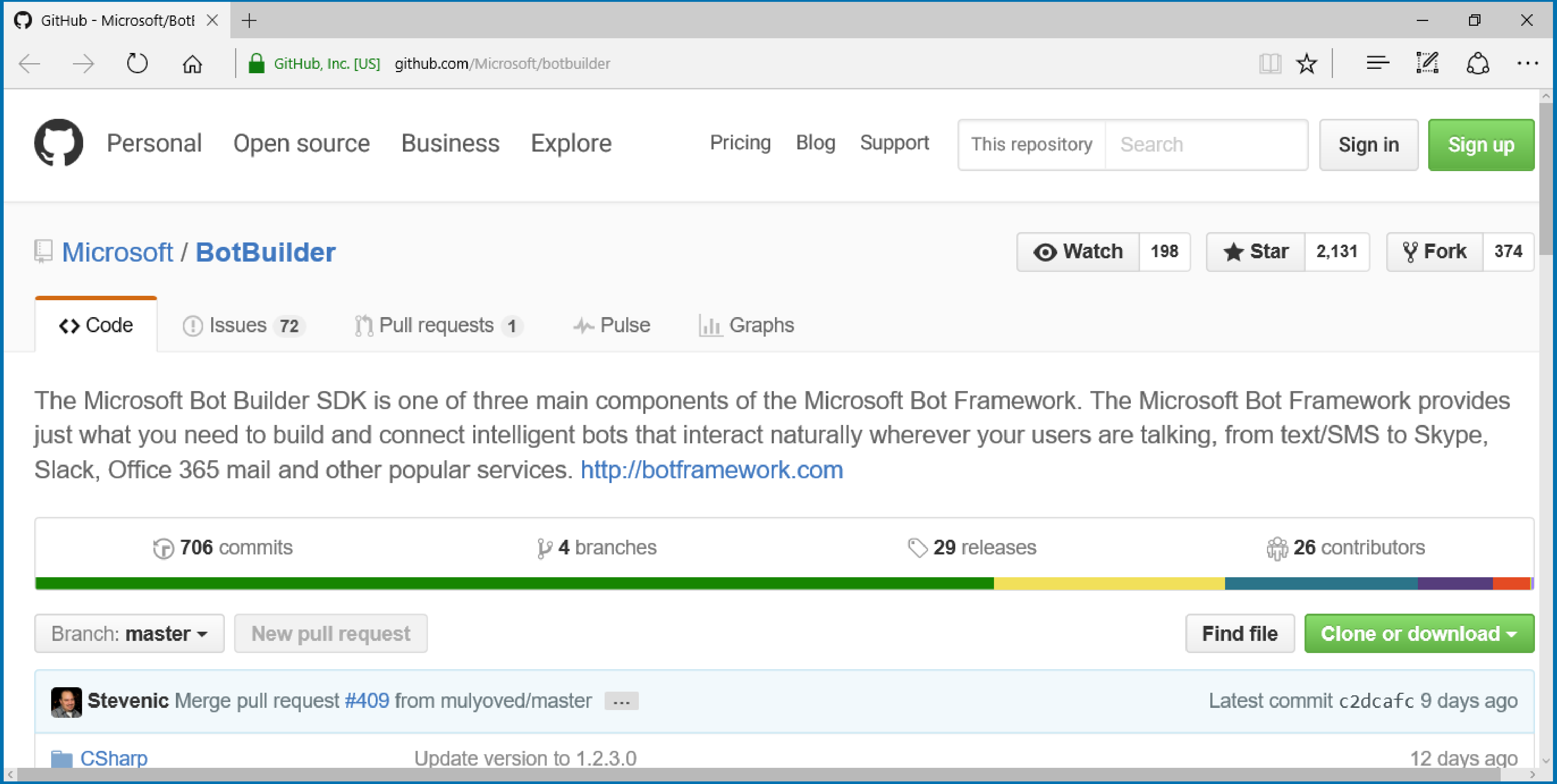


Hackfest!!!

감사합니다

Thank you~!

GitHub!



Microsoft / BotBuilder

The Microsoft Bot Builder SDK is one of three main components of the Microsoft Bot Framework. The Microsoft Bot Framework provides just what you need to build and connect intelligent bots that interact naturally wherever your users are talking, from text/SMS to Skype, Slack, Office 365 mail and other popular services. http://botframework.com

706 commits | 4 branches | 29 releases | 26 contributors

Stevenic Merge pull request #409 from mulyoved/master … Latest commit c2dcafc 9 days ago

CSharp Update version to 1.2.3.0 12 days ago

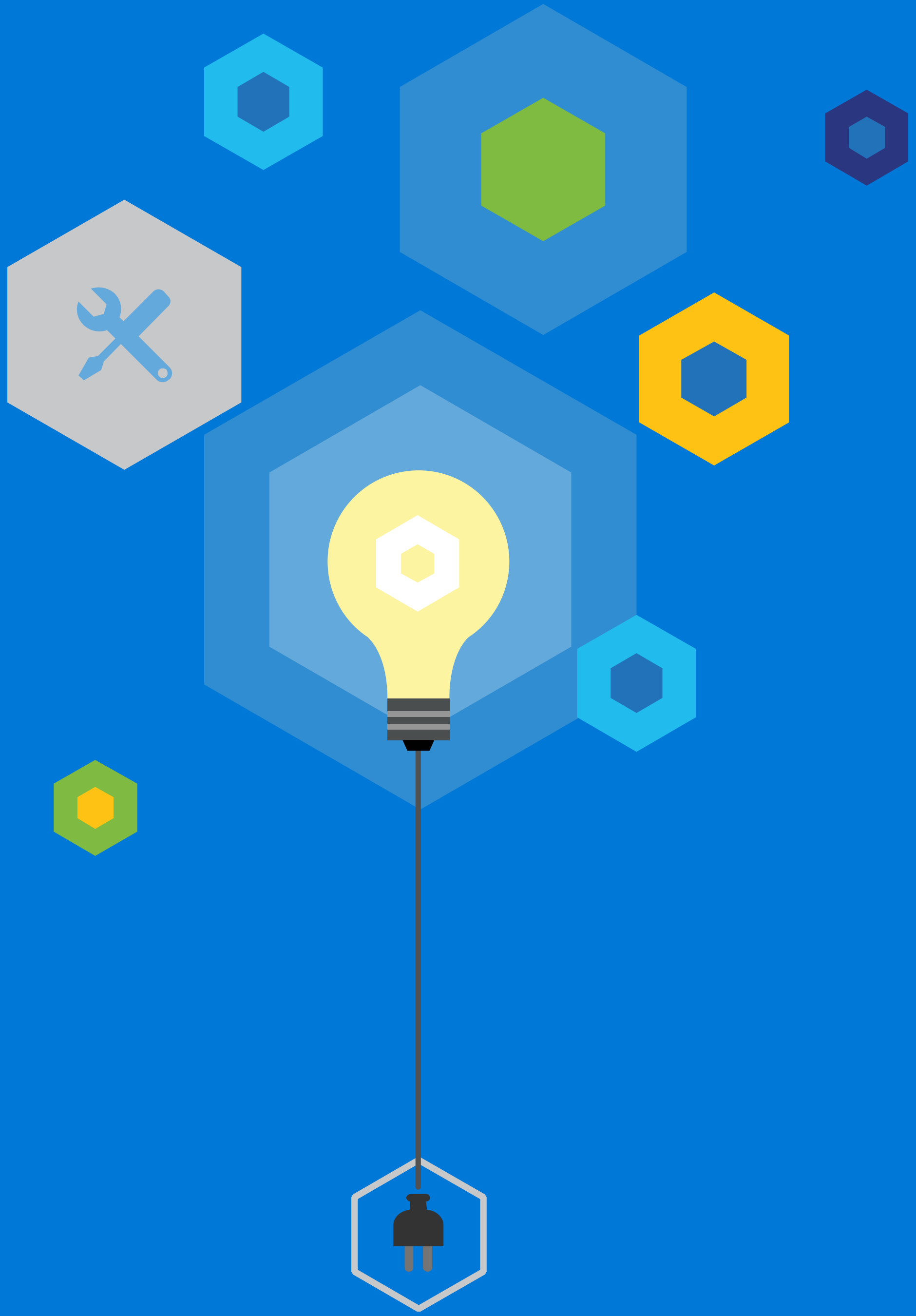
https://github.com/Microsoft/botbuilder

Tips & Tricks

- Use an empty string for your Microsoft App Id and Password in development, but remember to change these to your actual values before you publishing into production.
- Get used to understanding Lambda and “Fluid” concepts to make it easier to work with Dialogs, Forms and especially the concept of the Bot process “Chain”.
- This session demonstrates storing and managing Bot State is a number of ways. Use what makes sense in your environment by uses these concepts purely as examples.
- If the Microsoft Bot Emulator continues to give you authorization issues, try changing the port for your Bot Service in the Web tab of the project and redeploy.

DEMO

Integration Language Understanding Intelligence Services



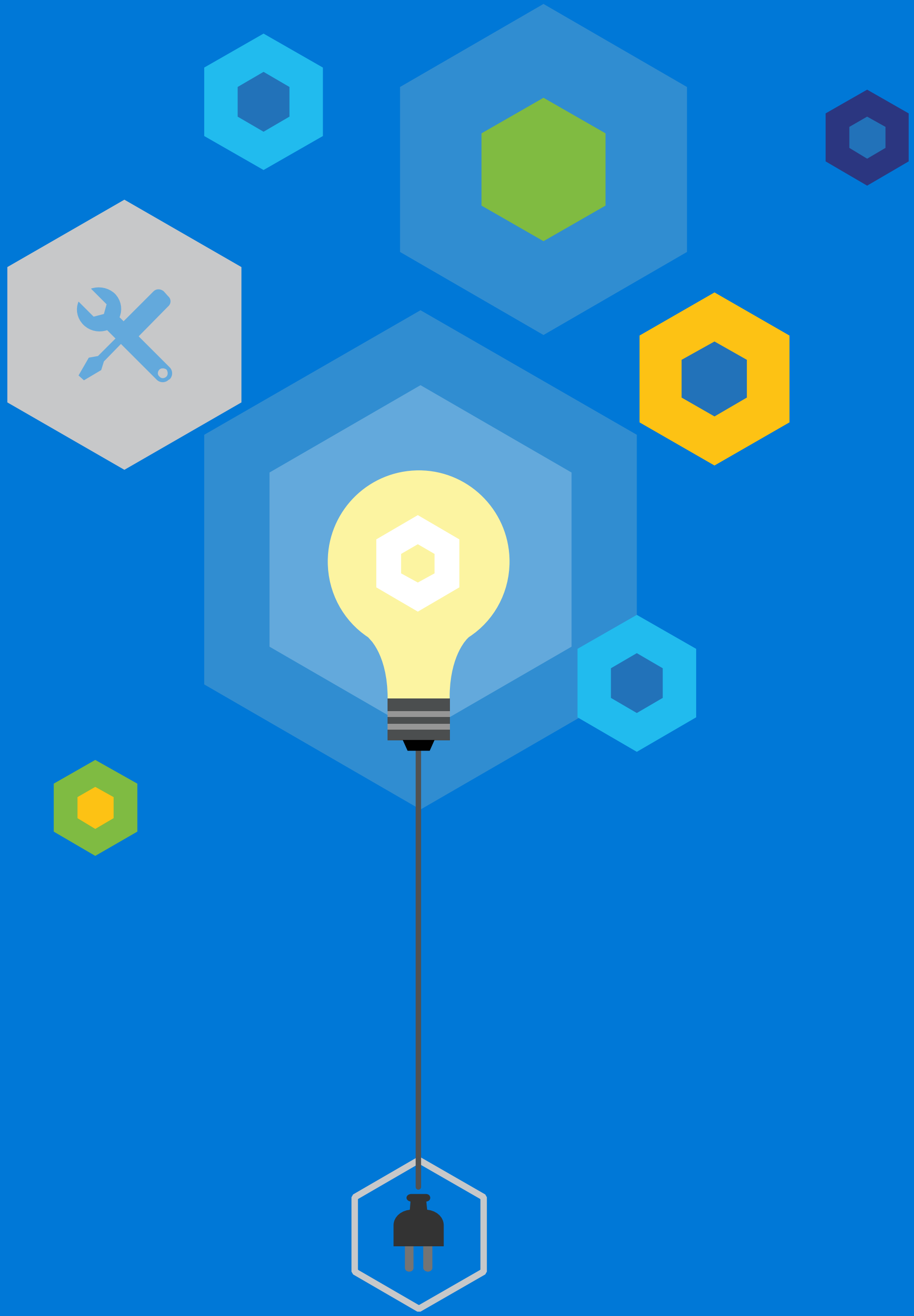
Putting it All Togethner

- Add some more features to demonstrate LUIS integration
- Walkthrough an example of using Attachments, Cards and Actions
- Publishing your Bot
- Using your Bot in a web chat and Skype

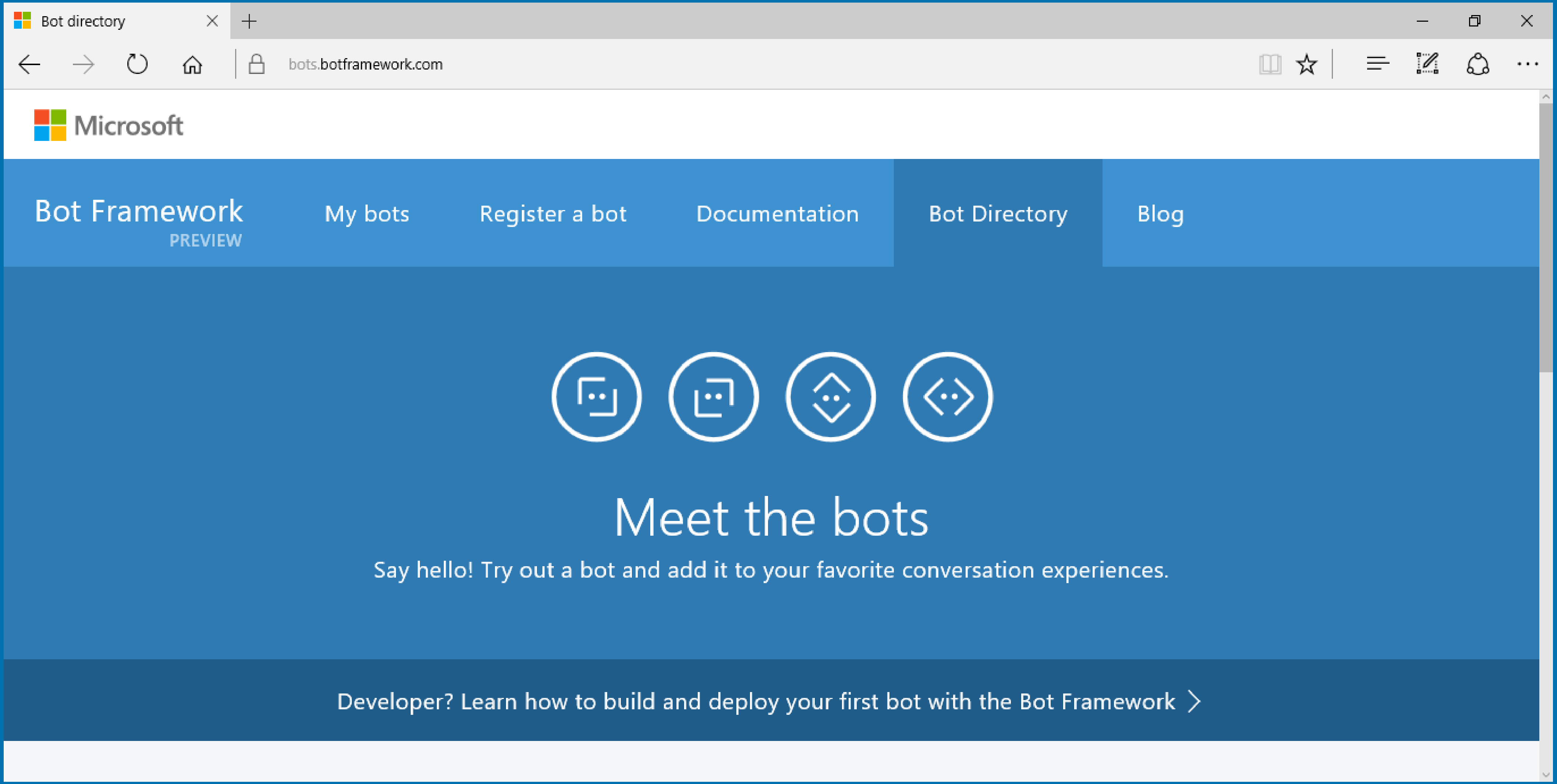
Putting it All Together

DEMO

Putting It All Together



Bot Directory



Meet the bots

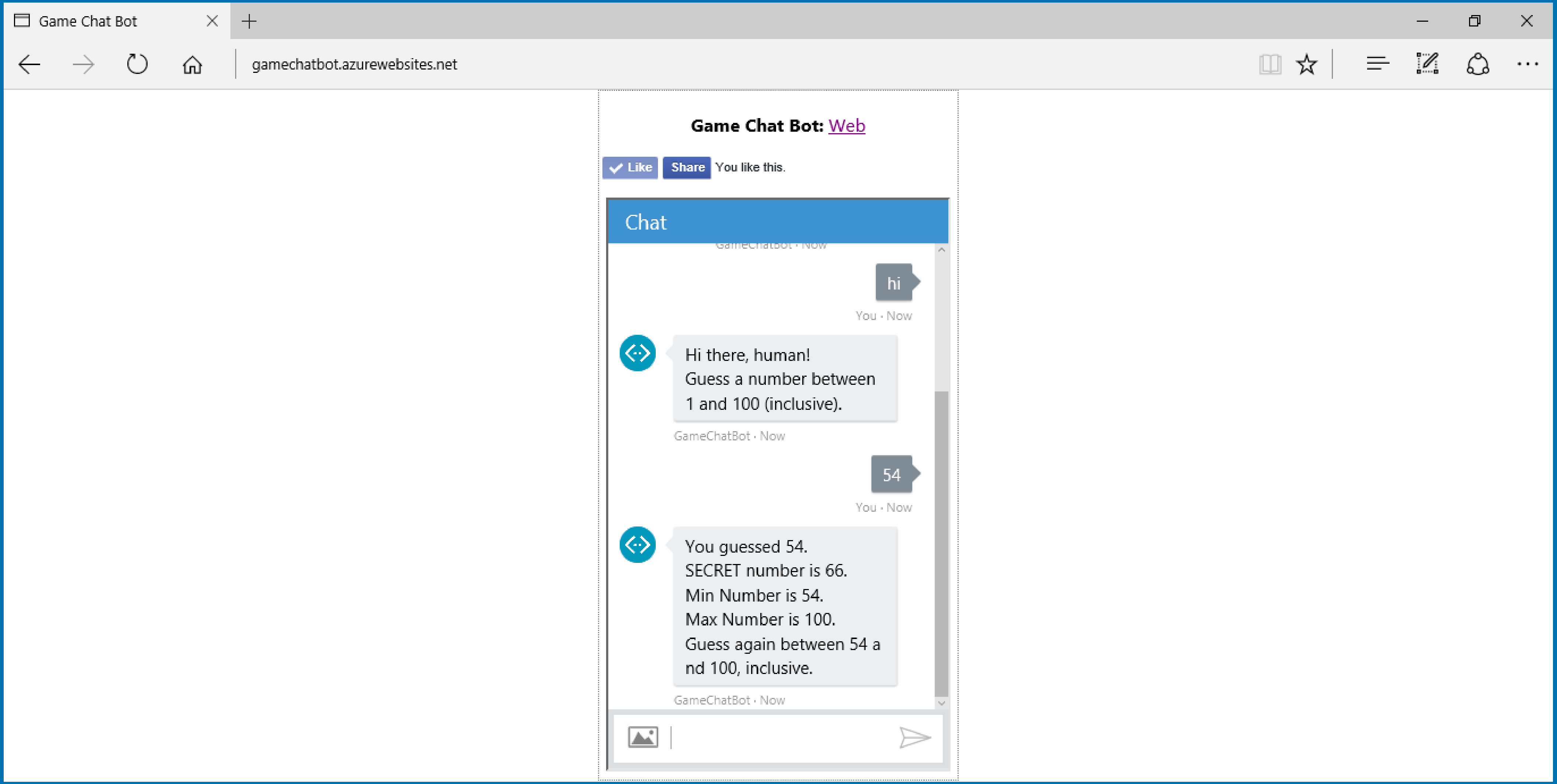
Say hello! Try out a bot and add it to your favorite conversation experiences.

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

https://bots.botframework.com/

Demo

Game Chat Bot



Game Chat Bot: Web

You like this.

Chat

GameChatBot · Now

hi

You · Now

Hi there, human!
Guess a number between 1 and 100 (inclusive).

GameChatBot · Now

54

You · Now

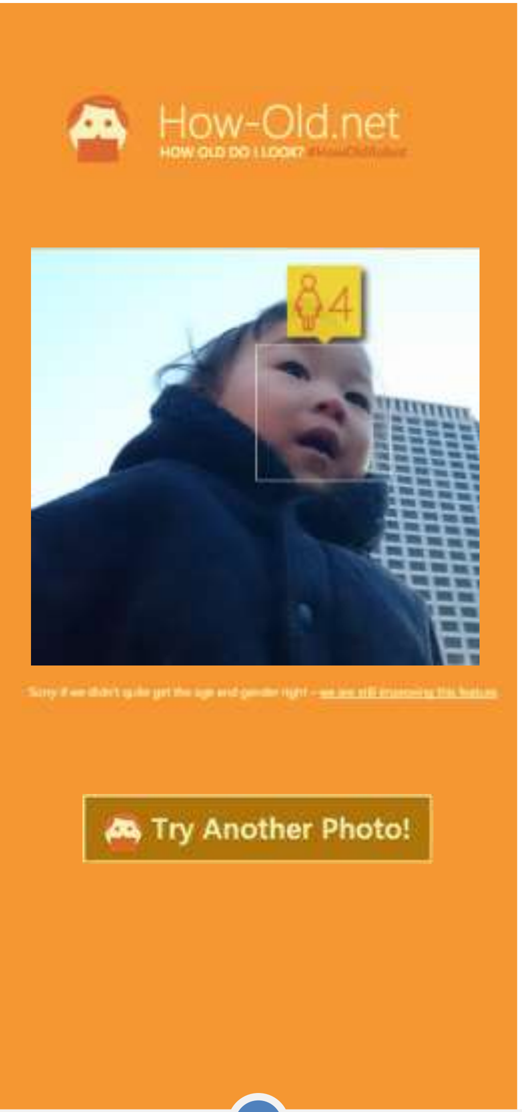
You guessed 54.
SECRET number is 66.
Min Number is 54.
Max Number is 100.
Guess again between 54 a
nd 100, inclusive.

GameChatBot · Now

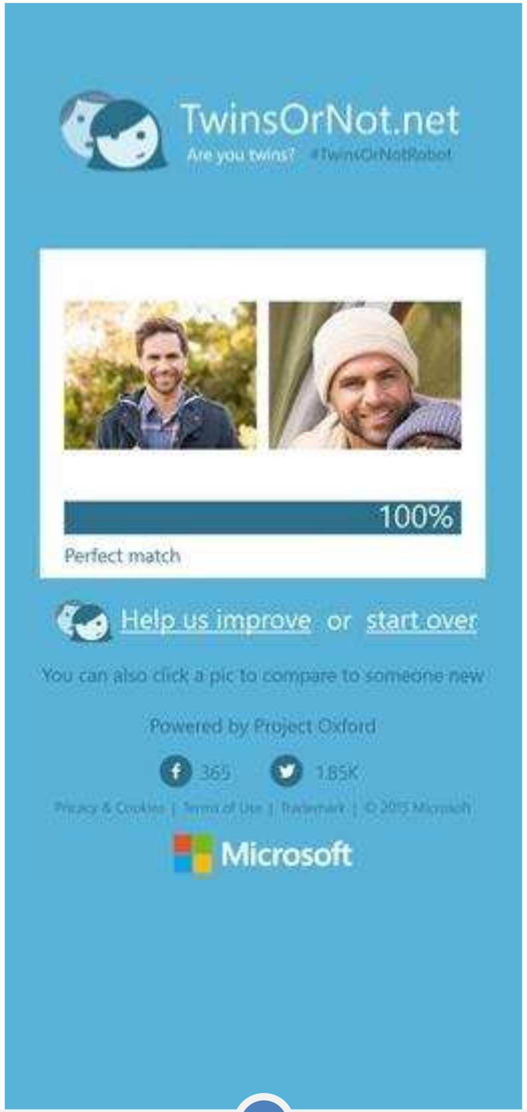
http://gamechatbot.azurewebsites.net/

flowe s by
40 OLD TOWN
BIRKSEN
(020) 76226466
40 OLD TOWN
BIRK EN
(020) 76226466

Variety of Creative Apps



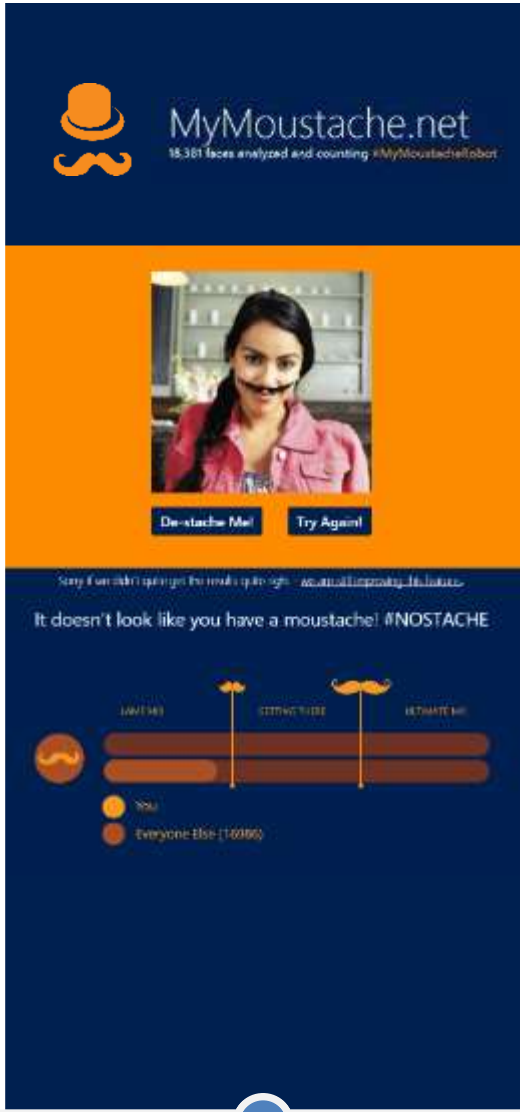
Sorry if we didn't quite get the age and gender right – we are still improving this feature


TwinsOrNot.net
Are you twins? #TwinsOrNotRobot
100%
Perfect match
Help us improve or start over
365
1.85K
Microsoft

You can also click a pic to compare to someone new

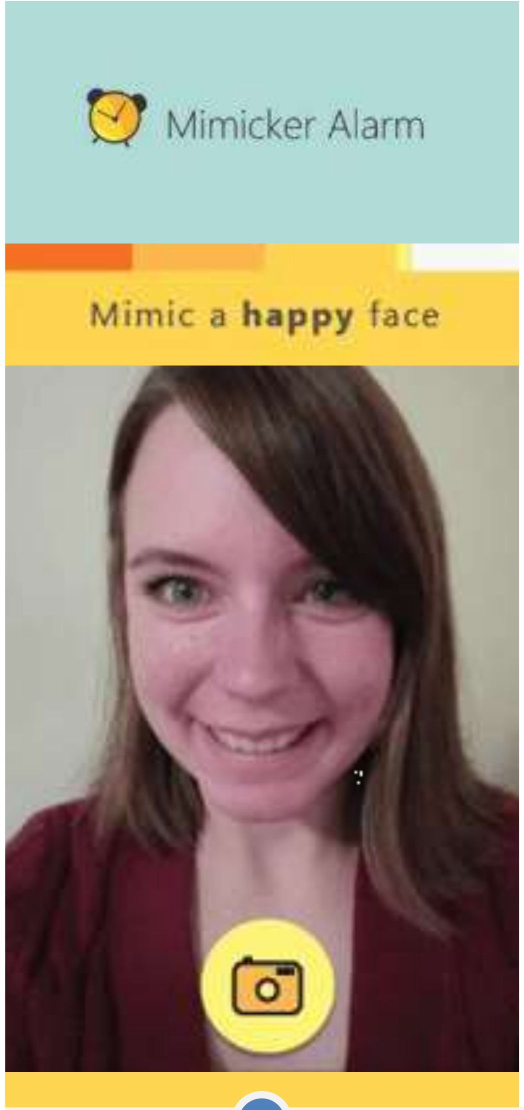
Powered by Project Oxford

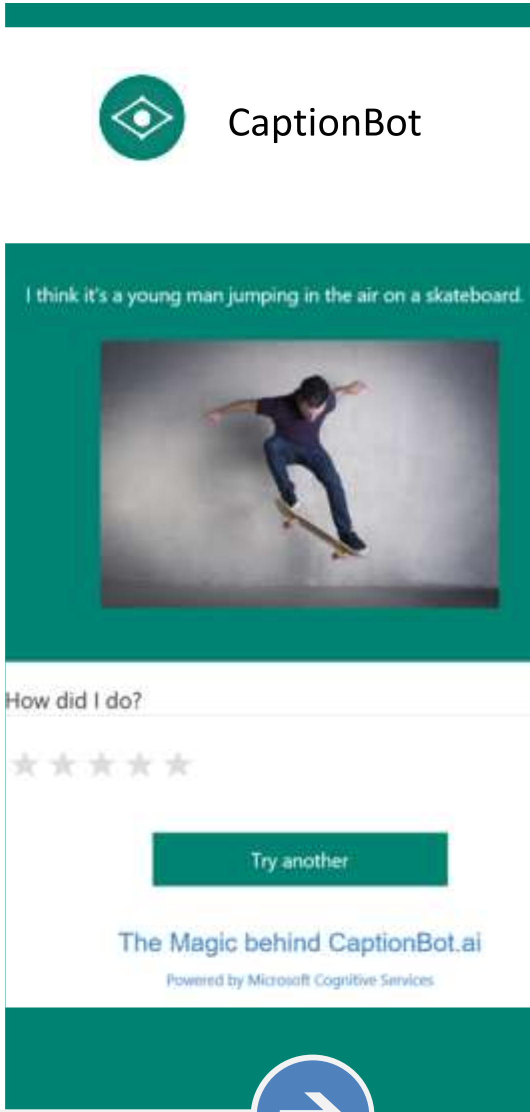
Privacy & Cookies | Terms of Use | Trademark | © 2015 Microsoft



Sorry if we didn't quite get the results quite right – we are still improving this feature.

It doesn't look like you have a moustache! #NOSTACHE





I think it's a young man jumping in the air on a skateboard.

How did I do?

The Magic behind CaptionBot.ai

Powered by Microsoft Cognitive Services