

A.I./Cognitive Technologies@TP

S. Kalyankumar
26 Sep 2018

Agenda

- Introduction
- Technology & Implementation
 - AskTP chatbot
 - Classroom Engagement Sensing
- Challenges
- Resources

Introduction

What is Cognitive Service?

A set of APIs, SDKs and services available to developers to make their applications more intelligent.

Provides applications with new capabilities like vision, voice and language processing. This new capabilities helping organizations/businesses to deliver digital services in new way.

TP uses the IBM Watson Assistant and Microsoft Cognitive Services for Face in the following services:

AskTP chatbot

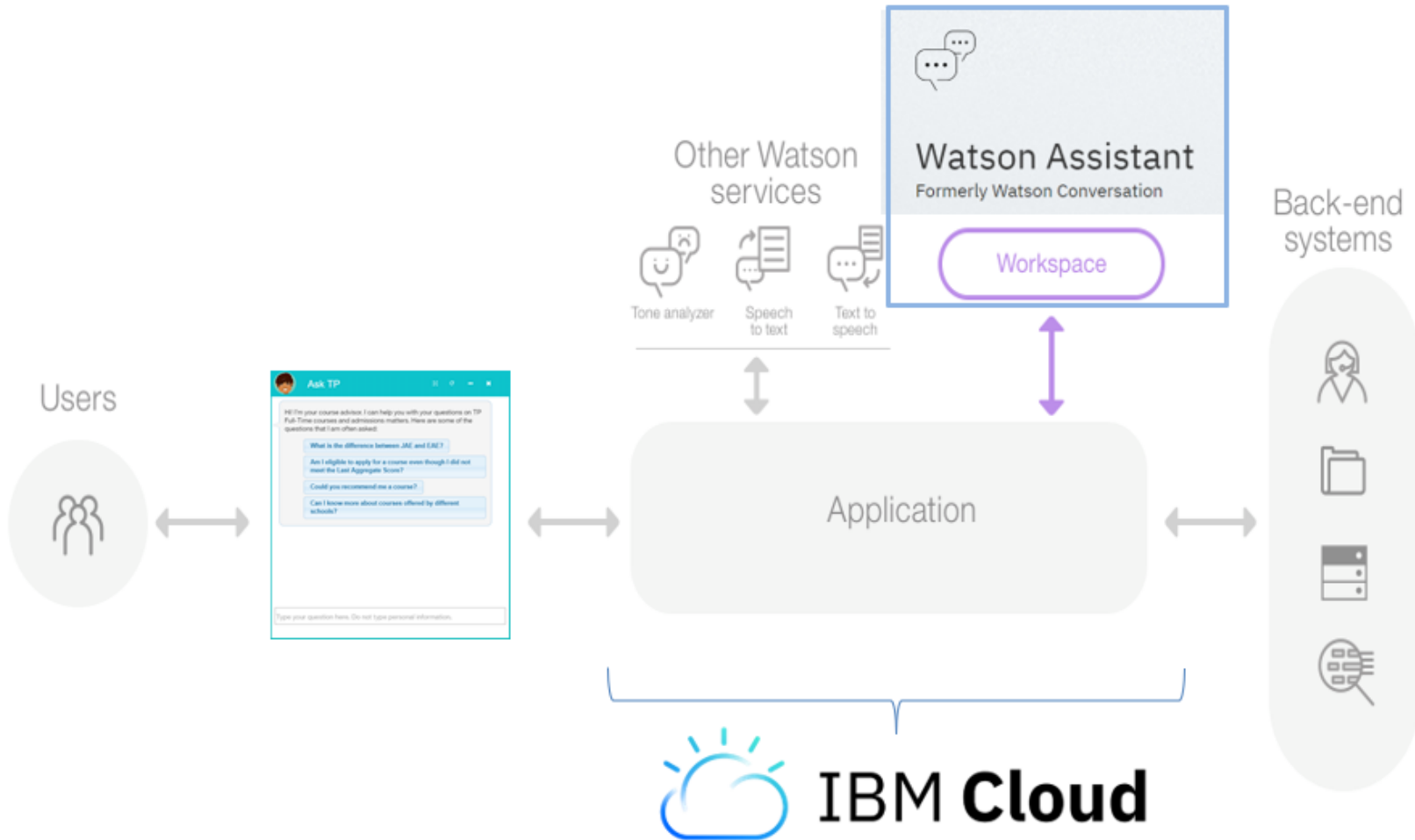
- This chatbot advises on TP courses and other matters about campus life. Uses IBM Watson Assistant to answer questions in natural language.

Classroom Engagement Sensing

- This is a platform for lecturers to know the engagement mood of students in the classroom. Uses Microsoft Cognitive Service for Face to identify the facial expression of the students.

AskTP Chatbot Technology & Implementation

AskTP Chatbot

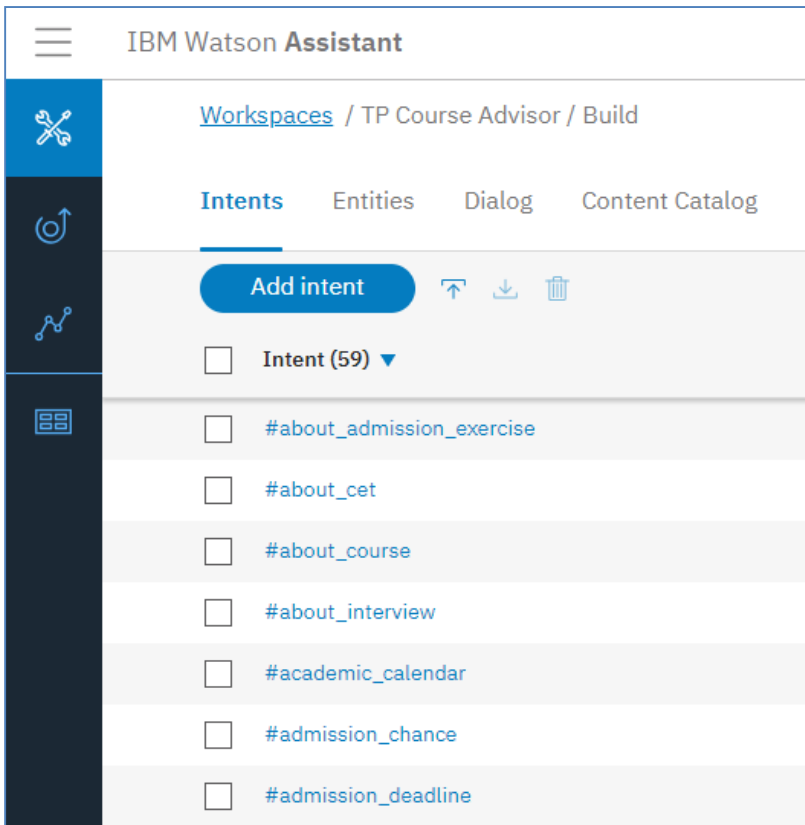


 **IBM Cloud**

<https://console.bluemix.net/>

AskTP Chatbot Platform

IBM Watson Assistant



IBM Watson Assistant

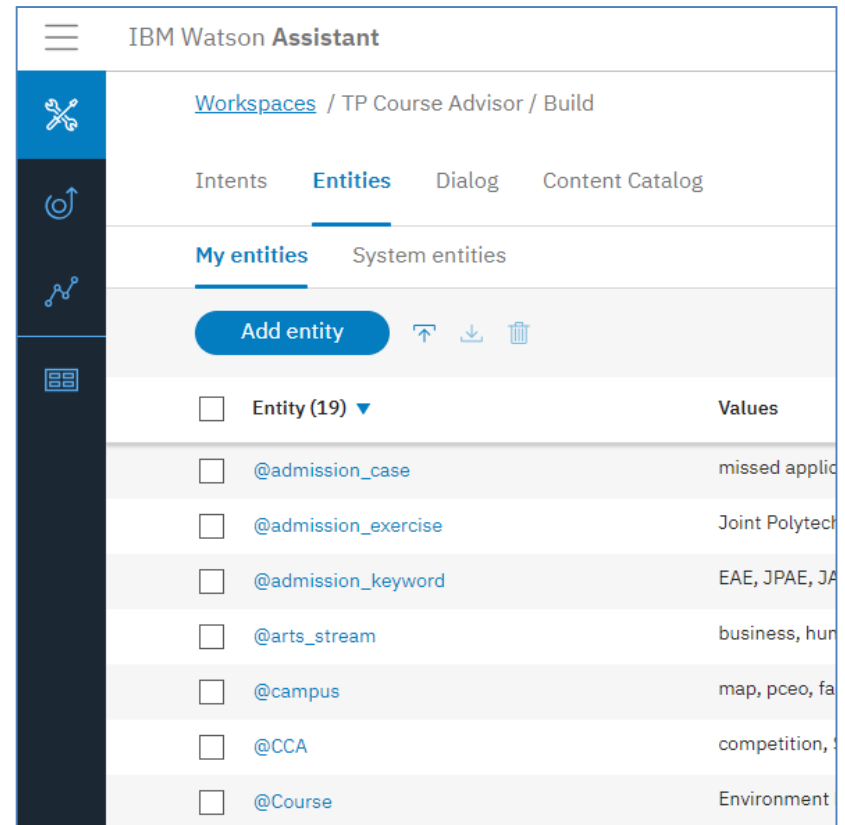
Workspaces / TP Course Advisor / Build

Intents Entities Dialog Content Catalog

Add intent

Intent (59) ▼

- #about_admission_exercise
- #about_cet
- #about_course
- #about_interview
- #academic_calendar
- #admission_chance
- #admission_deadline



IBM Watson Assistant

Workspaces / TP Course Advisor / Build

Intents Entities Dialog Content Catalog

My entities System entities

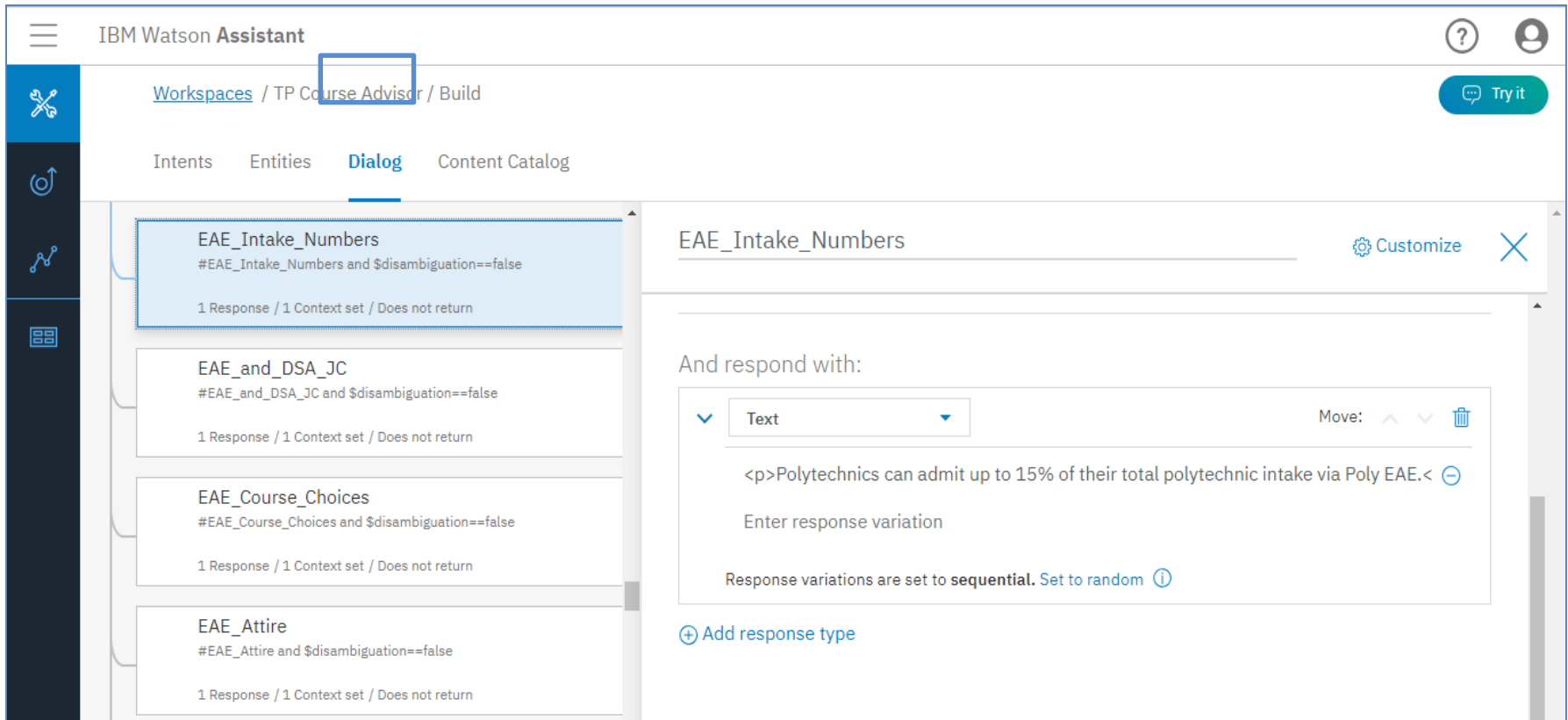
Add entity

Entity (19) ▼

Entity	Values
@admission_case	missed applic
@admission_exercise	Joint Polytech
@admission_keyword	EAE, JPAE, JA
@arts_stream	business, hun
@campus	map, pceo, fa
@CCA	competition, s
@Course	Environment

AskTP Chatbot Platform

IBM Watson Assistant



The screenshot displays the IBM Watson Assistant interface for configuring a chatbot. The top navigation bar shows the workspace path: **Workspaces** / TP Course Advisor / Build. The main navigation tabs include **Intents**, **Entities**, **Dialog** (selected), and **Content Catalog**. A sidebar on the left contains icons for workspace management, navigation, and settings.

The **Dialog** tab is active, showing a list of dialog nodes on the left. The selected node is **EAE_Intake_Numbers**, with the following details:

- Entity: #EAE_Intake_Numbers and \$disambiguation==false
- Configuration: 1 Response / 1 Context set / Does not return

The right-hand pane shows the configuration for the selected dialog node. The title is **EAE_Intake_Numbers**, with a **Customize** button and a close icon. Below the title, the instruction **And respond with:** is followed by a configuration box:

- Response type: **Text** (selected from a dropdown menu)
- Move: ^ v (navigation controls)
- Response text: `<p>Polytechnics can admit up to 15% of their total polytechnic intake via Poly EAE.</p>`
- Label: **Enter response variation**
- Configuration: **Response variations are set to sequential. Set to random** (with an information icon)

At the bottom of the configuration pane, there is a button labeled **+ Add response type**.

Chatbot Key Concepts

Key Concepts:

- **Intent** is a representation of **Category** (e.g. About_Course).
- **Entity** refers to **Topic** (e.g. Course).
- **Value** is a **Content** (e.g. Computer Engineering).
- **Synonym** is an **Alias** for Entity Value (e.g. T13, CEN, IoT).
- **Context** is the **Memory** to remember past matter conversed.
- **Dialog** is the **Conversation** defined by conditions above.

Symbols for the Key Elements


Intent	#
Entity	@
Value	:
Context	\$

Chatbot Key Concepts

Examples:

Intent (Category)	Entity (Topic)	Value (Content)	Synonyms (Alias)
About_Course	Course	Computer Engineering	T13, CEN, Embedded, Web developer, IoT, computer engine, computer eng
About_Course	Course	Pharmaceutical Science	T25, PHS, pharmaceutical science, pharmacy, pharmacist, drugs
About_Resource	Resource	Magazine	Periodical, journal, publication, mag, chronicle

Chatbot Setup – Dialog Structure

- 
- Greeting
 - To kick start the conversation. (eg. Hi, I am your course advisor! Ask me on...)
 - Context Handling (*optional*)
 - To capture context in variable to relate to past conversation.
 - Exclusion Handling
 - To handle sensitive questions. (eg. vulgar or offensive words)
 - Disambiguation Handling (*optional*)
 - To handle ambiguous questions. (eg. what course for finance?)
 - Scope Handling
 - To handle in-scope questions.
 - Off-topic Handling
 - To handle questions outside of intended scope.

Chatbot Logs

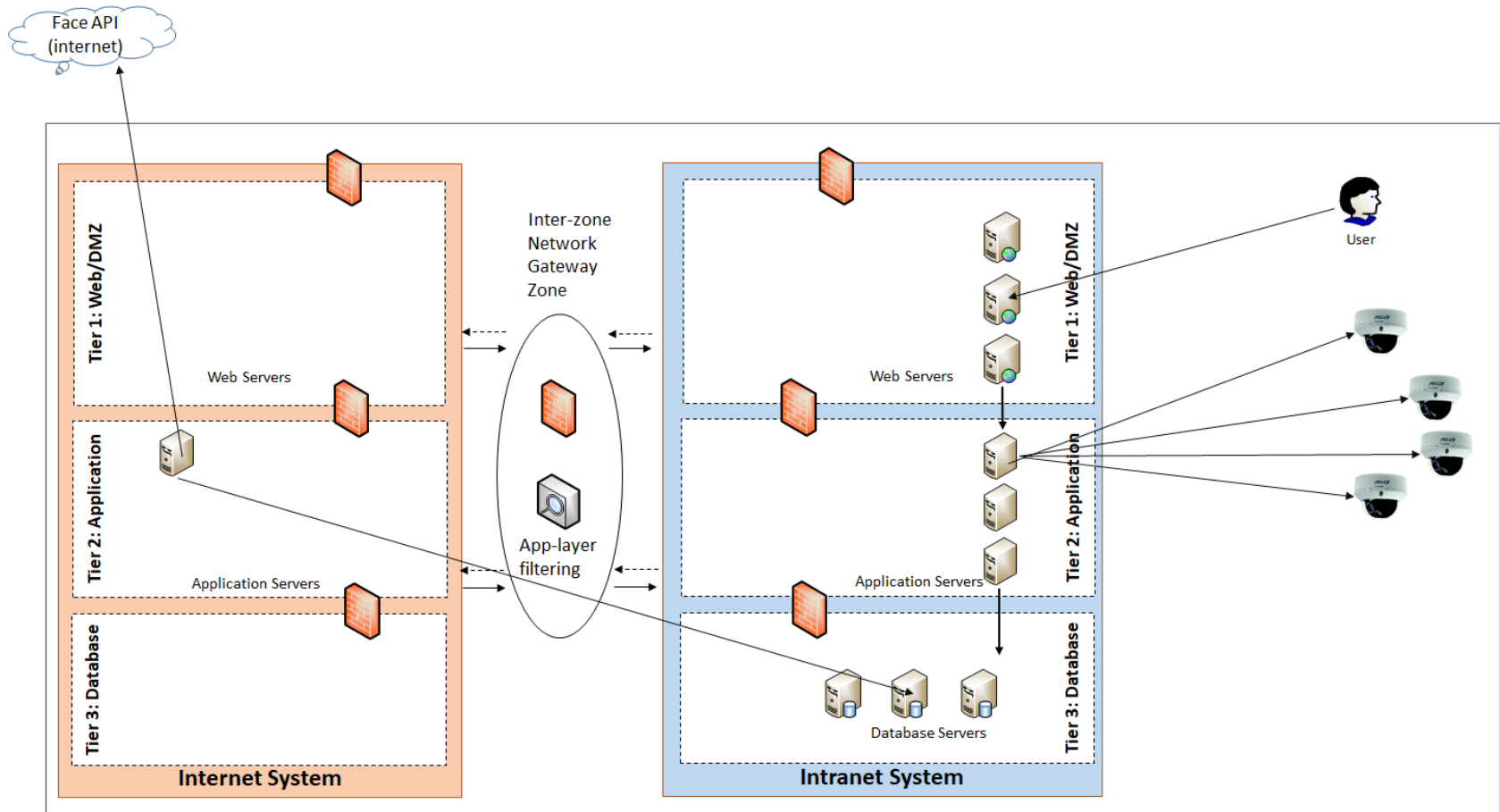
Information that can be derived from logs:

- Number of conversations per day.
- Estimated number of users per day.
- Conversation details (e.g. time of conversation, question asked, answers provided).
- Feedback from users.

 [Useful](#) |  [Not Useful](#) |  [Comment](#)

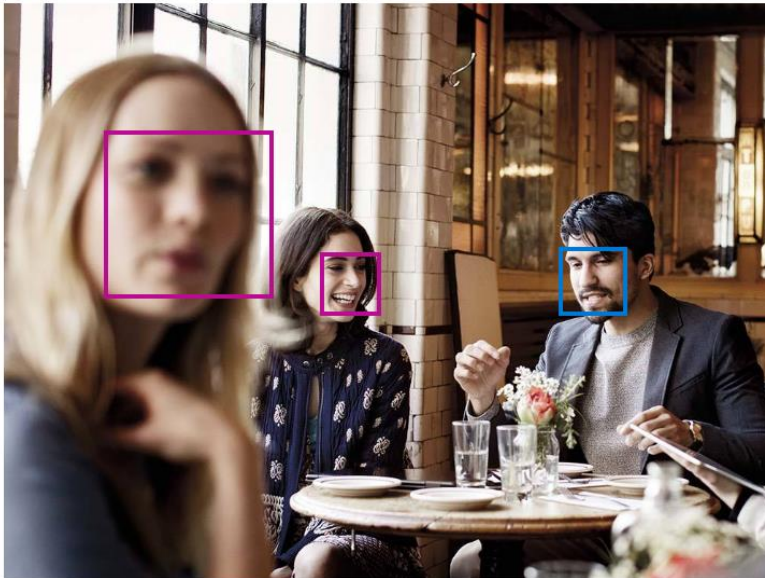
Classroom Engagement Sensing Technology & Implementation

Classroom Engagement Sensing



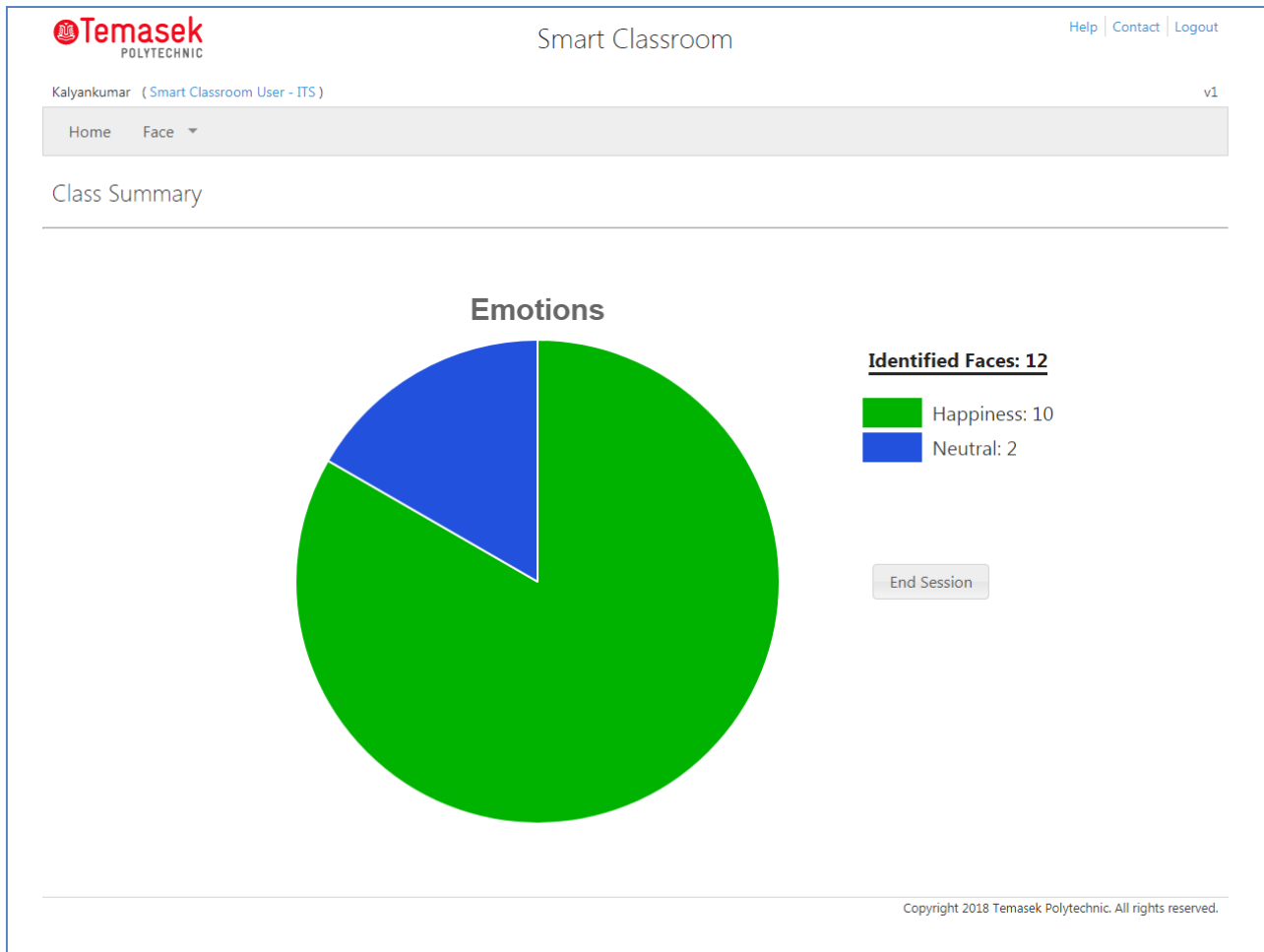
Classroom Engagement Sensing

- High-resolution IP Camera (5MP)
- Microsoft Azure Subscription
- Face service client library (C#)



```
"beard": 0.4,  
"sideburns": 0.4  
},  
"glasses": "NoGlasses",  
"makeup": {  
  "eyeMakeup": false,  
  "lipMakeup": false  
},  
"emotion": {  
  "anger": 0.0,  
  "contempt": 0.001,  
  "disgust": 0.0,  
  "fear": 0.0,  
  "happiness": 0.988,  
  "neutral": 0.01,  
  "sadness": 0.0,  
  "surprise": 0.0  
},  
"occlusion": {  
  "foreheadOccluded": false,  
  "eyeOccluded": false,  
  "mouthOccluded": false  
},  
"accessories": [],  
"blur": {  
  "blurLevel": "low",  
  "value": 0.04  
},  
}
```


Classroom Engagement Sensing



Identifiable emotions:

- Anger
- Contempt
- Disgust
- Fear
- Happiness
- Neutral
- Sadness
- Surprise

Challenges

Challenges

AskTP chatbot

- Learning of chatbot concept.
- Continuous training of chatbot.

Classroom Engagement Sensing

- Finding suitable IP cameras.
- Means to interact with IP cameras.
- Compliance with AIAS requirement.

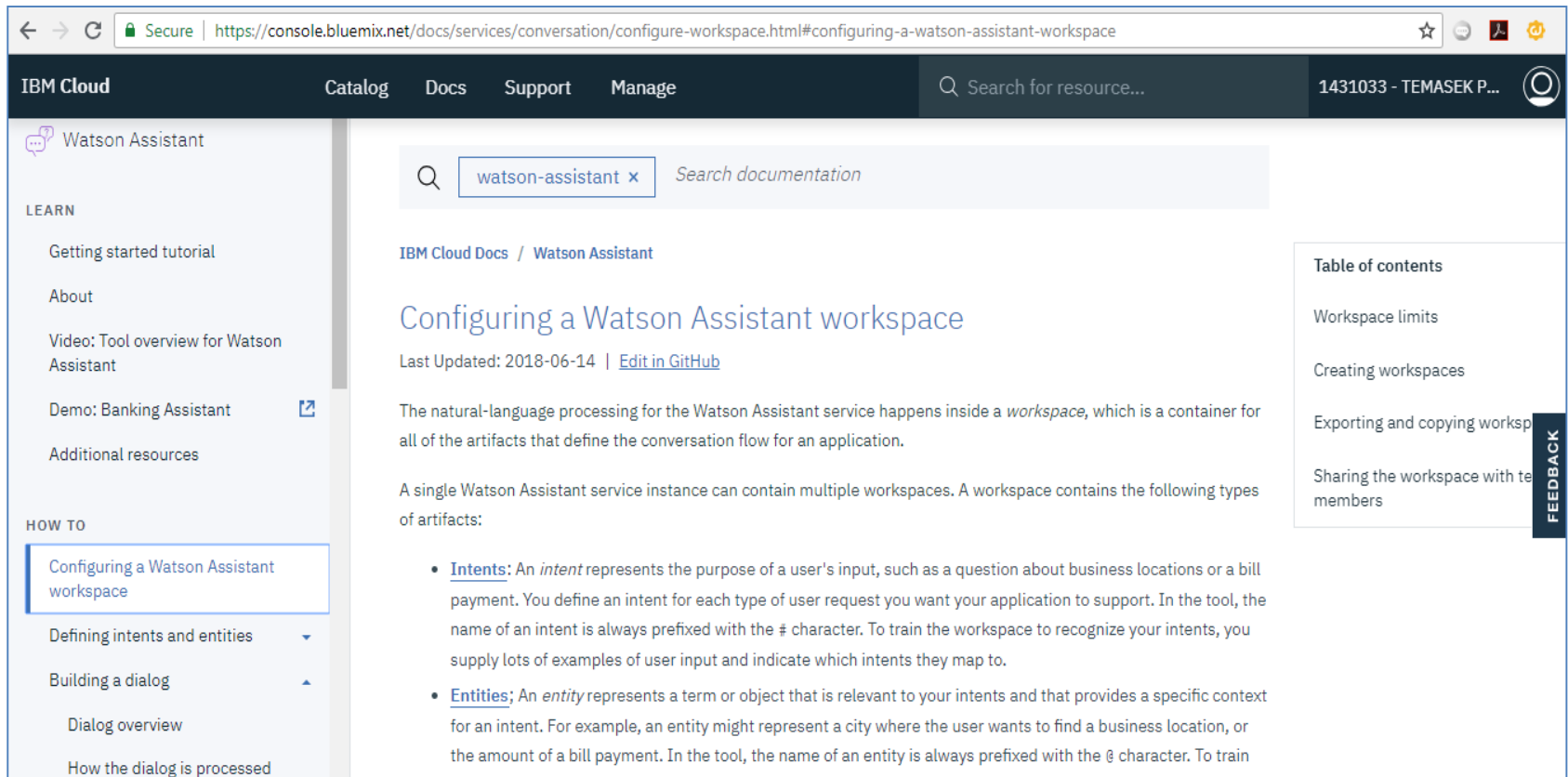
General

- Faster change of cognitive services landscape.

Resource

Resources

IBM Watson Assistant Online Documentation



The screenshot shows a web browser window displaying the IBM Cloud documentation page for configuring a Watson Assistant workspace. The browser address bar shows the URL: <https://console.bluemix.net/docs/services/conversation/configure-workspace.html#configuring-a-watson-assistant-workspace>. The page header includes the IBM Cloud logo, navigation links (Catalog, Docs, Support, Manage), a search bar, and the user ID 1431033 - TEMASEK P... The main content area features a search bar with the query "watson-assistant" and the title "Configuring a Watson Assistant workspace". The page is last updated on 2018-06-14. The content explains that the natural-language processing for the Watson Assistant service happens inside a workspace, which is a container for all artifacts. A single Watson Assistant service instance can contain multiple workspaces. The page lists two types of artifacts: **Intents** and **Entities**. The left sidebar contains a "LEARN" section with links to "Getting started tutorial", "About", "Video: Tool overview for Watson Assistant", "Demo: Banking Assistant", and "Additional resources". The "HOW TO" section is expanded to show "Configuring a Watson Assistant workspace", "Defining intents and entities", "Building a dialog", "Dialog overview", and "How the dialog is processed". The right sidebar contains a "Table of contents" section with links to "Workspace limits", "Creating workspaces", "Exporting and copying workspaces", and "Sharing the workspace with team members". A vertical "FEEDBACK" button is located on the right edge of the page.

IBM Cloud Docs / Watson Assistant

Configuring a Watson Assistant workspace

Last Updated: 2018-06-14 | [Edit in GitHub](#)

The natural-language processing for the Watson Assistant service happens inside a *workspace*, which is a container for all of the artifacts that define the conversation flow for an application.

A single Watson Assistant service instance can contain multiple workspaces. A workspace contains the following types of artifacts:

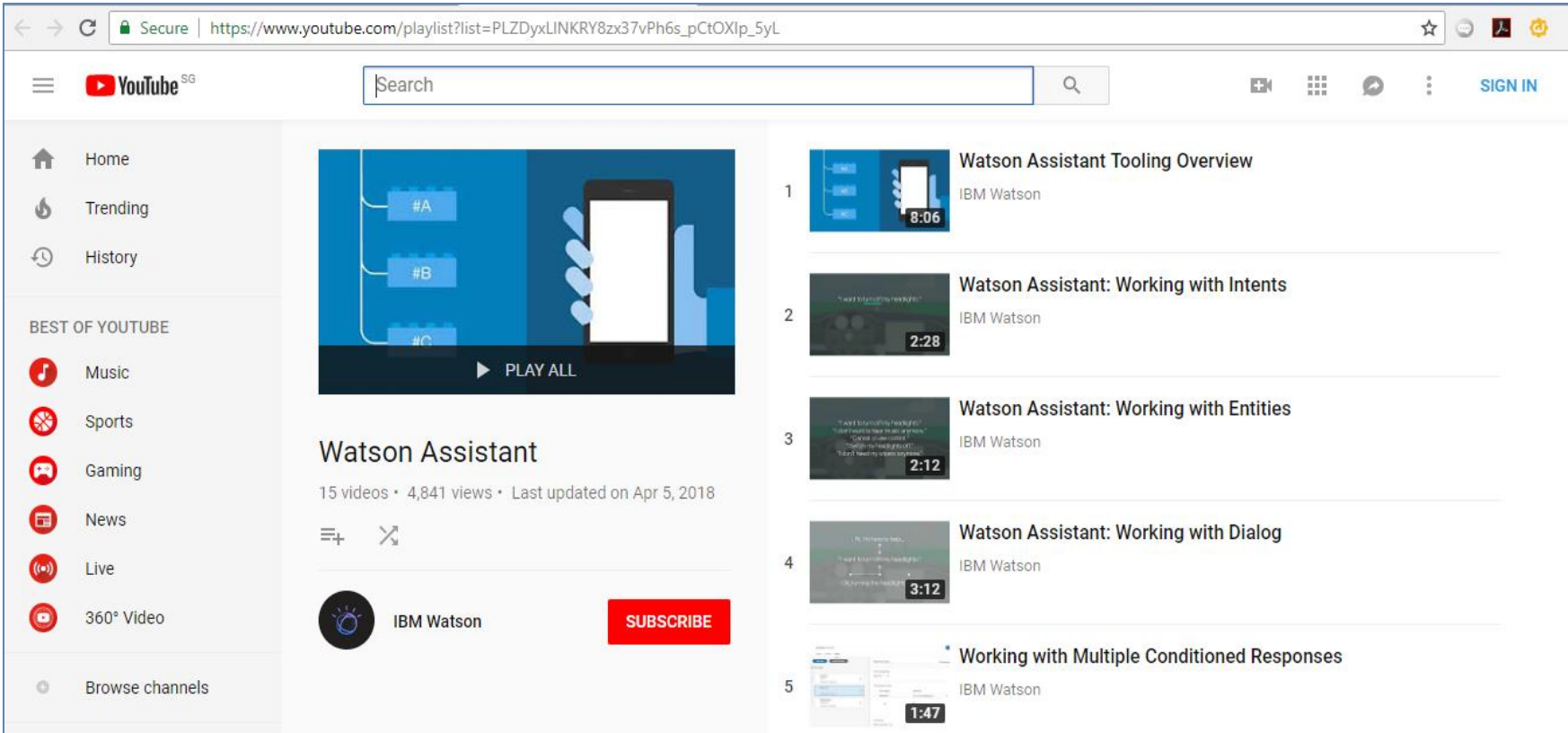
- **Intents**: An *intent* represents the purpose of a user's input, such as a question about business locations or a bill payment. You define an intent for each type of user request you want your application to support. In the tool, the name of an intent is always prefixed with the # character. To train the workspace to recognize your intents, you supply lots of examples of user input and indicate which intents they map to.
- **Entities**: An *entity* represents a term or object that is relevant to your intents and that provides a specific context for an intent. For example, an entity might represent a city where the user wants to find a business location, or the amount of a bill payment. In the tool, the name of an entity is always prefixed with the @ character. To train

Table of contents

- Workspace limits
- Creating workspaces
- Exporting and copying workspaces
- Sharing the workspace with team members

FEEDBACK

IBM Watson Assistant Videos

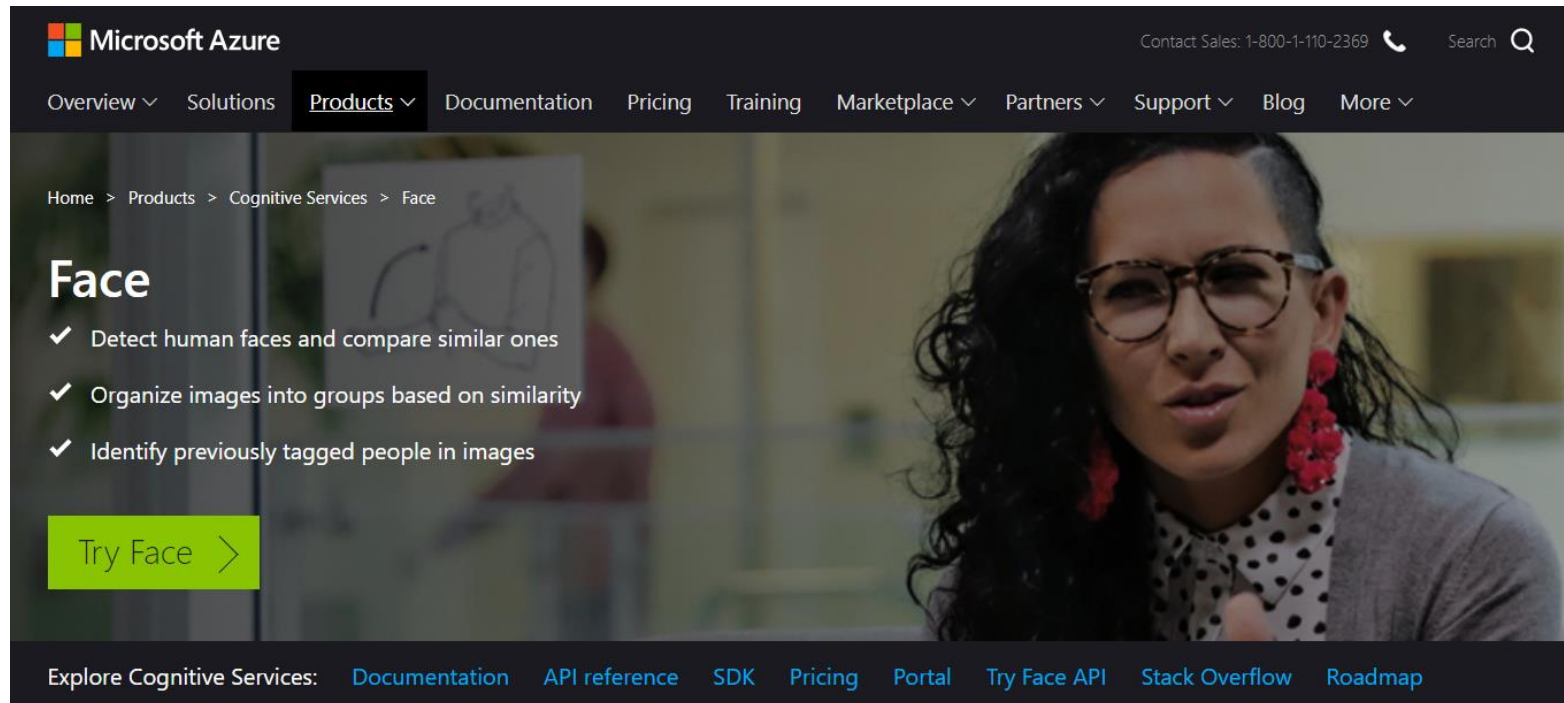


The screenshot shows a YouTube browser window displaying a playlist titled "Watson Assistant" by IBM Watson. The browser address bar shows the URL: https://www.youtube.com/playlist?list=PLZDyxLINKRY8zx37vPh6s_pCtOXIp_5yL. The YouTube interface includes a search bar, navigation icons, and a "SIGN IN" button. The left sidebar shows navigation options like Home, Trending, History, and "BEST OF YOUTUBE" categories such as Music, Sports, Gaming, News, Live, and 360° Video. The main content area features a video player with a blue background and a smartphone icon, with a "PLAY ALL" button below it. The video title is "Watson Assistant", with 15 videos, 4,841 views, and last updated on Apr 5, 2018. Below the title is the IBM Watson channel logo and a red "SUBSCRIBE" button. The right side of the page lists five videos in the playlist:

- 1 **Watson Assistant Tooling Overview** (8:06)
- 2 **Watson Assistant: Working with Intents** (2:28)
- 3 **Watson Assistant: Working with Entities** (2:12)
- 4 **Watson Assistant: Working with Dialog** (3:12)
- 5 **Working with Multiple Conditioned Responses** (1:47)

Face API

- <https://azure.microsoft.com/en-us/services/cognitive-services/face>



The screenshot shows the Microsoft Azure website's product page for the Face API. The page features a dark navigation bar with the Microsoft Azure logo and various menu items like Overview, Solutions, Products, Documentation, Pricing, Training, Marketplace, Partners, Support, Blog, and More. Below the navigation bar, there is a breadcrumb trail: Home > Products > Cognitive Services > Face. The main content area is titled "Face" and lists three key capabilities: detecting human faces and comparing similar ones, organizing images into groups based on similarity, and identifying previously tagged people in images. A prominent green button labeled "Try Face" is positioned below the list. At the bottom of the page, there is a footer with the text "Explore Cognitive Services:" followed by links to Documentation, API reference, SDK, Pricing, Portal, Try Face API, Stack Overflow, and Roadmap.

Any
Questions?