Building Next-Generation Cognitive Applications

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IBM

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IBM

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Developer

Robot Enthusiast

Runner

@jeffffrey

By **2030** over 2 billion jobs will not exist anymore, which is about **50%** of all jobs on the planet.

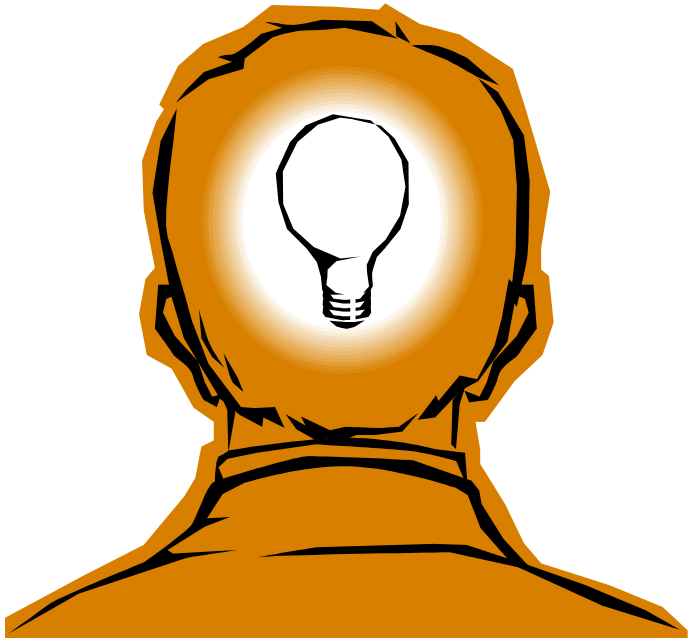
Innovation is the new currency

“Two guys in a Starbucks can have access to the same computing power as a Fortune 500 company.”

Jim Deters
Founder, Galvanize

The next billion dollar idea starts with a single developer.

That developer starts with a single line of code



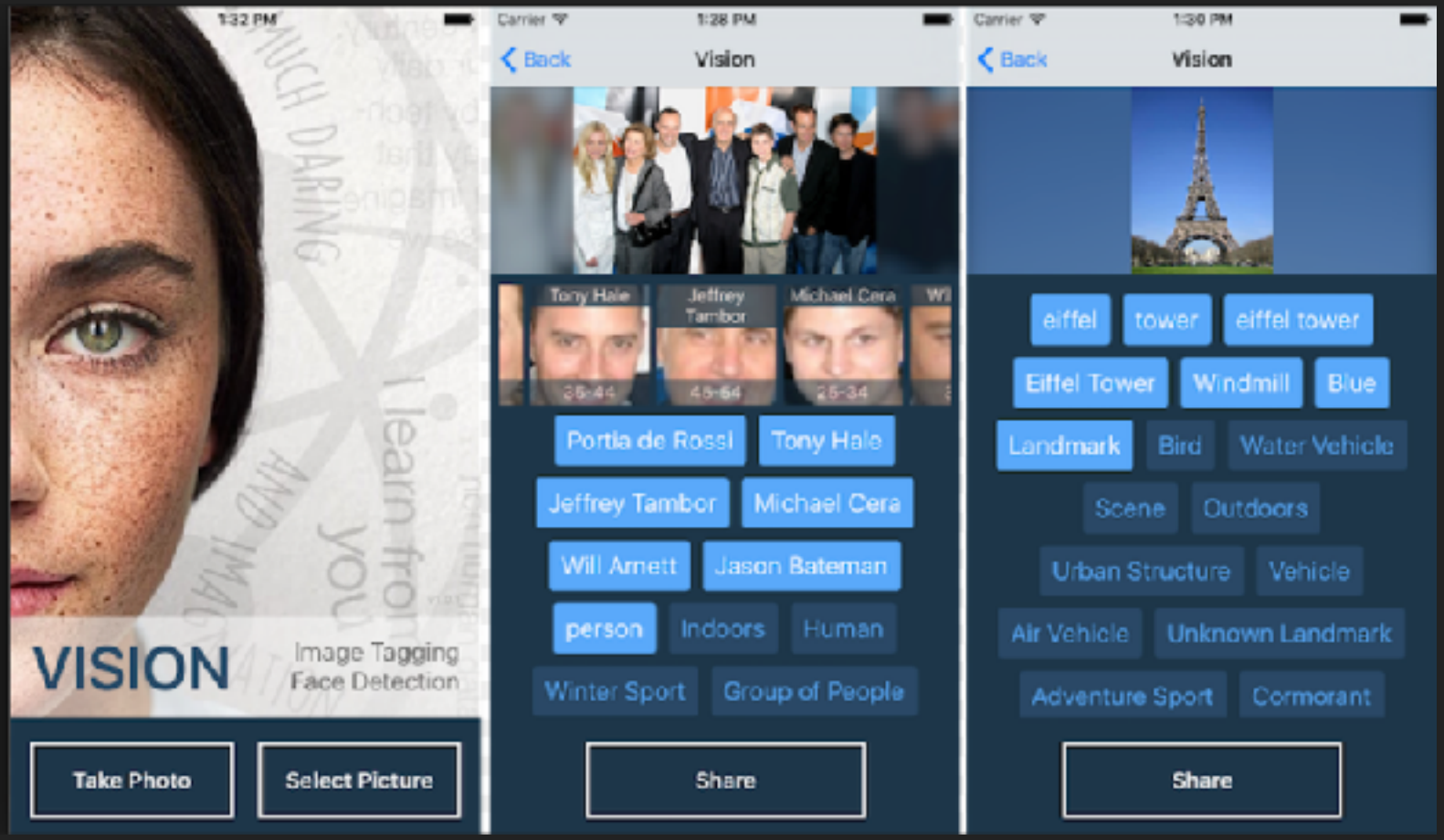
KEY AREA TO EXPLORE IN COGNITIVE ERA

Natural Language Processing & Reasoning & Natural Language Generation

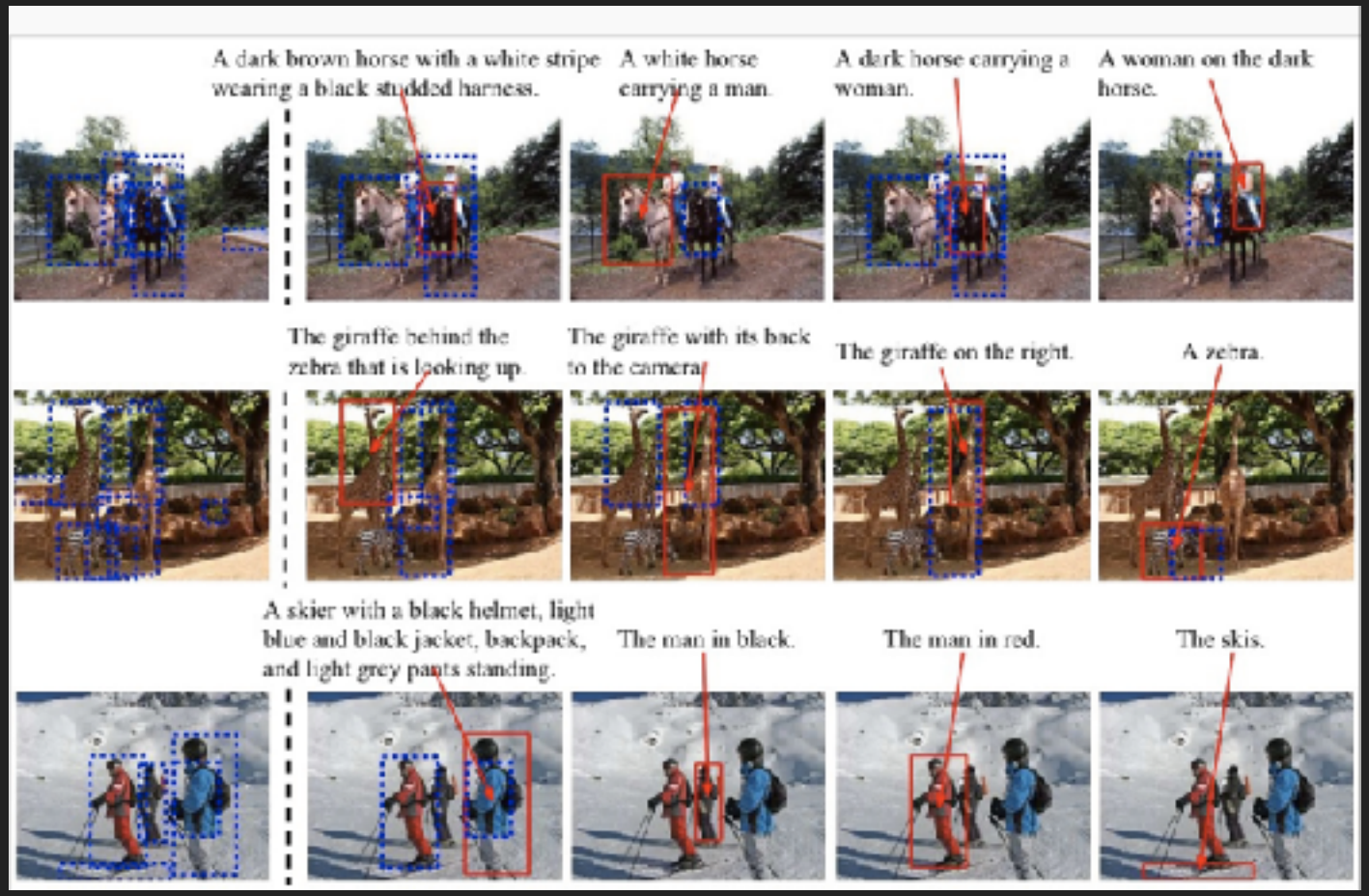
https://www.youtube.com/watch?v=bMXPyKYY0u8

KEY AREA TO EXPLORE IN COGNITIVE ERA

Machine Vision



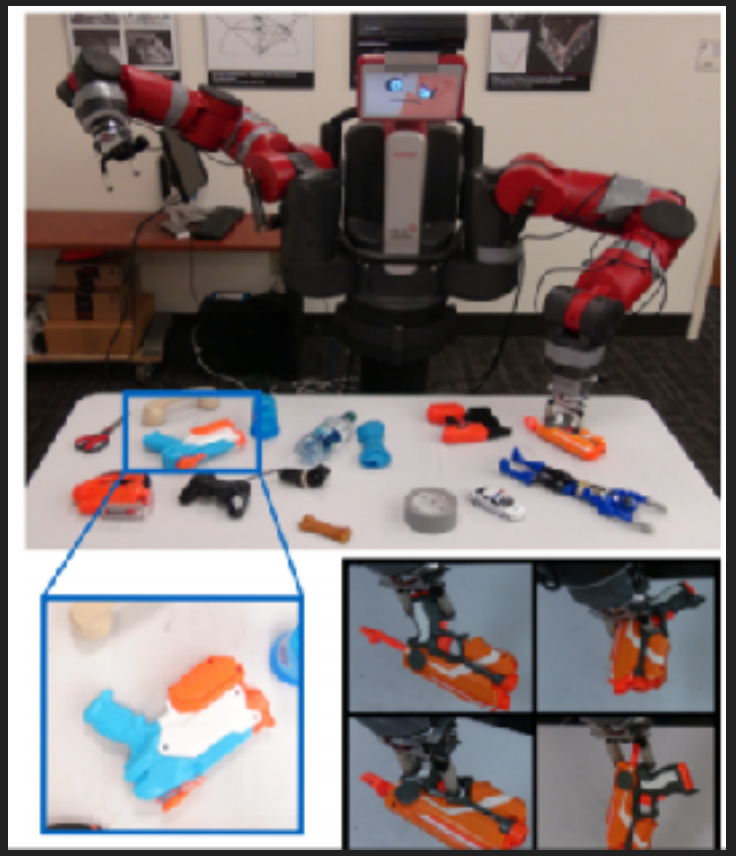
Machine Vision - turn picture into description



KEY AREA TO EXPLORE IN COGNITIVE ERA

Acoustic Analytics

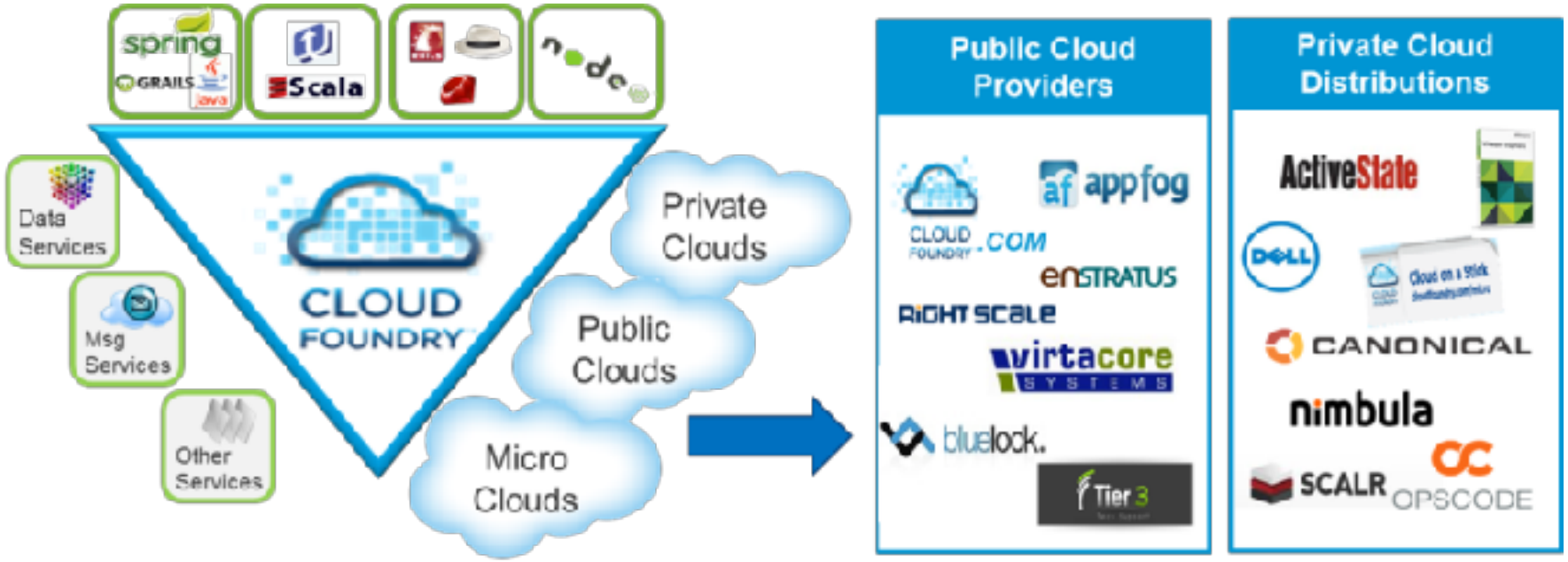
ROBOT WITH DEEP LEARNING



https://www.youtube.com/watch?v=jkaRO8J_1XI

What's Cloud Foundry?

*An open platform-as-a-service (**PaaS**). The system supports **multiple** frameworks, **multiple** application infrastructure services and deployment to **multiple** clouds.*



Making Multi-Cloud a Reality

What is Bluemix? How it works?

DevOps Tooling

Your Own Hosted Apps / Services

Catalog of Services that Extend Apps' Functionality

Web	Data	Mobile	Cognitive	Analytics	IoT	Security	Yours
Open Source	Open Source	Third Party	Third Party	Open Source	IBM	IBM	

Flexible Compute Options to Run Apps / Services

Instant Runtimes

Containers

Virtual Machines

Platform Deployment Options that Meet Your Workload Requirements

Bluemix Public

- Dallas (US)
- London(UK)
- Beijing(CN) *

Bluemix Dedicated

Amsterdam, Dallas, Frankfurt, Hong Kong, Houston, London, Melbourne, Milan, Montreal, Paris, Querétaro, San Jose, Sao Paulo, Seattle, Singapore, Sydney, Tokyo, Toronto, Washington

Bluemix Local*

Powered by IBM SoftLayer

You Data Center

Integration and API Mgmt

Create apps quickly with prebuilt services

A full range of capabilities to suit any great idea.

Choice

- Runtimes, services, and tooling up to you

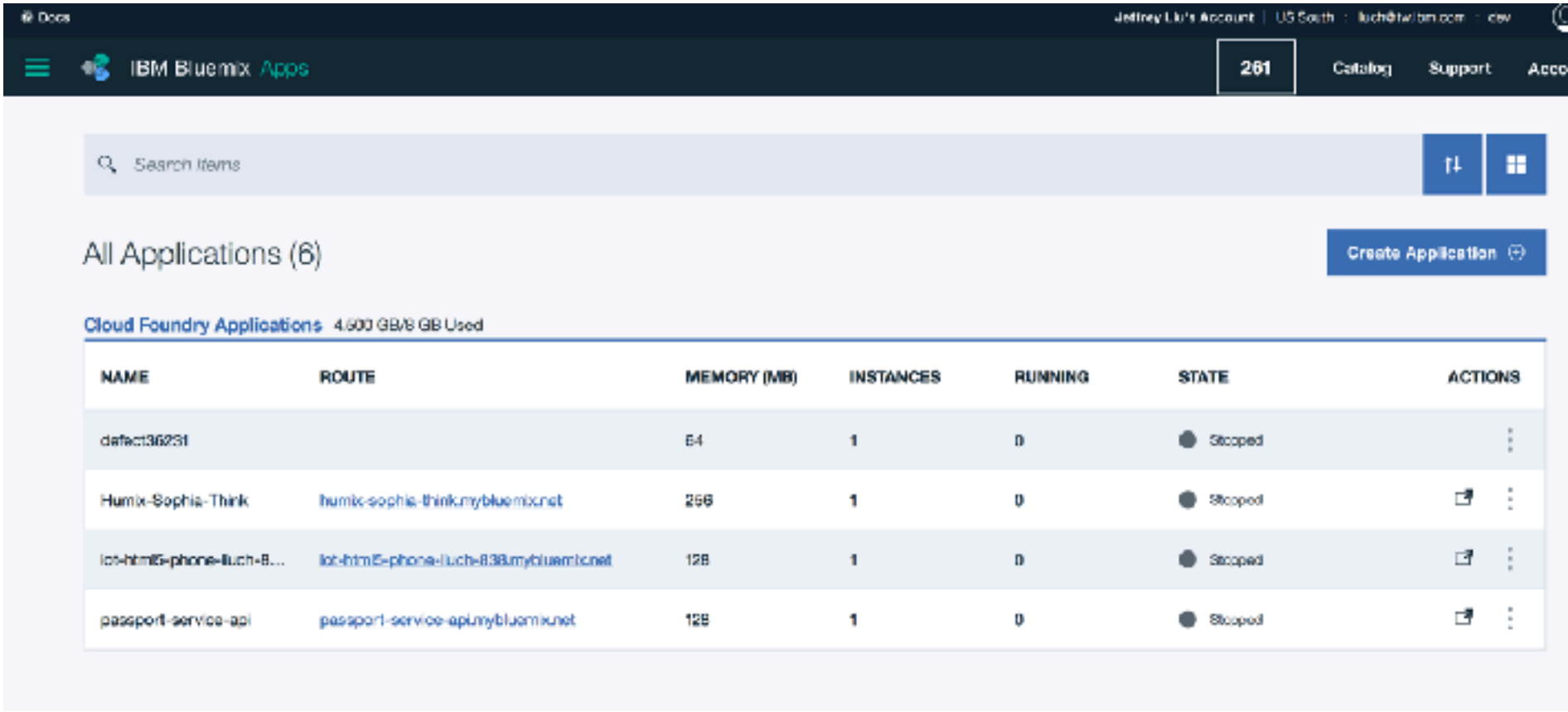
Industry Leading IBM Capabilities

- Services leveraging the depth of IBM software
- Full range of capabilities

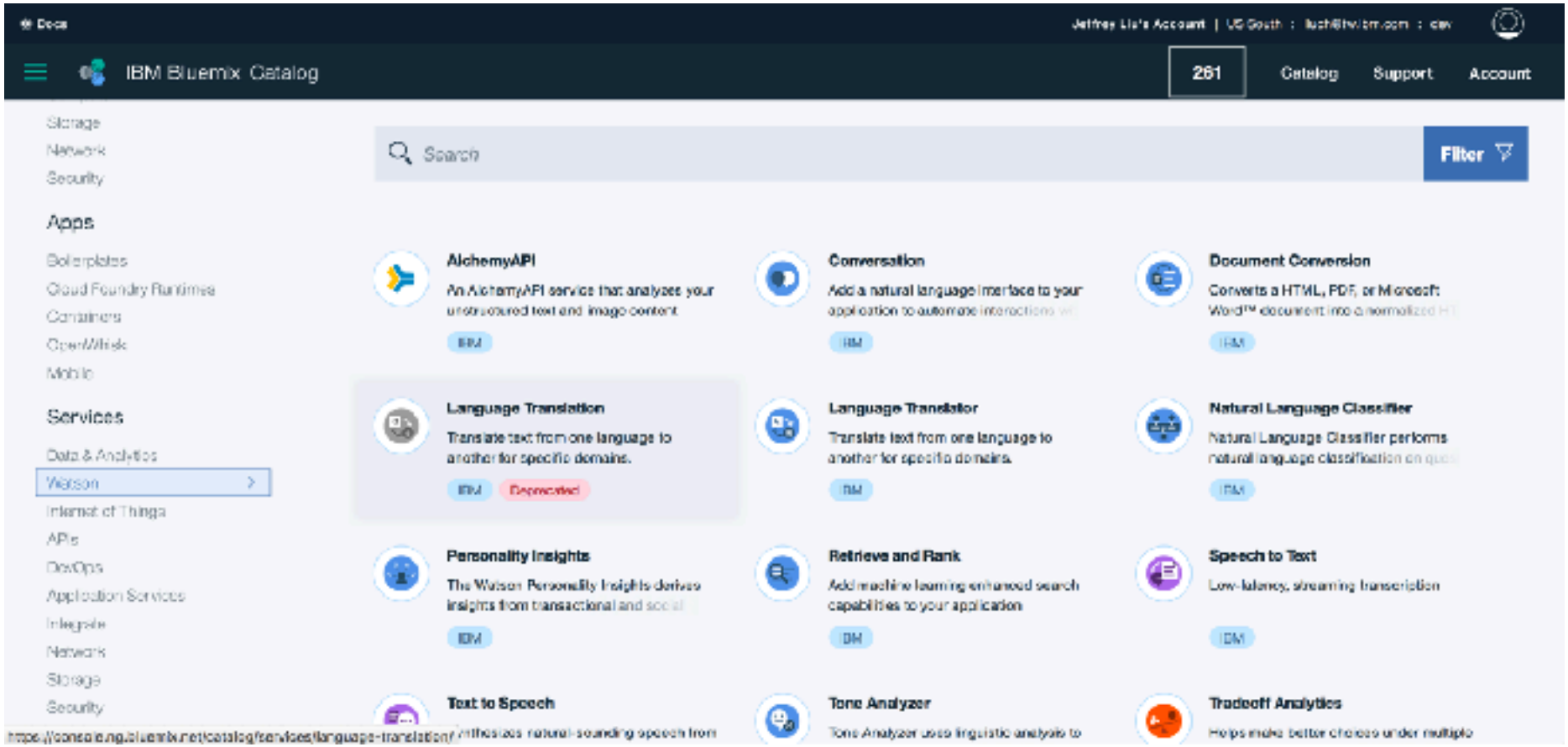
Completeness

- Open source platform and services
- Third party to enable key use cases

BlueMix UI – Dashboard

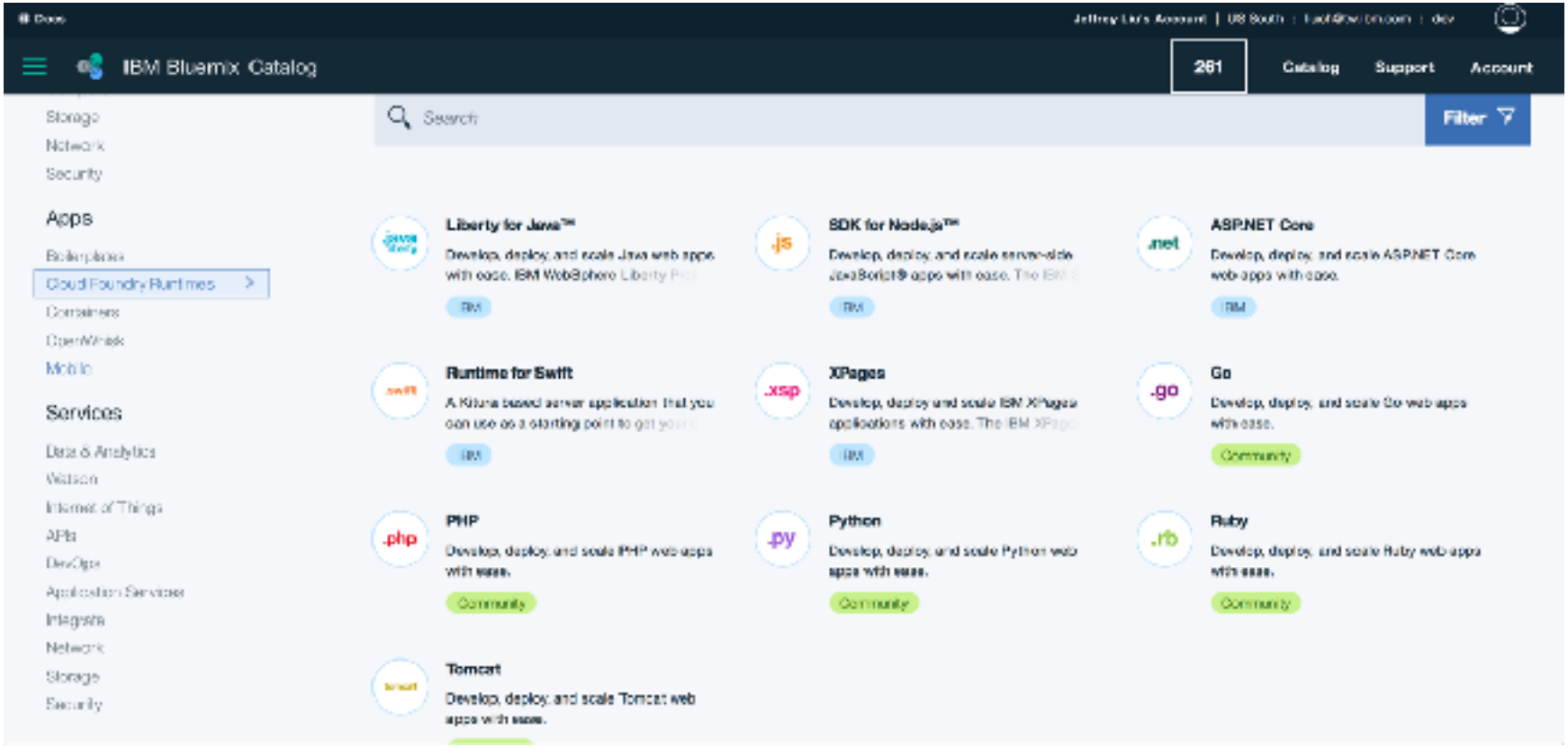


BlueMix UI – Catalog



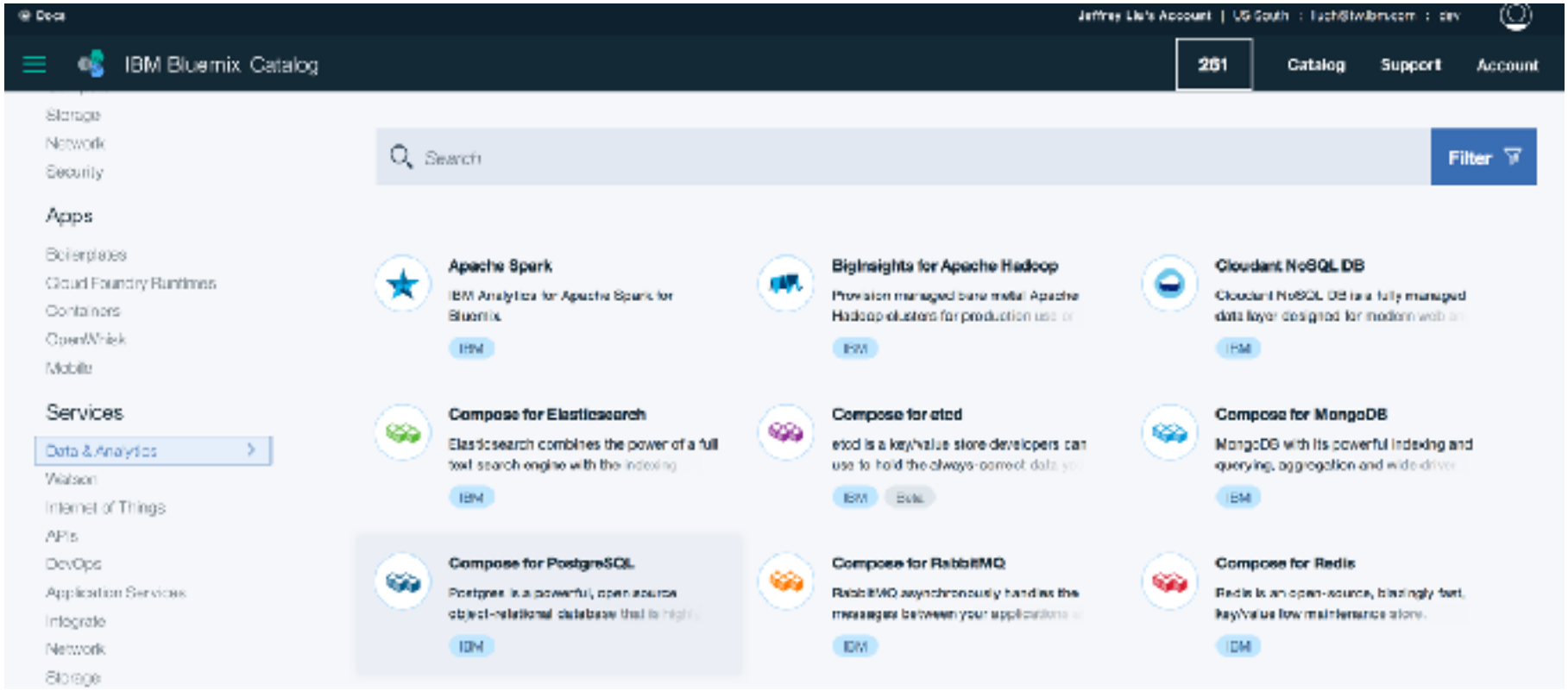
App Runtimes

Runtimes in the BlueMix represent different buildpacks that are provided. Each runtime is an application with a starter application code deployed, and a starter application is a template so that you can use it directly with the existing buildpack from BlueMix user interface.

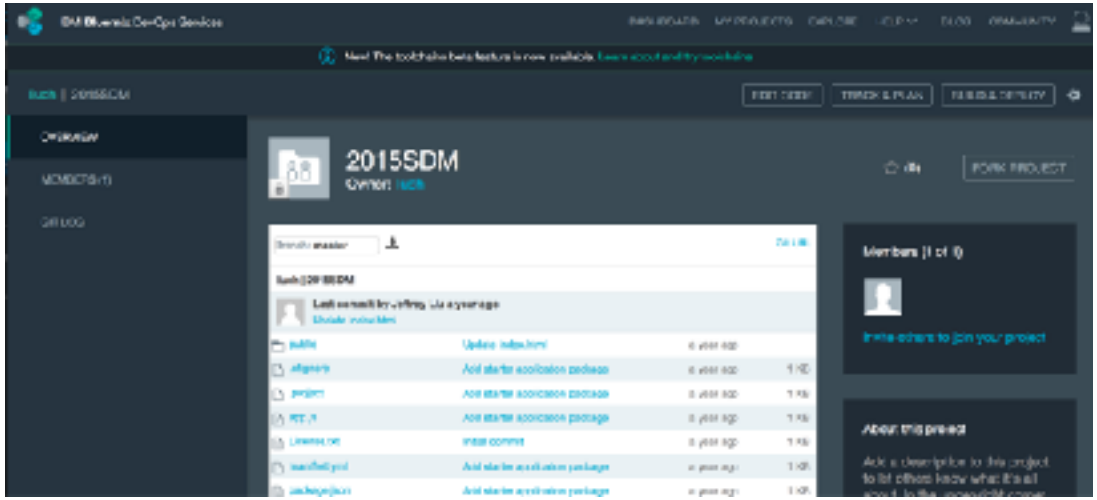


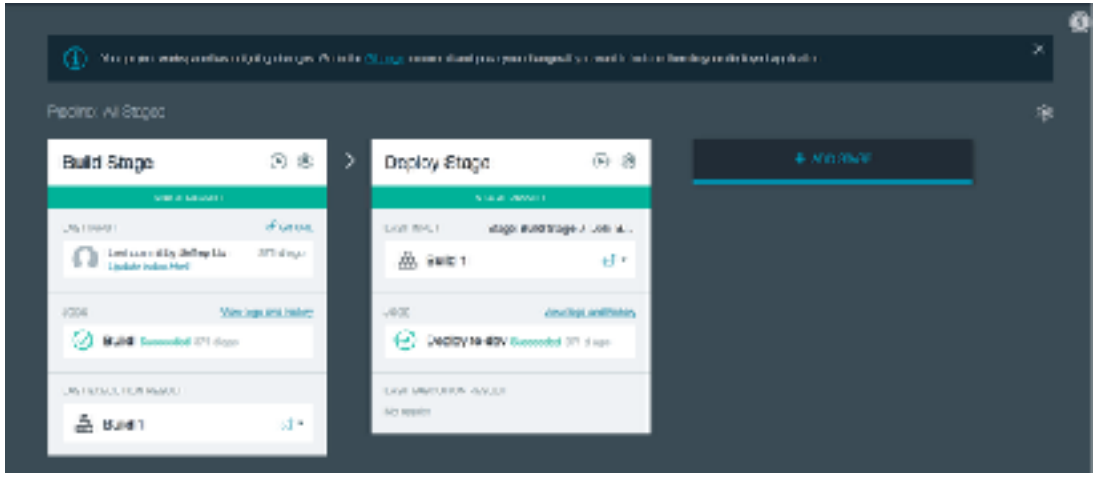
Services

A service is a piece of code that BlueMix hosts. And the service offers a piece of functionality for applications to use. BlueMix provides a set of predefined services that can you can use directly



IBM DevOps Services

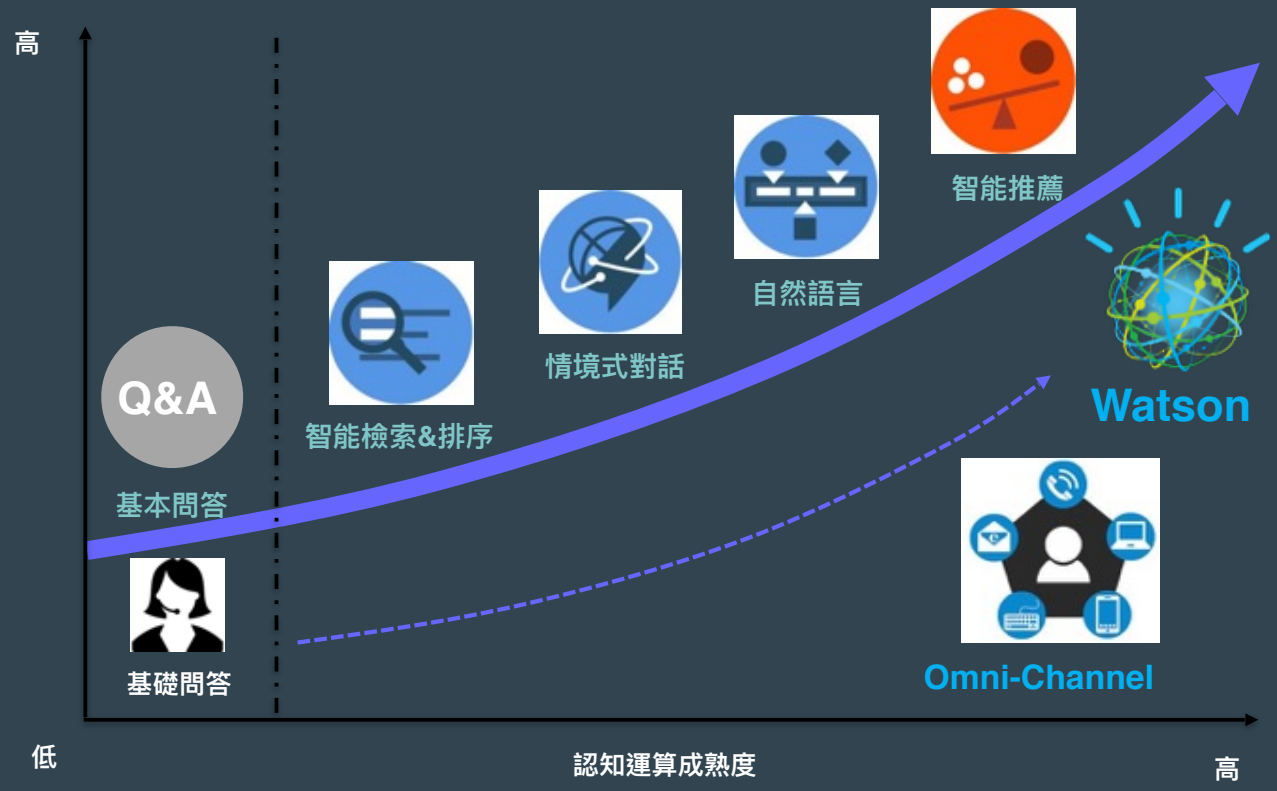


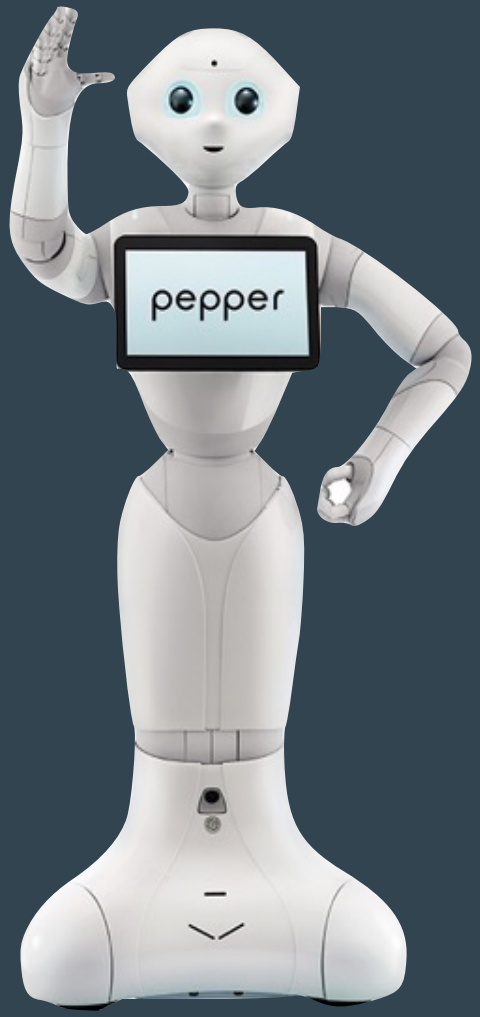


- DevOps Solution in the cloud for building mobile and cloud applications
- Optimized for use with BlueMix
- Integrated task tracking, agile planning, source control with auto deploy
- Use your favorite tools or work from the Web IDE
- Hosted Jazz SCM or Git or link to GitHub
- Public and private projects
- Continuous Integration and Deployment with Jenkins
- Mobile quality and application performance monitoring (coming)

Powered by JazzHub

Watson Enabled Cognitive Computing





Personality Insights

What is it?

Improved understanding of people's preferences to help engage users on their own terms

How does it work?

The IBM Watson Personality Insights service uses linguistic analytics to extract cognitive and social characteristics, including Big Five, Values, and Needs, from communications that the user makes available, such as email, text messages, tweets, forum posts, and more. By deriving cognitive and social preferences, the service helps users to understand, connect to, and communicate with other people on a more personalized level.

Use Cases-

The service can analyze text based on a customer's twitter stream to help a travel agency decide between leading with a budget or luxury trip offer

Anywhere improving a customer engagement can help create an organization differentiate itself.

http://en.wikipedia.org/wiki/Big_Five_personality_traits

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Personality Insights 應用

Input Text

We need a minimum of 3500 words and ideally 6000 words or more to compute statistically significant results. See the science behind the service.

Ideally, the text should contain words we use in every day life relating to personal experiences, thoughts and responses. See usage guidance for details.

Choose Language: • English ○ Spanish

Mr. Vice President, my old colleague from Massachusetts and your new Speaker, John McCormack, Members of the 87th Congress, ladies and gentlemen:

This week we begin anew our joint and separate efforts to build the American future. But, sadly, we build without a man who linked a long past with the

6437 words

Clear Analyze

Your Personality*

You are inner-directed, restrained and rational.

You are empathetic: you feel what others feel and are compassionate towards them. You are self-controlled: you have control over your desires, which are not particularly intense. And you are calm-seeking: you prefer activities that are quiet, calm, and safe.

Your choices are driven by a desire for prestige.

You consider helping others to guide a large part of what you do: you think it is important to take care of the people around you. You are relatively unconcerned with tradition: you care more about making your own path than following what others have done.

**Compared to most people who participated in our surveys.*

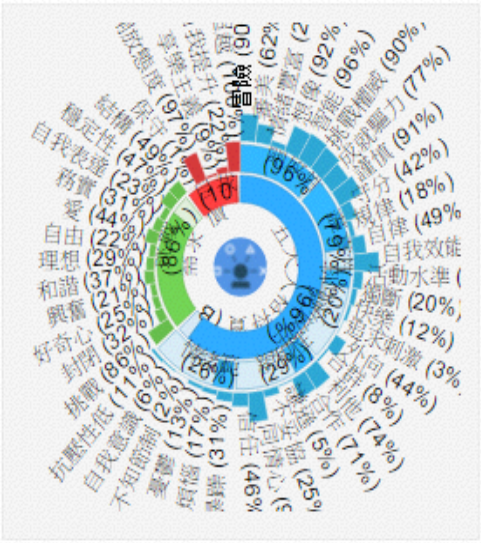
Personality Insights

The IBM Watson Personality Insights service uses linguistic analytics to extract a spectrum of cognitive and social characteristics from the text data that a person generates through blogs, tweets, forum posts, and more.

Data Behind Your Personality

Name	Value
五大人格特質 (Big 5)	
開放性	96%
冒險	90%
審美	62%
情緒豐富	19%
想像	91%
智能	96%
挑戰權威	89%
盡責性	79%
成就驅力	77%
謹慎	90%
守分	42%
規律	18%
自律	49%
自我效能	92%

Visualization of Personality Data



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Speech to Text

What is it?

Automatic recognition of the words that are being spoken in a live audio stream, and presents the highest-scoring textual representation of that message.

How does it work?

In addition to converting a raw audio signal into a best-guess of the words that are being spoken, intelligence about the relevant grammar / how language is used within a specific context is incorporated to generate a more accurate transcription.

Example Use Cases

- A new integration paradigm for mobile apps.
- Voice-control of applications / embedded devices.
- Transcription of meetings and conference calls. Dictation of emails.
- Critical building block for “Speech-to-Speech” translation.

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Text to Speech

What is it?

Generates an audio file that has a verbal representation of the input text - complete with appropriate cadence and intonation, and, in the future, the ability to customize the pronunciation of specific words.

How does it work?

Generates an audio file that has a verbal representation of the input text - complete with appropriate cadence and intonation.

Example Use Cases

- Enable a new interaction paradigm for mobile apps.
- Assistance tools for the vision-impaired.
- Read texts / emails aloud.
- Critical building block for enable "Speech-to-Speech Translation"

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Natural Language Classifier

What is it?

Natural Language Classifier service uses machine learning algorithms which can help your application understand the language of short texts and make predictions about how to handle them.

How does it work?

The Natural Language Classifier analyzes a string of text and assigns predefined categories to it by applying deep learning technology. Deep learning is a relatively recent set of approaches that use algorithms with similarities to the way the human brain works. Deep Learning algorithms offer state of the art approaches in image and speech recognition, and the Natural Language Classifier now applies them to text classification.

Use Cases-

- Classify tweets into a set of classes, such as events, news, or opinions.
- Analyze text messages into categories, such as Personal, Work, or Promotions.
- Sentiment analysis on text from social media or other sources and identify whether it relates positively or negatively to an offering or service.

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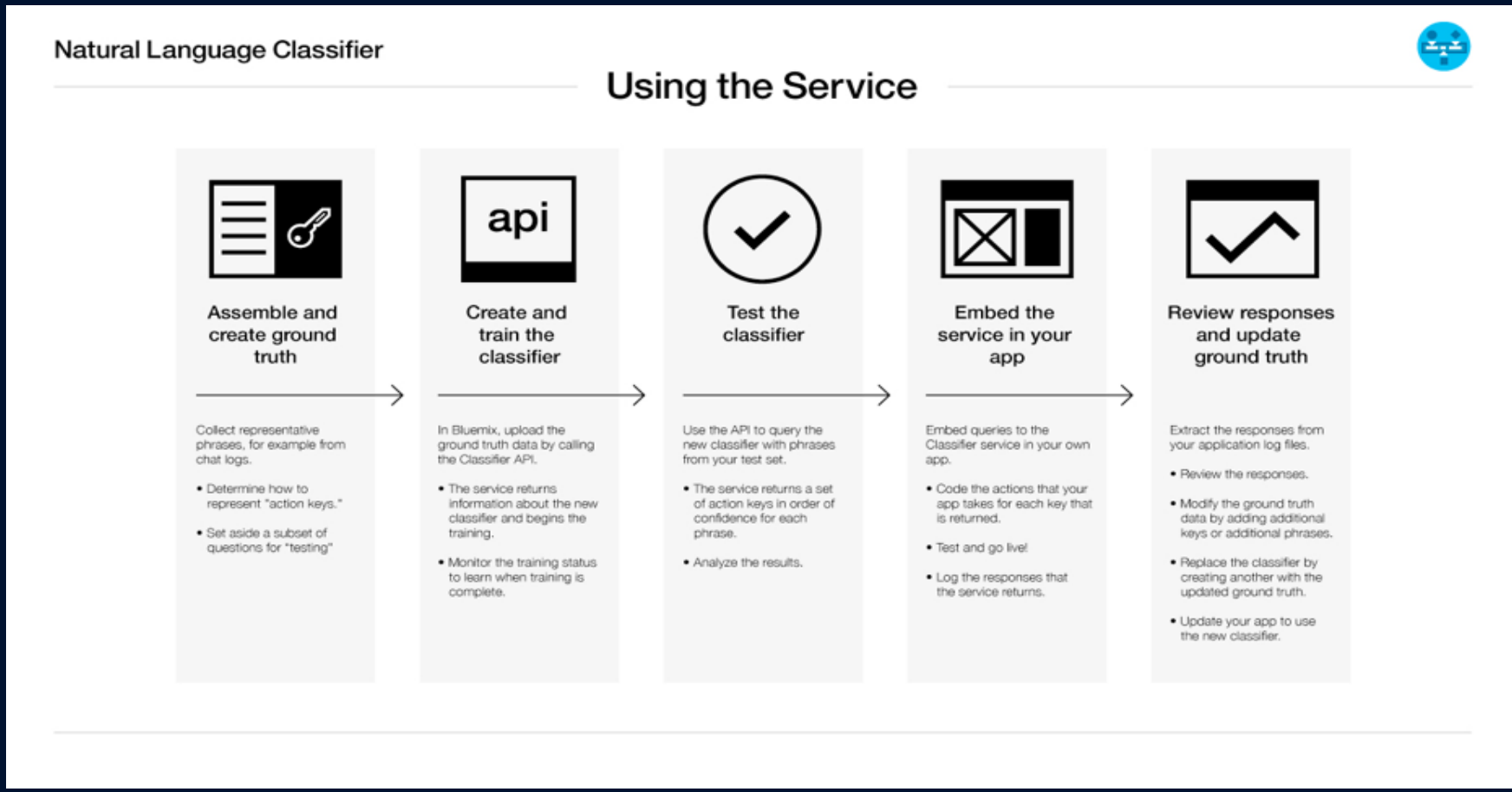
Natural Language Classifier



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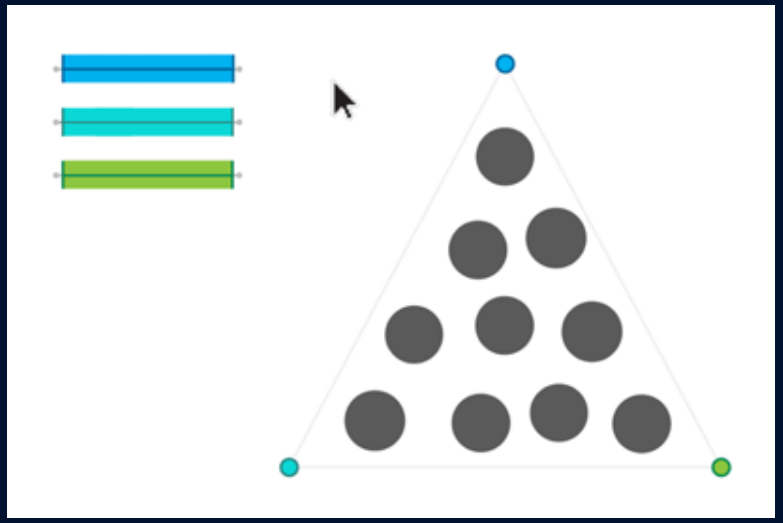
Tradeoff Analytics

What is it?
Helps make better choices under multiple conflicting goals. Combines smart visualizations and analytical recommendations for tradeoff exploration.

How does it work?
Tradeoff Analytics helps people make better choices when multiple conflicting goals come into play. Tradeoff Analytics uses Pareto filtering techniques in order to surface out only the optimal alternatives across multiple criteria. It then help the decision maker analyze the tradeoffs within the optimal set of alternatives helping them select the option that best meets their preferences and priorities.



Use Cases

- Wealth management using the technology to help choose mutual funds

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Tradeoff Analytics 應用

Tradeoff Analytics NodeJS Starter Application

The Tradeoff Analytics service helps find the best available options for you. It helps users make better decisions under multiple conflicting goals.

Try the service

Select a scenario to find the best options in the scenario:

Finance

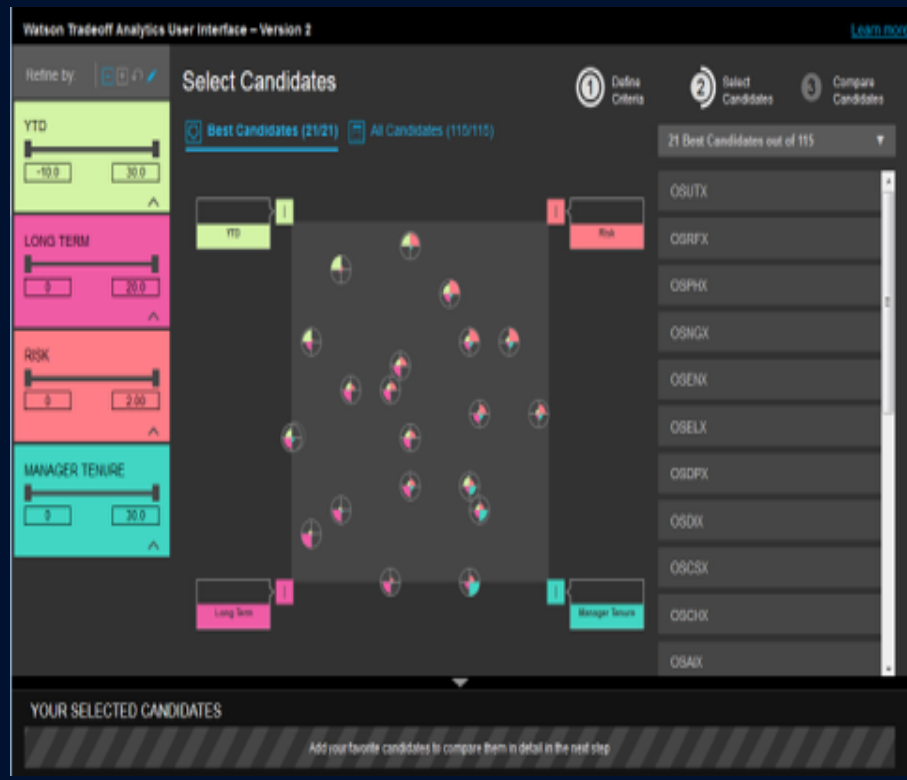
Bring your own data (CSV format)

Analyze Sample Data

Advanced

The list of options to analyze:

Id	Name	YTD	Short Term (1 Yr)	Mid Term (3 Yr)	Long Term (10 Yr)	Risk (Beta)	Net Expense	Morningstar Rating	Manager Tenure	Assets
0	OBIOX	8.24	27.74	31.22	13.08	0.94	0.76	4	9	8111.66
1	OSPHX	12.69	40.09	24.55	12.81	0.89	0.77	4	5	5863.63
2	OSAIX	10.52	39.57	21.83	13.06	0.85	0.87	4	2	426.31
3	OPHAX	11.78	32.3	20.49	12.61	0.77	0.82	4	1	1659.58
4	OBMPX	0.34	22.6	20.16	10.77	1.17	0.81	5	1	865.91
5	OSRPX	-3.85	18.07	18.92	12.41	0.99	0.83	4	4	855.24
6	OSCSX	-0.13	28.58	18.79	13.19	1.15	0.79	5	5	3149.56
7	OSRFX	12.36	37.28	18.55	13.39	1.06	0.85	4	2	598.17
8	OSHOX	1.5	6.42	18.2	9.33	1.25	0.81	2	2	335.79
9	OSVLX	1.33	13.85	17.89	-5.56	0.98	0.85	3	2	182.3
10	OBSOX	-3.11	22.96	17.85	13.16	1.23	0.84	5	5	1193.62
11	OSDAX	1.46	26.87	17.61	12.63	0.95	0.81	4	2	897.41
12	OSCPX	0.42	19.5	17.14	8.78	1.09	0.82	3	2	885.83
13	OLCSX	5.67	22.93	17.07	8.88	1.13	0.85	4	9	2950.25
14	OSPCX	2.41	18.68	16.45	5.24	1.12	0.83	4	0	410.67
15	OSCHX	6.55	25.98	16.41	15.86	1.38	0.81	5	4	1651.79
16	ODLSX	0.76	20.77	16.3	11.18	1.13	0.82	3	0	539.66



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Visual Recognition

What is it?

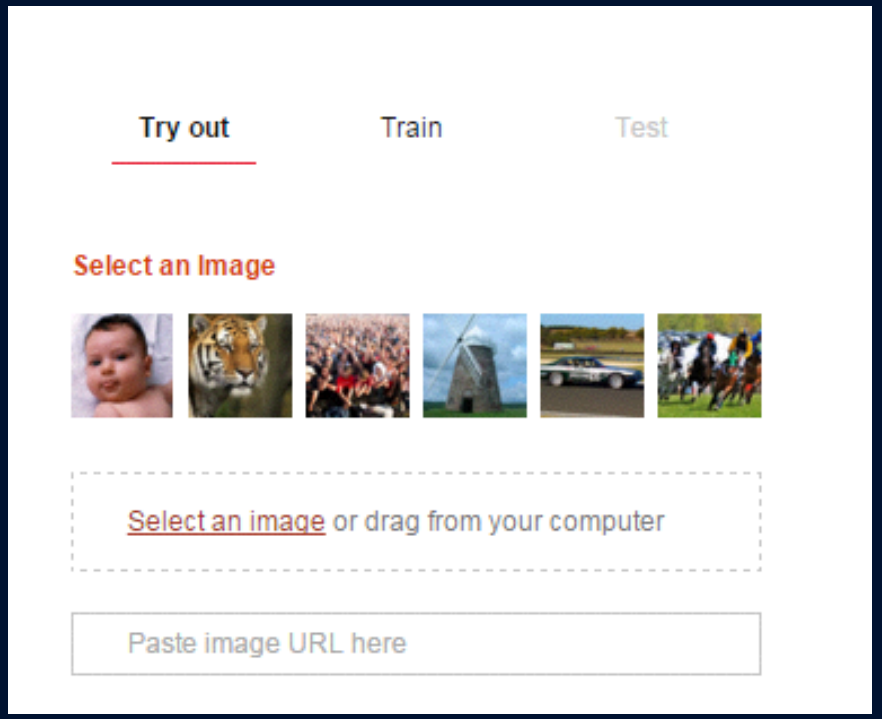
Understand the contents of images. Trainable for custom content.

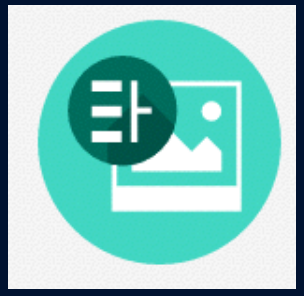
How does it work?

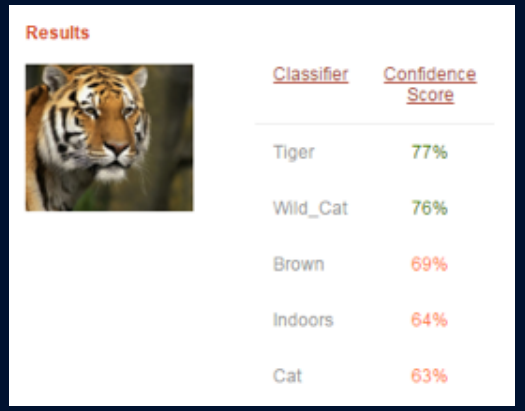
Visual Recognition allows users to understand the contents of an image or video frame, answering the question: “What is in this image?” Submit an image, and the service returns scores for relevant classifiers representing things such as objects, events and settings.

Use Cases-

- You can organize image libraries, understand an individual image.
- Train the robot to know image sense
- Doors Security & Web Cam Application







Demo :

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Watson Conversation

combines a number of cognitive techniques to help you build and train a bot - defining intents and entities and crafting dialog to simulate conversation.

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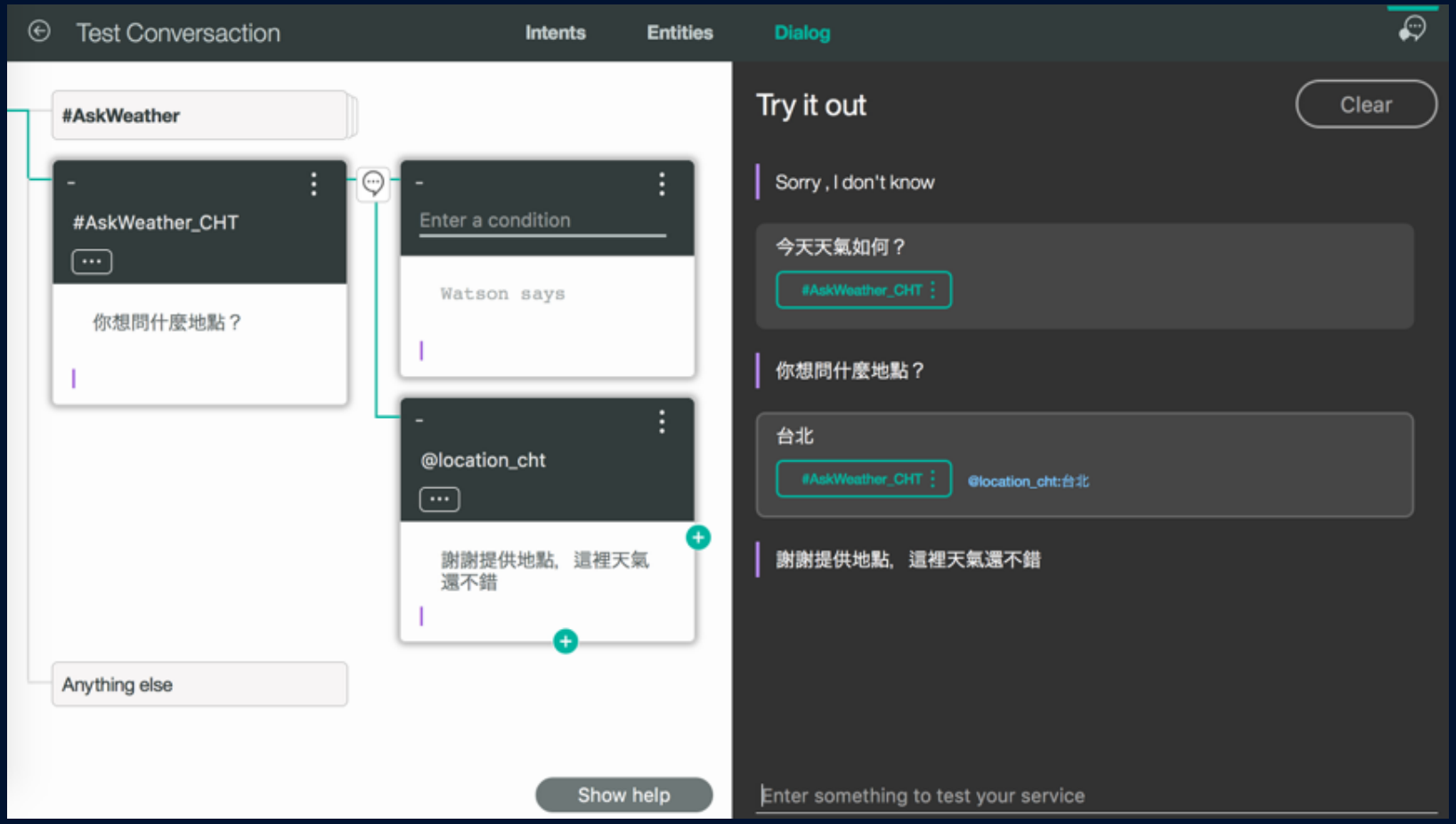
Watson Conversation (Live Demo)



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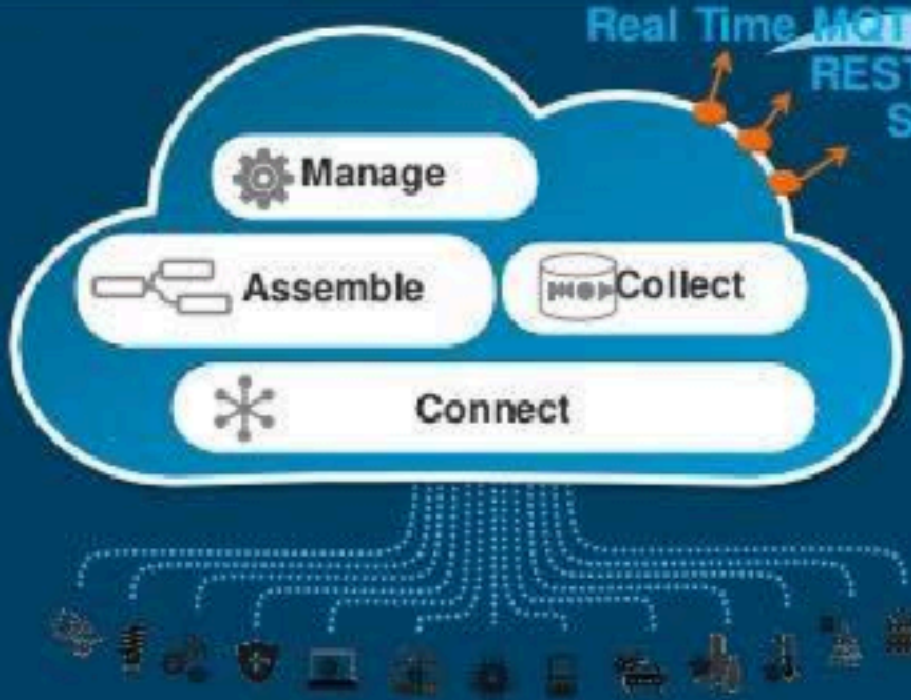
IBM **Bluemix IOT**

Instrument – Interconnect - Intelligent

IBM **Bluemix IOT**

Internet of Things Foundation

A fully managed, cloud-hosted service that makes it simple to Internet of Things (IoT) solutions



Build

IBM® Bluemix™

https://bluemix.net/

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IOT Recipe Catalog

Texas Instruments Energia with TM4C1294 Connected LaunchPad

By Vikki Paterson

May 13, 2015

Use the Energia Rapid Prototyping Environment to connect to the IBM Internet of Things Fo...

Connect an Intel Galileo to the Internet of Things Foundation

By Vikki Paterson

May 20, 2015

Use an Intel® Galileo to connect to the IBM Internet of Things Foundation and visualize ...

MQTT Chat Over IBM Bluemix

By microtime

May 29, 2015

Using Microtime PTK System with STM32F207 Adapted

NEXCOM NIO100/NIO100Y Bluemix connectivity tutorial

By Nexcom

June 10, 2015

Use IoT Studio Gateway Builder to create data path and send data to IBM Bluemix

28 1 0

u-blox Cellular IoT Starter Kit

By u-blox

July 3, 2015

Use an u-blox C027 cellular IoT Starter Kit to connect to the IBM Internet of Things Fou...

Intel Edison IoTF Recipe

By chlog

July 15, 2015

Connect your Intel® Edison to the IBM Internet of Things Foundation and visualize your d...

Connect a SimpleLink Wi-Fi CC3200 LaunchPad to IoTF with Energia

By EdProsser

July 16, 2015

Connecting a SimpleLink CC3200 Launchpad to the Internet of Things Foundation Service by

TI Sensor Tag and Raspberry Pi

By AllanMarube

In this tutorial, you will learn how to use Bluetooth to connect and get sensor readings ...

How to Connect a Device to the Cloud

By locked

July 17, 2015

Gotta "thing" to connect to the cloud? Learn how to connect the device or "thing" to the ...

Connect an Arduino Uno device to the IBM Internet of Things Foundation

By EdProsser

Tutorial that shows how to connect an Arduino Uno to the IoTF service in Bluemix

ARM® mbed™ IoT Starter Kit (Part 1)

By EdProsser

Connect an ARM mbed IoT starter kit to the Internet of Things Foundation, visualize the d...

ARM® mbed™ IoT Starter Kit (Part 2)

By EdProsser

July 20, 2015

Connect your ARM mbed device and application to the IBM Bluemix Service, and send command...

Connecting an ARM mbed NXP LPC 1768 to the Internet of Things

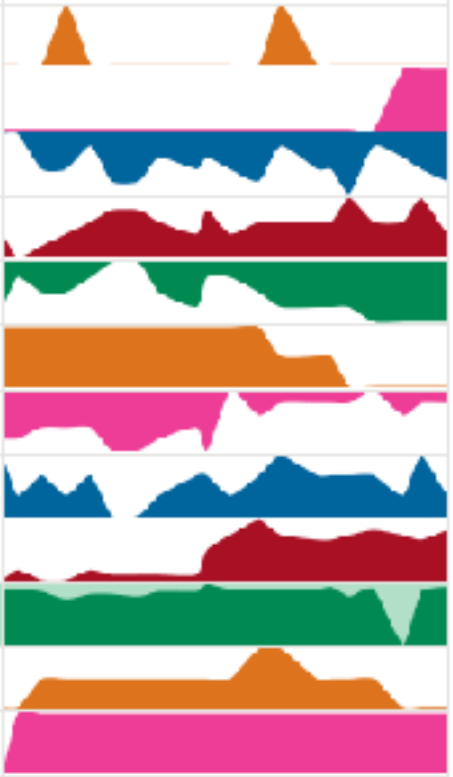
By EdProsser

Use an mbed microcontroller to connect to the IBM Internet of Things Foundation. Then you...

Connect and view the data

Overview **Chartview**

Sensor	Reading	Sparkline
Acceleration X	0 g	
Acceleration Y	0.1 g	
Acceleration Z	1 g	
Ambient Temperature	25 °C	
Gyroscope X	-1.3 °/s	
Gyroscope Y	0.9 °/s	
Gyroscope Z	-1 °/s	
Humidity	63.7 %	
Magnetic X	-35.0 µT	
Magnetic Y	3.6 µT	
Magnetic Z	82.3 µT	
Object Temperature	18.2 °C	
Pressure	1,016.2 mBar	
Temperature	25.0 °C	



DEMO TIME

The Economist
SPECIAL REPORT
TECH STARTUPS
A Cambrian moment

Useful links

- IBM cloud marketplace
  http://www.ibm.com/cloud

- IBM BlueMix
  https://ace.ng.bluemix.net/

- IBM BlueMix introduction
  https://www.ibmdw.net/bluemix/docs/about/

- Getting started with BlueMix and JazzHub
  https://hub.jazz.net/tutorials/jazzeditor