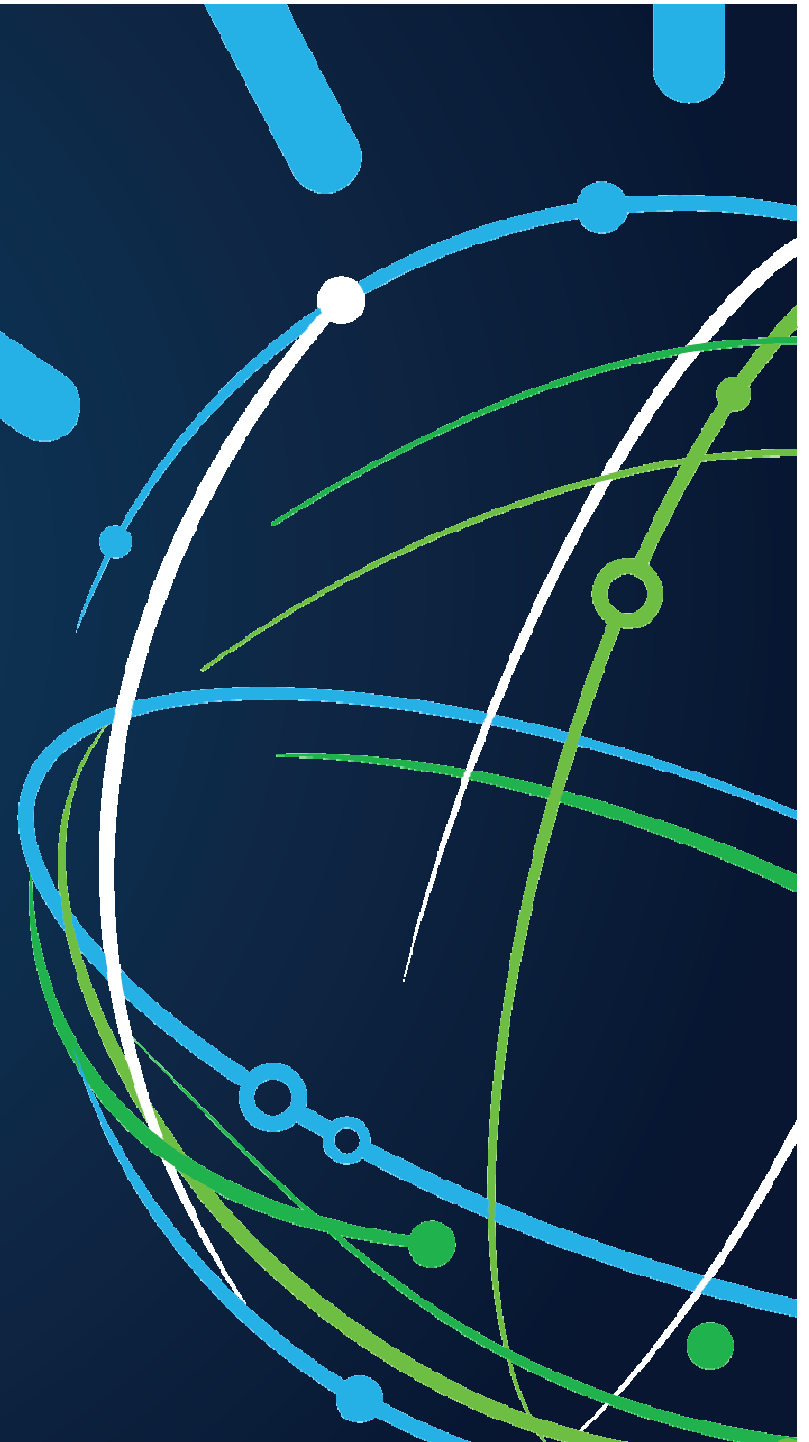


# Mobile Cloud with Watson Services

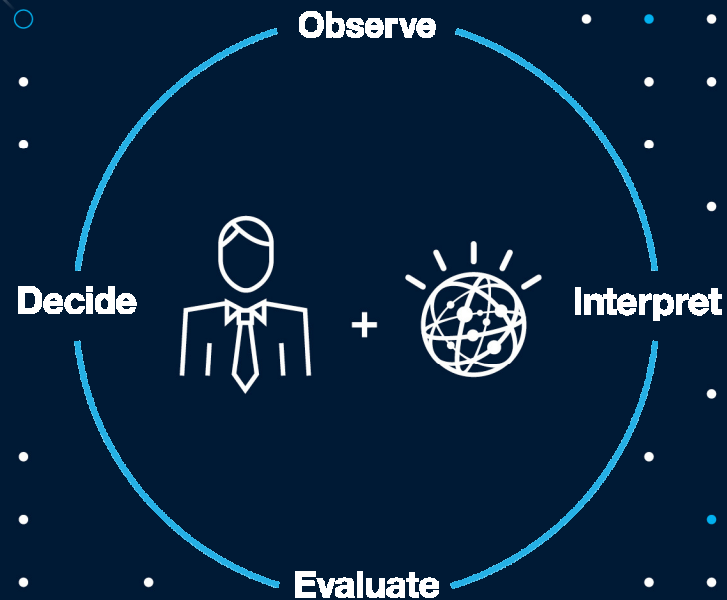
Leveraging cognitive computing and social  
media data from the mobile cloud

*Eco System Development*

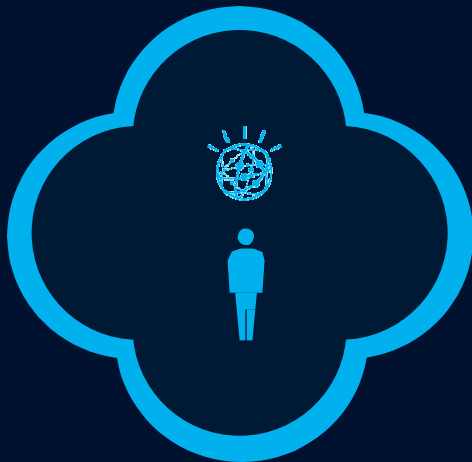


# What is Watson ?

To understand Watson, we need to understand cognitive computing

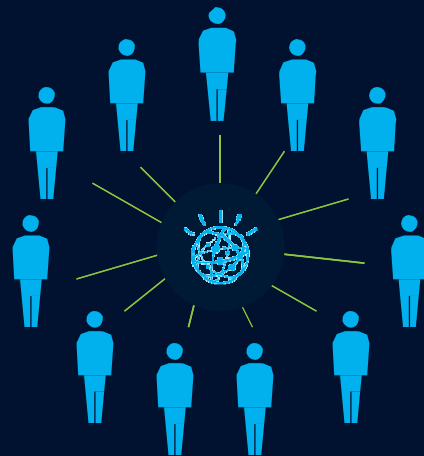


# Benefits of Watson on the Cloud Infrastructure



## Enhance

the cognitive process of professionals to strengthen decision making in the moment



## Reach Out

expertise by elevating the consistency and objectivity of decision making across an organization.



## Accelerate

development of expertise in others by capturing the expertise of top performers

# Reusable services form the basis for all Watson cognitive solutions



# Users access Watson services in different ways

depending on their needs and goals

## Watson Developer Cloud

**\*\*Trial\*\***

- Developer free access
- Beta services
- Fixed content
- No SLAs

## Watson Developer Cloud

**\*\*Sandbox\*\***

- Enterprise paid access to production and beta services
- Use custom content
- GA-level Q&A service
- Dev SLAs
- Enterprise training

## Watson Developer Cloud

**\*\*Production\*\***

- Clients and ecosystem partners
- Revenue share or monthly fee
- Full service access and custom content
- Prod SLAs

## IBM Products

**\*\*Development & Production\*\***

- Select offerings include 180 day access to services
- Production level when services go GA

# Bluemix has radically expanded access to Watson services



Access restricted to partners  
and IBM developers

Wait until services are GA to  
release

North America

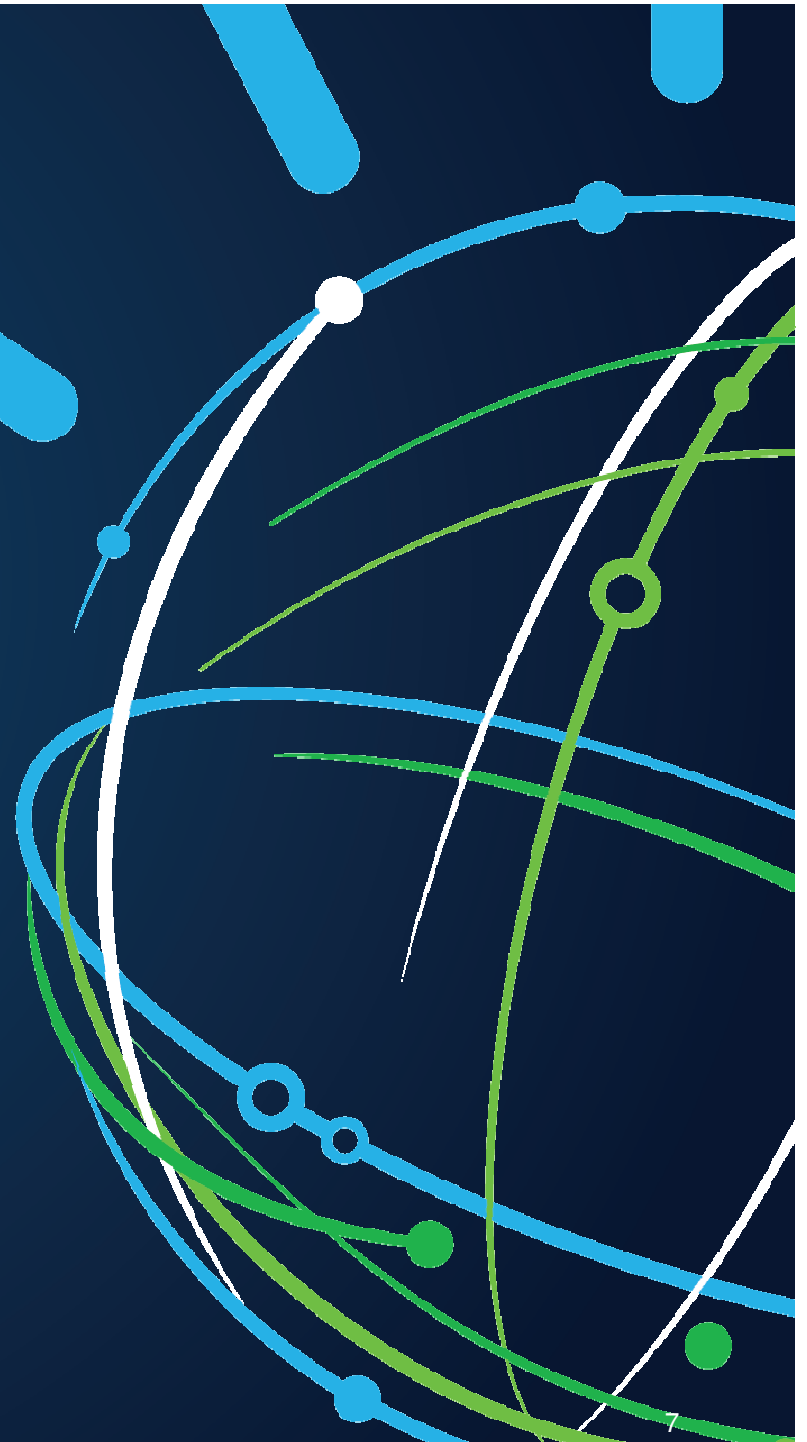


Accessible by anyone with a  
Bluemix account

Release in Beta and gather  
input from user community

Global

# Watson Services in Bluemix



# Concept Expansion

## What is it?

Concept Expansion employs an interactive human-machine partnership to guide concept expansion from a suggested "seed list" with an ultra high speed pattern matching algorithm, enabling rapid development of rich entity terminologies.

## Use Cases-

From a list of "SEED" terms like "apple, orange, cherry" we get all the fruit like terms mentioned in Text to "apple, orange, cherry, limes, strawberries"

**Concept Expansion Sample**

Label:

Corpus: ☒ Medical Transcriptions <http://www.mtsamples.com>  
☐ Social Media - WARNING: Might take a couple minutes depending on seed list

Seeds:

**Output:**

Prevalence	Result
24	multivitamin daily , aspirin
19	tricar 145 mg daily , aspirin
14	penicillin
14	abilify 5 mg daily , motrin
12	venom - bee / wasp
12	adhesive tape
10	aspirin , plavix
10	aspirin one tablet daily , tylenol
9	hydrocodone / acetaminophen tablets and motrin
7	insulin sliding scale , tylenol
7	aricept 5 mg daily , tylenol
6	oxazepam 15 mg daily ; aspirin
6	a beta blocker , aspirin
6	nkda . medications : tylenol
6	plenty of fluids . tylenol
6	antiinflammatories or aspirin
6	2 . tylenol
6	d . 2 . tylenol
6	lasix on a
6	none . medications : tylenol
6	plan : 1 . aspirin
5	aspirin . dr
5	sublingual nitro
5	lunesta 2 mg
5	5 . aspirin
5	motrin , lotensin
5	and aspirin
5	advair 250 as needed , aspirin
5	ibuprofen
5	d . 5 . aspirin
5	he may see dr . xyz
5	daily . 17 . aspirin
5	tylenol . now resolved . 2
5	tylenol . now resolved
5	plan : 1 . motrin
5	cardura



# Concept Expansion

```
ConceptExpansion cet = new ConceptExpansion();
try {
    cet.setUsernameAndPassword(...);
    cet.setEndPoint("...");
} catch (Exception e1) { ... }

String []seeds = new String[]{"motrin","tylenol","aspirin"};
String label = "medicine";
cet.setDataset(ConceptExpansionDataset.MT_SAMPLES);

Job job = cet.createJob(label, seeds);
Status status = cet.getJobStatus(job);

while (status == Status.AWAITING_WORK // status == Status.IN_FLIGHT) {
    status = cet.getJobStatus(job);
    try { Thread.sleep(1000); } catch (InterruptedException e) { throw new RuntimeException(e); }
}

if (status == Status.DONE) {
    List<Concept> concepts = cet.getJobResult(job);
    for (int i = 0; i < concepts.size(); i++) {
        Concept element = concepts.get(i);
        System.out.println(element);
    }
} else {
    System.out.println("The concept couldn't be expanded");
}
```

# Concept Expansion

```
ConceptExpansion cet = new ConceptExpansion();
try {
    cet.setUsernameAndPassword(...);
    cet.setEndPoint("...");
} catch (Exception e1) { ... }

String []seeds = new String[]{"motrin","tylenol","aspirin"};
String label = "medicine";
cet.setDataset(ConceptExpansionDataset.MT_SAMPLES);

Job job = cet.createJob(label, seeds);
Status status = cet.getJobStatus(job);

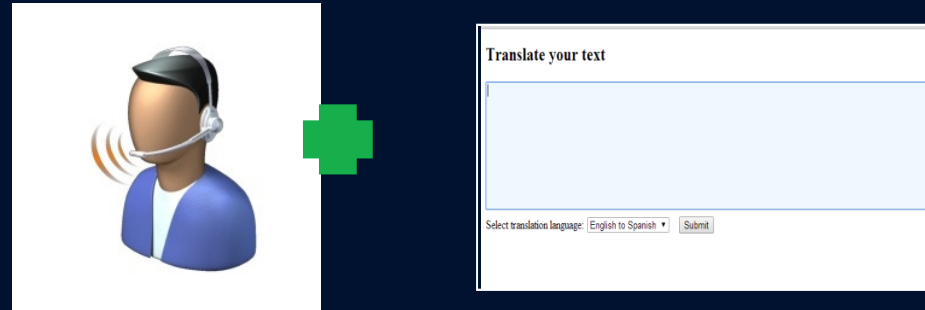
while (status == Status.AWAITING_WORK // status == Status.IN_FLIGHT) {
    status = cet.getJobStatus(job);
    try { Thread.sleep(1000); } catch (InterruptedException e) { throw new RuntimeException(e); }
}

if (status == Status.DONE) {
    List<Concept> concepts = cet.getJobResult(job);
    for (int i = 0; i < concepts.size(); i++) {
        Concept element = concepts.get(i);
        System.out.println(element);
    }
} else {
    System.out.println("The concept couldn't be expanded");
}
```

# Machine Translation

## What is it?

Translate text from one language to another.



## How does it work?

Converts text input in one language into a destination language



## Use Cases

A French speaking help desk representative is assisting a Portuguese speaking customer through a chat



# Machine Translation

---

```
MachineTranslation mtservice = new MachineTranslation();  
try {  
    mtservice.setUsernameAndPassword( .. , .. );  
    mtservice.setEndPoint("...");  
} catch (Exception e1) {  
    e1.printStackTrace();  
}
```

```
String response = mtservice.translate(  

```

```
"The IBM ECOD team is awesome",  

```

```
Language.ENGLISH,  

```

```
Language.SPANISH  
);  

```

```
System.out.println(response);
```

# Relationship Extraction

## What is it?

Intelligently finds relationships between nouns, verbs, subjects, objects, etc.

## How does it work?

Parses sentences into their various components and detects relationships between the components.

## Use Cases-

News article analysis to extract relevant people, organization, event type, date/time, or location

The United States House of Representatives is one of the two houses of the United States Congress (a bicameral legislature). It is frequently referred to as The House. The other house is the Senate.

The composition and powers of the House are established in Article One of the United States Constitution. The major power of the House is to pass federal legislation that affects the entire country, although its bills must also be passed by the Senate and further agreed to by the U.S. President before becoming law (unless both the House and Senate re-pass the legislation with a two-thirds majority in each chamber). The House has some exclusive powers: the power to initiate revenue bills,[1] to impeach officials (impeached officials are subsequently tried in the Senate),[2] and to elect the U.S. President in case there is no majority in the Electoral College.[3]

Each U.S. state is represented in the House in proportion to its population as measured in the census, but every state is entitled to at least one representative. The most populous state, California, currently has 53 representatives. On the other end of the spectrum, there are seven states with only one representative each (Alaska, Delaware, Montana, North Dakota, South Dakota, Vermont, and Wyoming). The total number of voting representatives is fixed by law at 435.[4] Each representative serves for a two-year term. The Speaker of the House, who presides over the chamber, is elected by the members of the House, and is therefore traditionally the leader of the House Democratic Caucus or the House Republican Conference, whichever party has more voting members. The House meets in the south wing of the United States Capitol.



EVENT\_COMMUNICATION PEOPLE ORGANIZATION TIME PERSON FACILITY  
CARDINAL LOCATION DATE EVENT\_VIOLENCE

P Ukraine said that dozens of pro-Russian separatists were killed in fighting around a regional airport that continued for a second day on Tuesday, forcing schools to close and residents to flee.

P Rebel fighters took over Donetsk International Airport early Monday.

P prompting the military to deploy helicopters, fighter jets and paratroopers to regain control of the main terminal.

P The Journal's reporters have been posting photos to social media from Ukraine as the country has fallen into turmoil.

P See the photos.

P Follow the continuing conflict in and around eastern Ukraine.

P "The airport is under our full control," Interior Minister Arsen Avakov said on Tuesday.

P "The enemy suffered serious losses and we have lost none."

P He estimated that dozens of separatist fighters had been killed, and said the combat operation was continuing to drive out the remnants of the pro-Russian forces.

PERSON

# Relationship Extraction

```
RelationshipExtraction ret = new RelationshipExtraction();
try {
    ret.setUsernameAndPassword(.. , ... );
    ret.setEndPoint( .. );
} catch (Exception e1) {
    e1.printStackTrace();
}

ret.setDataset(RelationshipExtractionDataset.ENGLISH_NEWS);
String response = ret.extract(
    "John works in IBM. John kicked the ball."
);

System.out.println(response);
```

# Question and Answer

## What is it?

Direct responses to users inquiries fueled by primary document sources

## How does it work?

Interprets and answers user questions based on source data and returns candidate responses with associated confidence levels and links to supporting evidence.

## Use Cases-

**Healthcare:** What is a stroke? What is the cause of Wilson Disease?

**Travel:** Where is the best place to stay in Prague?



Asks a question



Understands question



Produces possible answers and evidence



Analyzes evidence



Computes confidence



Delivers response, evidence and confidence



Considers response and evidence

## Question and Answer

---

```
QuestionAndAnswer qat = new QuestionAndAnswer();
try {
    qat.setUsernameAndPassword( .. , .. );
    qat.setEndPoint("..");
} catch (Exception e1) {
    e1.printStackTrace();
}
qat.setDataset(
    QuestionAndAnswerDataset.HEALTHCARE
);
WatsonAnswer watsonAnswers = qat.ask(
    "What is Migrane?"
);

System.out.println(watsonAnswers);
```



# Language Identification

## What is it?

Identifies the language in which text is written

## How does it work?

Can be used in tandem with the Machine Translation service.

## Use Cases-

A building block for Machine Translation and future tech.



The screenshot shows a web interface for a language identification demo. At the top right is a green button labeled "Launch Demo". Below it, the title "Detecting the language of input text" is displayed. A text input area contains a paragraph of Chinese text: "英国利物浦约翰·穆尔斯大学学者威尔金森在研究报告中说，根据一个简单的数学模型显示，蜥脚类恐龙体内微生物制造的甲烷数量可能对中生代气候产生重要影响。". Below the text area is a "Submit" button. At the bottom, a dropdown menu shows "zh-CN" as the selected language.

## Language Identification

---

```
LanguageIdentification lit = new
LanguageIdentification();
try {
    lit.setUsernameAndPassword(.. , .. );
    lit.setEndPoint(..);
} catch (Exception e1) {
    e1.printStackTrace();
}

IdentifiedLanguage lang = lit.identify(
    "Good Morning"
);

System.out.println(lang);
```

# Personality Insights

## What is it?

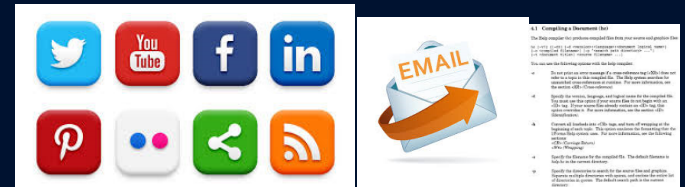
Personality insights to engage users on their own terms

## How does it work?

Extracts a set of personality and social traits based on the way a person communicates.

## Use Cases-

Guiding customer treatment - if a customer calls in, should my representative be friendly, outgoing, or just matter-of-fact



# Personality Insights

```
PersonalityInsights pit = new PersonalityInsights();
String realstring = "";
try {
    pit.setUsernameAndPassword(.. , .. ); pit.setEndPoint( .. );
    String str = "TXT TO BE ANALYSED,"; //typically from file/url
    InputStream is = new ByteArrayInputStream(str.getBytes() );
    realstring = getStringFromInputStream(is);
} catch (Exception e1) {
    e1.printStackTrace();
}
ContentItem citem = new ContentItem();
citem.setContent(realstring);
Content content = new Content();
content.addContentItem(citem);
Map<String, Object> params = new HashMap<String, Object>();
params.put("text",realstring);

Profile profile = pit.getProfile(params);
System.out.println(profile);
```

# Visualization Rendering

## What is it?

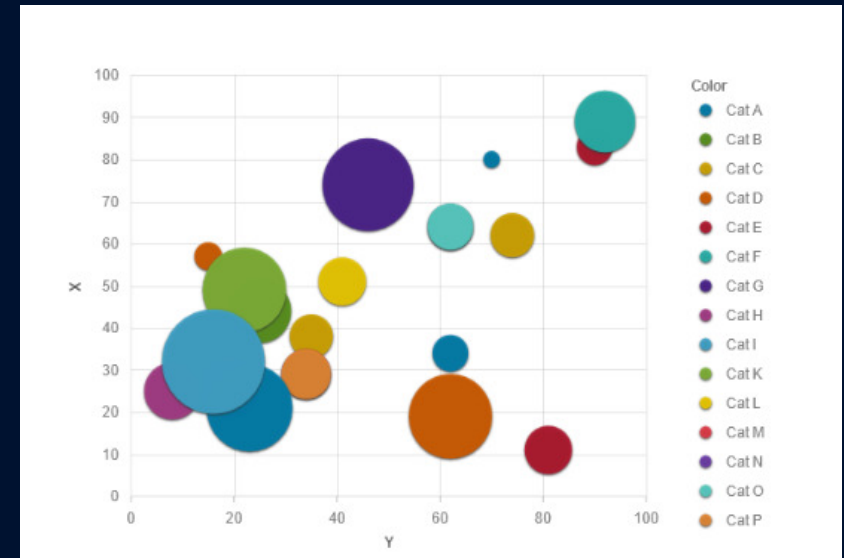
Graphical representations of data analysis for easier understanding

## How does it work?

Graphically renders data as an interactive visualization that can be easily modified to match user needs, visual styling, and types of data being analyzed.

## Use Cases-

Representation of neighborhood demographic data as showing income levels centered on geographic locations on maps



# Speech to Text

## What is it?

Recognition of the words that are being spoken in a live audio stream and transcribes into text

## 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

- Mobile apps. , Voice-control of applications / embedded devices.
- Transcription of meetings and conference calls., Dictation of emails.



Welcome to the Watson  
Developer Cloud.

# 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.

## How does it work?

Converts textual input into speech, and provides the option of three voices in English or Spanish, including the American English voice used by Watson in the 2011 Jeopardy match.

## Example Use Cases

- Mobile apps. Read texts / emails aloud.



# Concept Insights



## What is it?

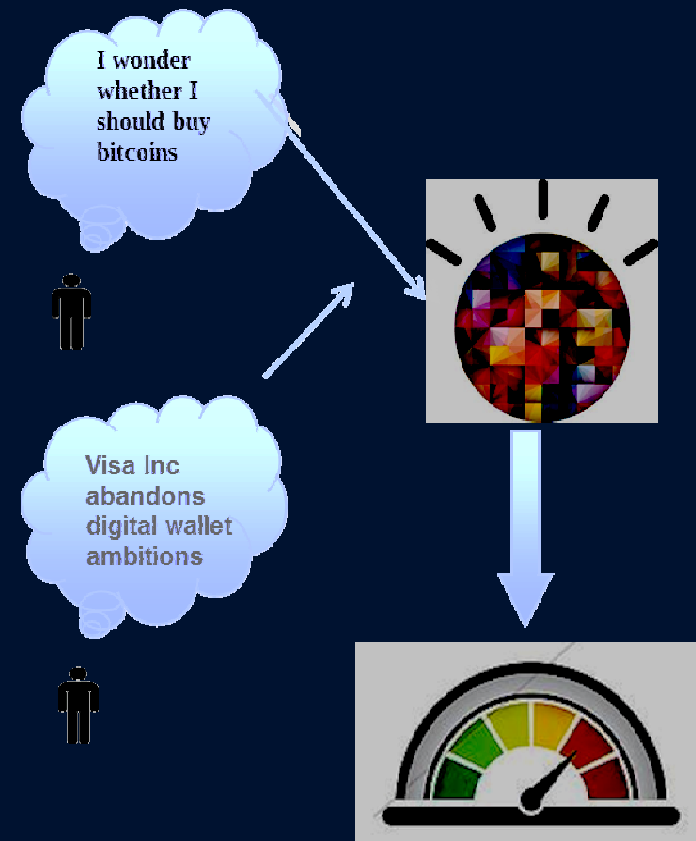
Locate relevant documents that may not directly mention your query.

## How does it work?

Maps user-input words to the underlying concepts of those words based on training on English Wikipedia data. The service identifies explicit links when an input document directly mentions a concept, and implicit links when relevant concepts that are not directly mentioned.

## Example Use Cases

- A legal firm could utilize this service to identify cases which may be related to the case in question
- Improve engagement on any external website





# Visual Recognition

## What is it?

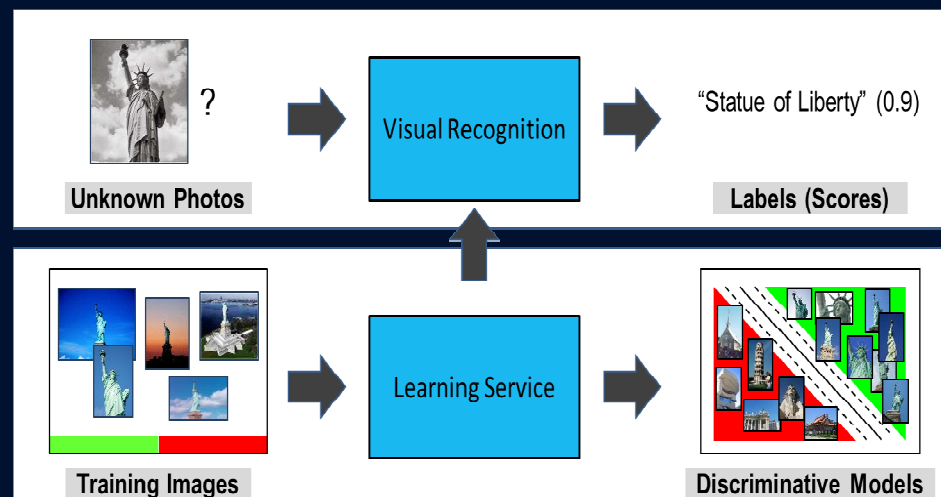
Analyzes the visual appearance of images or video frames to understand what is happening in a scene.

## How does it work?

Includes an unmatched number of preset classifier and trained labels (2,000+), a taxonomy that recognizes 150+ different sports, and can ingest 1,000+ batch images with the ability to recognize multiple labels in a picture.

## Example Use Cases

- Audio-visual indexing and search of media archive
- Automatic "Smart Album" generation
- Marketing data analysis from social media



Helps make better choices under multiple conflicting goals with smart visualizations and analytical recommendations.

Uses Pareto filtering techniques in order to surface only the optimal alternatives across multiple criteria. It then uses various analytical and visual approaches to help the decision maker analyze the tradeoffs.

- Helps to determine product mix or to compare competitive products



# How to use the Personality Insights API

---

1. Create an instance of the Personality Insights service
2. Bind the service to your application
  - For ecosystem users: *take the url and credentials information from the Bluemix UI and configure your application to access Personality Insights from outside of Bluemix (e.g. Public Cloud, Private Cloud, etc)*
  - For Bluemix customers: *create an application in Bluemix and bind the service instance you created in #1 to it*
3. Build your application
4. Links to Bluemix documentation, Personality Insights docs & samples:
  - [Information about connecting to Bluemix and integrating the Personality Insights service into Bluemix applications](#)
  - [Sample source code in Node.js, Java, and Ruby for using Personality Insights service in applications](#)

# Personality Insights API Architecture



## Input Parameters

Text data

Social media,  
emails, etc.



Generic  
Text Ingest

Formats:  
JSON, Text,  
HTML

## Portrait API Implementation (runs in Java EE 6.0 Web Profile containers)

Data Model (JSON)

### Analysis Platform

#### Linguistic Algorithms

Big-5 Personality

Basic Human Values

Fundamental Needs

## JSON output

```
{
  "tree": {
    "id": "r",
    "name": "root",
    "children": [
      {
        "id": "personality",
        "name": "Big 5",
        "children": [
          {
            "id": "openness",
            "name": "openness",
            "percentage": 0.83,
            "category": "personality",
            "children": [
              {
                "id": "openness",
                "name": "openness",
                "percentage": 0.83,
                "category": "personality",
                "children": [
                  {
                    "id": "Adventurousness",
                    "name": "Adventurousness",
                    "percentage": 0.66,
                    "category": "personality",
                    "size": 1
                  }
                ]
              }
            ]
          }
        ]
      },
      {
        "id": "Artistic interests",
        "name": "Artistic interests",
        "percentage": 0.28,
        "category": "personality",
        "size": 1
      },
      {
        "id": "Emotionality",
        "name": "Emotionality",
        "percentage": 0.22,
        "category": "personality",
        "size": 1
      },
      {
        "id": "Imagination",
        "name": "Imagination",
        "percentage": 0.84,
        "category": "personality",
        "size": 1
      },
      {
        "id": "Intellect",
        "name": "Intellect",
        "percentage": 0.88,
        "category": "personality",
        "size": 1
      }
    ]
  }
}
```

## Json output

```
1 userid, xxxx@enron.com,
2 sourceid,enron,
3 Agreeableness,0.10850128028436584,
4 Altruism, 0.10850128028436584,
5 Cooperation, 0.19548073381498007,
6 Modesty, 0.9616805925790718,
7 Morality, 0.027793202998213792,
8 Sympathy, 0.3839485289224775,
9 Trust, 0.9498054425868085,
10 Achievement, 0.8721325714198523,
```

## Applications

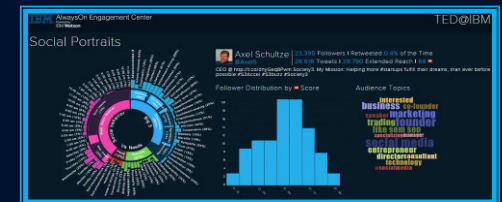
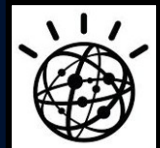
SPSS, Unica, Cognos, Kenexa



### Interactive Visualizations



### Watson Ecosystem



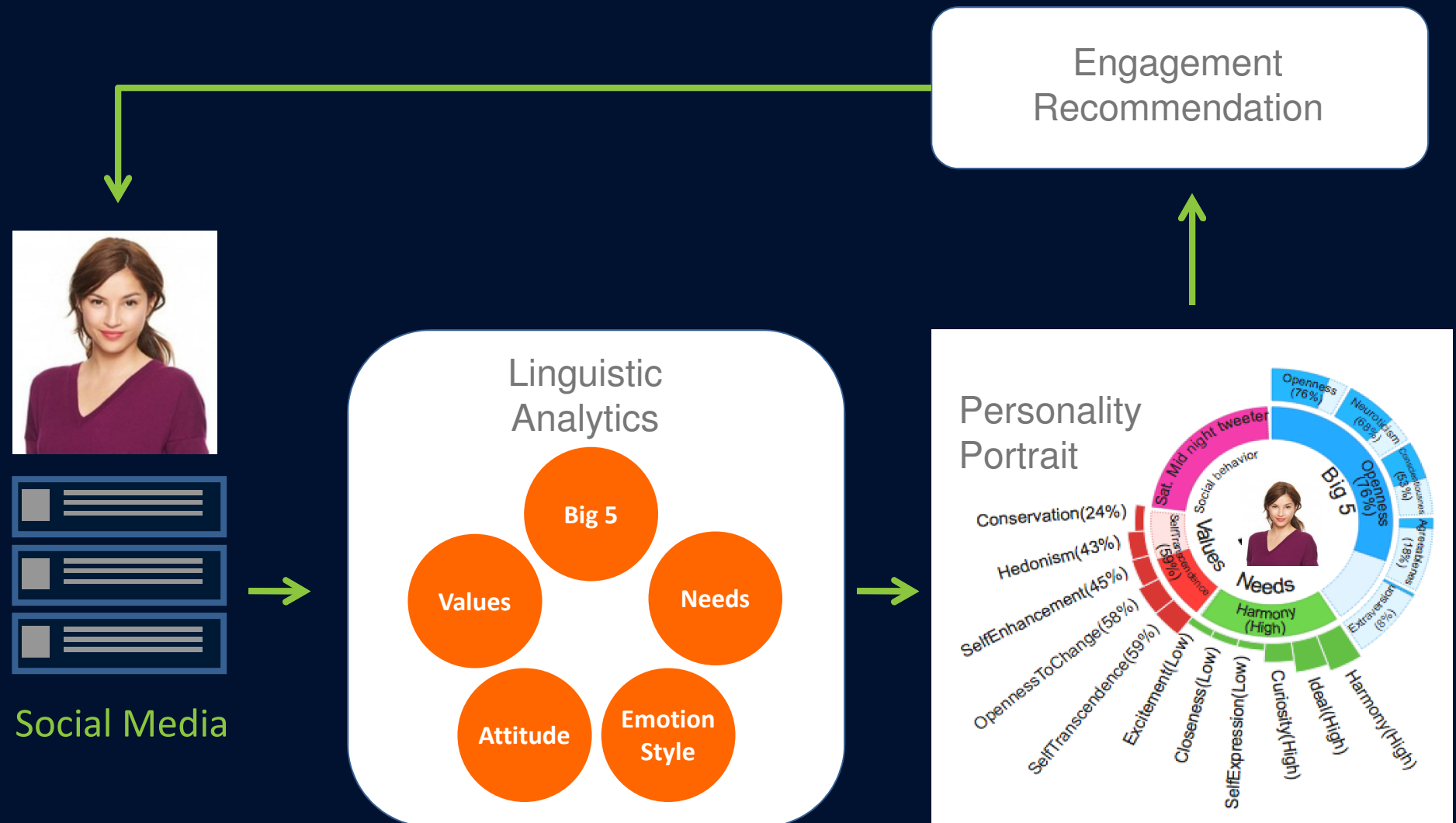
### Hybrid Mobile App



### Mobile Web



# Personality Insights in a Nutshell



# Watson has been trained to be an Analyst



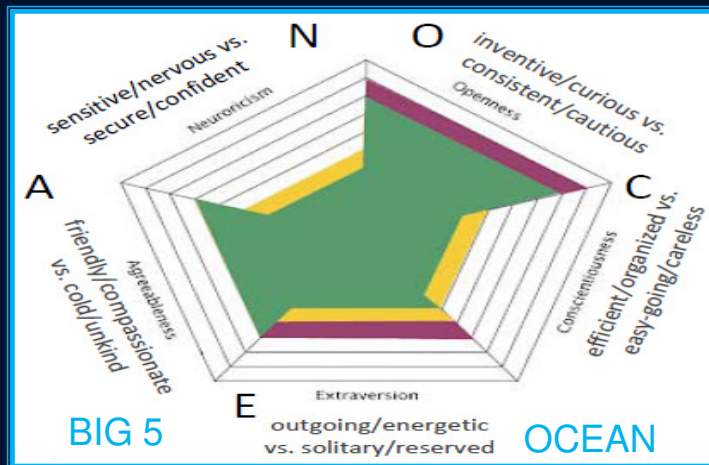
- **Performs complex linguistic analytics**



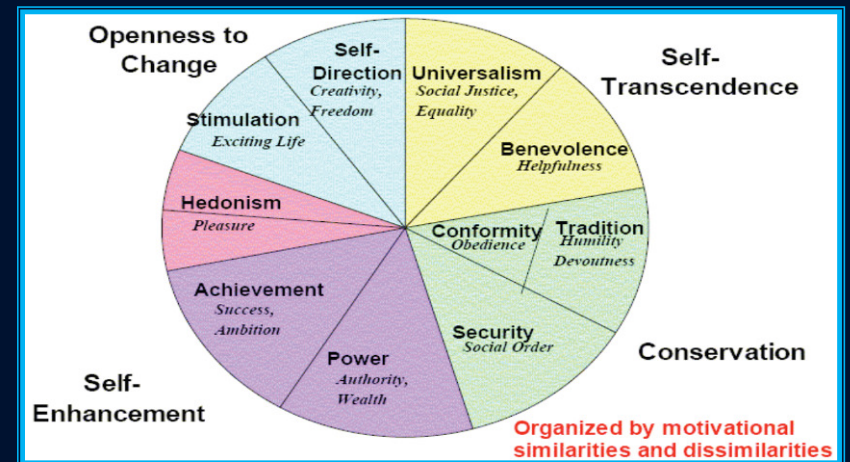
- **Analyzes hundreds of millions of documents in seconds, from social media and other enterprise sources**  
Hundreds of millions of people leave media "footprints" within social media text
- **Evaluate groups (segmentation) or individuals**
- **Also adapts text to portray a specific personality**

# Discovering with Personality Insights

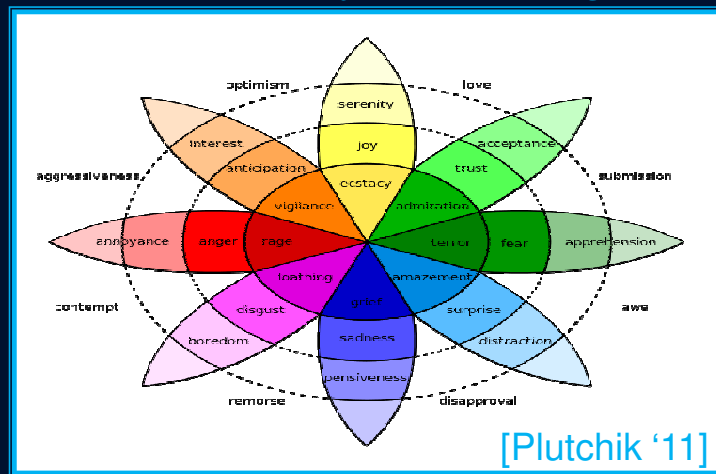
## Discovering Characteristics



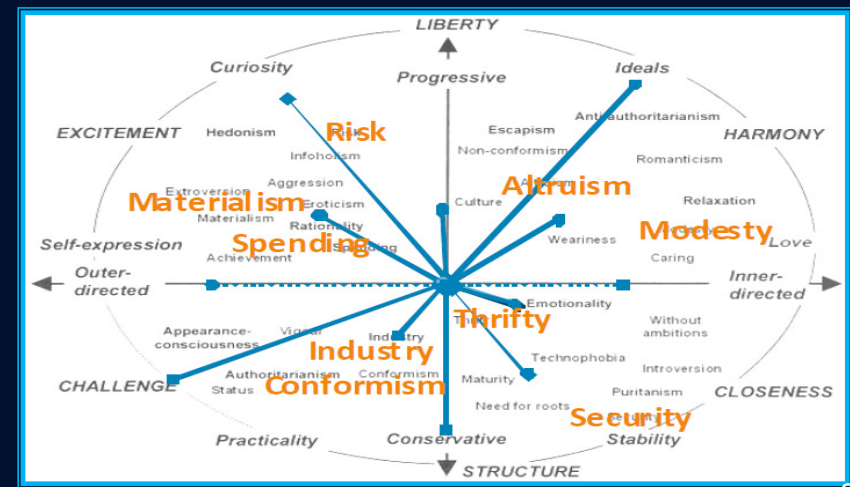
## Basic Human Values



## Emotional Style Modeling



## Fundamental Human Needs

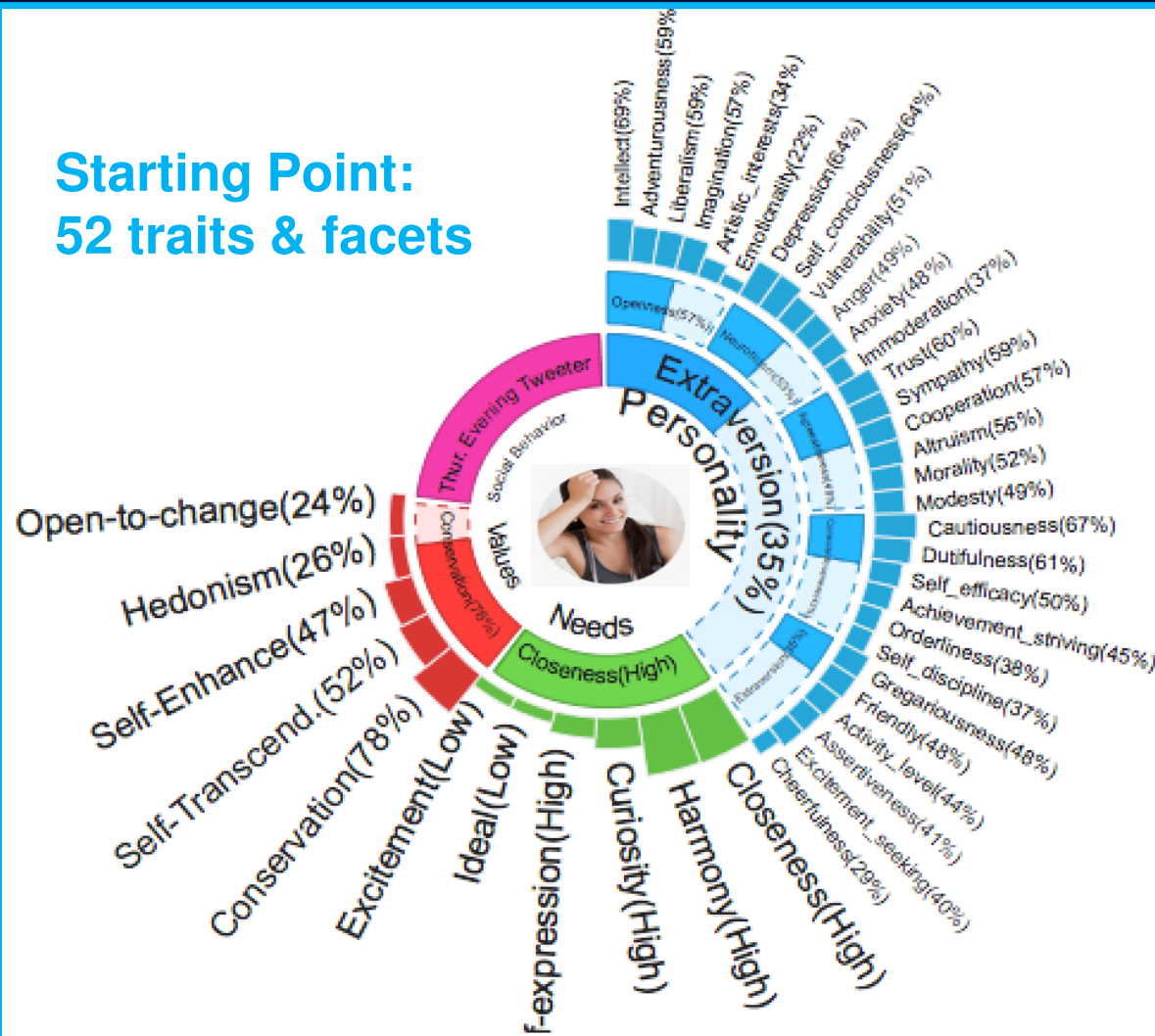




# Example of a Customer Portrait



Starting Point:  
52 traits & facets



API output in JSON

```
{
  "tree": {
    "id": "r",
    "name": "root",
    "children": [
      {
        "id": "personality",
        "name": "Big 5",
        "children": [
          {
            "id": "openness_parent",
            "name": "Openness",
            "percentage": 0.83,
            "category": "personality",
            "children": [
              {
                "id": "openness",
                "name": "Openness",
                "percentage": 0.83,
                "category": "personality",
                "children": [
                  {
                    "id": "Adventurousness",
                    "name": "Adventurousness",
                    "percentage": 0.66,
                    "category": "personality",
                    "size": 1
                  },
                  {
                    "id": "Artistic interests",
                    "name": "Artistic interests",
                    "percentage": 0.28,
                    "category": "personality",
                    "size": 1
                  },
                  {
                    "id": "Emotionality",
                    "name": "Emotionality",
                    "percentage": 0.22,
                    "category": "personality",
                    "size": 1
                  },
                  {
                    "id": "Imagination",
                    "name": "Imagination",
                    "percentage": 0.84,
                    "category": "personality",
                    "size": 1
                  },
                  {
                    "id": "Intellect",
                    "name": "Intellect",
                    "percentage": 0.88,
                    "category": "personality",
                    "size": 1
                  }
                ]
              }
            ]
          }
        ]
      }
    ]
  }
}
```



## Benefits of Watson Cognitive Services to End User

---



- Understands me
- Engages me
- Learns and improves over time
- Helps me discover
- Establishes trust
- Has endless capacity for insight
- Operates in a timely fashion on  
big volumes of data (noisy social media)
- Provides to you only the most relevant information