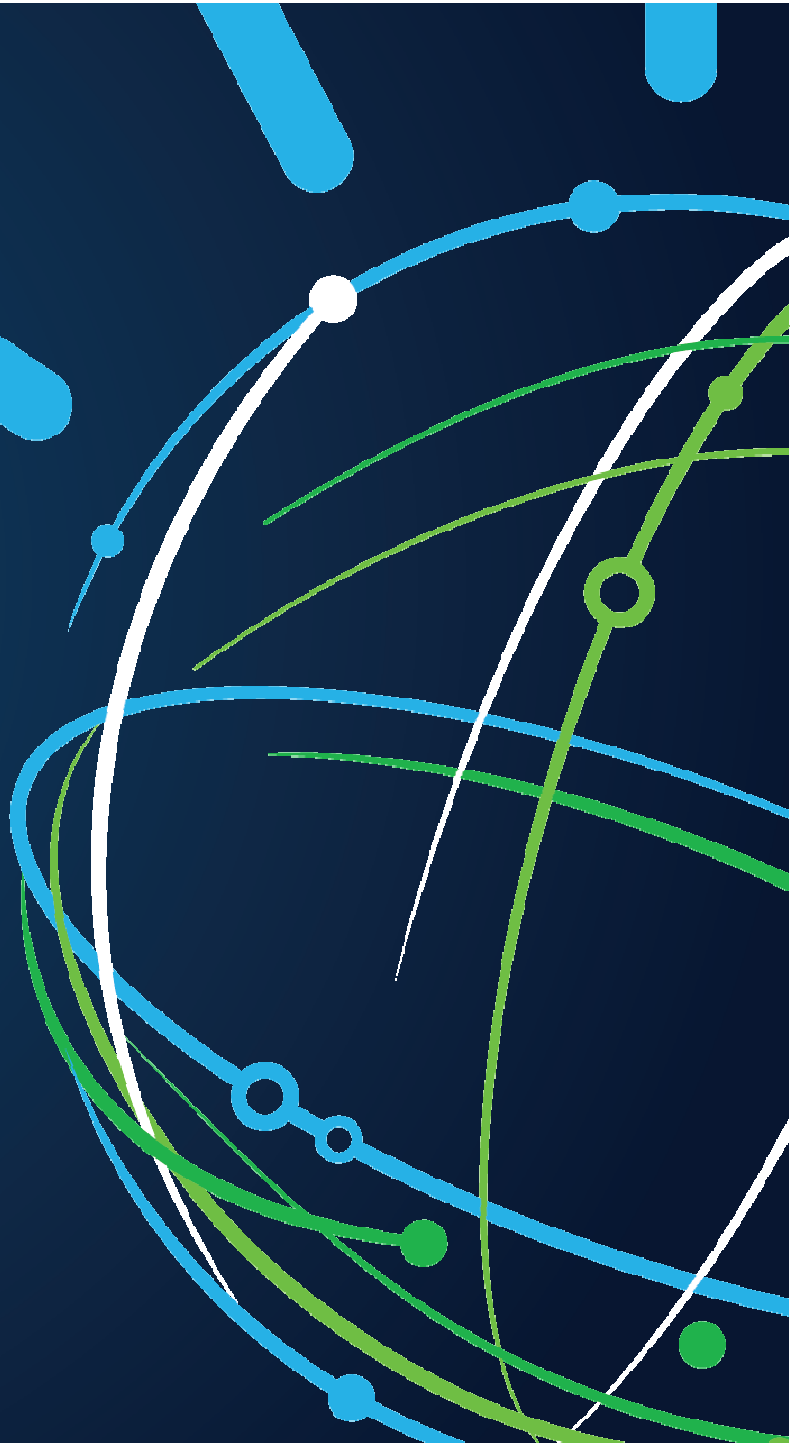
Mobile Cloud with Watson Services

Leveraging cognitive computing and social media data from the mobile cloud

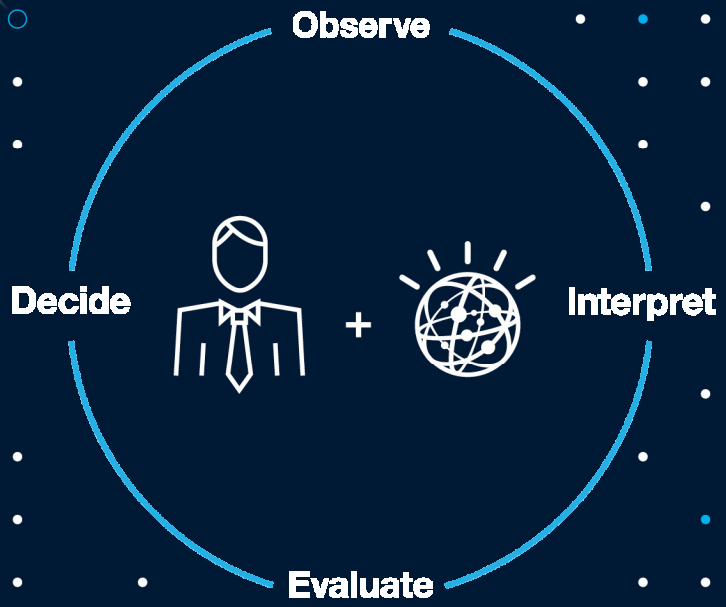
Eco System Development



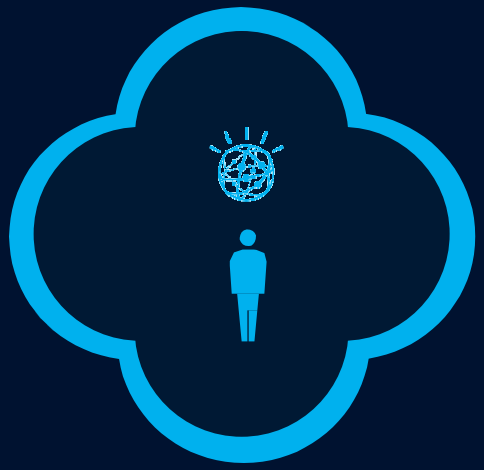
IBM

What is Watson ?

To understand Watson, we need to understand cognitive computing

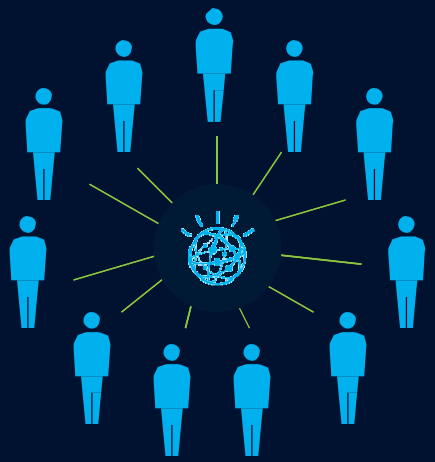


Benefits of Watson on the Cloud Infrastructure



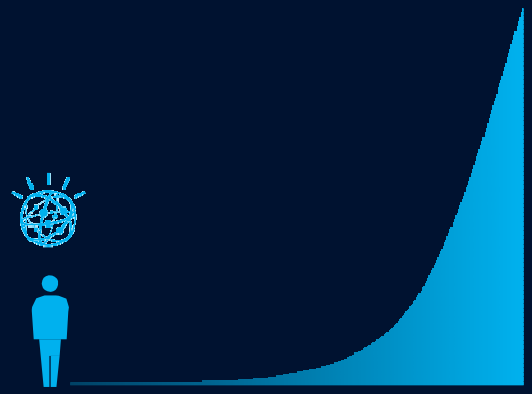
Enhance

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

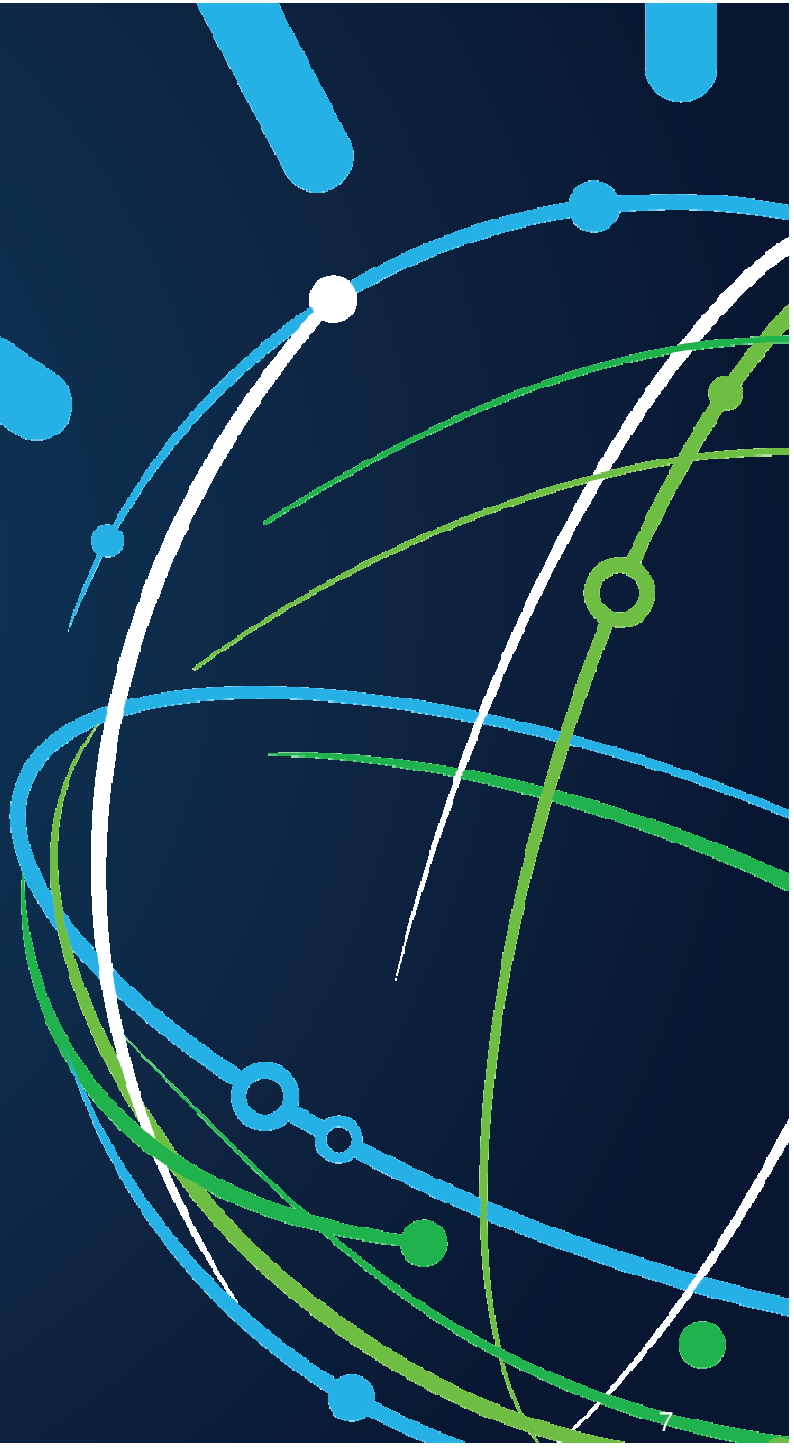
North America

Accessible by anyone with a Bluemix account

Release in Beta and gather input from user community

Global

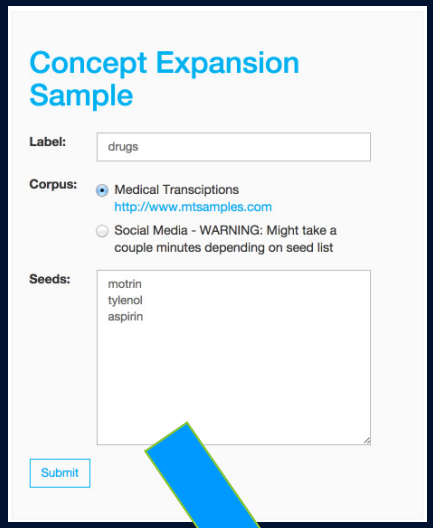
Watson Services in Bluemix



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.



Ouput:

Prevalence	Result
24	multivitamin daily , aspirin
19	tricor 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

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

```
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 coudn't be expanded");
}
```

Concept Expansion

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try {
        cet.setUsernameAndPassword(..,..);
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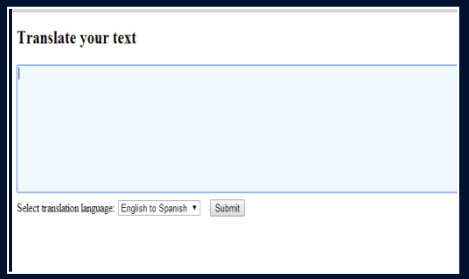
        System.out.println("The concept coudn't be expanded");
}
```

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

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

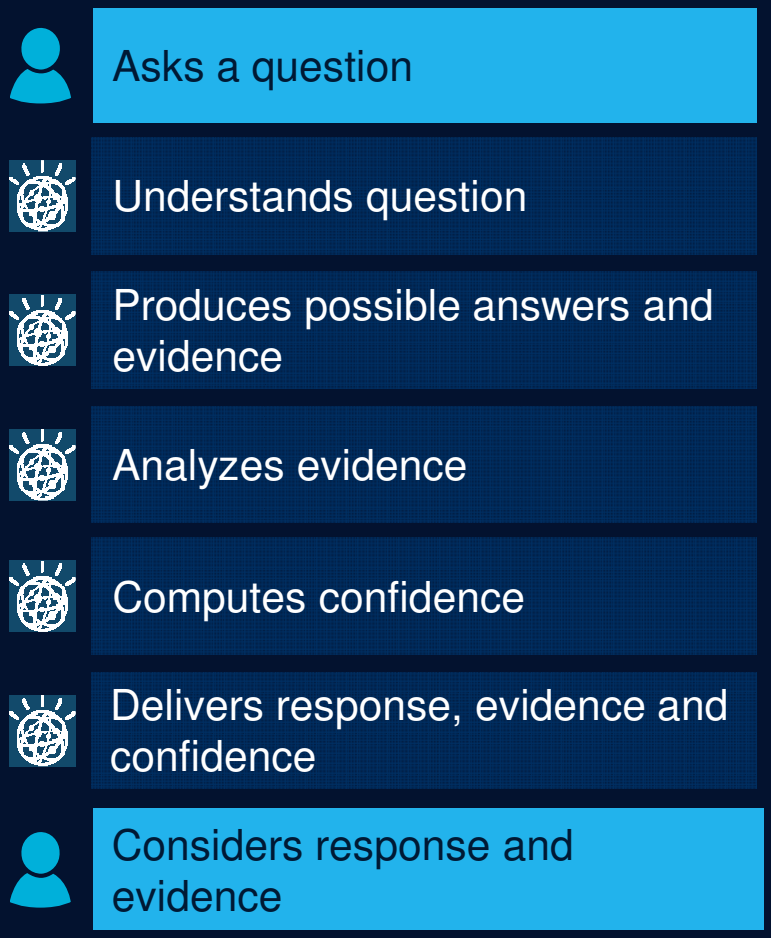
How does it work?

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?



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?

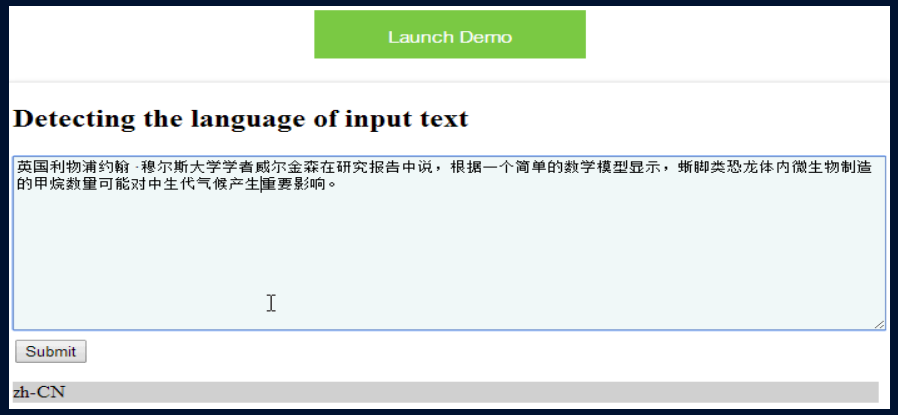
Identifies the language in which text is written

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.



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

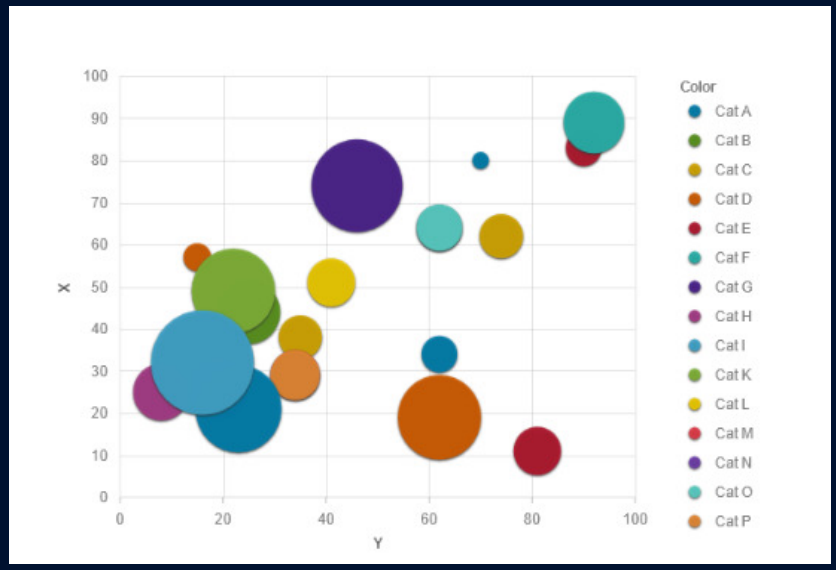
```
PersonalityInsights pit = new PersonalityInsights();
 String realstring = "";
try {
        pit.setUsernameAndPassword(.. , .. ); pit.setEndPoint( .. );
        String str = "TXT TO BE ANALYSED,"; //typically from file/url
        InputStream is = new ByteArrayInputStream(str.getBytes() );
        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

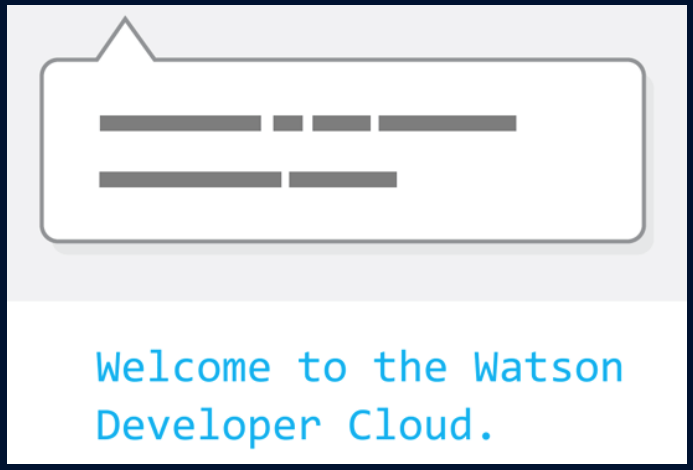
Speech to Text

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.

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.

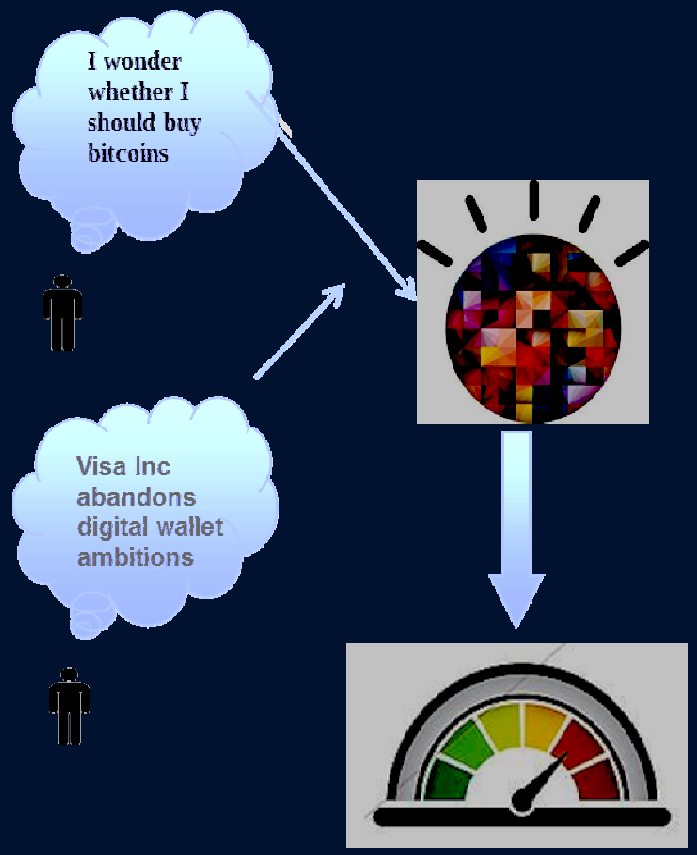
Concept Insights

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

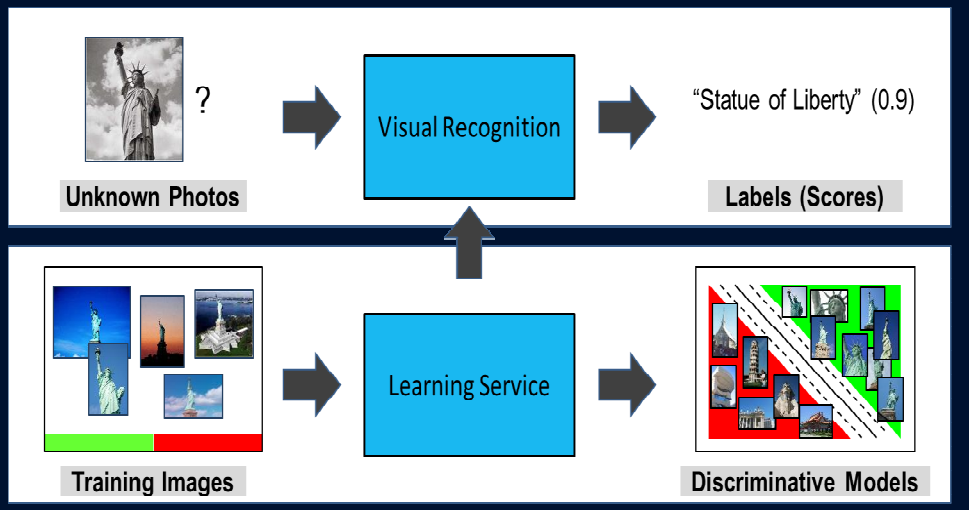
Visual Recognition

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.



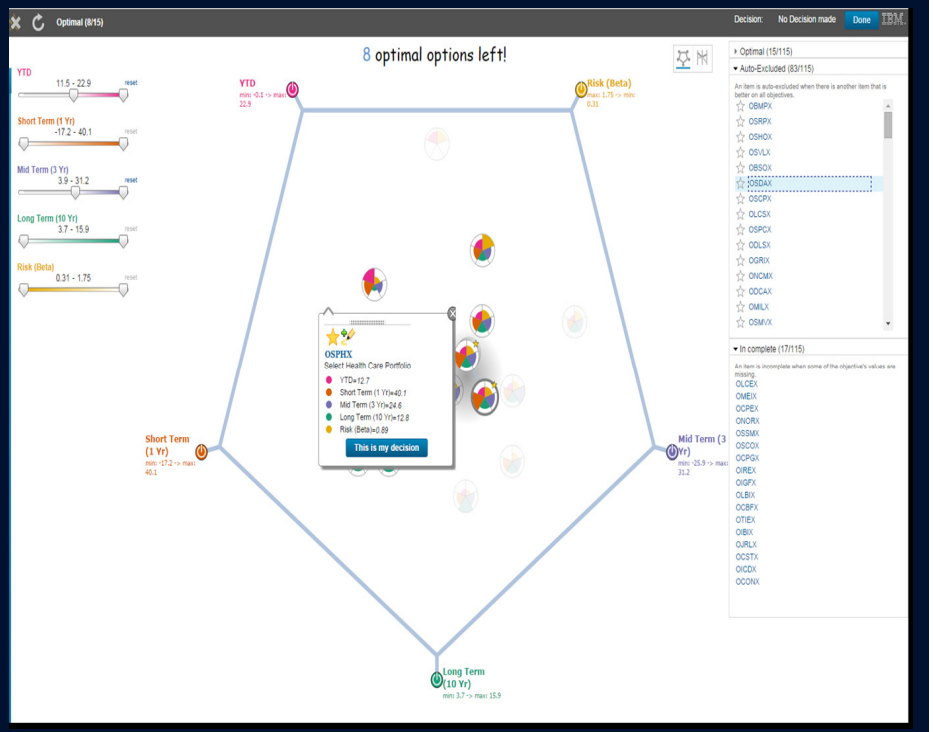
Example Use Cases

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

Tradeoff Analytics

What is it?

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



How does it work?

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.

Use Cases

- 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_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
          },
```


Json output

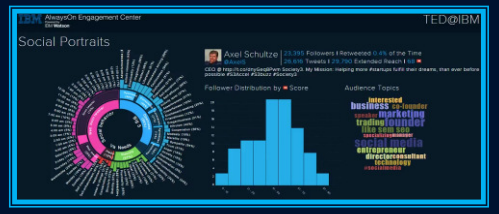

```
1 userid,  xxxx@enron.com,
2 sourceid,enron,
3 Agreeableness,0.10850128028436584,
4 Altruism, 0.10850128028436584,
5 Cooperation, 0.19548073381498007,
6 Modesty, 0.9616805925790718,
7 Morality, 0.027793202998213792,
8 Sympathy, 0.3839485289224775,
9 Trust, 0.9498054425868085,
10 Achievement, 0.8721325714198523,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


Applications

SPSS, Unica, Cognos, Kenexa

Interactive Visualizations

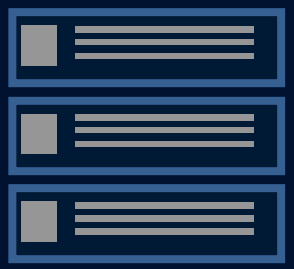
Watson Ecosystem



Hybrid Mobile App

Mobile Web

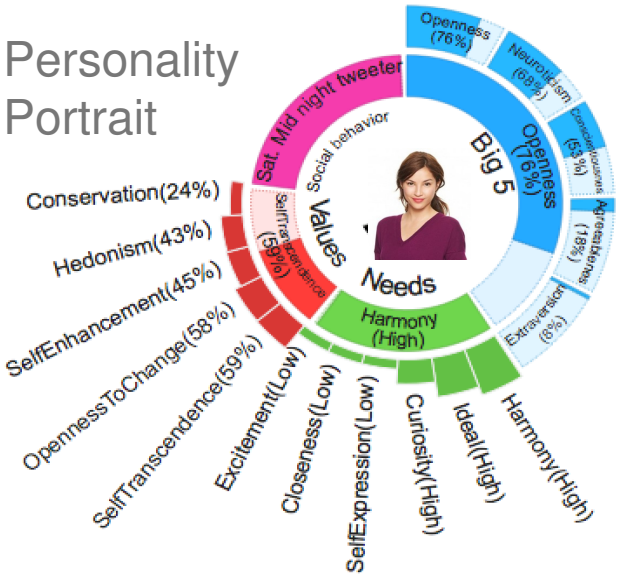
Personality Insights in a Nutshell



Social Media

Linguistic Analytics

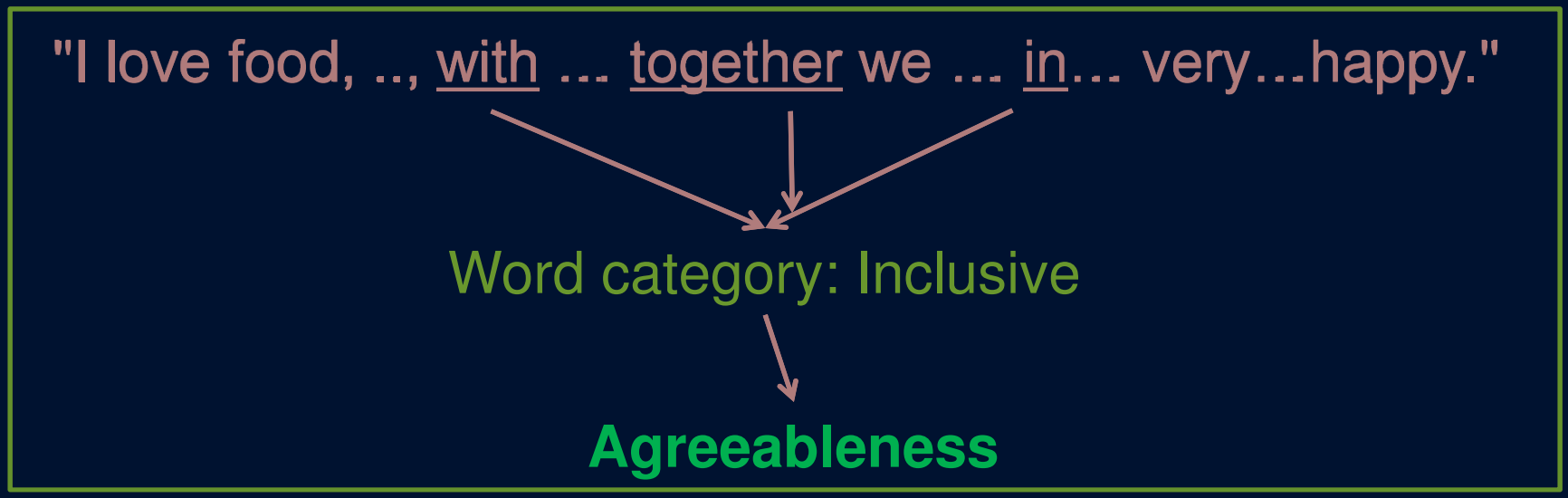
Personality Portrait



Engagement Recommendation

Watson has been trained to be an Analyst

- **Performs complex linguistic analytics**

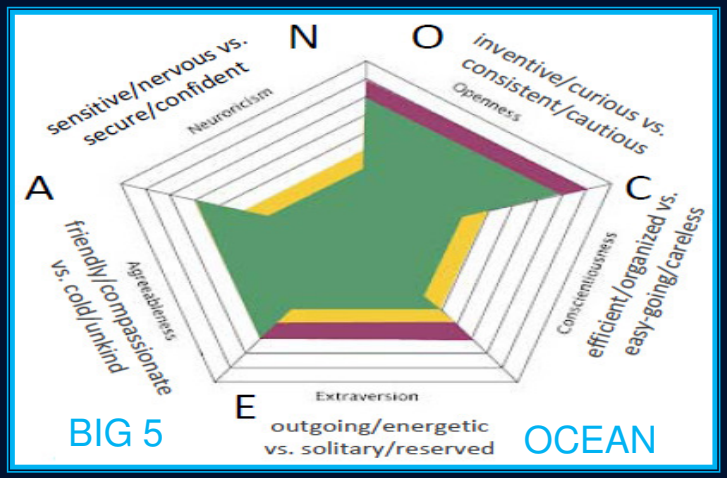


- **Analyzes hundreds of millions of documents in seconds, from social media and other enterprise sources**

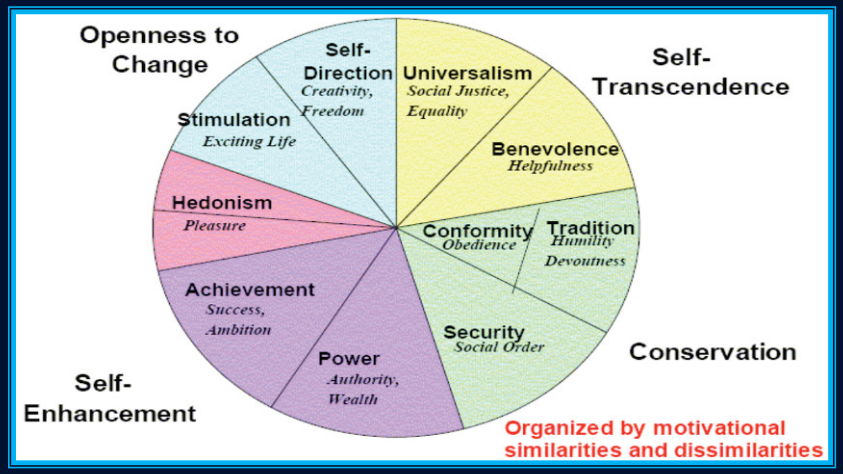
  Hundreds of millions of people leave media "footprints" within social media text
- **Evaluate groups (segmentation) or individuals**
- **Also adapts text to portray a specific personality**

Discovering with Personality Insights

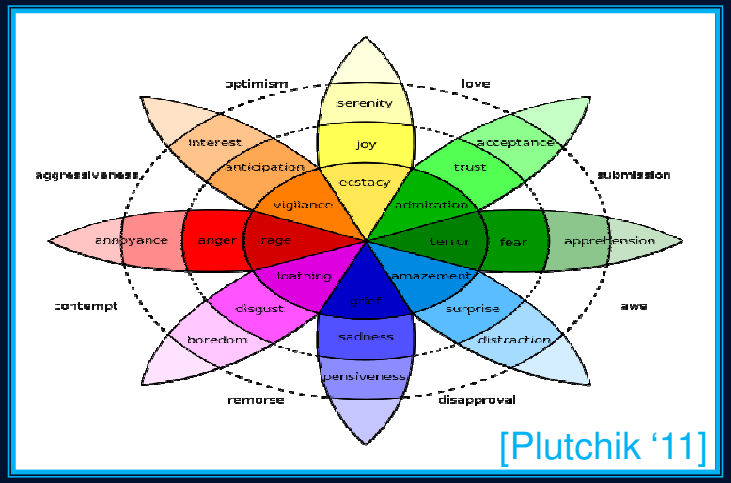
Discovering Characteristics



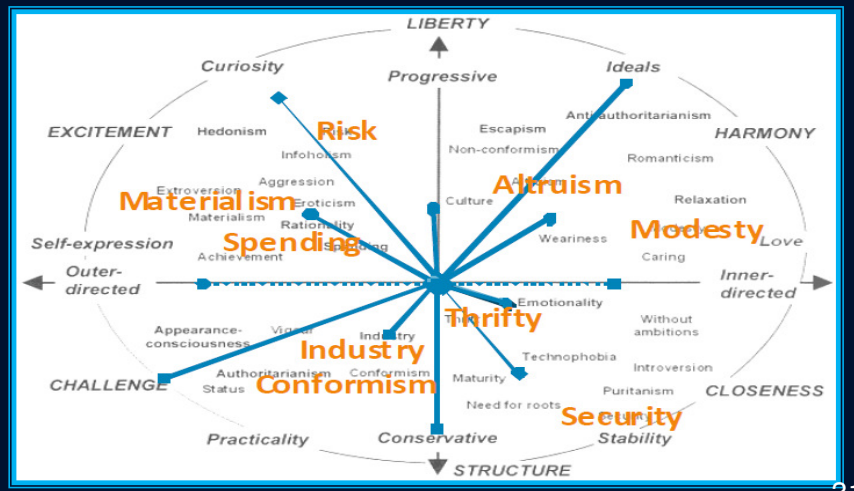
Basic Human Values



Emotional Style Modeling



Fundamental Human Needs



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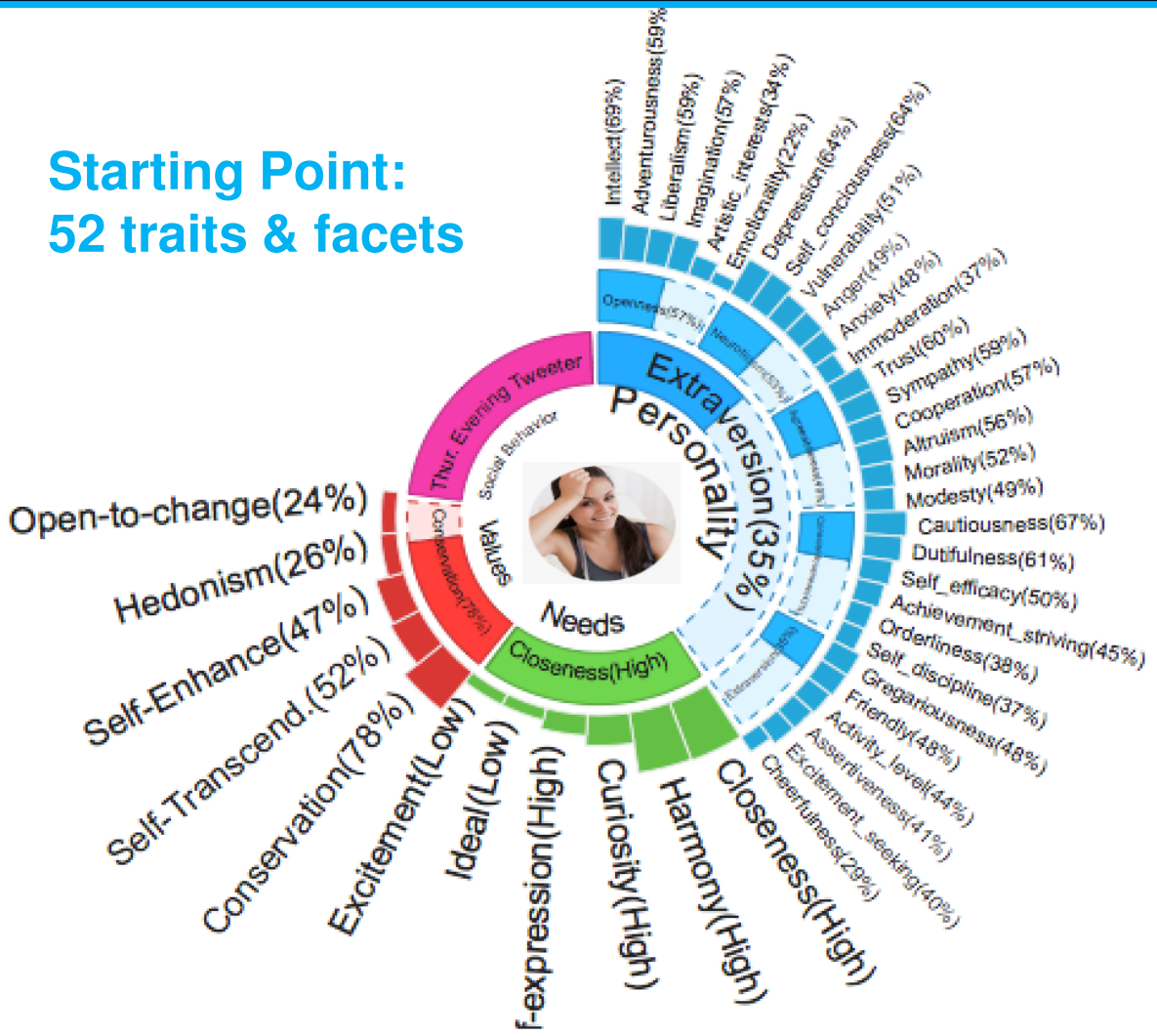
Example of a Customer Portrait

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

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