Cognitive Computing

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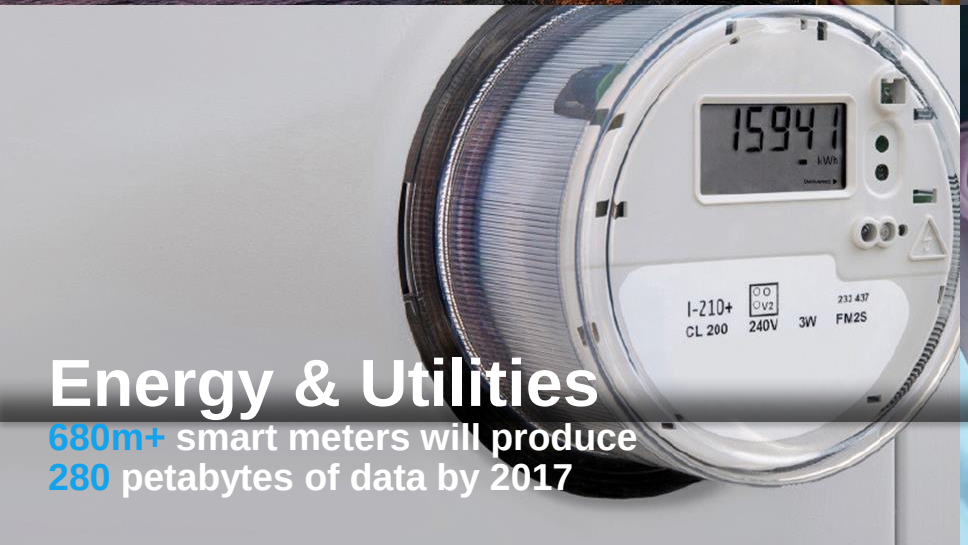
Oil & Gas

80,000 sensors in a facility
produce **15** petabytes of data

Public Safety

520 terabytes of data are produced
by New York City's surveillance cameras each day



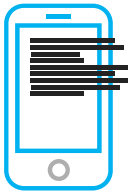
Energy & Utilities

680m+ smart meters will produce
280 petabytes of data by 2017

Healthcare

The equivalent of **300** million books of health
related data is produced per human in a lifetime

More devices are creating more information.



1,200,000

lines of code in a smartphone

80,000

lines of code in a pacemaker

100,000,000

lines of code in a new car

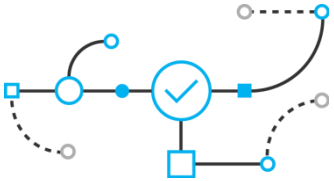
5,000,000

lines of code in smart appliance

Three capabilities differentiate cognitive systems from traditional programmed computing systems…

Understanding

Cognitive systems understand like humans do.



Reasoning

They reason. They understand underlying ideas and concepts. They form hypothesis. They infer and extract concepts.

Learning

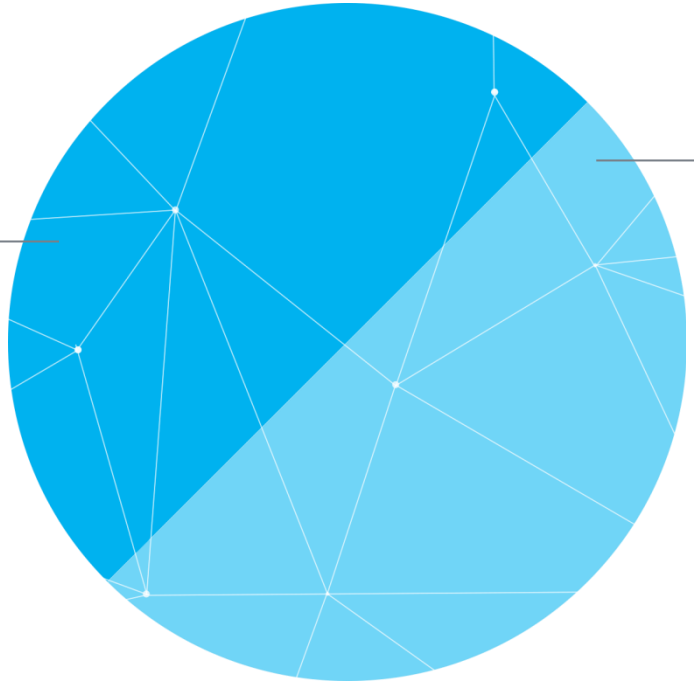
They never stop learning getting more valuable with time. Advancing with each new piece of information, interaction, and outcome. They develop “expertise”.

…. allowing them to interact with humans.

Cognitive systems forge a new partnership between man and machine.

Humans excel at:

Common Sense
Morals
Imagination
Compassion
Abstraction
Dilemmas
Dreaming
Generalization



Cognitive Systems excel at:

Locating Knowledge
Pattern Identification
Natural Language
Machine Learning
Eliminate Bias
Endless Capacity

As the Watson technology evolves and deepens, so are the ways it's being put to work in the world.

20
Industries

45
Countries

50,000
Students
in Melbourne

80K
Developers
building with Watson

500+
Partners
Powered by Watson

1.1M
Patients
at Bumrungrad

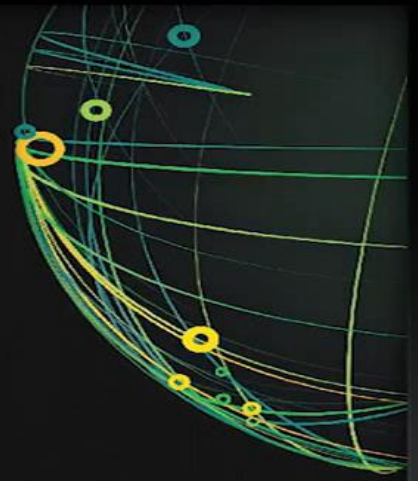
8
Languages
Learned by Watson

200
Universities
offering Watson courses

5.5M
Citizens
in Singapore

Bumrungrad
International
HOSPITAL

Preparation for Doctor's First Consultation with Patient



IBM WATSON

Memorial Sloan-Kettering Cancer Center

SoftBank
Robotics

Cognitive systems rely on collections of data and information:

Data, information, and expertise create the foundation.

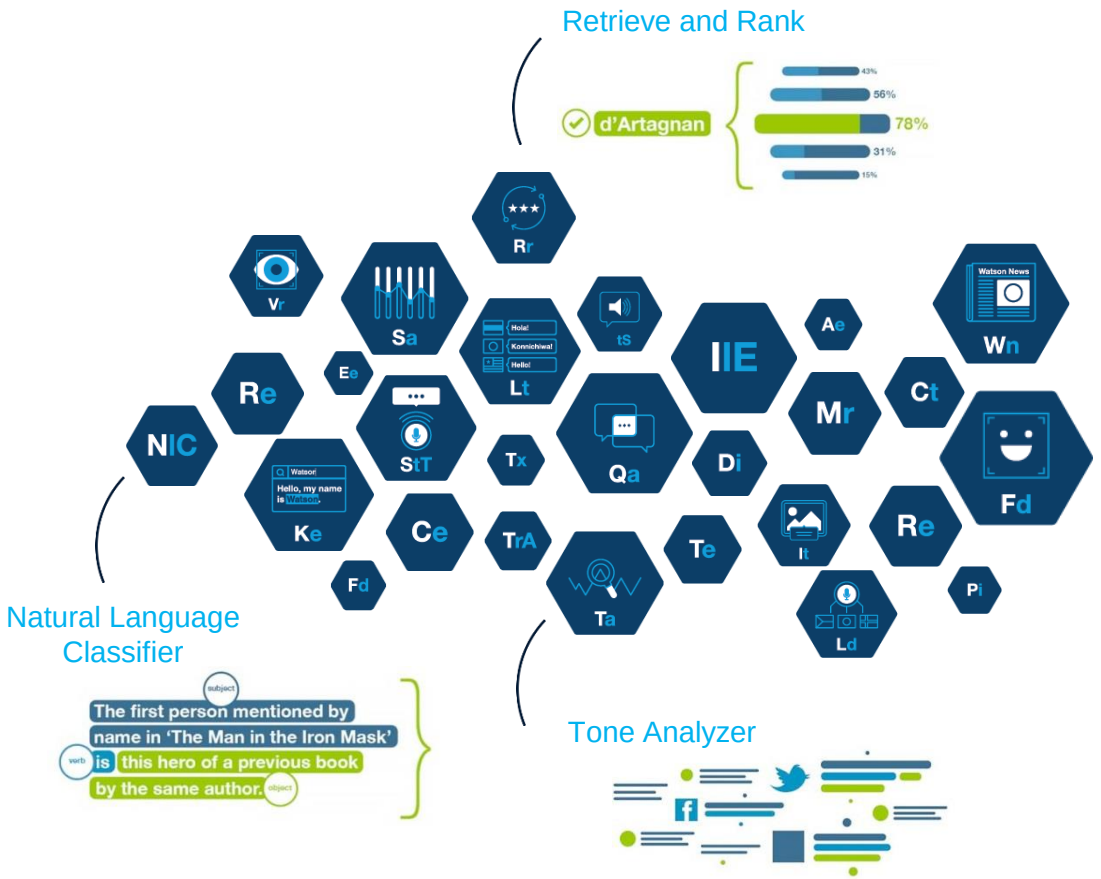
Examples include:

- Analyst reports
- tweets
- Wire tap transcripts
- Battlefield docs
- E-mails
- Texts
- Forensic reports
- Newspapers
- Blogs
- Wiki
- Court rulings
- International crime database
- Stolen vehicle data
- Missing persons data

Leverage Watson APIs to apply cognitive capabilities.

50 underlying technologies

Entity Extraction
Sentiment Analysis
Emotion Analysis (Beta)
Keyword Extraction
Concept Tagging
Taxonomy Classification
Author Extraction
Language Detection
Text Extraction
Microformats Parsing
Feed Detection
Linked Data Support
Concept Expansion
Concept Insights
Dialog
Document Conversion
Language Translation
Natural Language Classifier
Personality insights
Relationship Extraction
Retrieve and Rank
Tone Analyzer
Emotive Speech to Text
Text to Speech
Face Detection
Image Link Extraction
Image Tagging
Text Detection
Visual Insights
Visual Recognition
AlchemyData News
Tradeoff Analytics



Combine Watson APIs for higher value apps

Example: Interactive Q&A with greater understanding and personality

Speech to Text,
Text to Speech

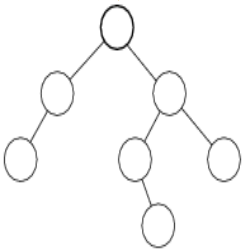
Phone, Text, Chat

How do I open an account?
Convert Speech to Text

Natural Language
Classifier

Identify Intent
-Intent = “Open_Account”
-Confidence: 0.876655900

Dialog



Dialog tree walks user to desired outcome
- Intent=“Open_Account” ”
- Context = “Online Banking”
- Dialog could call a DB or CMS

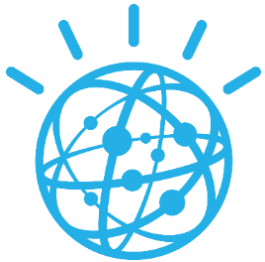
Watson for Engagement

State of the Art Virtual Assistant Capability

- Allows a natural language interaction with the customer
- Q&A, Chit-chat etc.

- Walks customers through business processes
- E.g. Application forms, password resets

- Detects emotional states
- Responds in appropriate ways



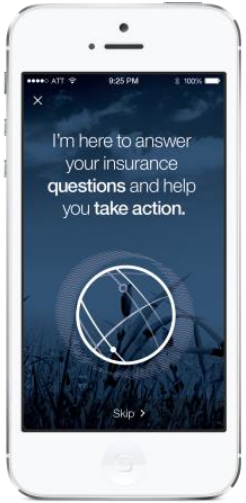
Market Leading Platform

- Cross-platform mobile and web experience

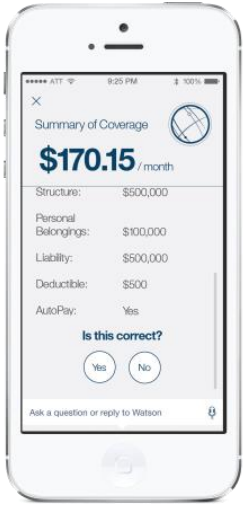
- New channels supported
- Partnerships with leading robotics manufacturers
- Robot SDK available

- Advanced Machine Learning capabilities

Watson for Engagement – An automated solution for customer engagement



Consumers can ask questions & get answers – at any time of day



Common business processes can be simplified and automated

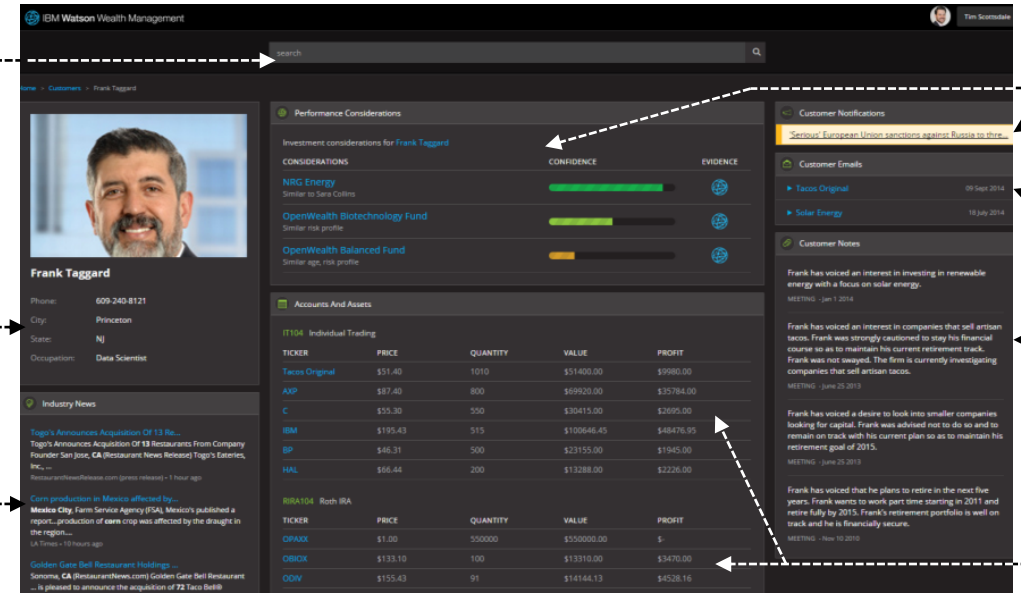
Watson is available on more than mobile devices

Watson Explorer: Unified information application using Watson Developer Cloud services

User's search can be submitted to Watson Question Answering service simultaneously

Client data from cloud and enterprise systems (CRM, DBMS, etc.)

News highlighted with Watson Relationship Extraction service



Recommendations and alerts based on structured and unstructured content

Customer e-mails from corporate email system

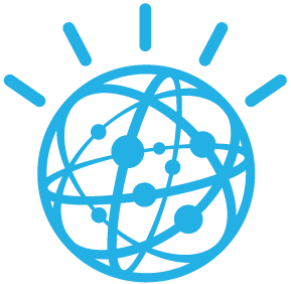
Client notes from CRM

Account holdings from systems of record

Watson Explorer's content analytics creates actionable data from unstructured content

Unstructured content

Commander 4.0 Cu. Ft. 26-Cycle King-Size **washer** – **white**. I hate this machine. Have had 3 calls on machine. You can't wash **large items**, Won't clean in the middle. **Leaves dry spots** through the clothes, I can only do **½ basket** of clothes. Will **not clean** or **mix bleach** in with the water...



Watson Explorer
Deep natural-language analysis

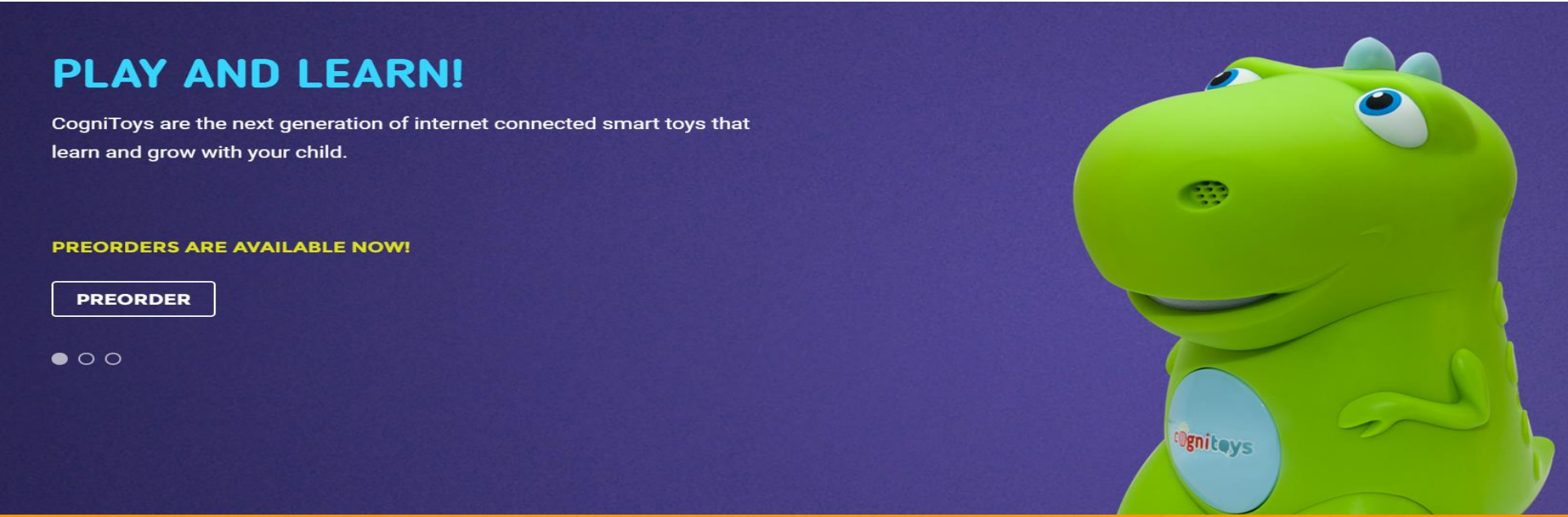
Structured data for analysis

Product	**Commander**
Category	**4.0 Cu. Ft.**
Size	**26-Cycle King-Size**
Model	**washer**
Color	**white**
Issue	**large items**
Issue	**leaves dry spots**
Issue	**½ basket**
Issue	**not clean**
Issue	**mix bleach**

CogniToys

Meet the CogniToys Dino

https://cognitoys.com/



What will you do with Watson?