

Cognitive Era

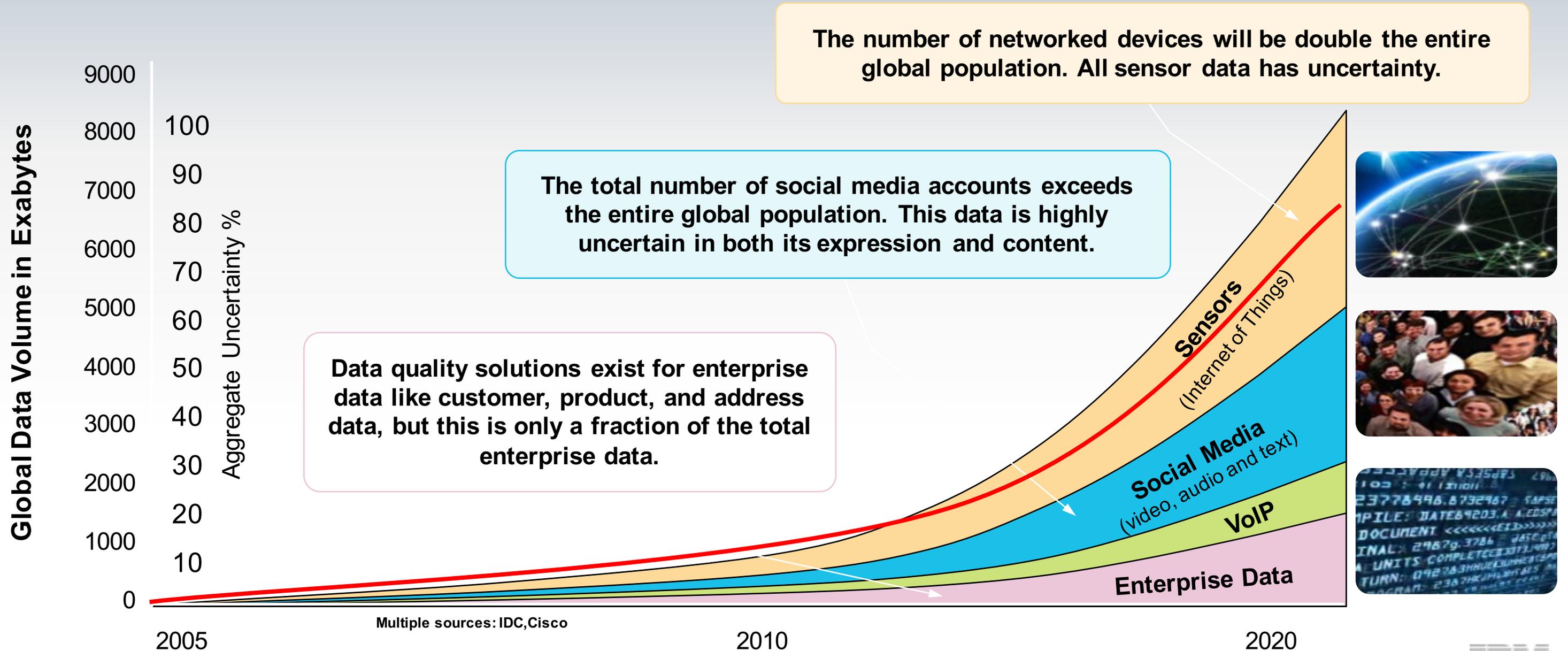
Mike Starkey

Distinguished Engineer

CTO and VP, IBM Central & Eastern Europe

Data is growing exponentially and demands new approaches (technology and strategy)

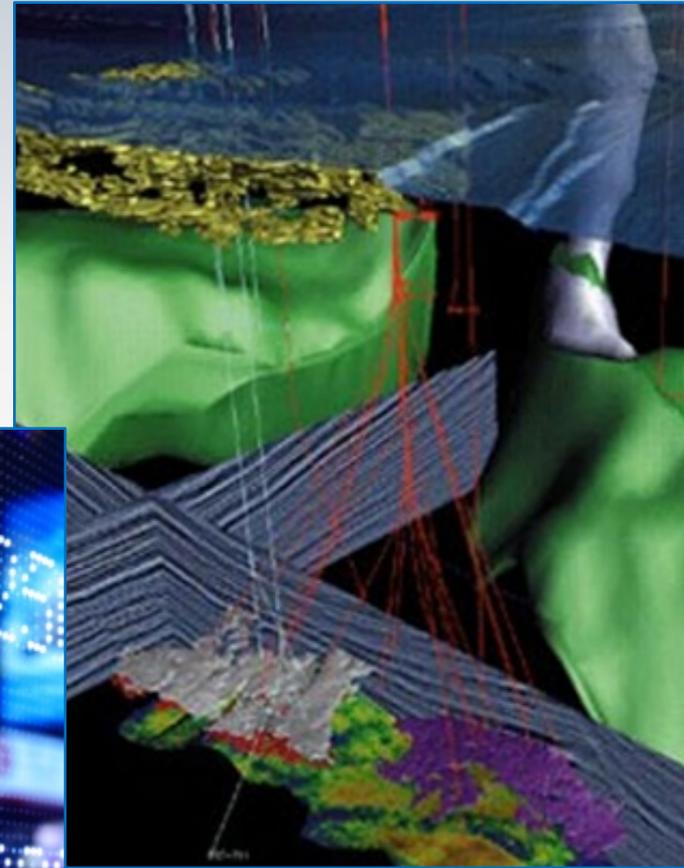
More than 80% of all available data will be uncertain



Data is the new basis of competitive value



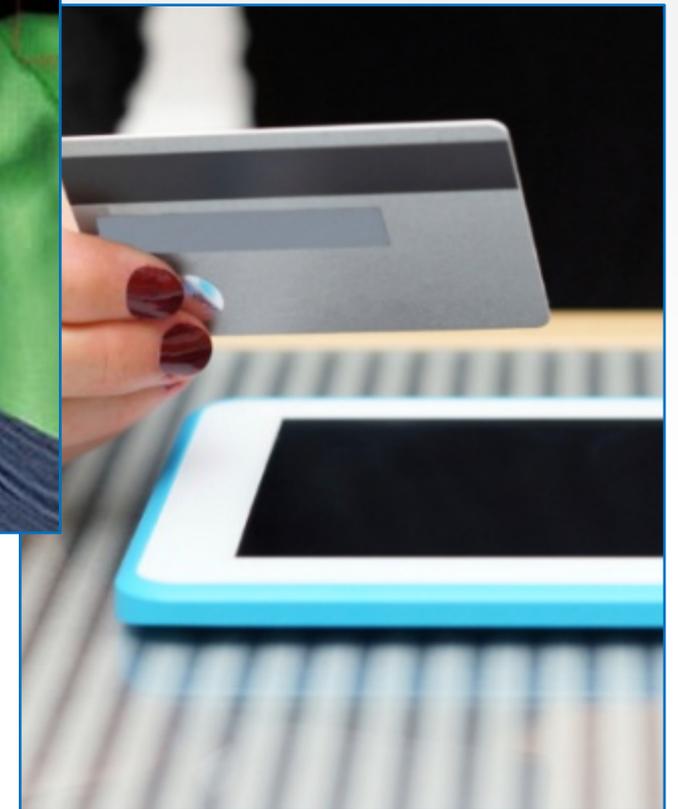
Healthcare



Oil & Gas

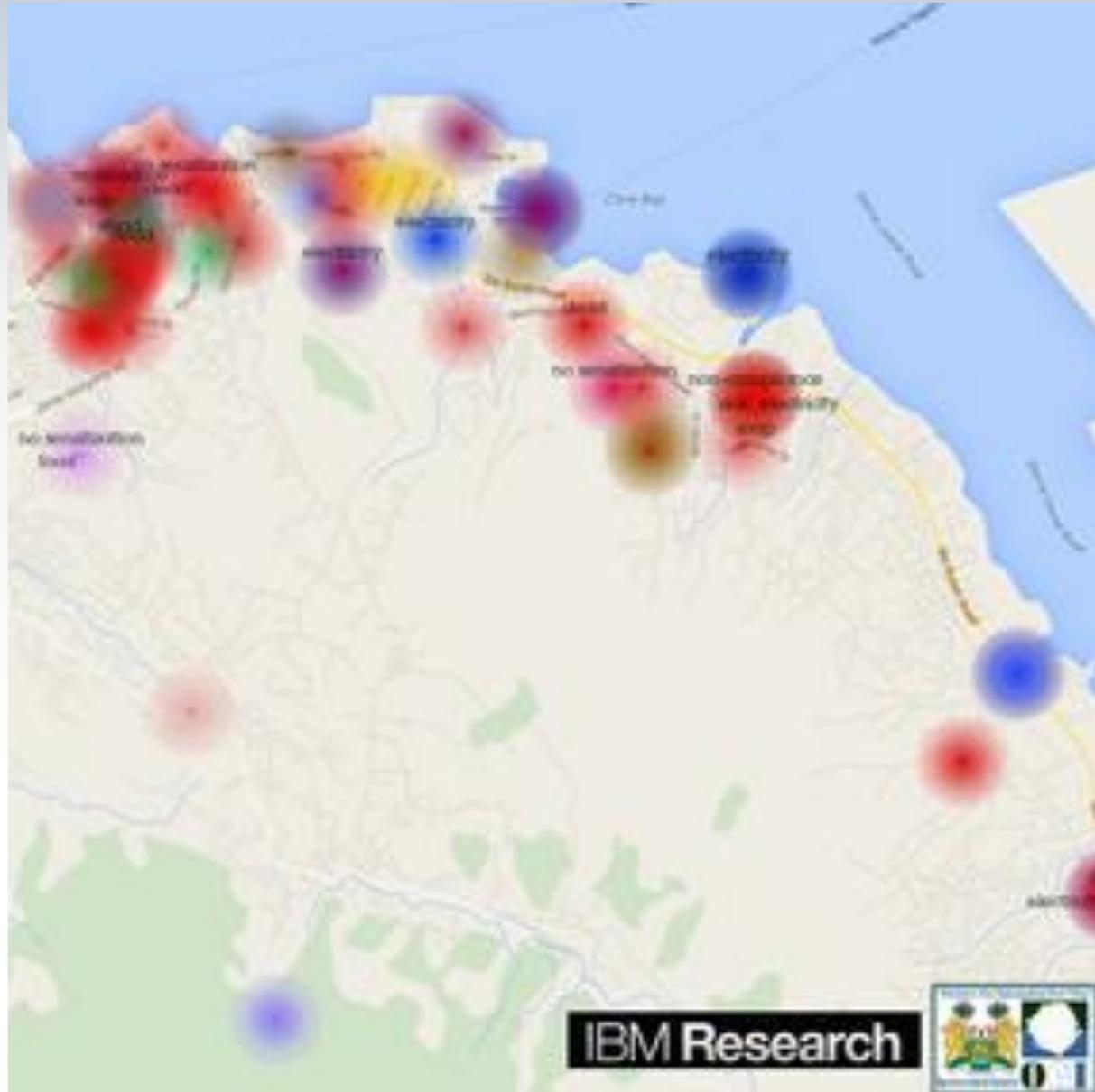


Banking



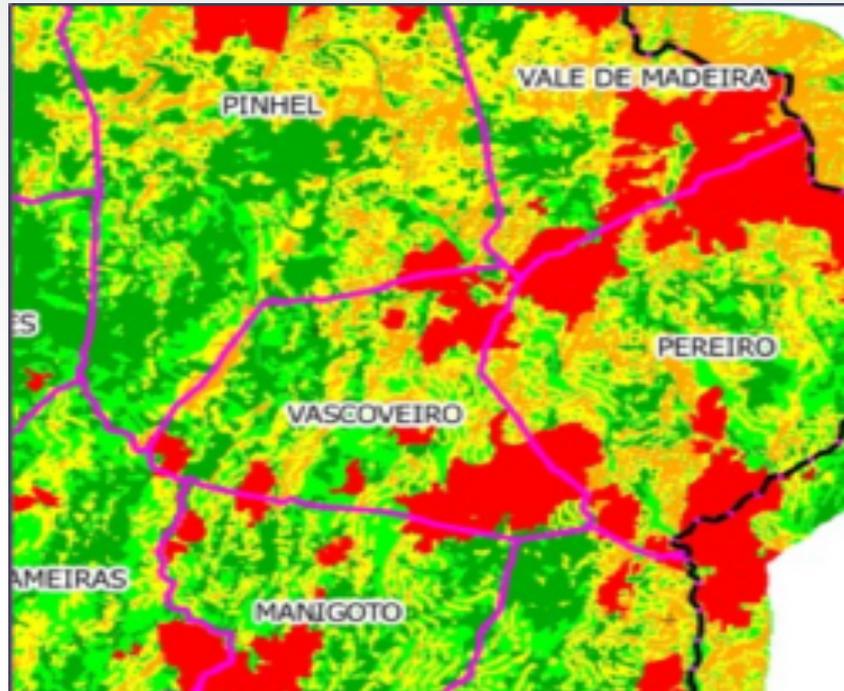
Retail

Transforming Epidemiology: Social media data helps detect and forecast disease outbreaks



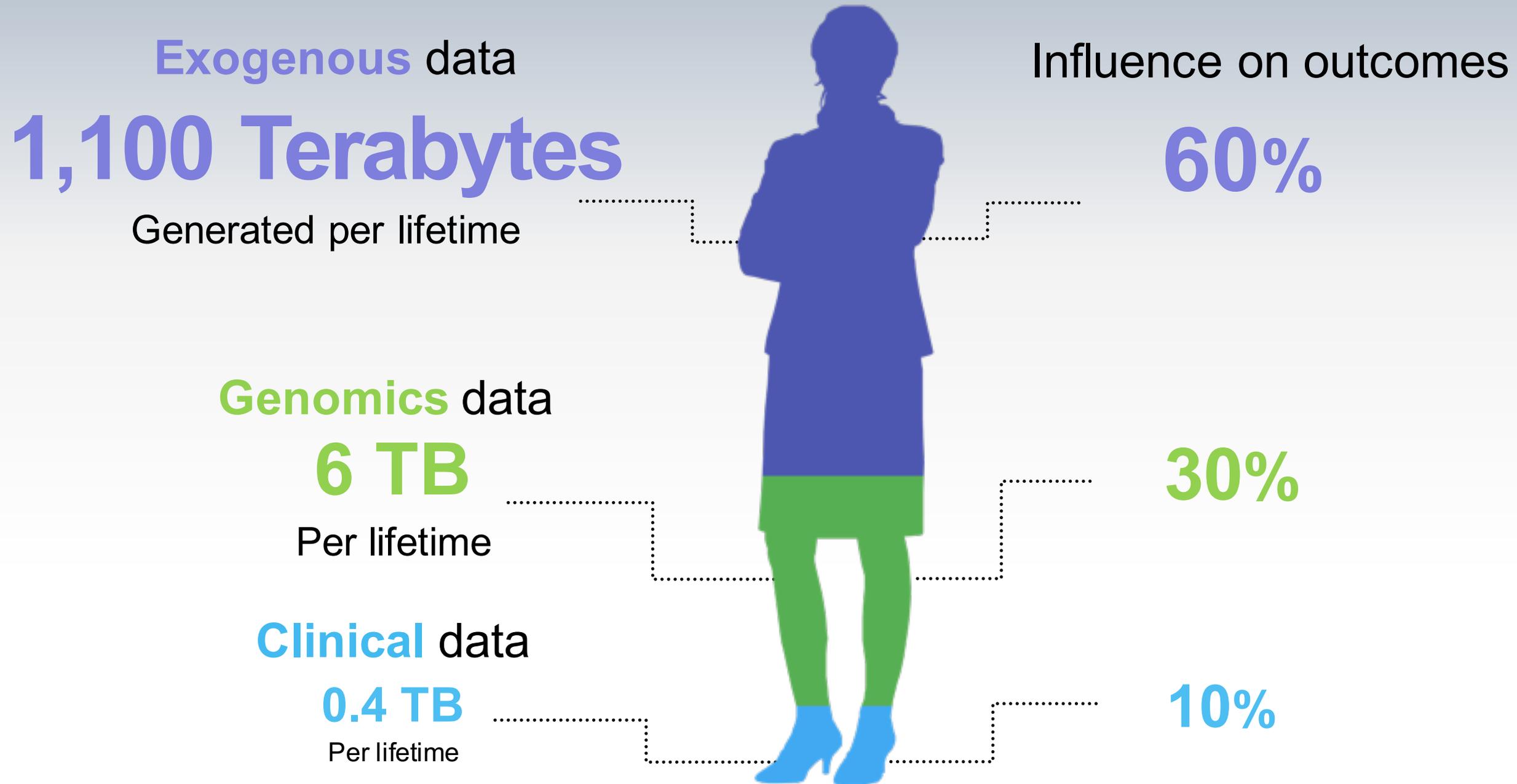
- Ability to understand disease progression across wide regions
- Individuals post outbreak incidents and aggregated information can help draw disease progression maps

Transforming Insurance: Spatio-temporal data for hazard insurance models



- Climate data key for predicting hazards
- Historical geospatial data on floods and other hazards used to build better models for predicting hazard insurance policies

Rapid growth of exogenous data is transforming healthcare



Source: "The Relative Contribution of Multiple Determinants to Health Outcomes", Lauren McGover et al., *Health Affairs*, 33, no. 2 (2014)



Uncertain data

Computer programs are natively explicit, fast and exacting in their calculation over numbers and symbols....
But Natural Language is implicit. highly contextual, ambiguous and often imprecise.

Structured

Person	Birth Place
A. Einstein	ULM

- Where was X born?

One day, from among his city views of Ulm, Otto chose a water color to send to Albert Einstein as a remembrance of Einstein's birthplace.

Unstructured

What company did X run?

If leadership is an art then surely Jack Welch has proved himself a master painter during his tenure at GE.

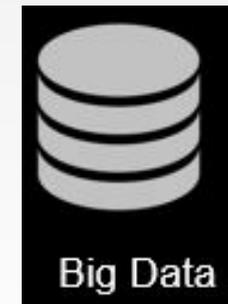
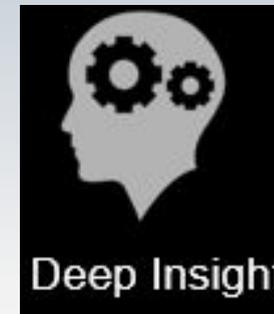
Person	Organization
J. Welch	GE

Cognitive Systems

Cognitive computing is the simulation of human thought processes in a computerized model

- **Adaptive**
- **Interactive** (Expert system)
- **Natural language processing**
- **Iterative and Stateful**
- **Contextual**
- **Reasoning capability**
- **Machine Learning (AI)**
- **Fast** (Real time)
- **Need a lot of data**

Cognitive Computing



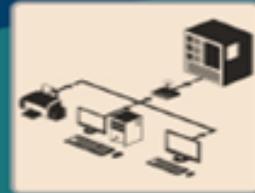
Cognitive computing systems learn and interact naturally with people to extend what either humans or machine could do on their own

Eras of Computing

Tabulating Systems Era



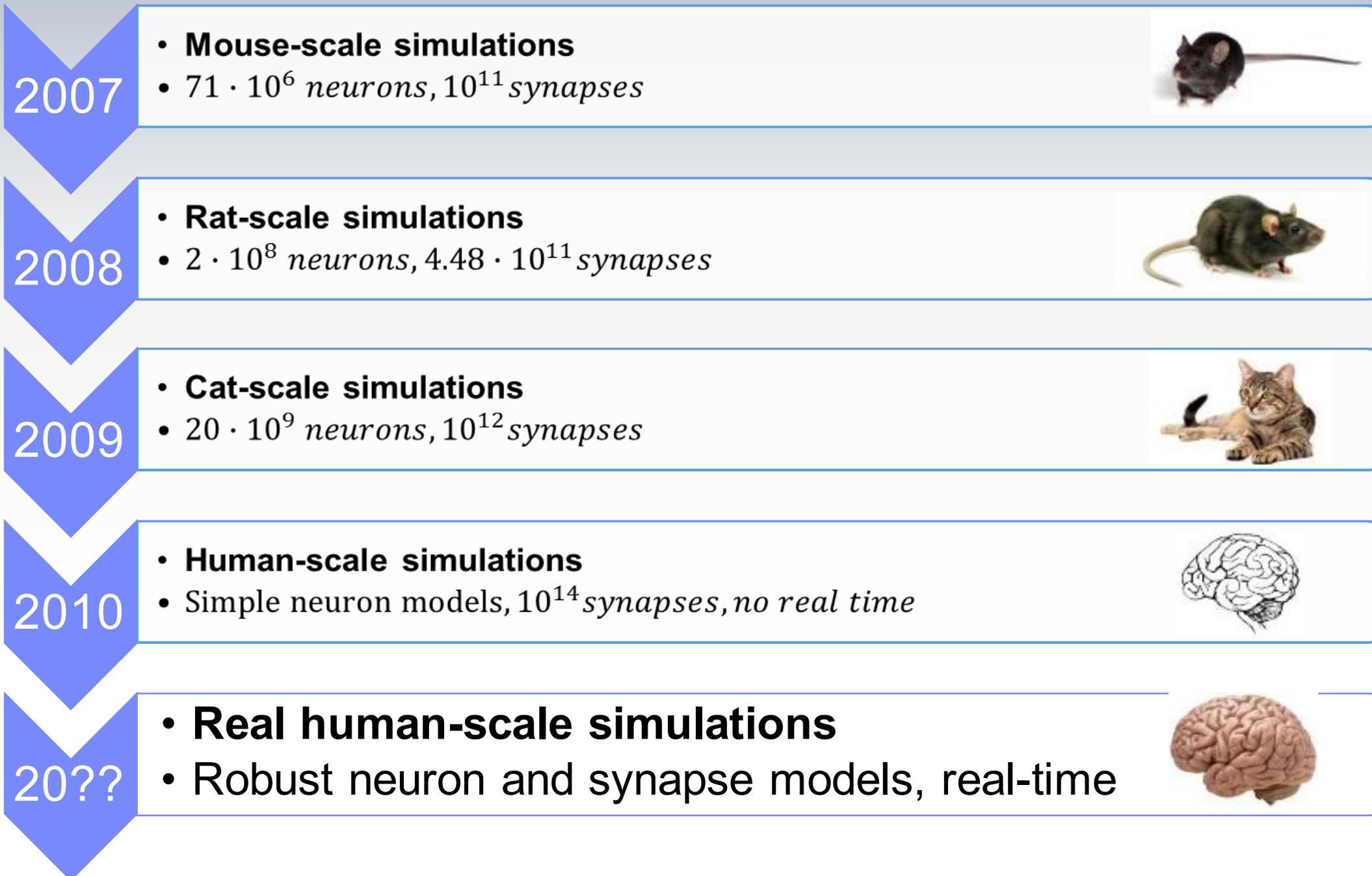
Programmable Systems Era



Cognitive Systems Era



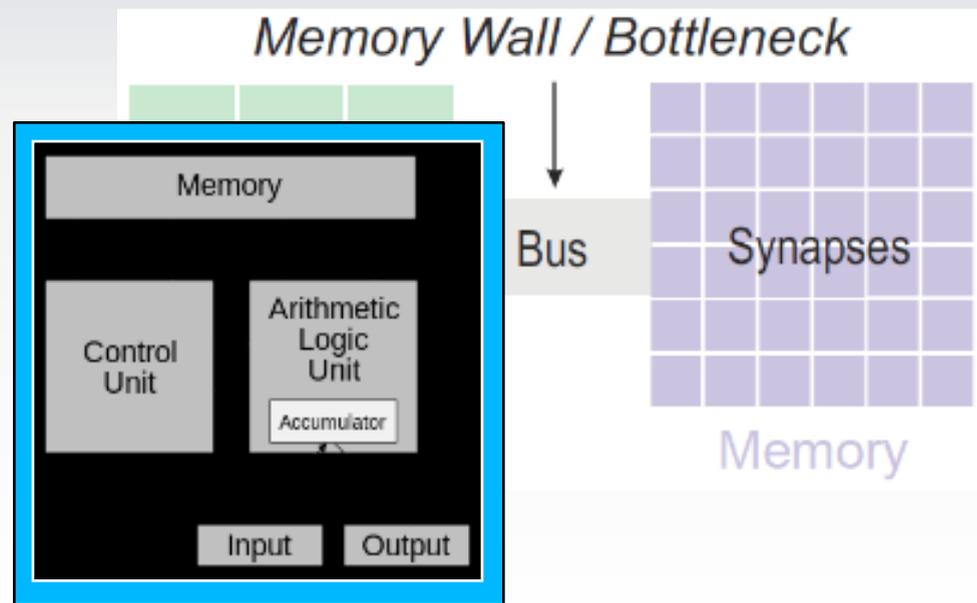
Brain inspired computing - simulation



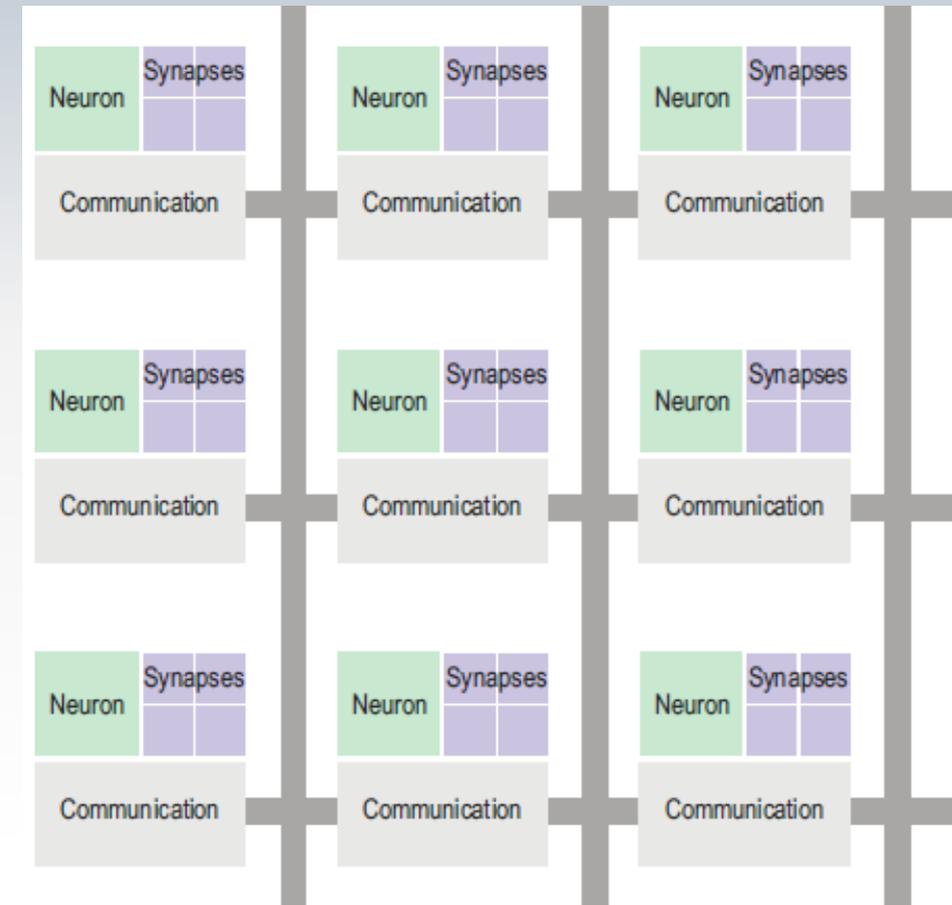
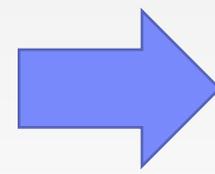
Brain inspired Cognitive Computing Challenge:

IBM Synapse → New Architecture and paradigm shift

$$Power = f(technology, architecture)$$



Von Neumann architecture:
Brain is aligned to computer



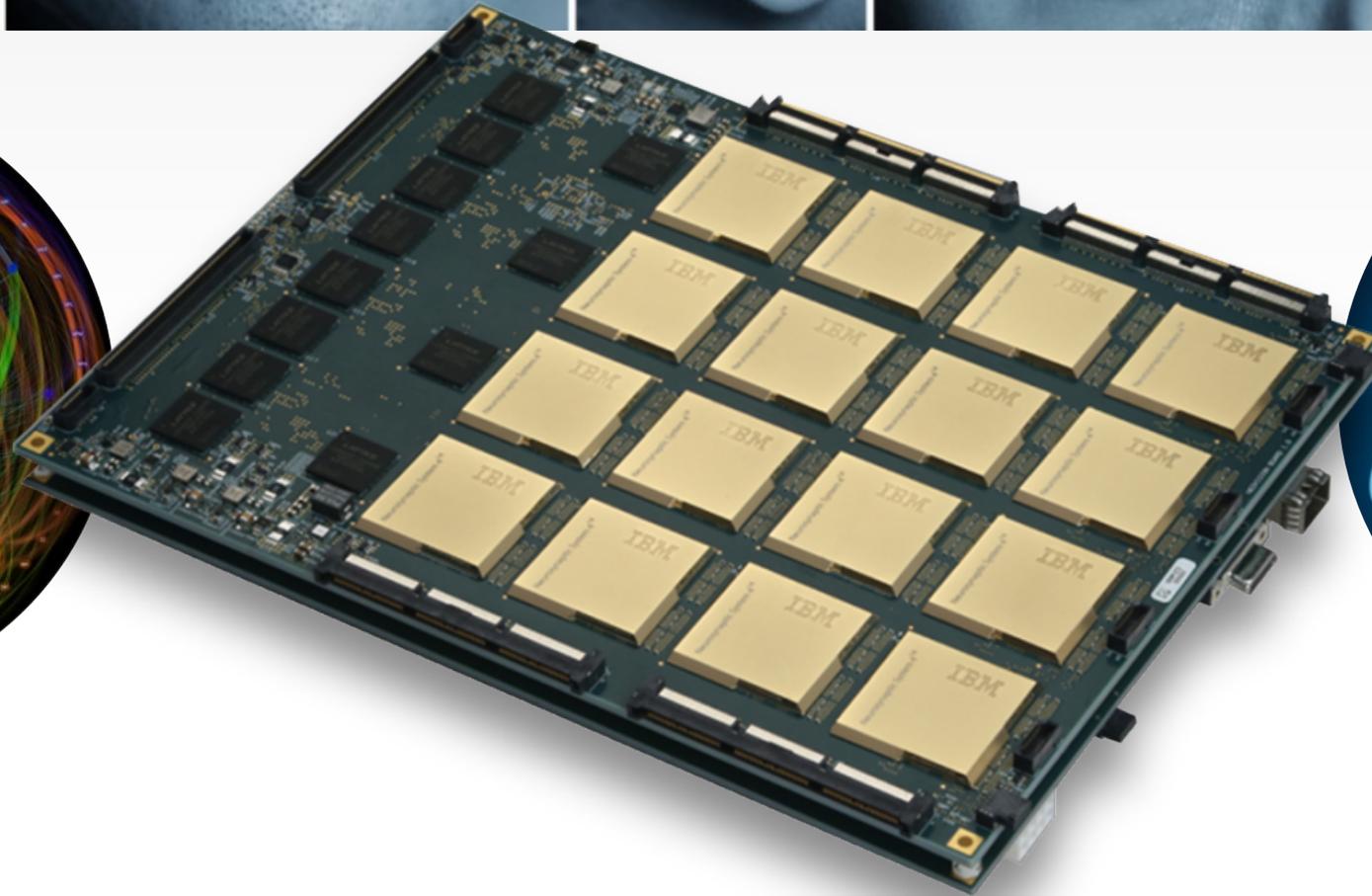
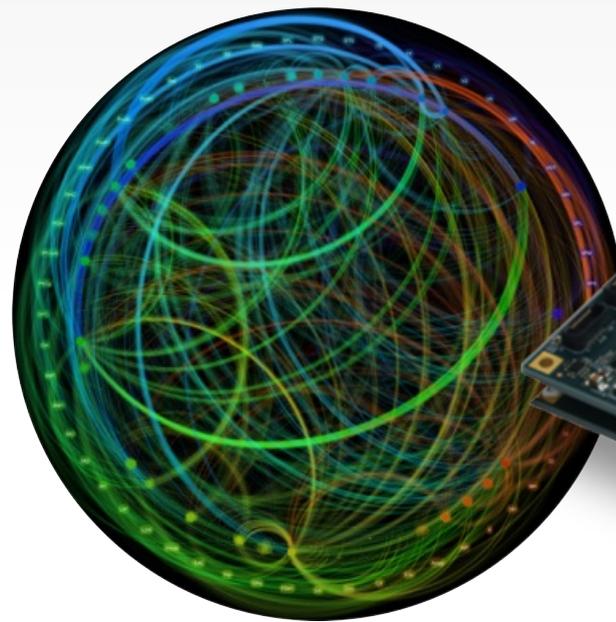
SyNAPSE:
Computer is aligned to a brain

SyNAPSE: Systems of Neuromorphic Adaptive Plastic Scalable Electronics



IBM Synapse

16 million neurons
4 billion synapses



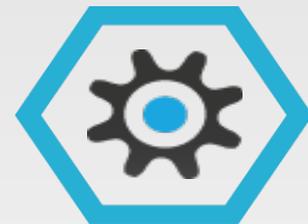
How can software developers use Cognitive Computing?

To **rapidly** innovate in the market at **lower cost**



Go from zero to running code in a matter of minutes

To **continuously deliver** new functionality to their applications



Automate the development and delivery of many applications

To extend **existing environments** where the data reside



Extend existing investments by connecting securely to on-premise infrastructure

Cognitive applications enhances our abilities to perceive, reason and relate.



Perception:

Watson understands the world as we do: it interprets sensory input beyond traditional data

Reasoning:

Watson thinks through complex problems: it deepens our analysis and inspires creativity

Relating:

Watson understands how we communicate, and personalizes its interactions with each of us

Learning:

Watson learns from every interaction, scaling our ability to build experience



Visual Recognition

Visual Recognition uses deep learning algorithms to analyze images for scenes, objects, faces, text, and other subjects that can give you insights into your visual content. You can organize image libraries, understand an individual image, and create custom classifiers for specific results that are tailored to your needs.

- Resources:**
- [API Reference](#)
 - [Documentation](#)
 - [Fork on Github](#)
 - [Deploy on Bluemix](#)

Try Train Test

Try the service

Choose a sample image or upload your own image (max 2mb) to try out Visual Recognition.



Or paste an image URL

Results

Classes	Score
people	0.95
Did we wow you? <input type="radio"/> Yes <input type="radio"/> No	

Faces	Score
female	0.99
age 25 - 34	0.37
female	0.97
age 18 - 24	0.5
Did we wow you? <input type="radio"/> Yes <input type="radio"/> No	



personality-insights-livedemo.mybluemix.net

Personality Insights

IBM Watson Developer Cloud Services Docs App Gallery Community



Personality Insights

Gain insight into how and why people think, act, and feel the way they do. This service applies linguistic analytics and personality theory to infer attributes from a person's unstructured text.

Resources:

- [API Reference](#)
- [Documentation](#)
- [Fork on Github](#)
- [Fork and Deploy on Bluemix](#)

Try the service

You need text written by the person whose personality you're interested in. It should contain words about every day experiences, thoughts, and responses.

For statistically significant results, **you need at least 3500 words and ideally 6000**. You can still play with the demo if you have at least 100 words, but you should take those results with a grain of salt.

Personality Portrait

128 words analyzed: **Weak Analysis**

Summary

You are rational, tranquil and inner-directed.

You are driven: you have high goals for yourself and work hard to achieve them. You are energetic: you enjoy a fast-paced, busy schedule with many activities. And you are empathetic: you feel what others feel and are compassionate towards them.

Your choices are driven by a desire for self-expression.

You consider achieving success to guide a large part of what you do: you seek out opportunities to improve yourself and demonstrate that you are a capable person. You are relatively unconcerned with taking pleasure in life: you prefer activities with a purpose greater than just personal enjoyment.

[How did we get this?](#)

You are likely to _____

- Click on an ad
- Follow on social media
- Buy healthy foods

You are unlikely to _____

- Put health at risk
- Take financial risks
- Recreating risks

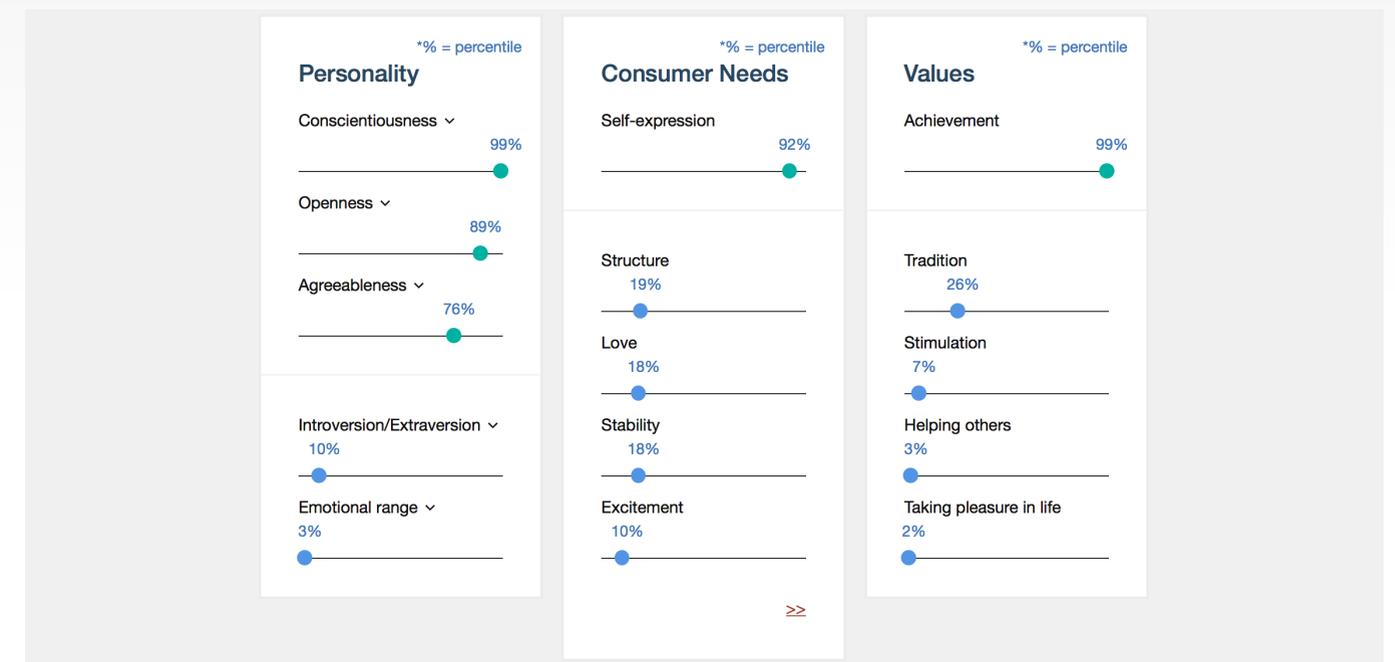
Tweets and Replies **Body of Text** Your Twitter Personality

Choose: 2012 Debate - Barack Obama (EN) Reflection - Gandhi (EN)

Michikusa - Natsume (JA) Your own text

tailable solution assets to solve similar business challenges. He has brought technology to client challenges as well as internal corporate business challenges while building capability as he delivers. His coaching style ensures that as he leads he builds technical leadership and he has grown successful teams and leaders in different countries and cultures. He has worked with teams in their local environments as well as distributed teams and has built new teams as well as fixed dysfunctional teams to make them highly effective.

Choose language: English Spanish Arabic Japanese **Analyze**



Data Transforming Cooking



Strawberry Curry

HERE'S A STARTING POINT * . . .

8 servings

SWEETENER

1 1/4 tsp acacia honey

FISH/SEAFOOD

2 1/2 lb king salmon

OIL/FAT

1 tbsp peanut oil

FRUIT

strawberry

HERB

chive

STOCK/SOUP

1/2 cup chicken broth

DAIRY

1 1/2 cup yogurt

VEGETABLE

1 diced, pitted, peeled
avocado

22 sliced, trimmed
radishes

1/2 cucumber (8-1/4"),
chopped english
cucumber

CONDIMENT

2 1/2 tbsp curry paste

1 1/2 oz red curry paste



Based On Thai Shrimp Curry
From Bon Appétit

ALCOHOLIC BEVERAGE

bourbon

1. Chef Watson is pretty sure that bourbon will taste good in this dish, but needs your help in figuring out the details.
2. Heat peanut oil in heavy large skillet over medium-high heat.
3. Add sliced radishes; stir-fry.
4. Reduce heat to medium.
5. Add english cucumber and red curry paste; stir about 1 minute.

Based on: pad thai noodles from Bon Appétit

ox sađolun

Thank You