What is Cognitive Business?

Where digital business meets digital intelligence

(and creates disruption)

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Agenda and topics

Intro
AI and the real world
Disruption
Cognitive business
Examples
How to start

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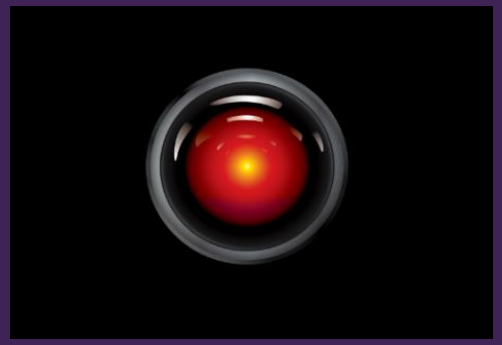
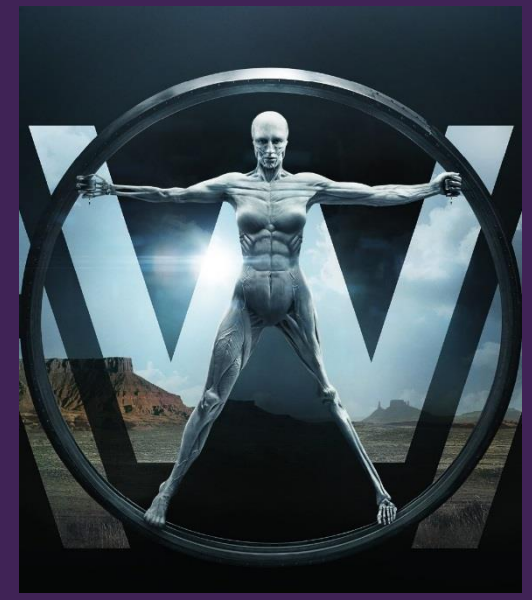
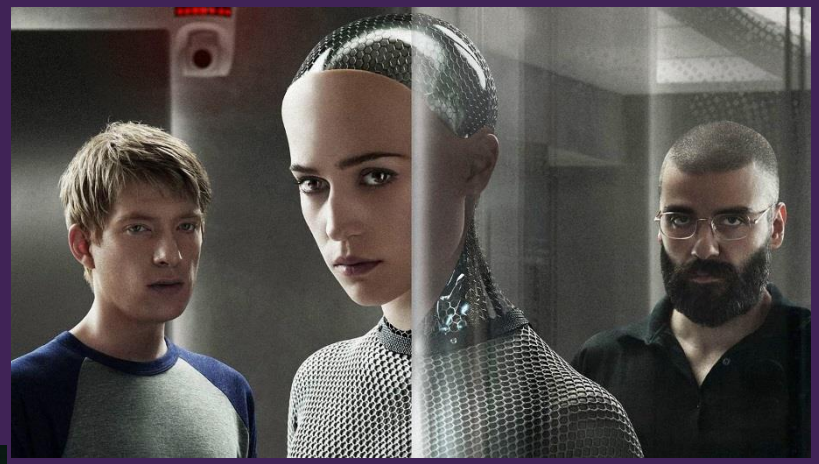
Artificial Intelligence in Hollywood

A small test







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Artificial Intelligence in real life

Robot 'Peppert' wordt als proef ingezet om burgers wegwijs te maken in de Stadswinkel.
Foto: foto gemeente rotterdam

DFT

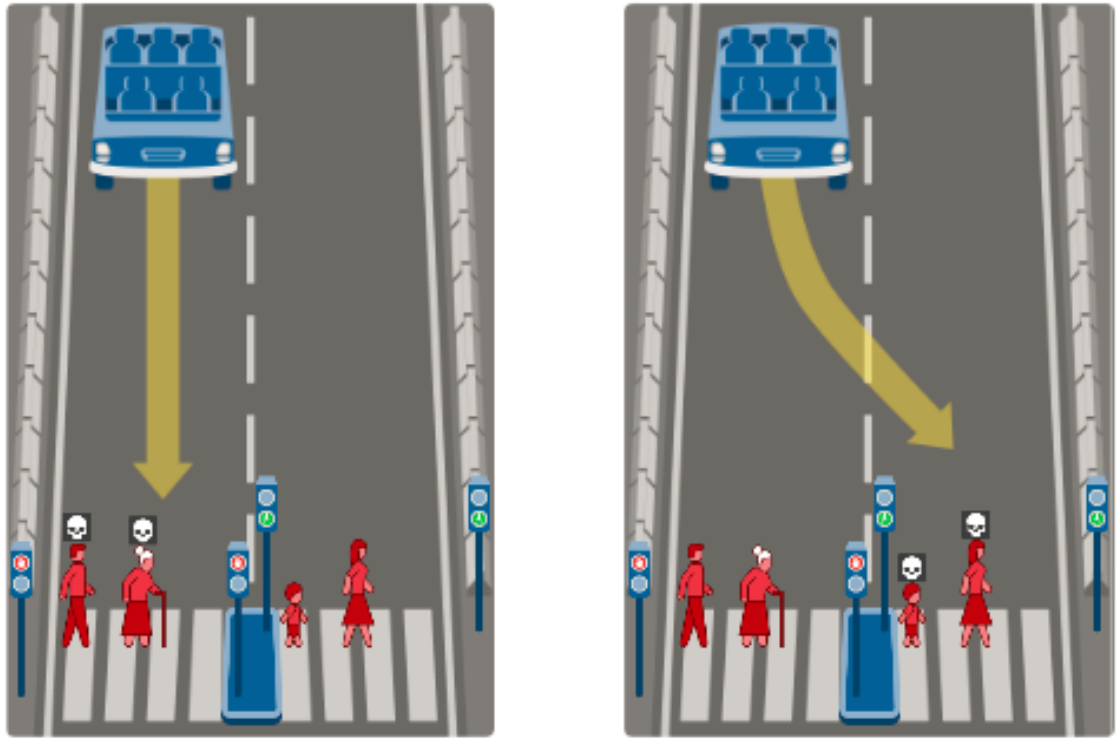
'Peppert' wordt ingezet als ambtenaar

Robots maken Rotterdammers wegwijs

AI concerns and ethics

For example, here you're presented with an empty car, but either action will result in fatalities to pedestrians.

What should the self-driving car do?



CYBER TEDDY LEAK NIGHTMARE

Bill Gates Says Robots Should Be Taxed Like Workers

David Z. Morris
Feb 18, 2017

In a new interview with Quartz, Microsoft founder Bill Gates makes a rather stunning argument—that robots who replace human workers should incur taxes equivalent to that worker's income taxes.

"Right now, the human worker who does, say, $50,000 worth of work in a factory, that income is taxed . . . If a robot comes in to do the same thing, you'd think that we'd tax the robot at a similar level."

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Digital businesses are disrupting virtually every industry and profession.

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3D “printing” propeller blade manufacturing.

RAM-LAB

- On site
- Faster
- Repeatable
- Cheaper
- Embedded quality control

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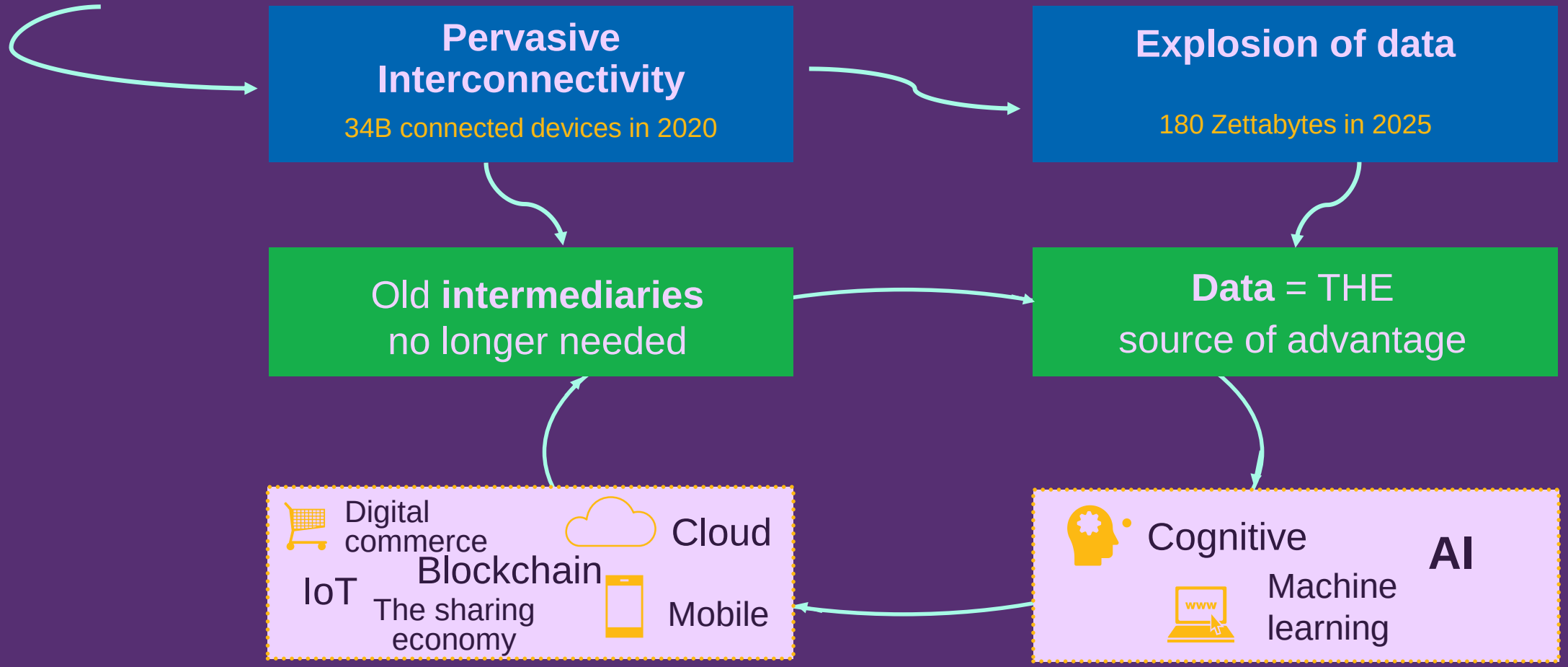
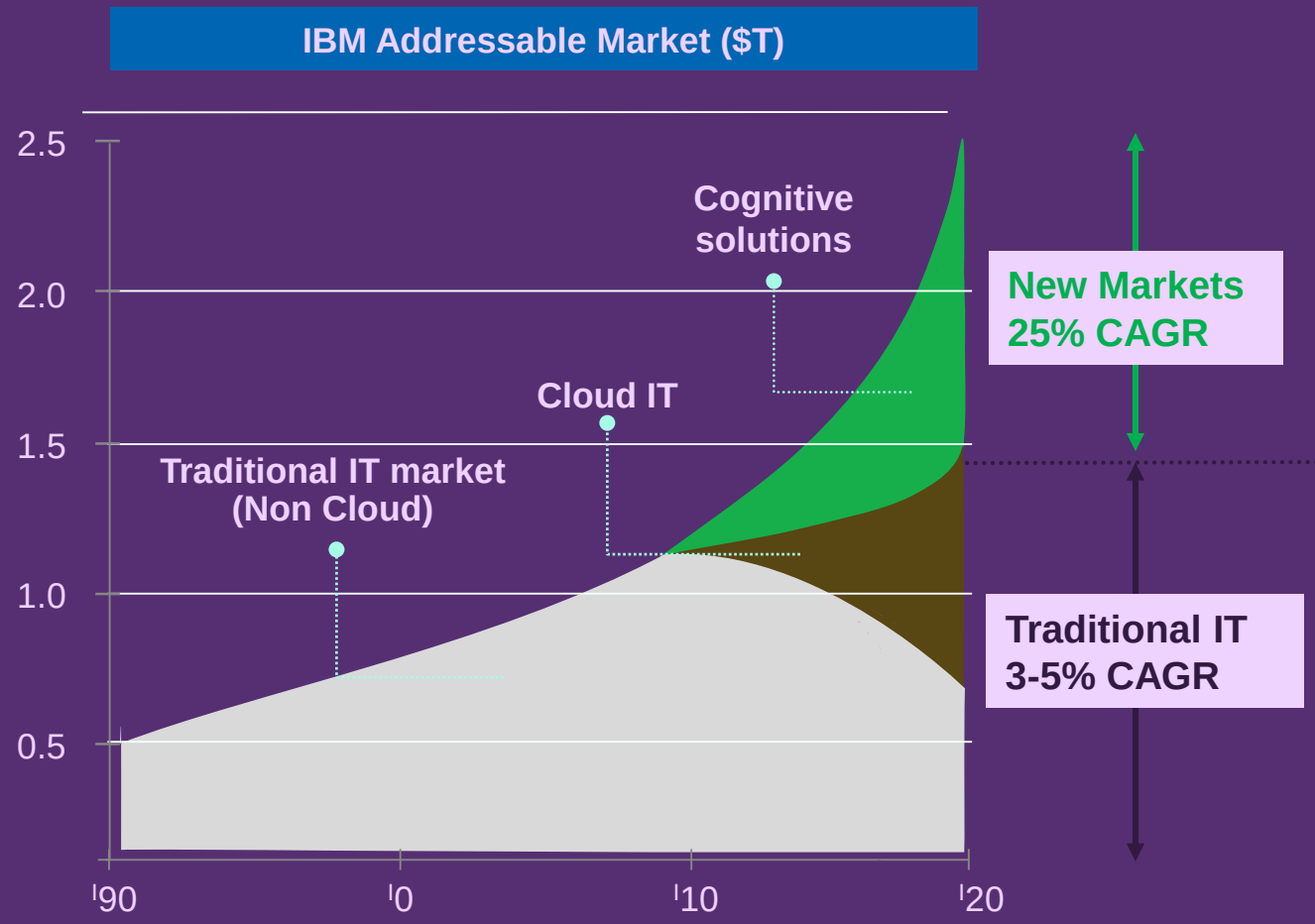
Dramatic technology forces are behind "creative disruption"



... transforming the IT industry



Industry-focused cognitive/AI **top Investment** by '20

— IDC

75% of developers **to embed cognitive** into apps by '18

— IDC

55% of new **Apps cloud** native by '19

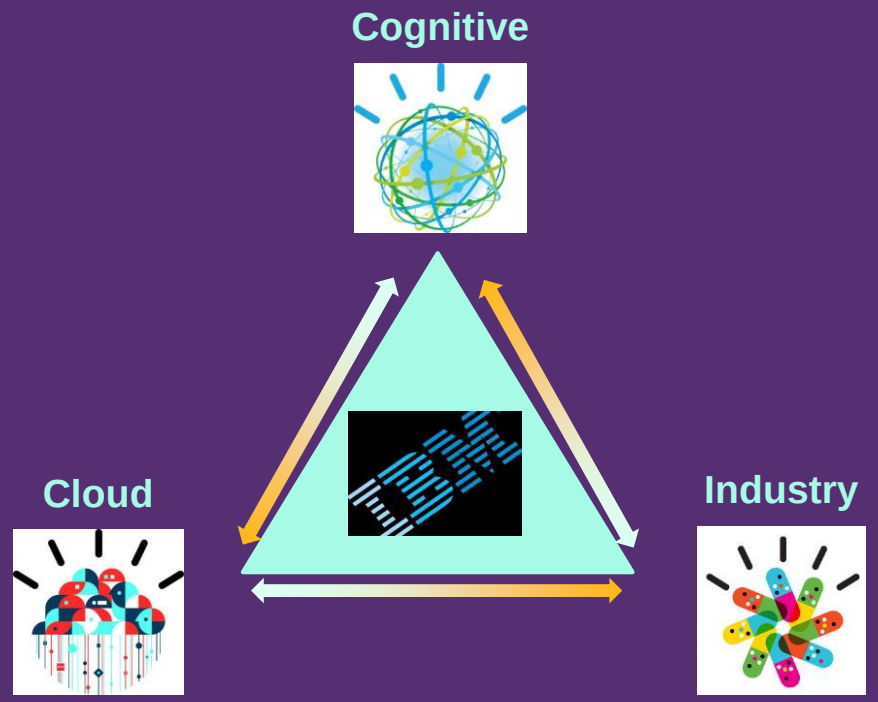
— IDC

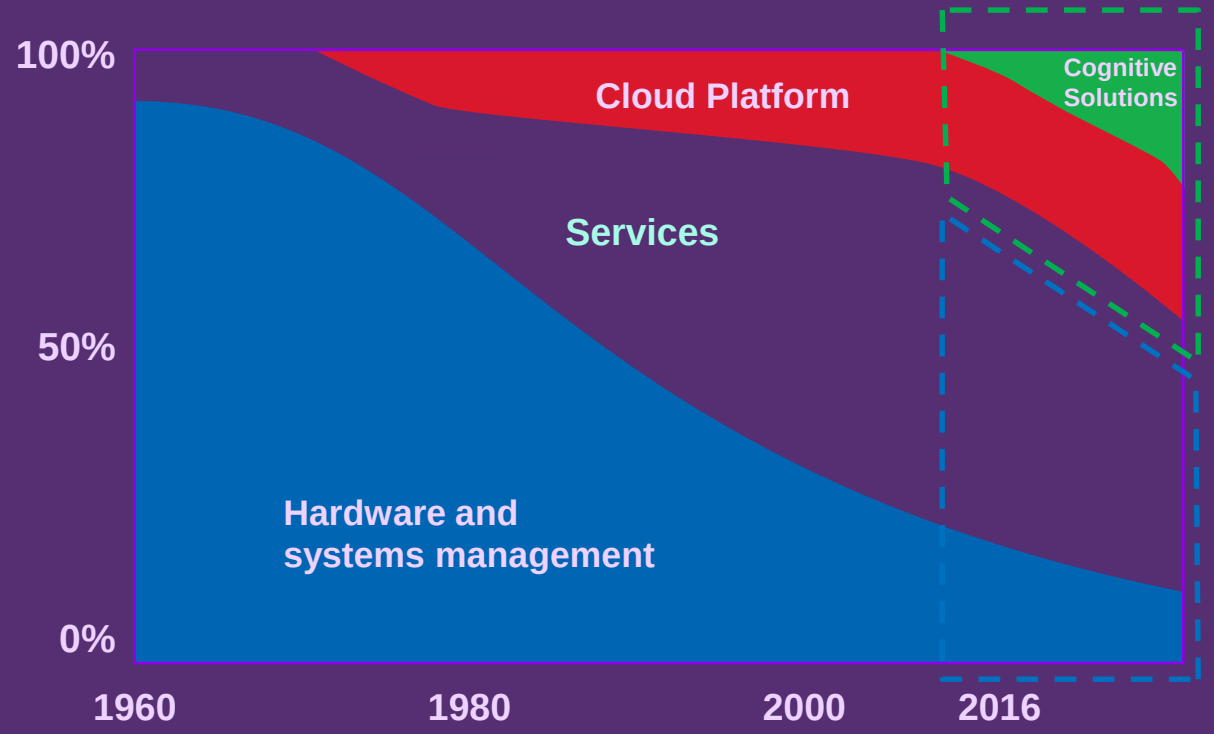
Hybrid becomes the **infrastructure foundation** for next move of apps

— Gartner

The next revolution: IBM emerges

IBM's next era





Cloud and cognitive-led to be half of IBM...

...the other half with it embedded

Data is growing fast- in volume, variety, and complexity – traditional analytics solutions are not able to fully exploit its value…

Data is growing with time, but usability is limited..

.5%

of data is produced a day by each cancer patient[1]

2.63 PB

Projected volume of data stored on average by in US Federal agencies in 2015[2,3]

... because of the limits of traditional analytics capabilities

- Addresses predefined problems but cannot adopt to new problem domain
- Provides accurate and definitive answers but cannot handle ambiguity or gray areas
- Handles structured and unstructured information with known semantics – thus cannot make use of data from new and varied sources
- Interacts in formal digital means (e.g., commands, screens) with human – thus limits the engagement of end user

Sources: See speaker notes

Data Iceberg

Only 20% of data is visible to computers

80%
is invisible

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Cognitive businesses can access and use all types of data.

Data you possess

- Customer records
- Transactional systems
- Predictive models
- Institutional expertise
- Operational systems

+

Data outside your firewall

- News
- Events
- Social media
- Weather
- Geospatial information

+

Data that's coming

- Internet of Things (IoT)
- Sensory data
- Images
- Video

Structured and active

Unstructured and dark

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Cognitive systems are creating a new partnership between humans and technology

Humans
excel at

COMMON SENSE (but with many biases)

MORALS

IMAGINATION

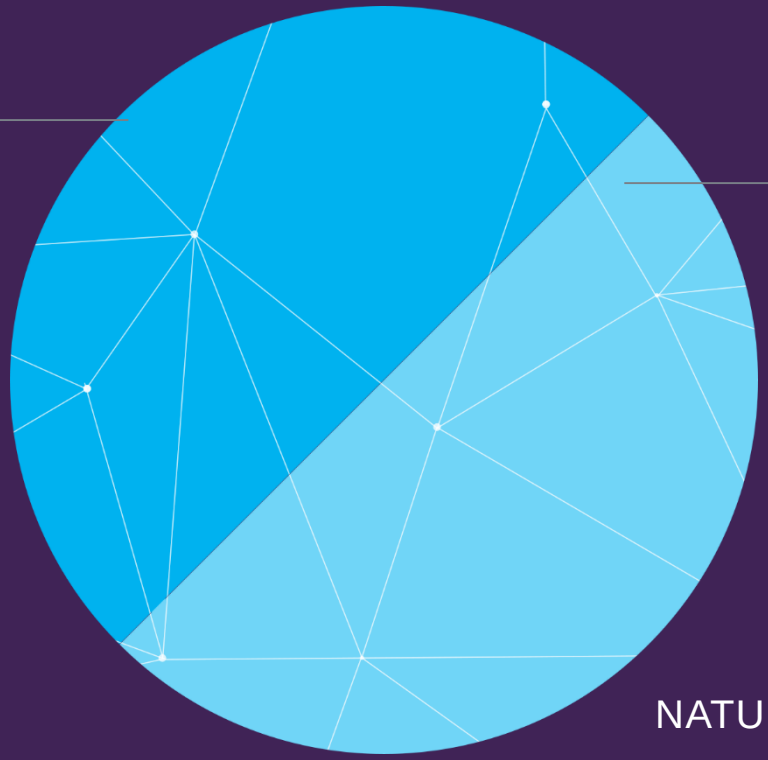
COMPASSION

DILEMMAS

ABSTRACTION

DREAMING

GENERALIZATION



Cognitive Systems
excel at

LOCATING KNOWLEDGE

ELIMINATING BIASES

PATTERN IDENTIFICATION

MACHINE LEARNING

NATURAL LANGUAGE PROCESSING AT SCALE

PROVIDING ENDLESS CAPACITY

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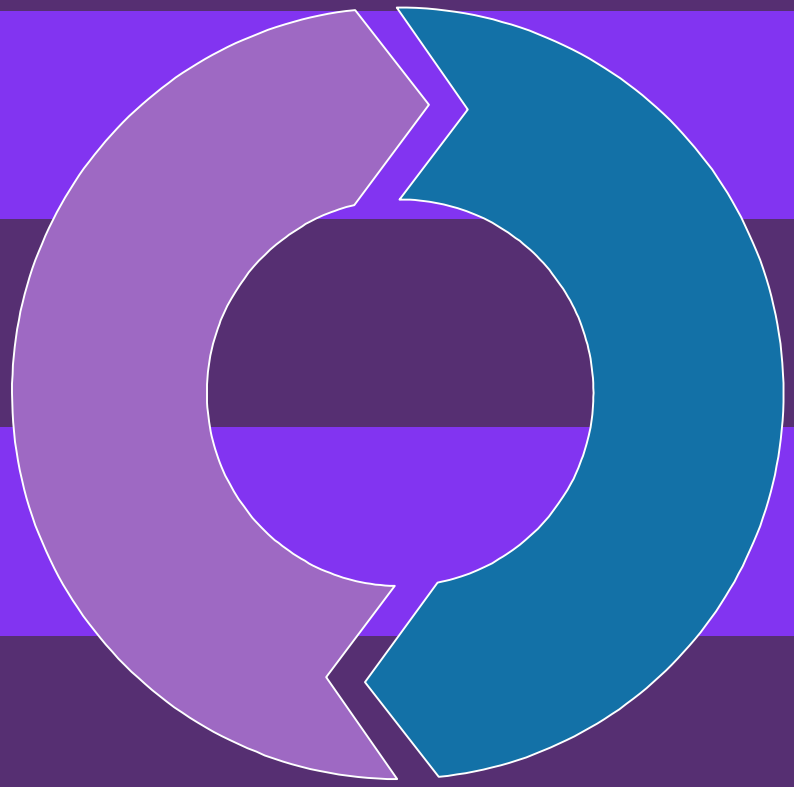
Cognitive computing complements traditional analytics by creating a value continuum

Analytics	Cognitive computing
▪ Addresses predefined problems	▪ Addresses ambiguous problems
▪ Provides accurate and definitive answers	▪ Provides answers with a margin of error
▪ Handles information with known semantics	▪ Handles information without explicitly knowing semantics
▪ Interacts in formal digital means (e.g. commands, screens) with humans	▪ Interacts in natural language with humans



What would this look like in the real world?

Celia

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What is real now?

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A quick tour to the early years: 2011

Watson only knew “Q&A”

Watson Jeopardy
Q&A

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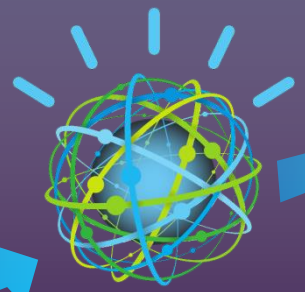
What happened to Watson after Jeopardy?

IBM
Research Project
(2006 –)

R&D

Jeopardy!
Grand Challenge
(Feb 2011)



Demonstration

Watson
for
Healthcare
(Aug 2011 –)

Commercialization

Watson
for Financial Services
(Mar 2012 –)

Expansion

Watson
Industry Solutions
(2012 –)

Cross-industry Applications

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Real-world applications for Watson

Healthcare / Life Sciences: Diagnostic Assistance, Evidence-based, Collaborative Medicine

Tech Support: Help-desk, Contact Centers, Web Self-Service

Government: Improved Information Sharing and Security

Enterprise Knowledge Management and Business Intelligence, Regulatory Compliance

Financial markets, insurance & banking

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20

PON and Health Deal: incl. IBM Watson

Home / Actueel / Nieuws / Schippers en Kamp tekenen eerste Health Deal

Schippers en Kamp tekenen eerste Health Deal

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IBM Watson Industries

Financial services
- CI for banking
- CI for wealth management
- Virtual Agent for Insurance

Healthcare
- Watson for Oncology
- Watson for Genomics
- Watson for drug discovery
- Watson Care Manager

Travel & Transportation
- Watson Travel Retail
- Cognitive Line Maintenance
- Cognitive hotel room

Telecommunications
- Watson Virtual Agent for Call center

Public sector
- Watson Discovery Advisor Public Sector

IBM Watson solutions

Watson Developer Cloud

Conversation, Document conversion, Language translator, NLC, NLU, Retrieve & Rank , Personality Insights, Tone Analyzer

Discovery, Tradeoff analytics, Discovery news

Speech to text, Text to Speech

VR

Watson virtual agent
- Conversation Service
- Tone Analyzer
- NL understanding

Watson Discovery service
- NL understanding
- Tone Analyzer

Watson company profiler

IBM Watson core products

Watson APIs
- **Cloud**
- Content extraction
- ML annotators

Watson Knowledge studio
- **On premise**
- Content extraction
- Rules-based annotators
- Content analytics

Watson Explorer
- **Cloud**
- Structured & Unstructured data analyses
- Predictive

Watson Analytics
- **Cloud**
- Cognitive experience

Conversation Service

Underlying cognitive technologies

Machine learning

Natural Language Processing

Pattern recognition: speech & vision

Knowledge representation

Watson News explorer

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http://watson.ted.com/

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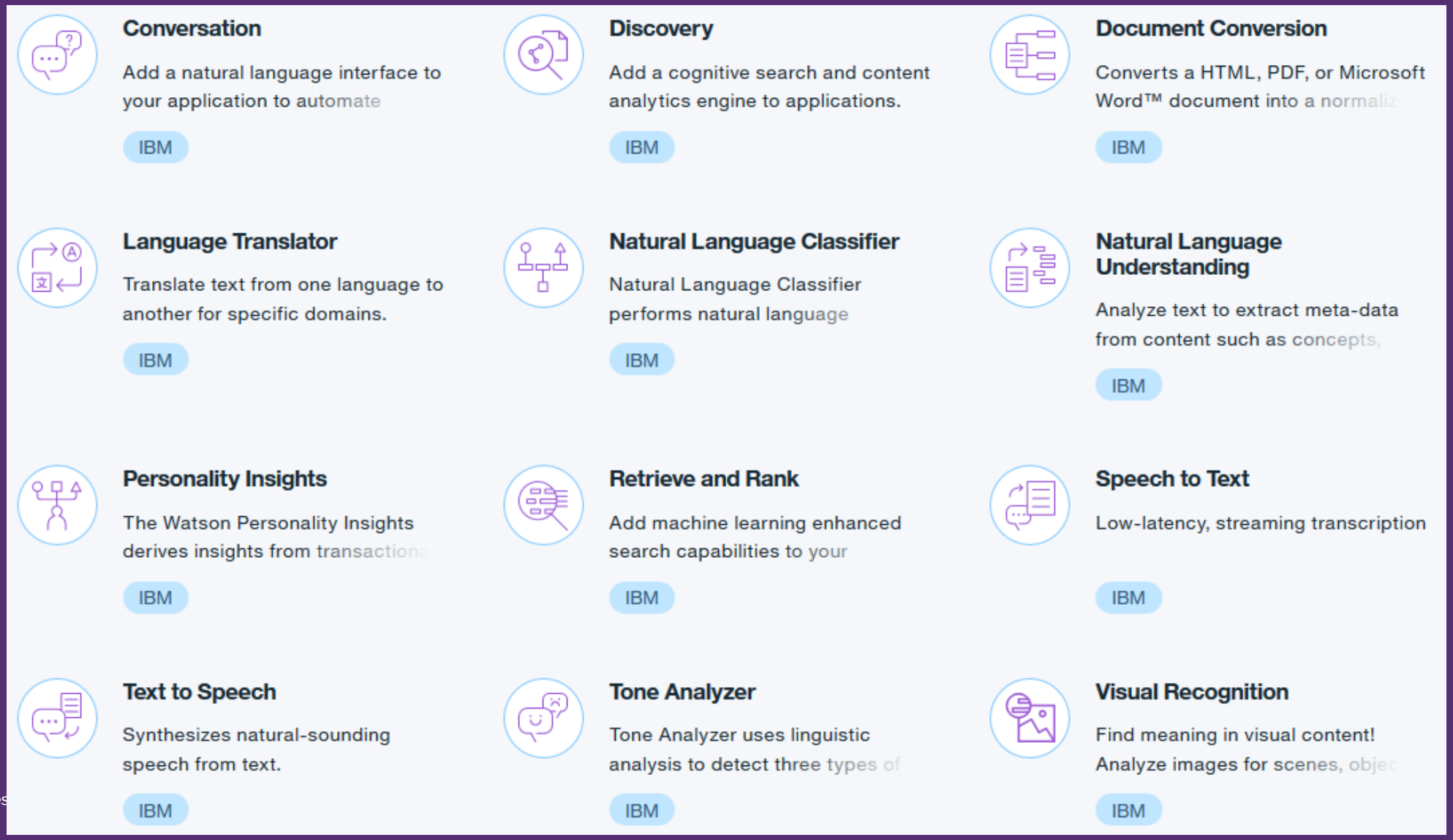
Build cognitive apps in Bluemix that help enhance, scale, and accelerate human expertise.



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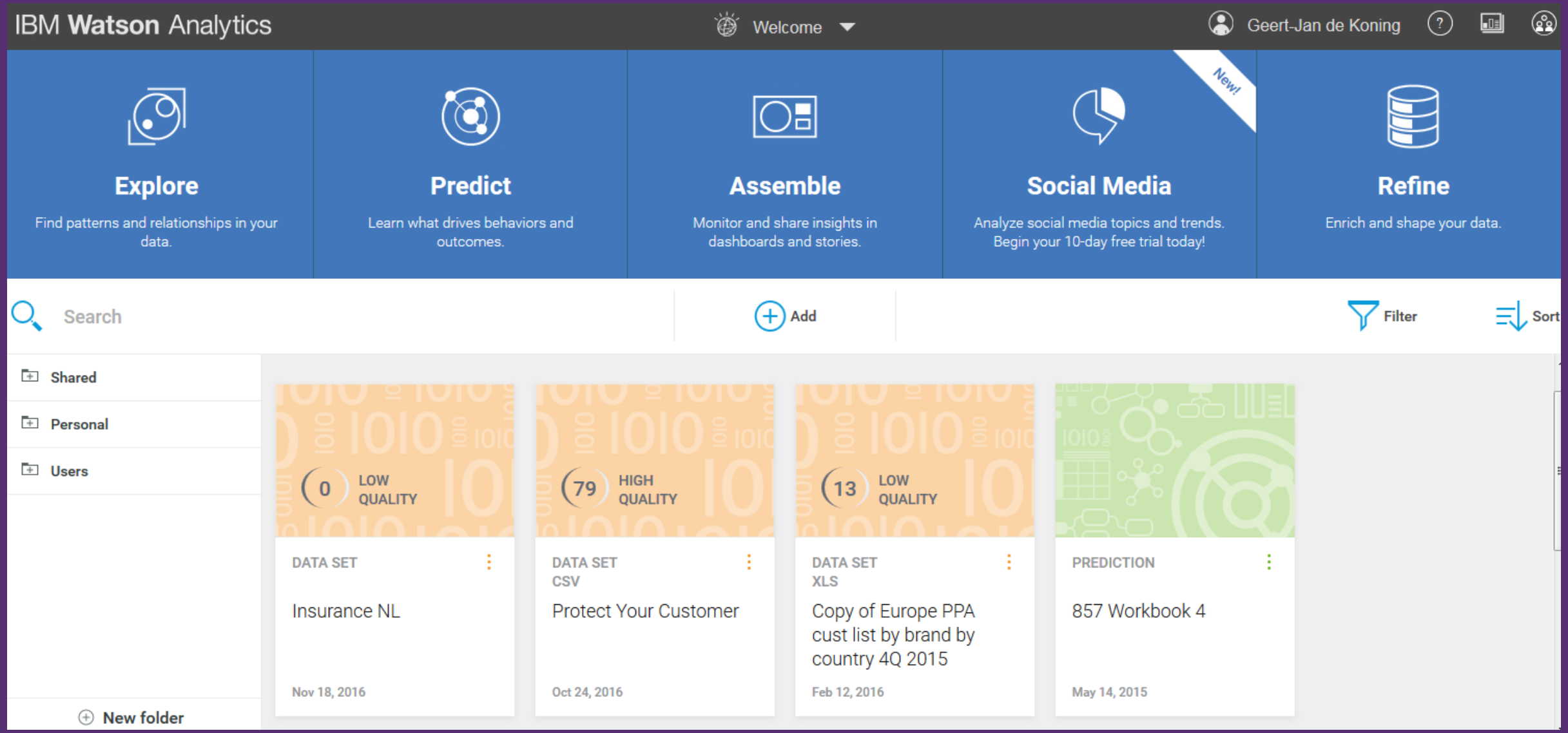
Watson applied to BI

http://www.watsonanalytics.com/



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The future of AI: 10 scenarios IBM is already working on

1. Understanding PDFs
2. Understanding obligations
3. Image captioning
4. Automatically building movie trailers
5. Cognitive assistant for data scientists
6. Radiologist's assistant
7. Operational research
8. Conversing without deep instance knowledge
9. Cognitive software DevOps
10. Scaling deep learning

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Where to start?

The answer is in the data!

- **Show what is already in there**
- **Data Quality**
- **Data Governance**
- **Sensitive Data (GDPR!)**

Watson has many faces, what is your use case?

Think Big – Start Small – Fail Fast

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Cognitive = IBM

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Resources:

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

TED: *http://watson.ted.com* (TED ID/Password required)

News Explorer: *http://news-explorer.mybluemix.net*

BlueMix: *www.ibm.com/WatsonDeveloperCloud*

Watson Analytics: *https://www.watsonanalytics.com*

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