Cognitive Computing: A new era

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Fueling the shift to AI

Data growth

165 Zettabytes by 2025*

We are here

2010

2025

Cloud

Data-centric Systems

End-to-end Security

Extreme Scalability

Computing power

Advances in neural networks, machine learning and deep learning

*Source IDC. IBM projections based on analyst report
Explosive growth in AI investment 2011-16

Number of venture capital investments in AI start ups

Disclosed Funding ($M)

The AI landscape in 2017

**Applications & Services**

**Enterprise**
- Cybersecurity
- Finance & Risk
- Marketing
- Forecasting
- Human Resources
- Operations / IoT
- Sales
- Virtual agents

**Industry**
- Healthcare
- Finance
- Automotive/Transportation
- Industrial Products
- Buildings
- Retail
- Energy & Utilities

**Consumer**
- Voice-activated Chatbots
- Smart Home
- E-commerce
- Wellness and Wearables
- Social Media

**Autonomous Systems**
- Self-driving Cars
- Robots
- Drones
- Planning and Decision Support

**Core AI**
- Machine Learning
- Deep Learning
- Natural Language Processing
- Vision
- Speech
- Virtual/Augmented Reality
- Dialog
- Machine Reasoning
- Neural Networks
- Emotion

**Infrastructure**
- Cloud
- Enabling hardware and software
How we see it: IBM’s take on the AI market

**Cognitive Computing**
Interactive decision-making and reasoning over deep domain models and evidence-based explanations, using Artificial Intelligence/Machine Learning tools.

**Artificial Intelligence**
Range of techniques including natural language processing, knowledge, reasoning and planning, for advanced tasks.

**Machine Learning**
Statistical analysis for pattern recognition to make data-driven predictions.
The AI opportunity for enterprise and industry

~$2T

Opportunity for decision-making support
2025

~$1.4T

Traditional global IT spend
2020

Decision Support

Productivity

CRM

ERP

Data center systems

Infrastructure

Process automation

24%

Healthcare and Life Sciences

12%

Retail, Wholesale, Consumer Product Goods

12%

Auto, Aerospace and Defense

11%

Financial Services

9%

Telco, Media and Entertainment

20%

Rest of Industries

Source: MDI Analysis, Oxford economics, CapitalIQ, McKinsey Global Institute
Watson 2011: Natural language machine

[Diagrams and images showing the process of question analysis, hypothesis scoring, and evidence sources with visual elements such as a globe and an IBM logo.]

Question & Answer

<table>
<thead>
<tr>
<th>Question</th>
<th>Query analysis</th>
<th>Hypothesis scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data set</td>
<td></td>
<td>Evidence sources</td>
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</tbody>
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- Haemophilia: 60%
- Telangiectasia: 11%
- Elliptocytosis: 10%
Watson 2017: Robust cognitive platform

Enterprise-scale
Cognitive Platform

Question & Answer

Discovery

Text to Speech

Dialog

Discovery Insights

Personality

Natural Language Classifier

Natural Language Understanding

Language Translator

Document Conversion

Tradeoff Analytics

Visual Recognition

Conversation

Tone Analyzer

Discovery News

Understand emotions

9 Languages

Retrieve and Rank

Text to Speech

Discovery

Speech to Text

Visual Recognition

Vision
Watson 2017: Strategic differentiation

- Industry and Process Specialization
- Depth of Ecosystem Collaboration
- Enterprise-scale Cognitive Platform
- Public, Private, Multimodal

Built for Security

Data (Public, Private, Partner)

IBM Provided Data
- IBM Provided Data
- Public Filings
- Medical Journals
- U.S. Geological Survey
- Patents

Publicly Sourced Data
- Publicly Sourced Data

Partner Provided Data
- Partner Provided Data
- Apple
- Associated Press
- Twitter

Private Client Data
- Private Client Data
- Medtronic
- Thomson Reuters
- Johnson & Johnson
Watson 2017: New revenue models

- Data access/
  Pay-per-Insight

- Subscription

- Shared value
  with partners

- Licensing
Our clients and partners are scaling

Example set of cognitive and cloud clients and partners
Shaping the future

Cognitively enable and disrupt industries

Advanced AI / cognitive reasoning / decision making

New data assurance and trust

New hybrid system designs

New neuromorphic and quantum devices