2017 MAI 25

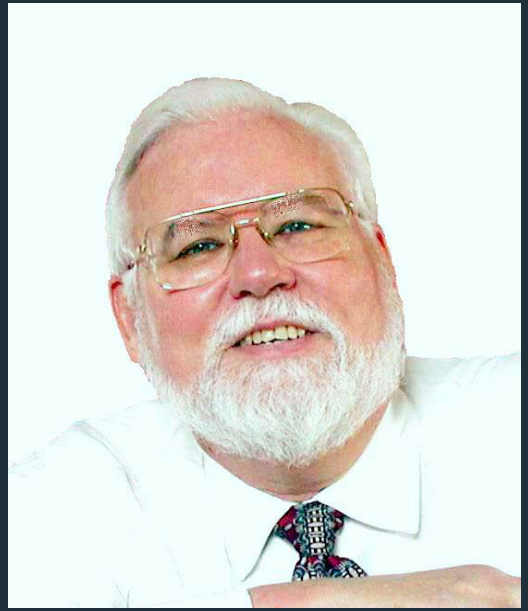
BPM CONFERENCE PORTUGAL

Managing the Cognitive Transformation

Paul Harmon

Rumos

Thank You for Joining Us!



Paul Harmon

- Author, ***Expert Systems: AI and Business***
- Senior Consultant, Cutter Consortium
- Executive Editor, www.bptrends.com
- Author, ***Business Process Change***

Agenda

- **Some Basics**
- A Little History
- Some Case Studies
- The Next Wave
- How To Prepare

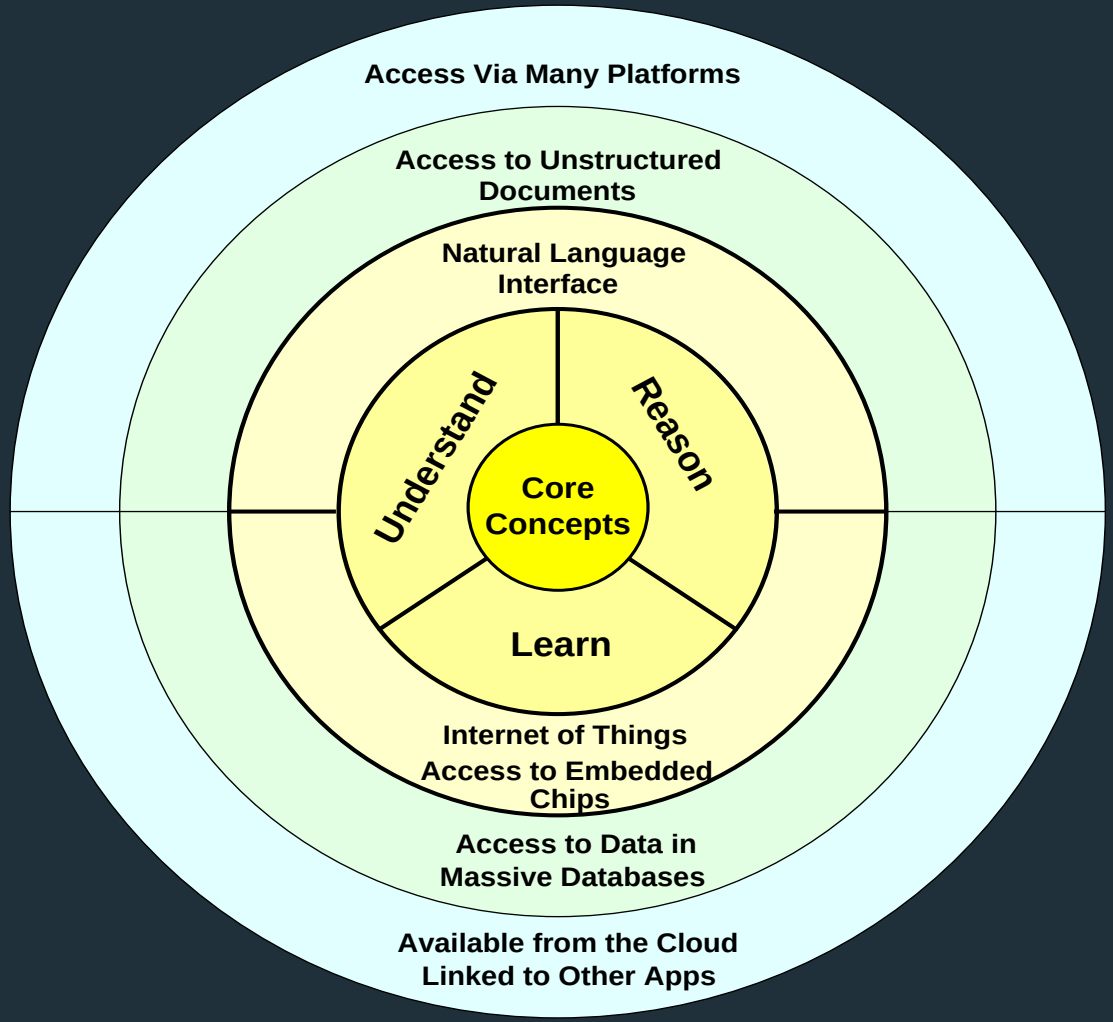
Some Basic Vocabulary

- **Transformation**
- **Digital Transformation**
- **Cognitive Transformation**

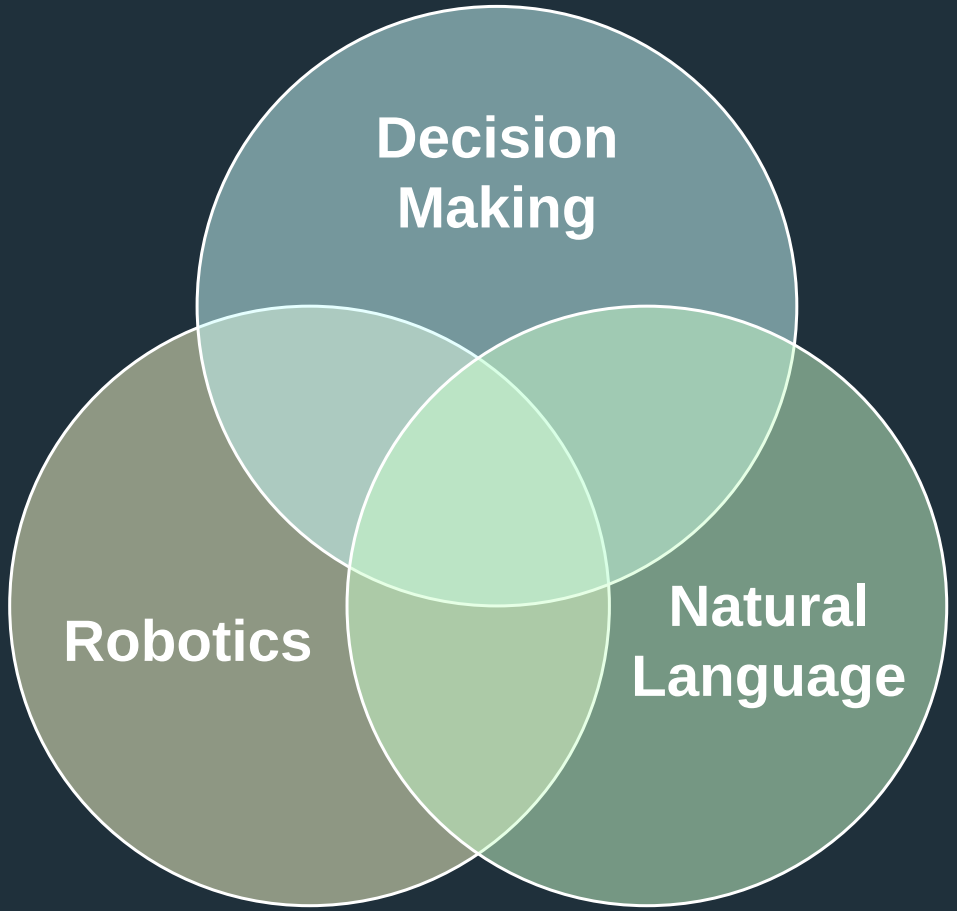
Cognitive/AI Technologies

Latest AI technologies are based on neural networks and deep learning algorithms

This isn't strictly an AI play; it's very much a response to Internet opportunities



Another Overview of AI



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AI in the Eighties and AI Today

The Eighties (Expert Systems)

- Only Knowledge, No Robotics or Natural Language
- Knowledge Represented as Rules
- Rules captured by humans
- Applications too hard to maintain
- Companies had to build applications
- Computers underpowered. Large data stores unavailable (pre Internet)

Today (Cognitive Technology)

- Knowledge, Robotics, & Natural Language
- Knowledge Represented as deep Neural Networks
- **Neural networks developed by software algorithms (learning)**
- **Applications maintain themselves**
- Applications available from vendors
- Computers adequately powered. Data available (post Internet)

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Google Translate

- Google Translate (2006) used a rules/statistics-based approach
- Google set up AI Group: Google Brain
- New **Google Translate** (2016) (for 8 language pairs) is a major step forward – and getting better as its used. (released without announcement)
- Google is rapidly adding new language pairs
- Google CEO Pichai says Google's future is **AI**

Fanuc Robots

- Fanuc is the world’s largest manufacturer of industrial robots
- It has recently launched a line of robots that employ neural nets and deep learning to learn tasks. They can usually learn to do tasks like picking widgets out of one box and putting them in another in 8 hours.
- After 8 hours, the robot has 90% accuracy, which is the same as if a human expert were to program the robot to do the task.
- The learning curve is significantly improved if several robots seek to learn the same task and then share what they have learned.

Shifting Toyota Production Line

- Robotic assembly line machines can shift from one model to another on demand
- A vehicle starts down the line – with a chip announcing that it is to be a Red SUV 900…
- Each machine adjusts and treats the evolving vehicle as a SUV … which is ultimately painted red
- This is a major step toward very small runs and JIT, tailored orders

Banking According to Citi

- This is the time to switch your customers from branch to mobile phone/Internet-centric banking. If you don’t, other banks and Fintech companies will.
- The challenge with phone/Internet-centric banking is ease of use. Applications that talk to customers is one key. Good graphics is another. Applications that quickly analyze and announce decisions is another.

Fukoku Mutual Life Insurance

- 30 employees who examine medical reports and calculate payouts to policyholders are being replaced by AI system.
- System examines pictures and reads text to gather information.
- System cost 200M yen. It will cost 15M per year in maintenance. It saves 140M a year. ROI under 2 years.
- Japan Research Institute suggests that 50% of jobs in Japan could be replaced by 2035.

Fintech and AI

- The new hi-tech companies that will eat the bank’s lunches, if the banks don’t get there soon
- Most Fintech companies are already using AI/Cognitive technologies
- A dozen companies are offering Digital Wealth Management algorithms – some for individuals and some for CFOs
- Several are offering apps that gather data and analyze trends
- And advanced consideration is helping companies calculate risks caused by global warming

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IBM Survey of Cognitive Technology

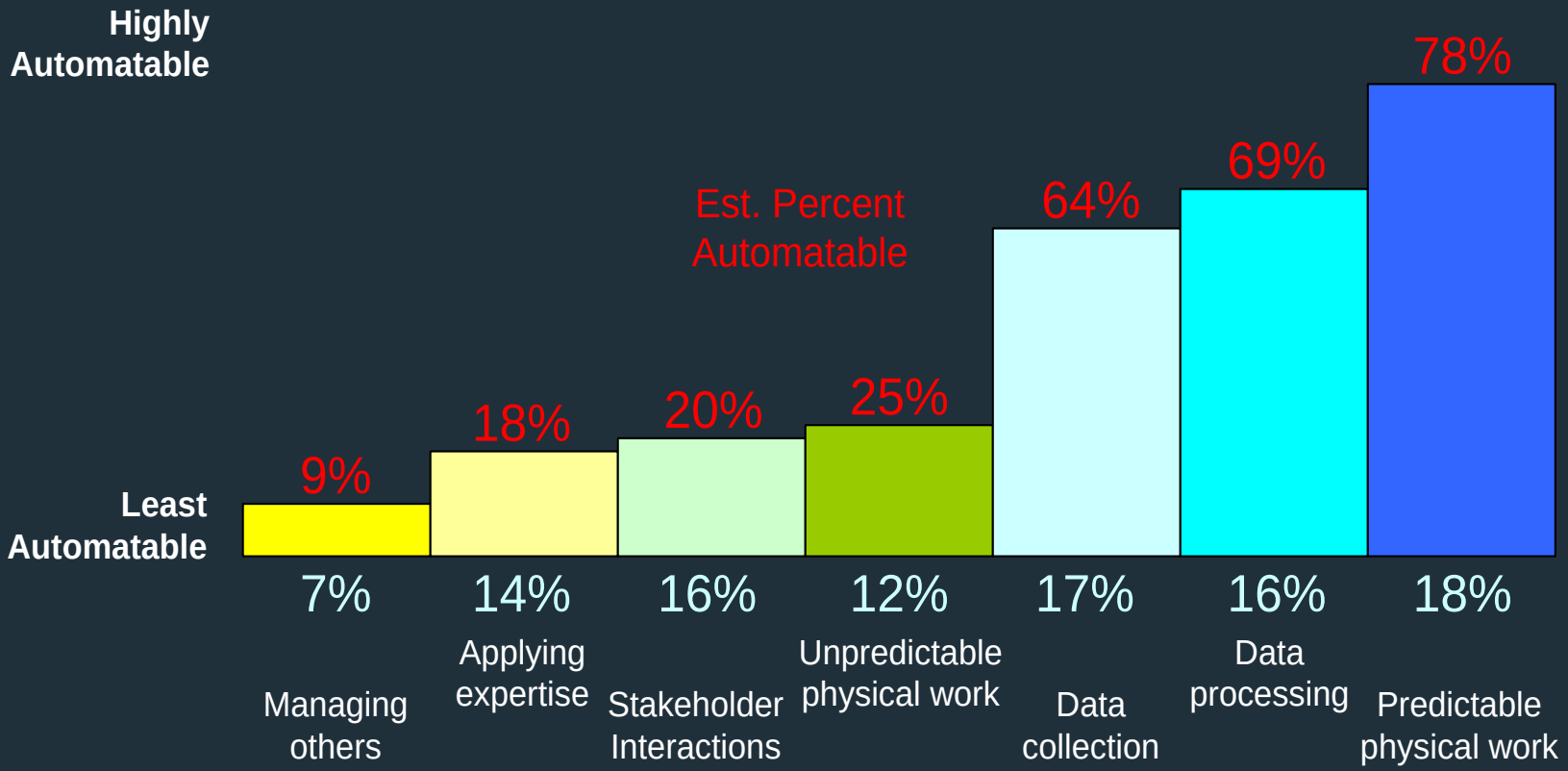
- Respondents who have been using 2 or more cognitive technologies for more than a year … **22%**
- Where they are using cognitive technologies:
  - IT 66%
  - Data Analytics 59%
  - Customer Service 51%
  - Operations 50%
  - Corporate Strategy & Mgt 48%
  - Finance 48%
  - Human Resources 47%
  - Product Development 44%
  - Sales & Marketing 40%

IBM Survey of Cognitive Technology

- Cognitive Technologies Used by 22% of Early Adopters
  - 84% Automated scheduling and planning
  - 80% Pattern recognition
  - 79% Knowledge representation and reasoning
  - 77% Machine learning
  - 75% Natural language processing
  - 68% Social and emotional (affective) computing *
  - 58% Intelligent robotics

*Ability of computers to recognize human emotions and respond in context

McKinsey's Automation Criteria (Pre Cognitive!)



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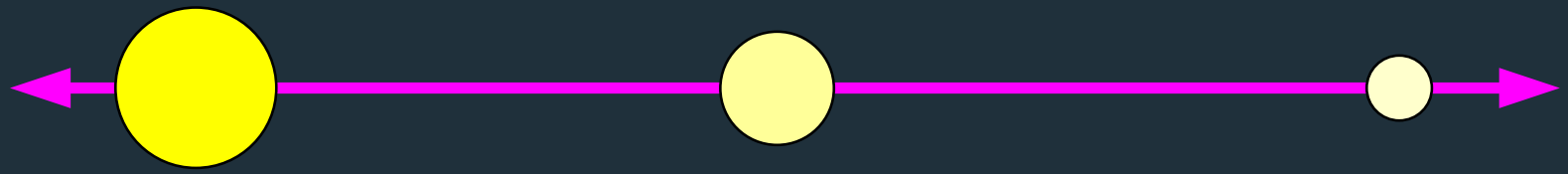
Davenport’s Continuum



From an article published in Harvard Business Review (10/2016) by Thomas Davenport. “7 Ways to Introduce AI Into Your Organization”

IBM’s Watson

- **Watson** is a cognitive development package or platform. It includes a wide variety of tools, apps, and components. It includes natural language and knowledge acquisition and learning capabilities and can be accessed from the cloud and interfaced with the Internet and databases.
- Virginia Rometty, IBM CEO, says IBM’s future is Cognitive Technology (AI). She has also said that IBM expects Watson to create $10 billion in annual revenue in the coming 10 years.

Some Watson Apps

- In addition to the Watson platform, IBM offers a number of **tailored apps** which have been used with other companies
- **Industrial**
  - Safety Analytics (Recall and Safety Mgt., Risk Mgt.)
  - Technical Support Services (Call Center)
  - Procurement Intelligence (Procurement & Supply Chain Mgt.)
  - Cognitive Vehicle (Vehicle Digital Asst.)
- **Telecom**
  - Telco Digital Agent (Agent Asst., First Call Resolution, NPS Improvement, Call Deflection)

Watson Apps (Continued)

- **Retail**
  - **Natural Language Customer Service Apps**, Embedded chip monitoring, Answering Customer Questions, Smart analytics to evaluate data and project trends
- **Financial Services**
  - Watson Digital Virtual Agent (Insurance, Banking)
  - Risk and Compliance
  - Smarter Advisor (Core Wealth Mgt., Broker dealers, private banks, discount /
    e-brokers)

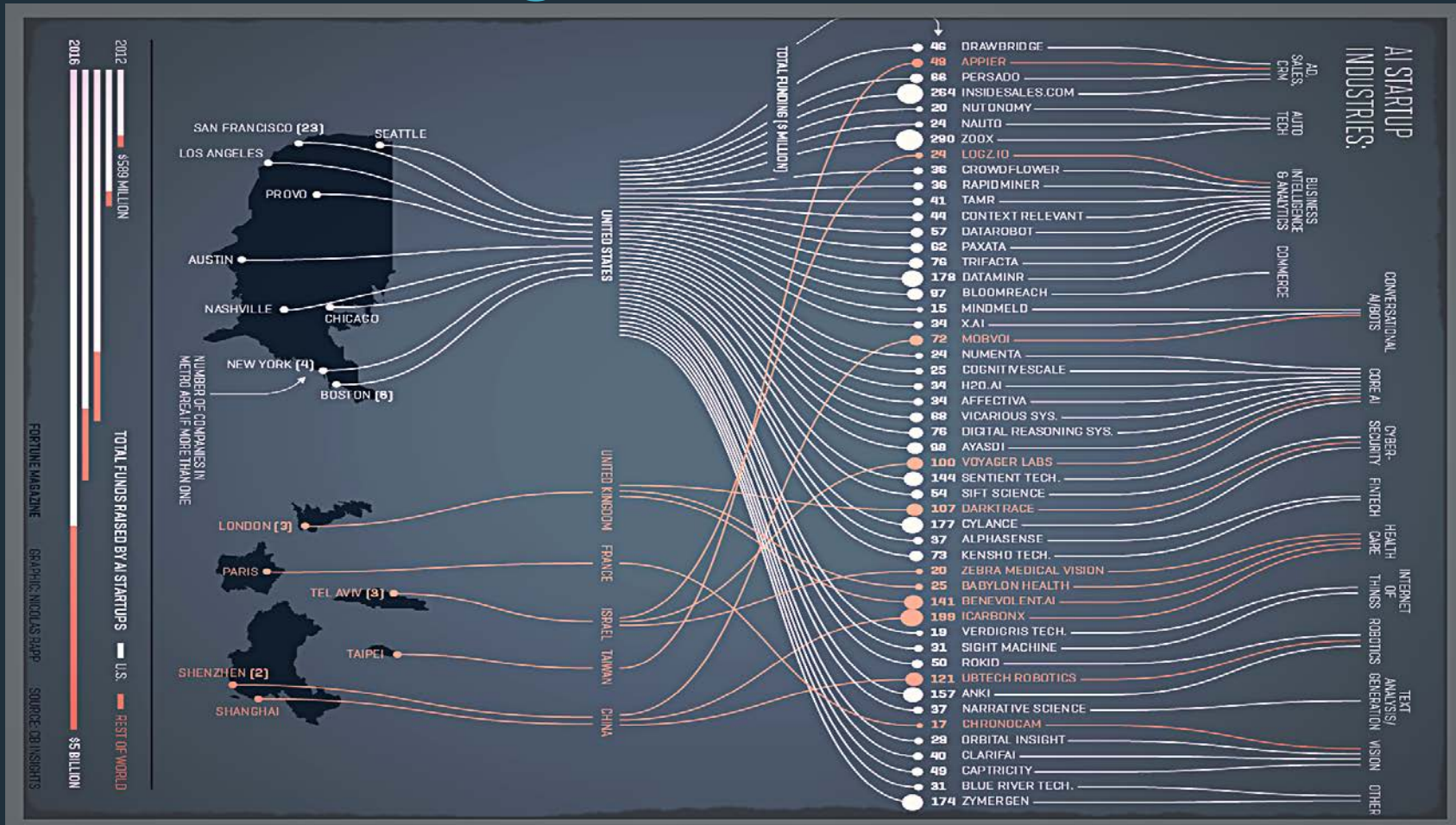
Watson Apps (Continued)

- **Cross-Sector**
  - **City Analytics** (Ongoing information about a city or region: Optimize product mix, Route optimization, Promotion Optimization, Predict demand spikes, Optimize on-shelf availability, Asset placement)

Who Else is Active in Cognitive/AI?

- IBM achieved an early lead in cognitive technology development, but
- Other companies, including Microsoft, Google, Facebook, and Apple are working hard to catch up.
- Note that many of these are Internet-based companies that have very large databases and are accustomed to mining their databases for insights.
- There are also a growing number of highly focused niche vendors entering the market

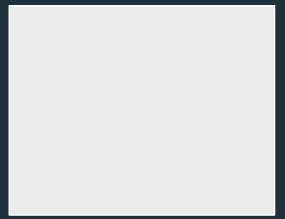
Fortune Magazine Overview of AI Firms



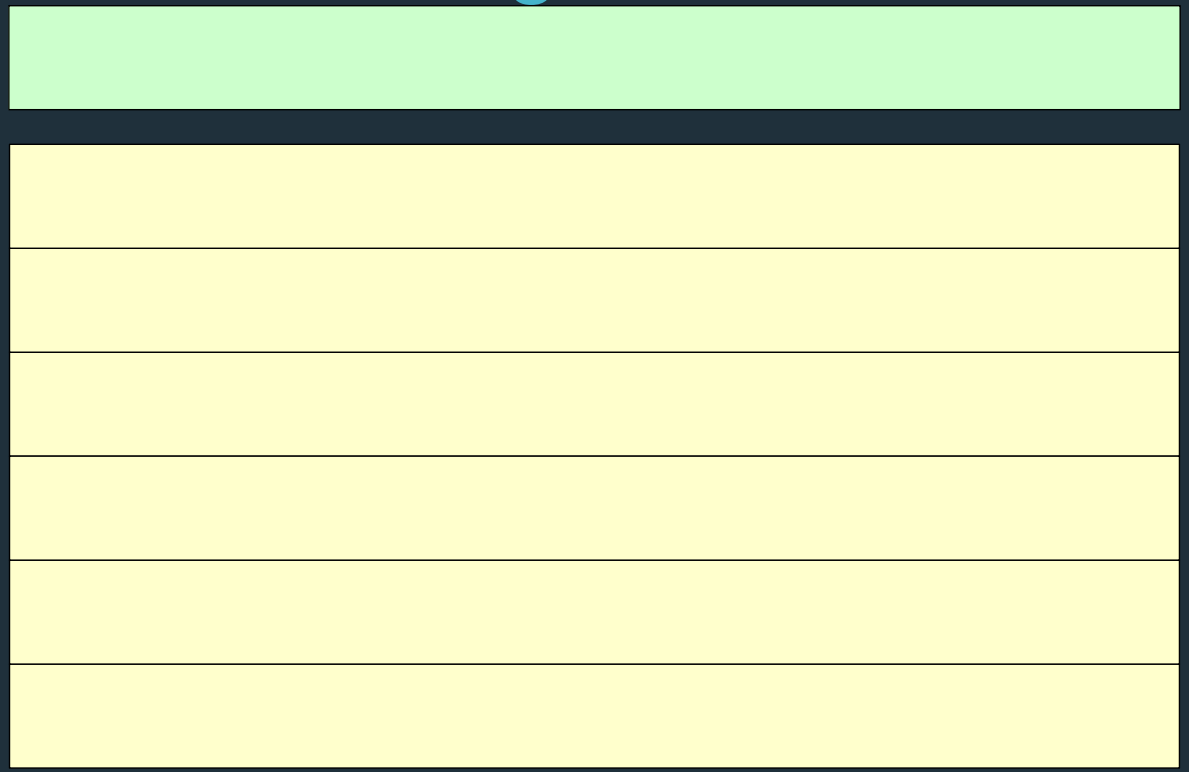
IBM Cognitive Value Assessment (CVA)

- IBM works with an organization to decide where it could use cognitive technologies to improve its business processes
  - **Step 1. Develop process overview, Develop use case**
  - Step 2. Develop a business case
  - Step 3. Develop a cognitive journey map
  - Step 4. Build a prototype (in Watson)

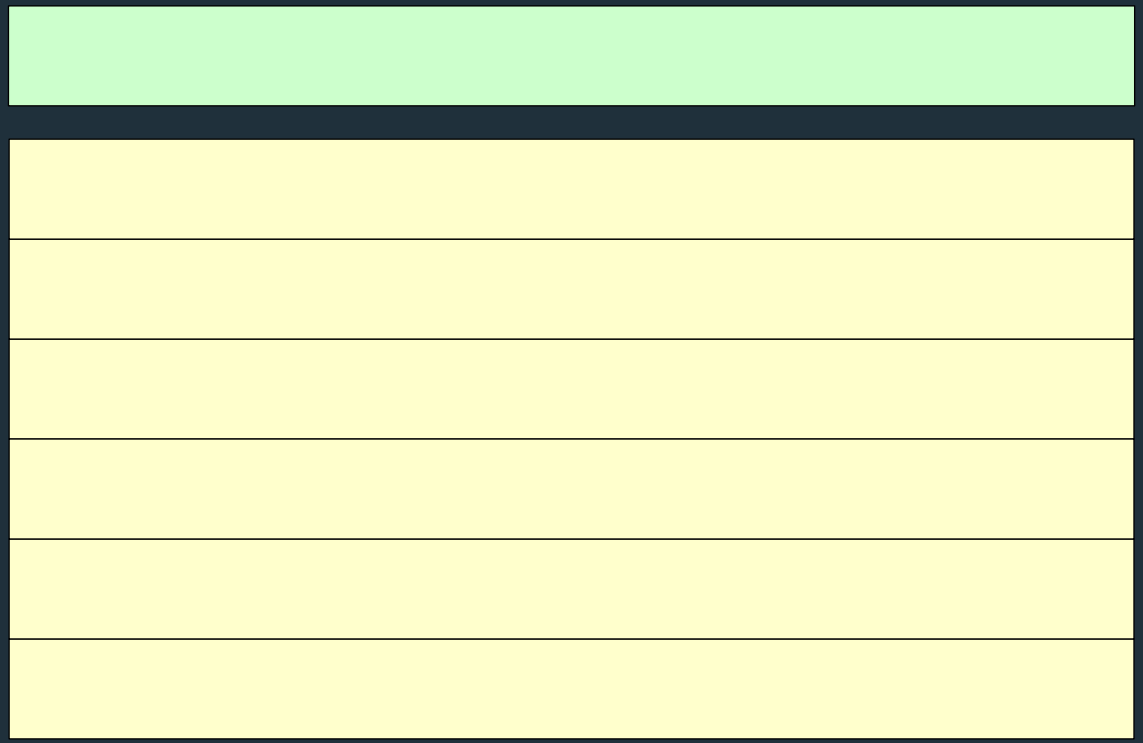
Develop an Architectural Overview of Your Organization’s Processes



Defining Processes



Defining Processes



Considerations

- Projects – To start learning, or to reinvent your organization?
- People – To oversee learning or to develop neural network systems?
- Software – To insert into existing processes, or to build a major new application?
- Management – You are going to need a group to stay on top of cognitive developments – in IT and in Business?

Summary

- Everything is going to continue to accelerate.
- To keep up with the digital response times required by customers, and to increase productivity, companies are going to have to invest in AI/Cognitive technologies – this will emerge as the broad trend in operations and IT for the coming decade.
- Most companies will depend on vendors to offer apps that they can tailor to provide very specific improvements – like natural language interfaces and instantaneous translation. The larger companies will form AI groups.

Summary

- Large amounts of data will be one key to developing cognitive apps so data will become more valuable than ever. Understanding your processes and identifying opportunities will also be very important. Those that don’t move quickly will get left behind: Think Amazon and retailers!
- Now is the time to start accumulating the talent and making plans to manage the cognitive transformation.

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