Challenges to Adopting Artificial Intelligence

Augmented Intelligence for Enterprise

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Timing & Opportunity

From Industry 1.0 to Industry 4.0

1.0 | 1784
| based on mechanical production equipment driven by water and steam power

2.0 | 1870
| based on mass production enabled by the division of labor and the use of electrical energy

3.0 | 1969
| based on the use of electronics and IT to further automate production

4.0 | tomorrow
| based on the use of cyber-physical systems

Time to impact industries’ business models

Impact felt already
- Rising geopolitical volatility
- Mobile internet and cloud technology
- Processing power, Big Data
- Sharing economy, crowdsourcing
- Middle class in emerging markets
- Young demographics in emerging markets
- Rapid urbanization
- Changing nature of work, flexible work
- Climate change, natural resources

2015–2017
- New energy supplies and technologies
- The Internet of Things
- Advanced manufacturing and 3D printing
- Longevity and ageing societies
- New consumer ethics, privacy issues
- Women’s economic power, aspirations

2018–2020
- Robotics, autonomous transport
- Artificial Intelligence
- Adv. materials, biotechnology
What Keeps CEOs Awake at Night?
Case Study: Fortune 500 CXO replaced over A.I.

"What I’ve said about autonomous vehicles is ... we have not given an indication of a market introduction date. “
Mark Fields, Ford CEO, 2016

Look at the technology coming into our industry...we really need transformational leadership.
Bill Ford, Chairman, 2017

What are the risks and opportunities that AI presents to our company?
Executives say AI will change business, but aren't doing much about it

Key takeaway:
Nearly 85% of the 3,000-plus executives surveyed expect AI will give them a competitive advantage. But their adoption of AI isn't matching up:

Worldwide Spending on Cognitive and Artificial Intelligence Systems Forecast to Reach $12.5 Billion This Year
Reduce CXO uncertainty by democratizing A.I. and address the challenges:

Barriers to AI adoption
What are the top three barriers to AI adoption in your organization?

- Attracting, acquiring, and developing the right AI talent
- Competing investment priorities
- Security concerns resulting from AI adoption
- Cultural resistance to AI approaches
- Limited or no general technology capabilities (e.g., analytics, data, IT)
- Lack of leadership support for AI initiatives
- Unclear or no business case for AI applications

Percentage of respondents ranking the selection as one of the top three barriers

A Data-Driven Approach: A.I. Basic Building Blocks

CURRICULUM BUILDING/MACHINE LEARNING

RAW DATA SETS → Feature Engineering → DERIVED DATA SETS

TRAINING MODEL (CURRICULUM)

W1 extractions W2 W3 W4 generation

INTELLIGENCE PRODUCT

NEW DATA

RAW DATA SETS → DERIVED DATA SETS

YOU NEED DATA & COMPUTING POWER…

Ping An, which employs 110 data scientists and launched 30 CEO-sponsored AI initiatives… “the biggest challenges has been acknowledging the fact that “humans don’t want to train algorithms”…

ADATOS.AI

COGNITIVE MACHINE

…TO BENEFIT FROM AUTONOMOUS ADAPTIVE AUGMENTED INTELLIGENCE
Challenges to Achieving ROI

To build a team with deep learning expertise: 2 months ~ 1 year

To prepare massive training data: ~ 10 man month(s)

To (re)train a new model: 1 hour ~ week

To give an AI inference result: < 1s

Autonomous Adaptive Augmented Intelligence

What if you could minimize or eliminate this effort? And

Immediately provide Data Science capability despite a shortage of qualified talent?
What if your A.I. could realize Financial R.O.I. in weeks?

An improvement in the Gini coefficient of one percentage point in a default prediction model can save a typical bank $10 million annually for every $1 billion in underwritten loans.

Accurate data capture and well-calibrated models have helped a global bank reduce risk-weighted assets by about $100 billion, leading to the release of billions in capital reserves that could be redeployed in the bank’s growth businesses.

Gini coefficients of 0.75 or more in default prediction models are now possible...banks can approve up to 90 percent of consumer loans in seconds, generating efficiencies of 50 percent and revenue increases of 5 to 10 percent.

https://www.mckinsey.it/idee/risk-analytics-enters-its-prime
A.I. Use Cases – Opportunities in the Banking Value Chain

- **Acquisition**
  - Customer360
  - Profiling
  - Segmentation
  - CLTV
  - Purchase Prediction

- **Onboarding**
  - Smart Underwriting
  - Real Time Qualification

- **Risk Mitigation**
  - Risk Modeling
  - Fraud Detection
  - AML

- **Servicing & Management**
  - Customer Service FAQs
  - Claims Processing
  - Transactions

- **Collection & Recovery**
  - Debt Recovery
  - Customer Reacquisition

- **Additional Use Cases**
  - Campaign Success Rate
  - CLTV
  - Revenue
  - Loyalty
  - Cross/Up-Sell

  - Conversion Rate / Yield
  - Efficient Process

  - Default
  - Late Payment
  - Loss

  - RWA & Capital Optimization
  - Throughput

  - Retention Rate / Yield
  - Efficient Process

Banking and securities investment services collectively, represent a quarter of [$12.5B] worldwide spending on cognitive/AI solutions. Stringent compliance requirements are key drivers to innovations in fraud and risk detection.
Democratizing AI: Data Science as a Service – Augmented Intelligence ‘in a Box’

3 Principles of achieving and democratizing Augmented Intelligence:

- **Purpose**
- **Transparency**
- **Skill**

Purpose – Transparency - Skill

https://www.ibm.com/blogs/think/2017/05/41041/
Applying A.I. to Save Lives

Tuberculosis affects one-third of the world's population; accounting for 1.8 Million annual deaths worldwide.

The World Health Organization (WHO) ranks Tuberculosis (TB) as the 7th leading cause of death worldwide; and the #1 cause of death in AIDS related cases.

Out of 196 countries, 22 high burden countries accounted for 83% of all estimated annual new incident cases worldwide: India, Indonesia and China, the other countries are Nigeria, Pakistan, South Africa, Bangladesh, Philippines, DR Congo, Ethiopia, Myanmar, UR Tanzania, Mozambique, Vietnam, Russian Federation, Thailand, Kenya, Brazil, Uganda, Afghanistan, Cambodia & Zimbabwe.
Agricultural and Forestry Yield Optimization

Rapid Classification of Remote Sending Images
Addendum
Justifying A.I. Use Cases (Ranked by ROI?)

- Automatic Speech Recognition (ASR) and Natural Language Understanding (NLU)
- Computer Vision (CNN)
- Micro-Segmentation/Customer Profiling, Anomaly Detection
- Process Yield Optimization leveraging SCADA/IoT
- Autonomous Vehicles
- Finance
Decision Making Sophistication and Data Complexity

**Software**

- Algorithms in decision making

**Fuzzy Boundaries**

- **Rule-based decision making**
  - *if condition fulfilled then* activity 1  *else* activity 2
  - Boolean data (yes or no)
  - Examples:
    - Phone notification
    - Time- or threshold-based alarms
    - Simple pattern matching
  - Every programmer

- **Statistical reasoning**
  - Simple regression
  - Numerical data allowing for curve fitting
  - Examples:
    - Extra- and interpolation
    - Outlier detection
    - Predictive maintenance
  - Data science types

- **Machine learning**
  - Classification tasks
  - Arbitrary data that needs to be abstracted into numbers
  - Examples:
    - Identification of relevant features from large input datasets
    - Quality control using various metrics
  - Complex systems specialists

- **Artificial intelligence**
  - Dynamic adaptation to novelty
  - Autonomous selection of best methodology when presented with arbitrary data
  - Examples:
    - Autonomous vehicles
    - Human-like conversational skills
    - Intelligent digital assistant
# A.I. Maturity

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**LEVEL OF SOPHISTICATION**

**MACHINES**