## Challenges to Adopting Artificial Intelligence

Augmented Intelligence for Enterprise

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INCEPTION PROGRAM



## Timing & Opportunity



#### From Industry 1.0 to Industry 4.0



based on mechanical production equipment driven by water and steam power



### Time to impact industries' business models

# 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





### 2015–2017

Rising geopolitical volatility Mobile internet and cloud technology Processing power, Big Data

Sharing economy, crowdsourcing

Impact felt already

Middle class in emerging markets

Young demographics in emerging markets

Rapid urbanization

Changing nature of work, flexible work

Climate change, natural resources

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

Robotics, autonomous transport

2018-2020

.....

Artificial Intelligence

Adv. materials, biotechnology

## What Keeps CEOs Awake at Night? Case Study: Fortune 500 CXO replaced over A.I.



What are the risks and opportunities that AI presents to our company?

"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

### Executives say AI will change business, but aren't doing much about it

Key takeaway:

### Adoption level of Al

What is the level of AI adoption in your organization?



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 Al adoption

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



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

http://sloanreview.mit.edu/projects/reshaping-business-with-artificial-intelligence/

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



### 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 Al 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. Analytically enhanced credit models can improve banks' returns in four ways.

Higher interest income from loan business	Lower sales and operating costs	Reduction of relative risk costs	Improved capital efficiency	
<ul> <li>Increase loan volume through sales cam- paigns, with lower turndown rate due to better customer prese- lection and cross-selling</li> <li>Increase margin and loan volume by gradually introducing risk- differentiated offers (eg, packages or prices) and cross-selling of higher- margin products</li> </ul>	Targeted and effective origina- tion process (eg. risk prescreening, policy prefilters)     More efficient underwrting process (eg. digital channels, risk-based cittler- enflated process across products)	<ul> <li>Better selection of risks, (eg, with combined risk scores, risk clus- tering of customer segments)</li> <li>Improved risk monitoring and early warning across product categories</li> </ul>	<ul> <li>Better calibra- tion and refine- ment of the models, leading to reduced risk-weighted asserts</li> <li>Better data cleaniness to accurately represent risk measures and mitigants</li> </ul>	
Typical impact, <sup>1</sup> %				
5-15	15-50	10-30	10-15	
Higher revenues	Greater productivity	Fewer loan losses	Fewer risk- weighted assets	

Impact not additive and depends on the bank's portfolio

McKinsey&Company

Exhibit 1

https://www.mckinsey.it/idee/risk-analytics-enters-its-prime

## A.I. Use Cases – Opportunities in the Banking Value Chain



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'

### ADATOS.AI

Empowering next generation competitive edge advantage for Financial Industry

"Banks can now extract deeper and more valuable insights from their ever-growing mountains of data.

Machine-learning techniques, such as deep learning, random forest, and XGBcost, are now common at top riskanalytics departments.

Banks that are fully exploiting these shifts are experiencing a "golden age" of risk analytics, capturing benefits in the accuracy and reach of their credit-risk models and in entirely new business models. ...resulting in higher profitability.' Mckinsey Report

#### Integrated Solution Offerings

#### OB ADATOS.AI for Debt Recovery

 More than 85% precision on identifying nonperforming loans
 More than 3x savings in resources spent on bad debt collection

• ADATOS.AI for Fraud Detection

 Accurately identified anomalous behaviour with 99% precision
 More than 90% reduction in false positives

### ADATOS.AI for Credit Scoring More than 25% saving in loan loss provisioning 2x increased accuracy on Gini Coefficient

IBM OpenPower Systems S822LC



IBM PowerAl Software, Linux Operating Systems
 20 × 2.86 GHz POWER8 CPU Cores, 512 GB Memory
 4 × NVIDIA Tesla P100 GPUs
 2 × 3.84 TB SSD storage devices



Adatos builds and deploys elegant, prize-winning Data Intelligence solutions tailor-made for the private sector.

Combining over three decades of extensive experience in Intelligence Analytic Tradecraft with advanced Deep Learning technology, Adatos delivers scale and consistent outperformance of industry benchmark metrics to valued clients in the Financial Services Insurance and Retail industries.

Mature A.I. approach
 Mature client's adoption
 Proven deep learning algorithm
 Rapid time to market
 Rapid ROI

ADATOS AI Solution Offerings is deeply engineered with IBM OpenPower Cognitive technology to tackle new complex problems with unparallel speed and accuracy. This total solution leverages on NVIDIA Tesla P100 with IBM only CPU:GPU NVLink technology and IBM PowerAI Software Stack. 3 Principles of achieving and democratizing Augmented Intelligence:

### Purpose – Transparency - Skill

https://www.ibm.com/blogs/think/2017/05/41041/







CORAL - Collaboration of Oak Ridge, Argonne and Livermore







## Applying A.I. to Save Lives

Tuberculosis affects one-third of the worlds population; accounting for 1.8 Million annual deaths worldwide

The World Health Organization (WHO) ranks Tuberculosis (TB) as the 7<sup>th</sup> 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







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#### Upload Image Data Set & Choose Models

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#### Perform Classification on Testing Data





## 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



SIGNAL PROCESSING

- Process Yield Optimization leveraging SCADA/IoT
- Autonomous Vehicles

Finance













complex systems specialists

## A.I. Maturity

GEN 0 Statistics	GEN 1.0 Big Data	GEN 2.0	GEN 2.5	GEN 3.0			
Heuristics/ Rules Based	Data driven	Machine Learning/ Natural Language Processing		$\begin{array}{c} \mathbf{k}_{n-1}(r) = \mathbf{l} & \mathbf{k}_{n-1}(r) = \mathbf{l} \\ \mathbf{k}_{n-1}(r) = \mathbf{k}_{n-1}(r) \\ \mathbf{k}_{n-1$			
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IBM Ssas SPSS	Micloop	Microsoft Azure	TensorFlow	ADATOS.AI			
Statisticians "Not necessarily true"	Data Scientists "Boil the Ocean"	Data Scientists "Algorithmic Library"	Data Scientists "Signal Processing"	Cognitive Machines			
LEVEL OF SOPHISTICATION							

MACHINES