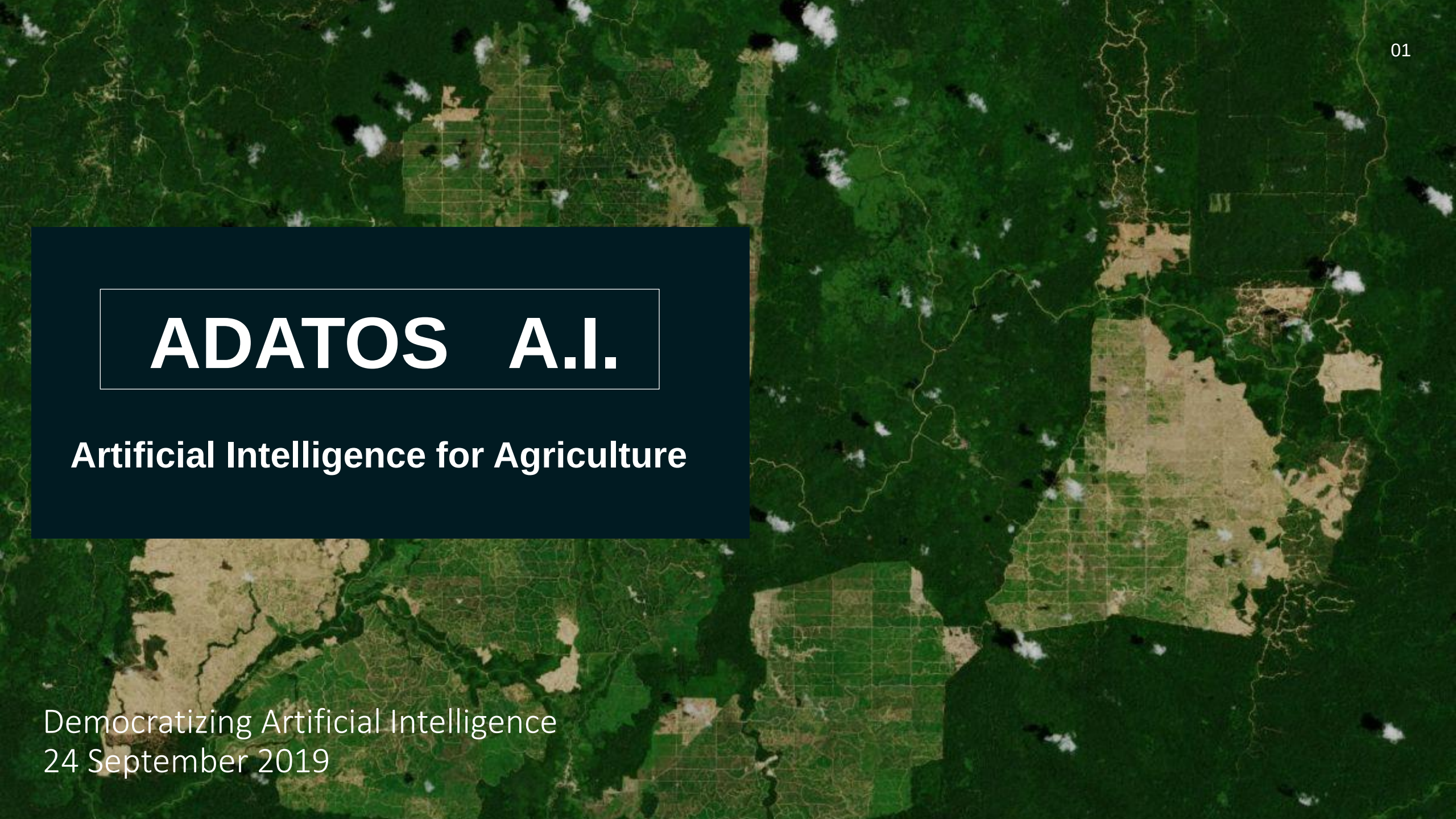


ADATOS A.I.

Artificial Intelligence for Agriculture

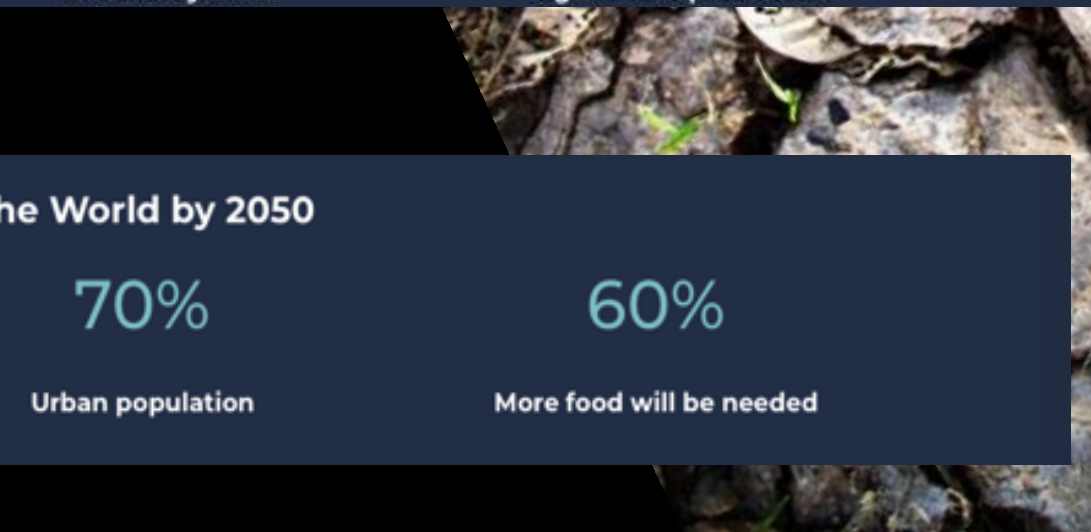
Democratizing Artificial Intelligence
24 September 2019

Food Security & Sustainability

By 2050, we must produce as much food as we have consumed in the last 10,000 years

Asia Pacific by 2050

67%	64%	37%
of the world's 1bn hungry reside here	of Asians living in cities by 2050	Post-harvest losses in agriculture production



The World by 2050

9.7 bn	70%	60%
Estimated population	Urban population	More food will be needed

Enterprise Singapore

SGINNOVATE

SCG

wavemaker PARTNERS

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

GrowAsia

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

Source: Future of Jobs Report, World Economic Forum

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."

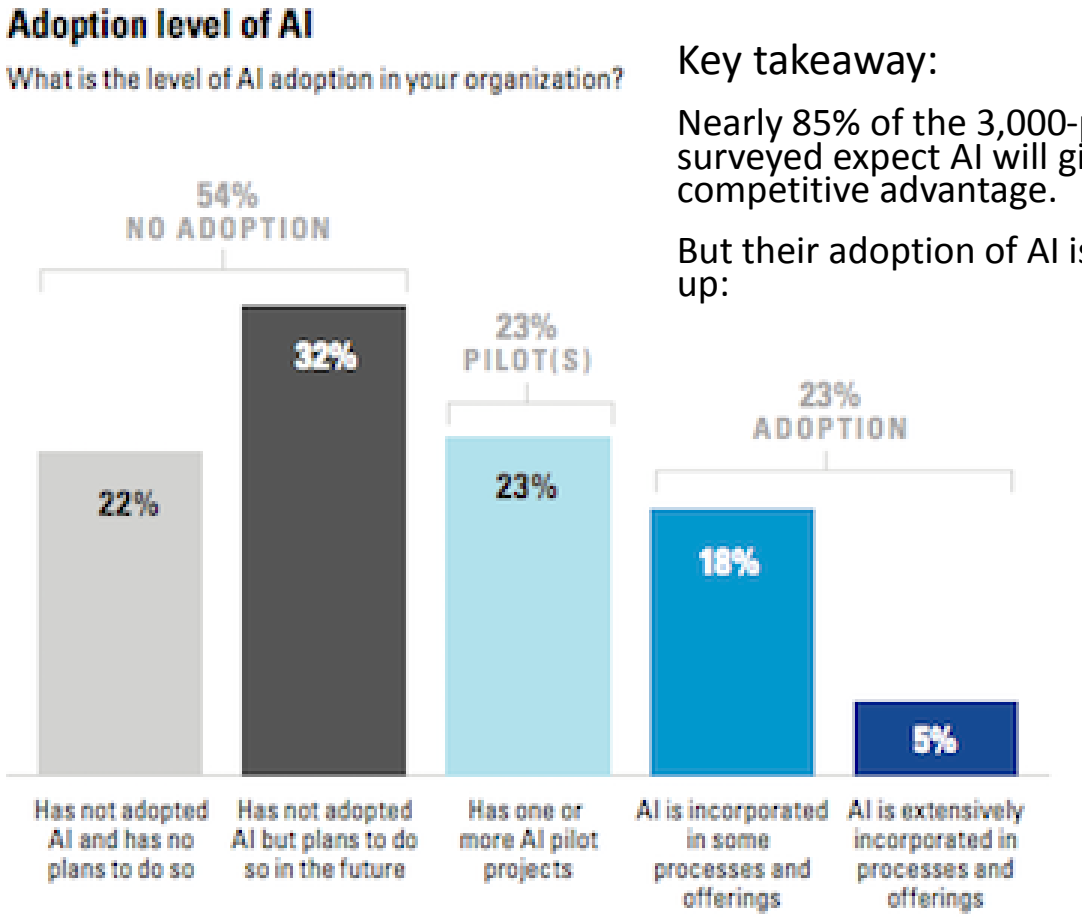
Mark Fields, Ford CEO, 2016

*Look at the technology coming into our industry…**we really need transformational leadership.***

Bill Ford, Chairman, 2017

Industry Insight

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



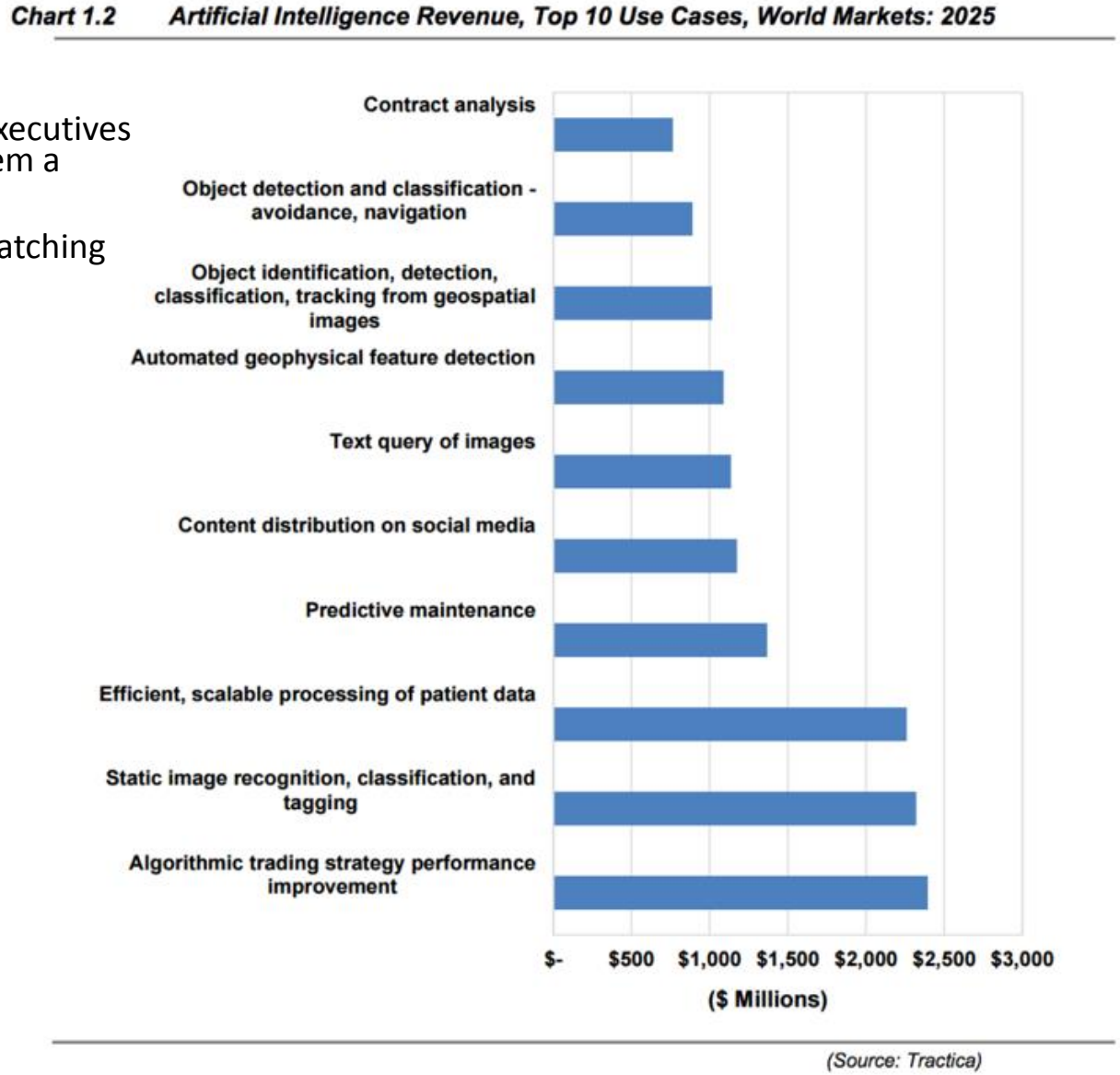
Key takeaway:

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:

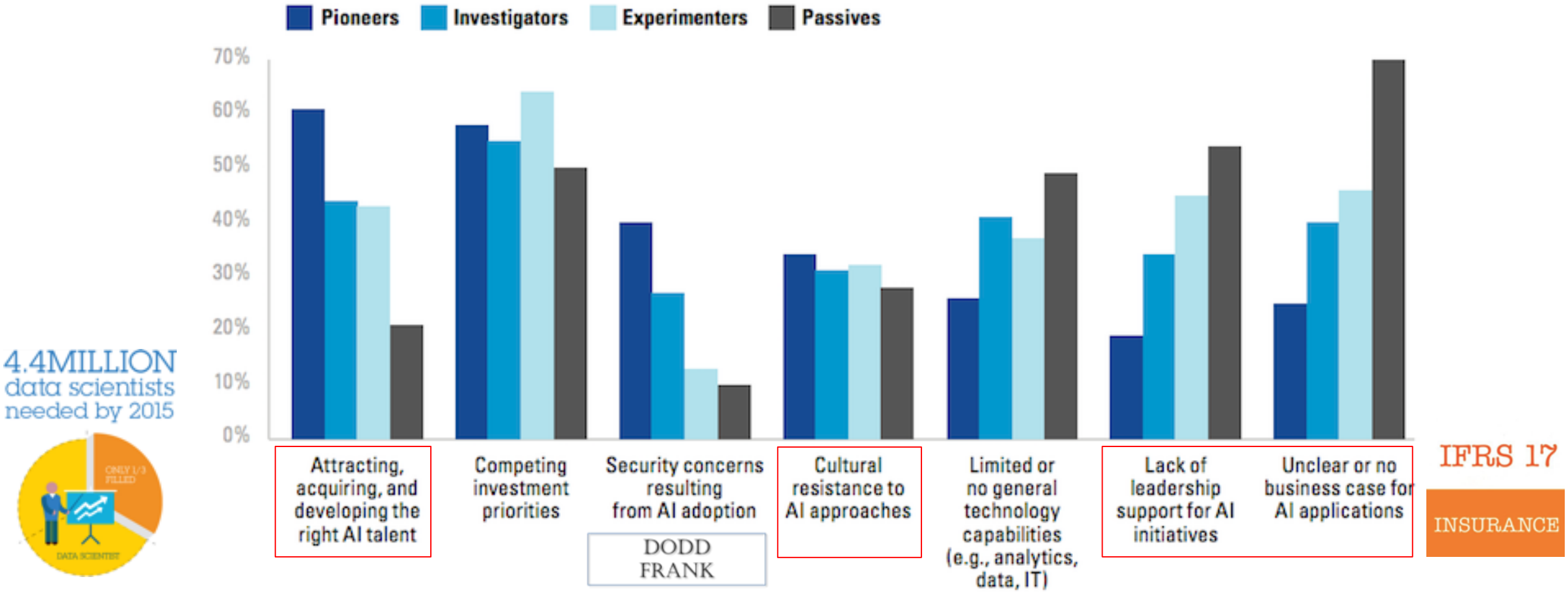
Worldwide Spending on Cognitive and Artificial Intelligence Systems Forecast to Reach $12.5 Billion This Year

http://www.idc.com/getdoc.jsp?containerId=prUS42439617



Barriers to AI Adoption

Reduce CXO uncertainty by democratizing A.I. and address the challenges:



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

Too much data, Not enough qualified Data Scientists

It will take 2 analysts working 24/7 over 10 years to manually analyze all the images generated by single drone flight.

”

The U.S. alone faces a shortage of **140,000** to **190,000** people with analytical expertise in statistics and machine learning and a shortage of **1.5 million** managers and analysts with the skills to understand and make decisions based on data.

Our focus is in industries that are unable to efficiently process collected data to derive timely insight

Our machines are able to outperform the human analysts in speed and accuracy.

We only focus on relevant and profitable use cases prepared to immediatlely profit from mature technology.

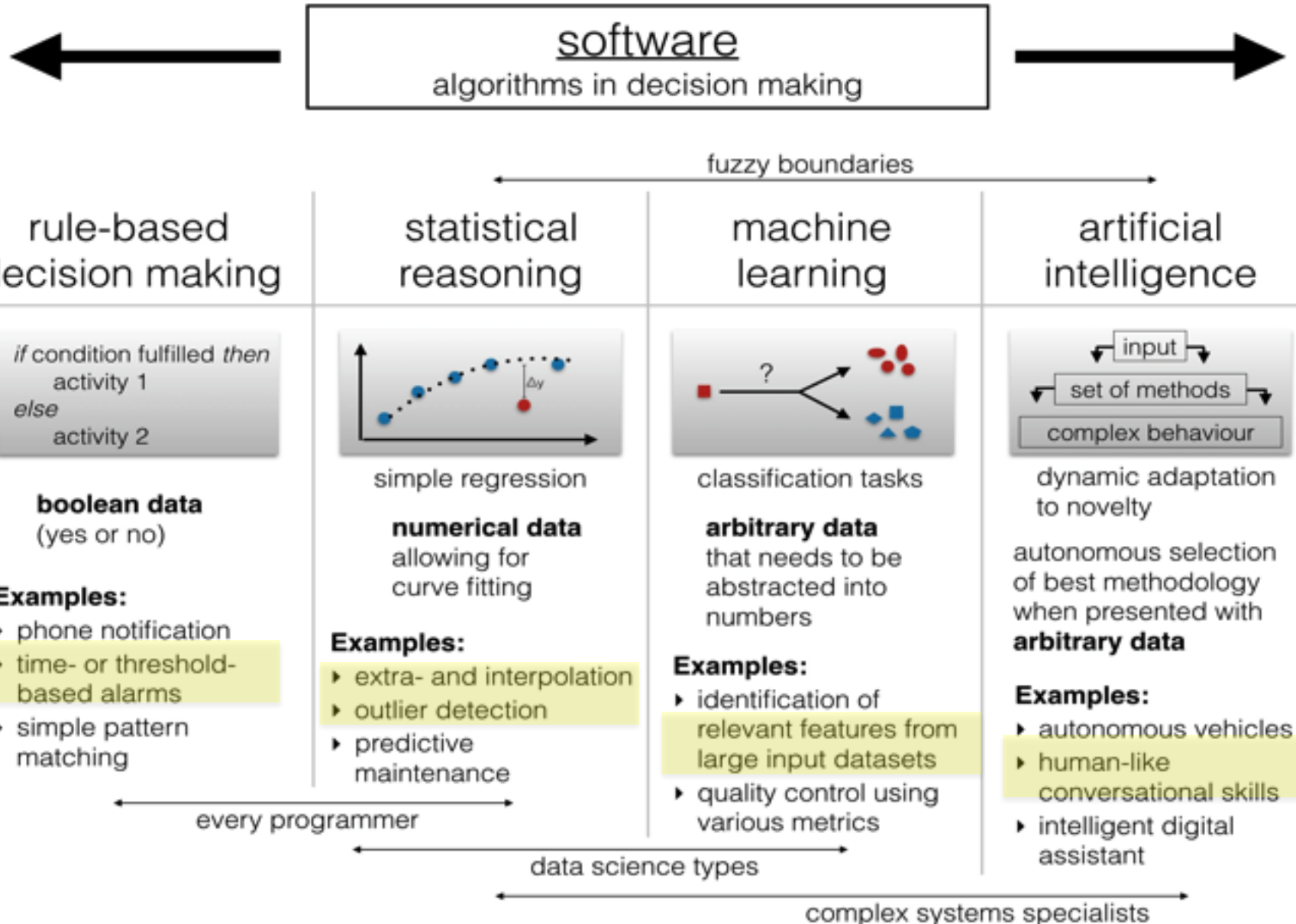
Technology matured in the Intelligence Community

”

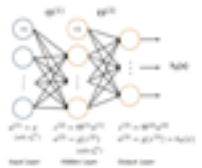
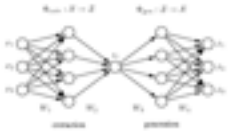
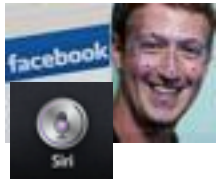
From our initial planning phase right through to the dissemination of our analysis, we leverage the **Intelligence Process** matured over three decades in the **Intelligence Community**, and **Intelligence Advanced Research Projects Activity (IARPA)**.

- Proprietary algorithms capable of analyzing vast volumes of high-dimensional data
- Algorithms that learn from a training data set to build models that improve themselves
- Holistic industry expertise to leverage our technology in Precision Agriculture

Algorithm Sophistication and Data Complexity



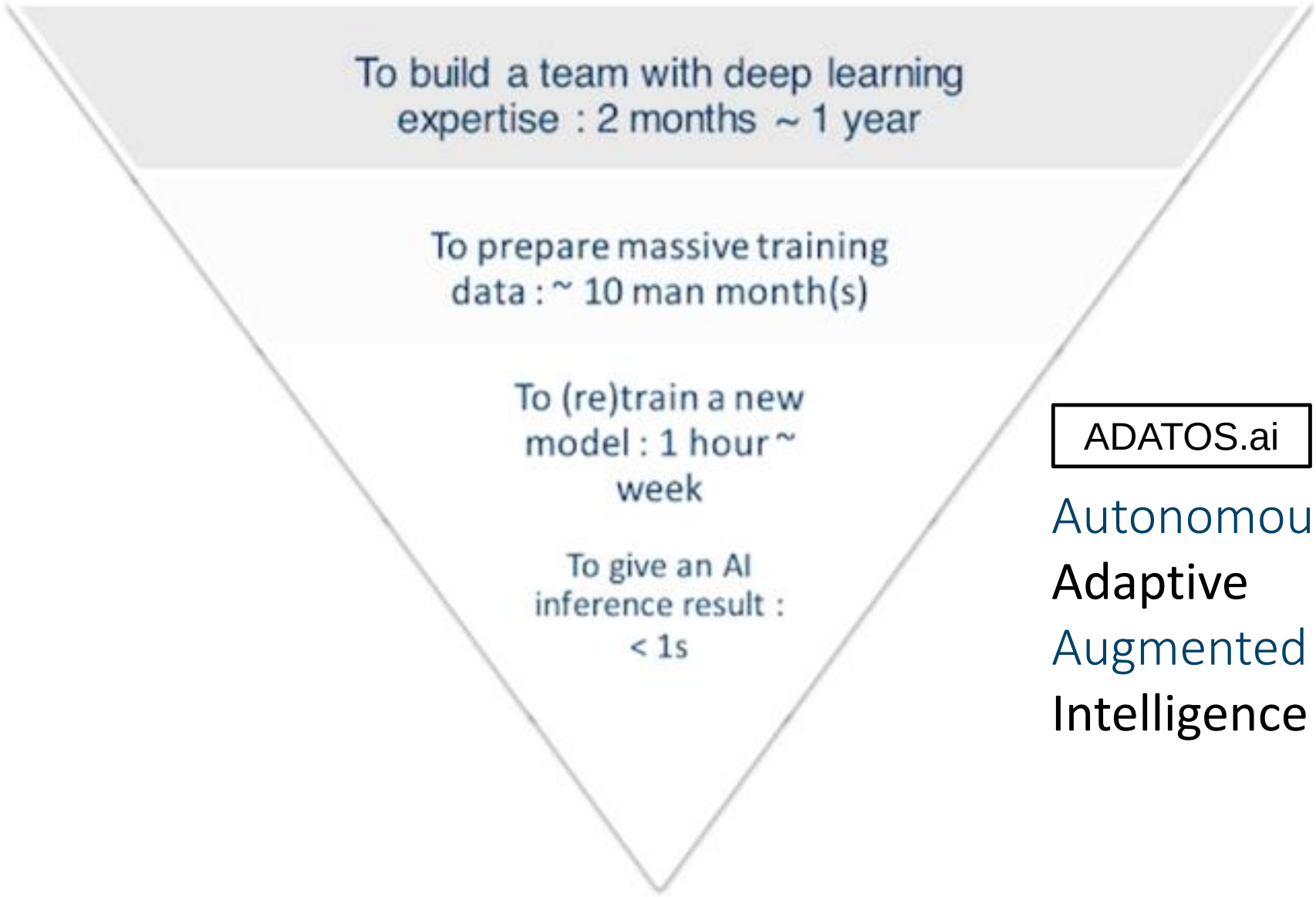
AI Maturity

GEN 0 **Statistics**	GEN 1.0 **Big Data**	GEN 2.0 **AI**	GEN 2.5 **AI**	GEN 3.0 **AI**
Heuristics/ Rules Based	Data driven	Machine Learning/ Natural Language Processing		
				
IBM SPSS sas	hadoop	Microsoft Azure IBM Watson	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

Challenges to Achieving ROI



ADATOS.ai

Autonomous
Adaptive
Augmented
Intelligence

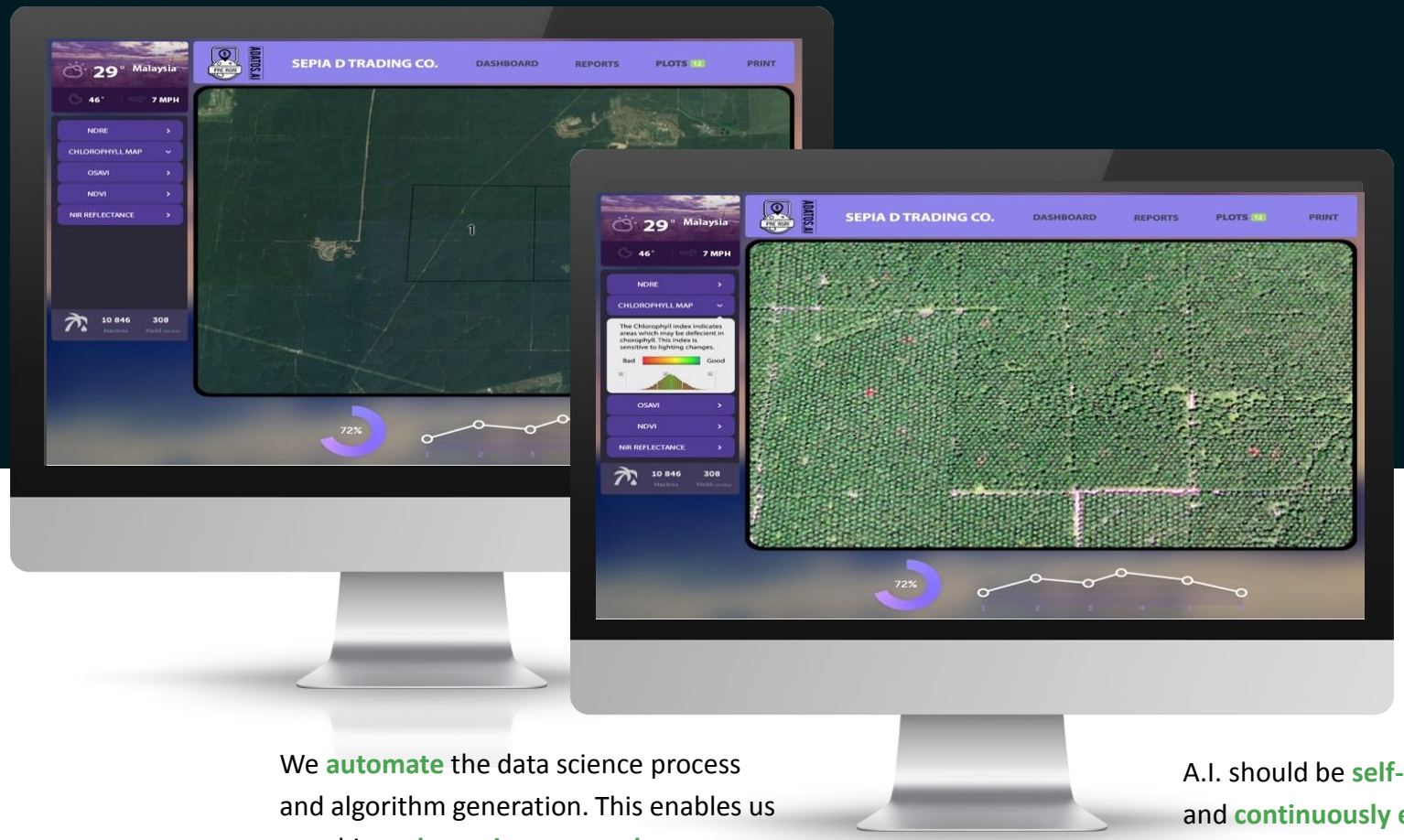
What if you could minimize or eliminate this effort? And

Immediately provide Data Science capability despite a shortage of qualified talent?

Let A.I. do the work

Solving the problem of too much data, not enough analysts

Democratise A.I. for the non-technical user



We **automate** the data science process and algorithm generation. This enables us to achieve **data science at scale**.

A.I. should be **self-learning**, and **continuously evolve** in performance.

A.I. that builds A.I.

Not just Machine Learning, but Autonomous Machine Learning

Our A.I. automates the process of reading geospatial imagery

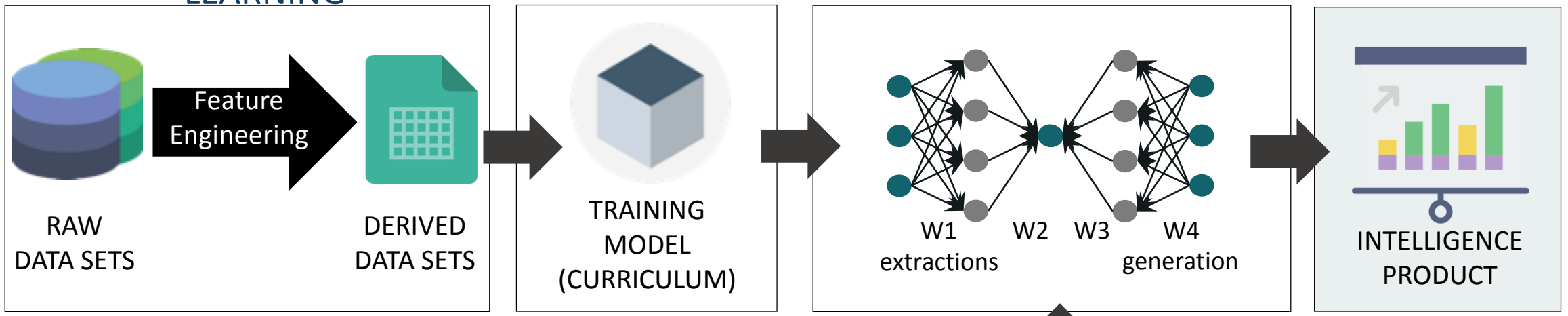
A.I. can perform all the functions of a GIS analyst or Agronomist including: plant count by species and maturity, monitoring: plant health, disease, soil quality, fertilizer optimization, moisture, weather conditions and yield prediction.

- Eliminate most repetitive and tedious manual processes
- Persistent Intelligence, Surveillance & Reconnaissance (ISR)

A.I. Building Blocks

A Data-Driven Approach

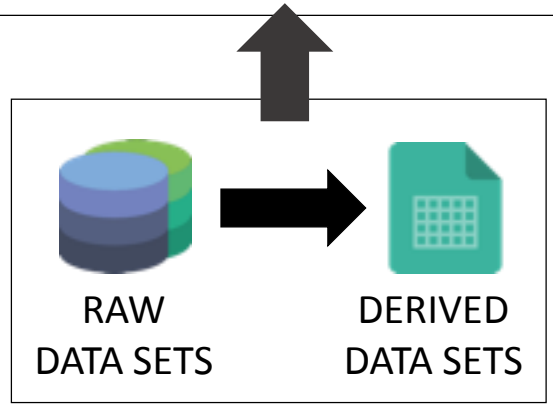
CURRICULUM BUILDING/MACHINE LEARNING → OUTPUT → ADATOS.ai COGNITIVE MACHINE → OUTPUT



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”…

NEW DATA



…TO BENEFIT FROM

AUTONOMOUS
ADAPTIVE
AUGMENTED
INTELLIGENCE

Industry spotlight

Precision Agriculture in Southeast Asia

TODAY

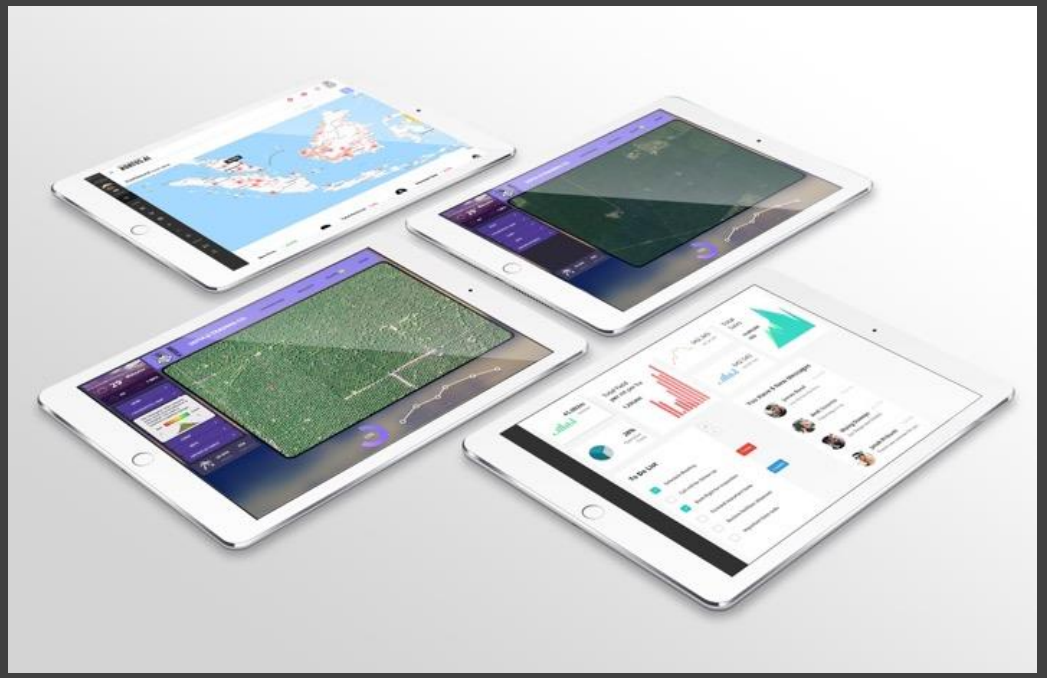
- Satellite and drone imagery with **manual analysis** which can take weeks or months
- Plantation **buys imagery**
- **Manual supervision** of very large areas
- **On-the-ground monitoring** for fertilizer, water, crop health and disease
- **Infrastructure challenges** in rural environments and emerging economies

TOMORROW

- **Fully automated analysis** performed in minutes to hours resulting in more accurate performance
- Adatos provides **full package** of images and analysis
- **Automated verification** of tasks performed
- Near **real-time feedback**
- Timely information to efficiently manage **yield, supply and demand, and trade investments**

Capabilities

- Inventory (Plant Count & Density)
- Determine Planting Age vs Maturity
- Measure Soil Quality (Fertilizer Distribution, NPK Values)
- Identify Ground Water Pooling, Road Condition
- Detect Pest & Disease
- Assess High Carbon Stock areas
- Estimate Yield by Hectare; Aggregate by Block, Plantation, Land Bank



- Agriculture Land Use and Crop Classification >98% accuracy
- Tree inventory ~98% accuracy
- Oil palm identification at very large scale 76,000,000 ha = 60 TB data
- Custom disease monitoring across >22,000,000 ha/year

Why we do it

It's a race against Time

“Imagine all the food mankind has produced over the past 8,000 years. Now consider that we need to produce that same amount again — but in just the next 40 years ..." – *Ban Ki-moon, United Nations Secretary-General.*

"To put it in stark terms --- the world’s farmers, ranchers, and fishers will be expected to produce more food in the next 40 years than they have had to in the last 8,000 years combined." - Dan Glickman, Former US Secretary of Agriculture and Catherine Bertini, former Executive Director of the UN World Food Program - May 26, 2011

We are trustees of a world, and a society, and must pass on a sustainable legacy for future generations.


ADATOS.AI