

Digitization of Everything: Implications for the Industry

Dr. Allan Gray

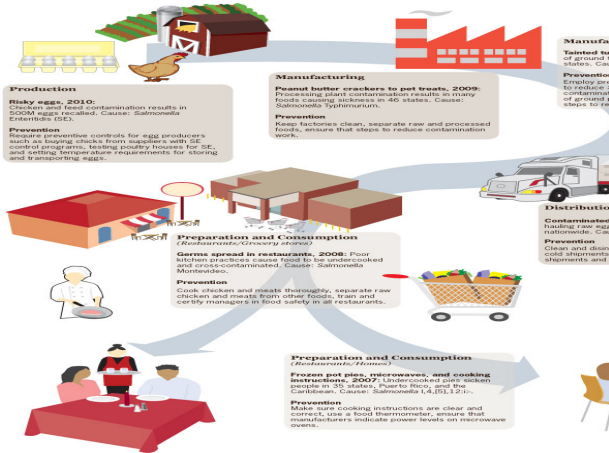
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COLLEGE OF AGRICULTURE

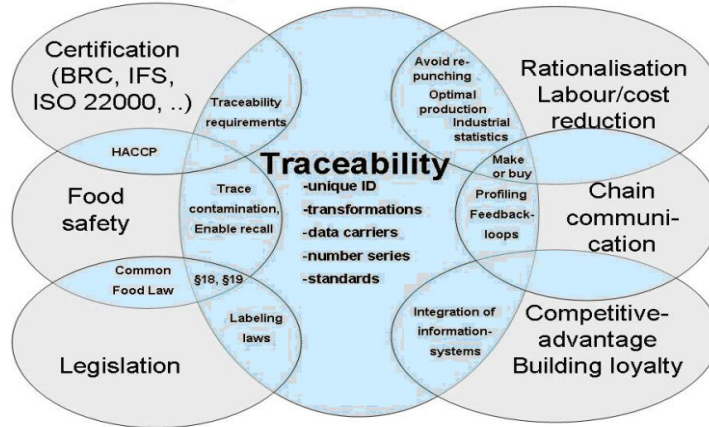
The Digital Age: Transparency, Productivity, and Sustainability

- Consumers are the driving force
- Transparency is a major goal
- Enabling tools are fueling the change
- Agriculture is behind but catching up rapidly

Consumers want to know



Traceability drivers in the food sector:



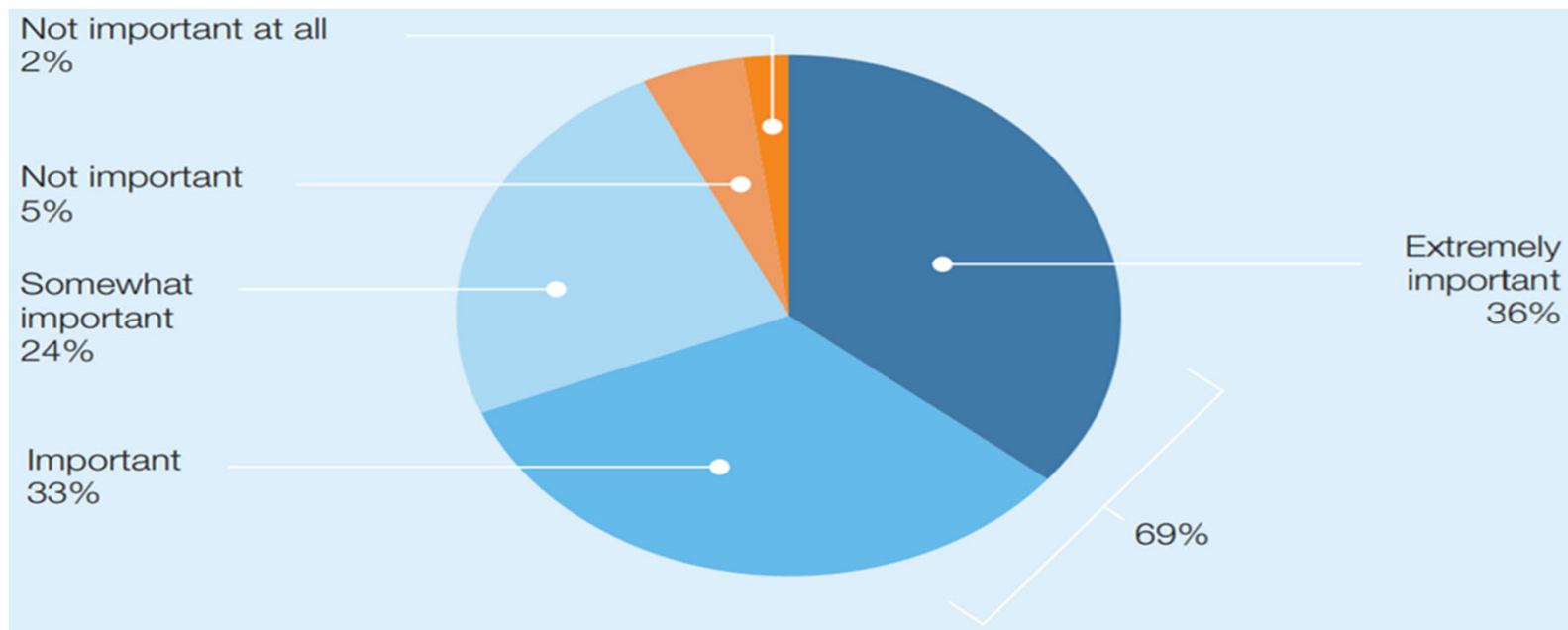
Petter Otten 2006 - © Fiskeriforsking - May be copied if source is acknowledged

A field-to-table global product portfolio



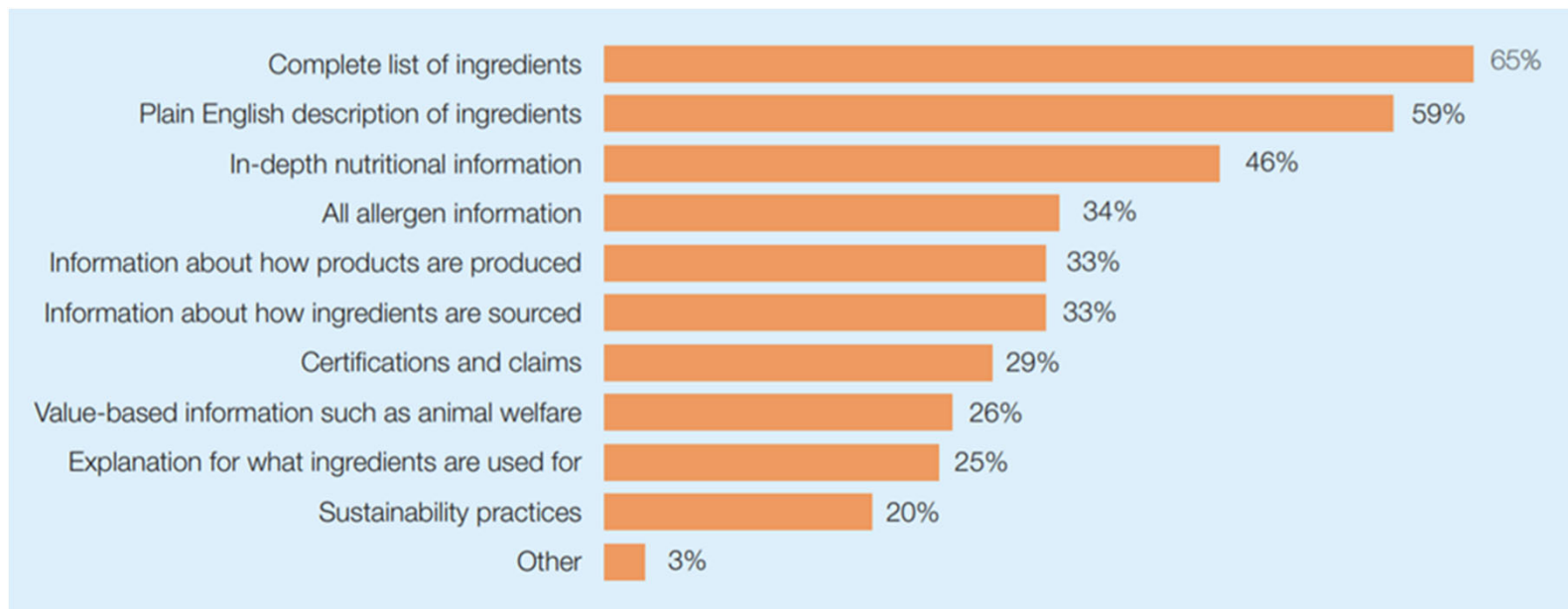
SunOpta Inc. is a leading global company specializing in the sourcing, processing and packaging of natural, organic and specialty food products. Integrated from seed through packaged products and with a focus on strategically significant vertically integrated business models, we can deliver the best quality and value.

How important is transparency to consumers?



Source: THE TRANSPARENCY IMPERATIVE Product Labeling from the Consumer Perspective Food Marketing Institute and Label Insight 2018

How do shoppers determine transparency?



Source: THE TRANSPARENCY IMPERATIVE Product Labeling from the Consumer Perspective Food Marketing Institute and Label Insight 2018

BLOCKCHAIN USE CASES FOR AGRICULTURE

SUSTAINABILITY

- The World Wildlife Fund piloted OpenSC—a blockchain platform that tracks the harvest and shipment of wild fish.
 - GPS location is recorded to ensure fish were caught in legal fishing waters.
 - Fish are tracked using RFID codes from source to the processor.
 - QR codes are placed on each fillet, giving consumers information on its source and harvest practice.

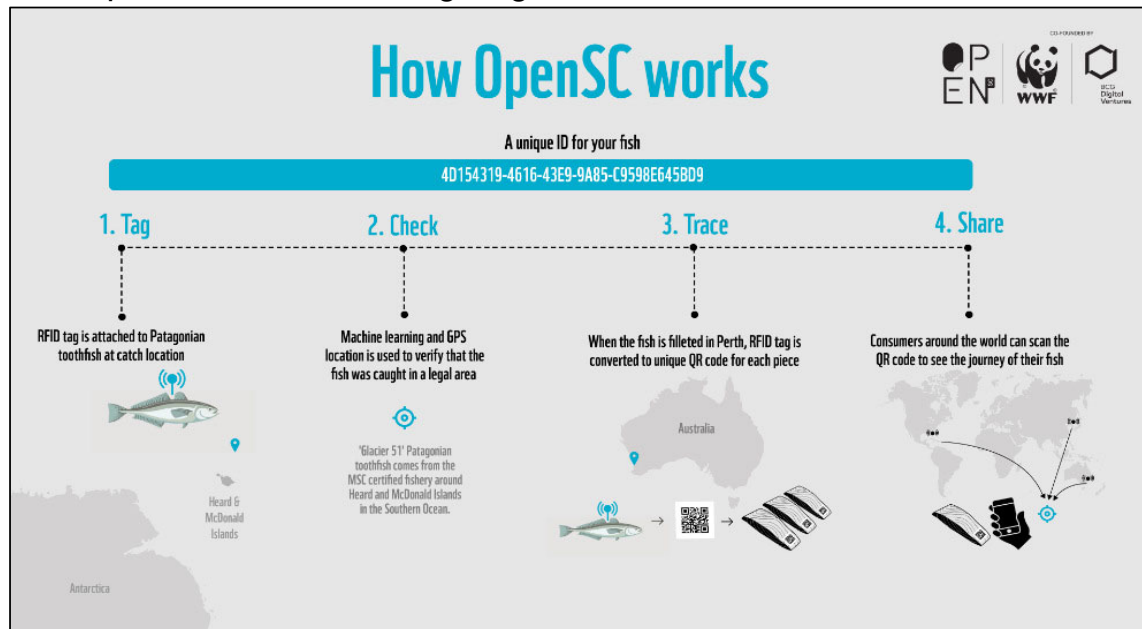


Image source: World Wildlife Fund-Australia

BLOCKCHAIN USE CASES FOR AGRICULTURE

FOOD SAFETY

- Walmart and IBM are working to ensure food safety with blockchain.
 - Time needed to identify the origin of sliced mangoes went from 7 days to 2.2 seconds with blockchain.
 - For pork in China, a blockchain system allowed for the uploading of certificates of authenticity—bringing trust to the system.
 - Requiring all suppliers of leafy greens to trace their products back to the farm using blockchain.

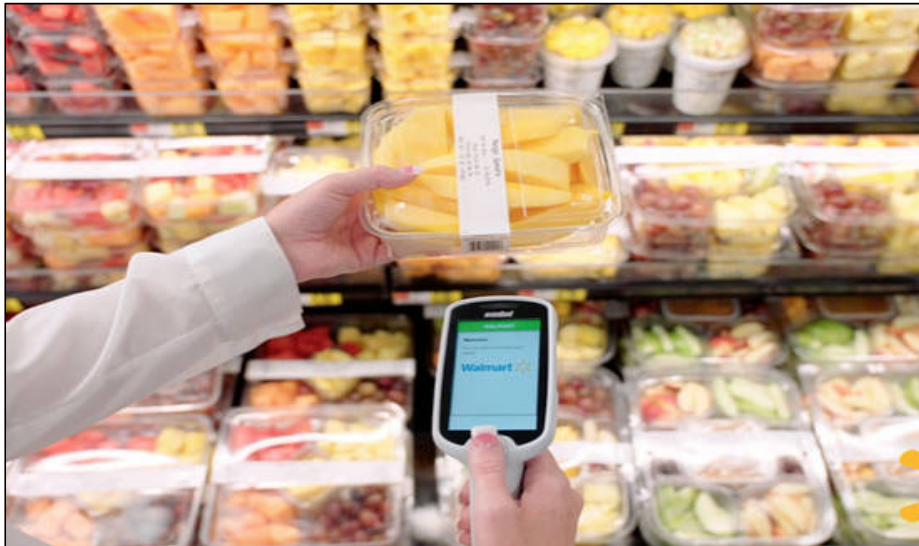


Image source: The Wall Street Journal

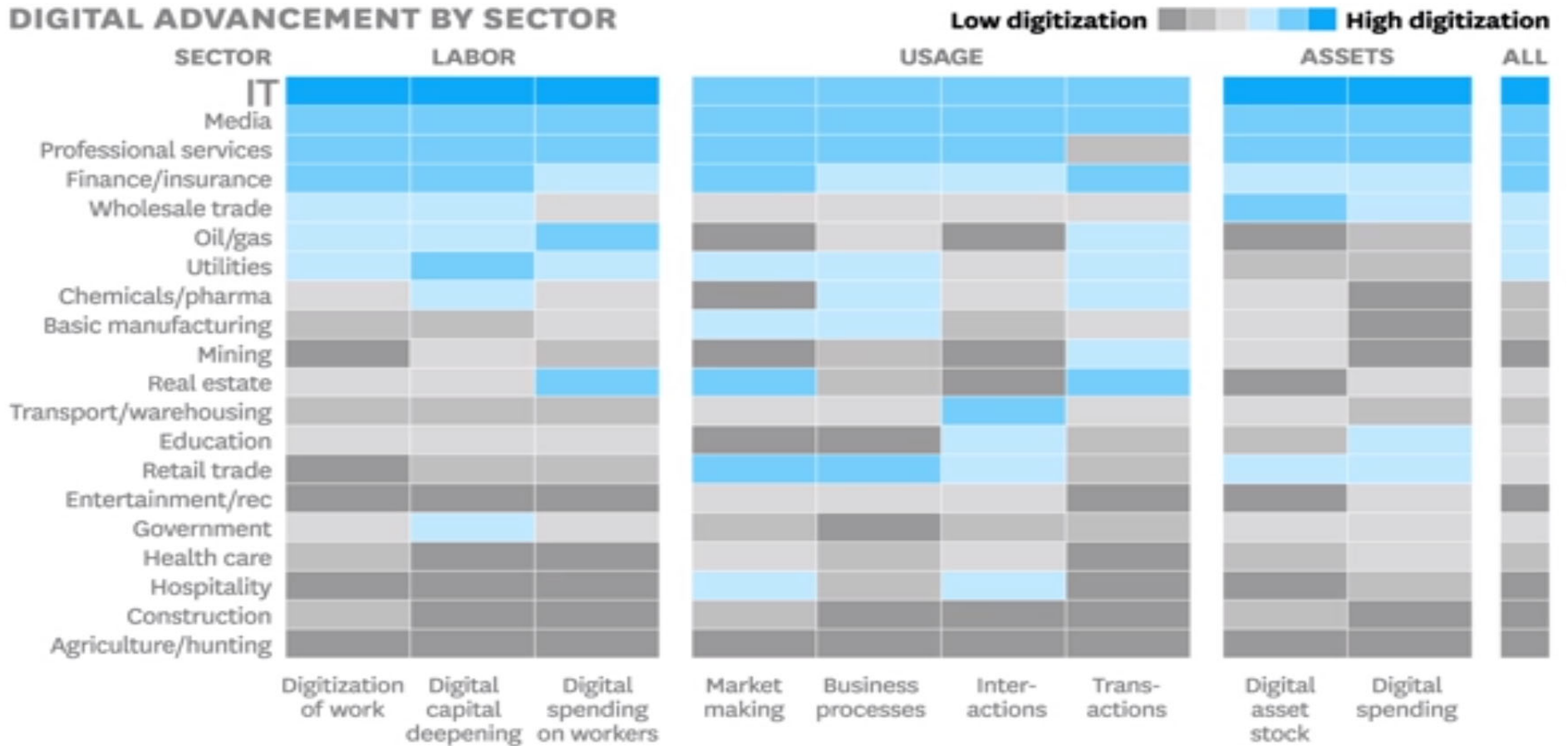
Blockchain: Possible Uses



Source: <https://www.disruptordaily.com/blockchain-use-cases-agriculture/>

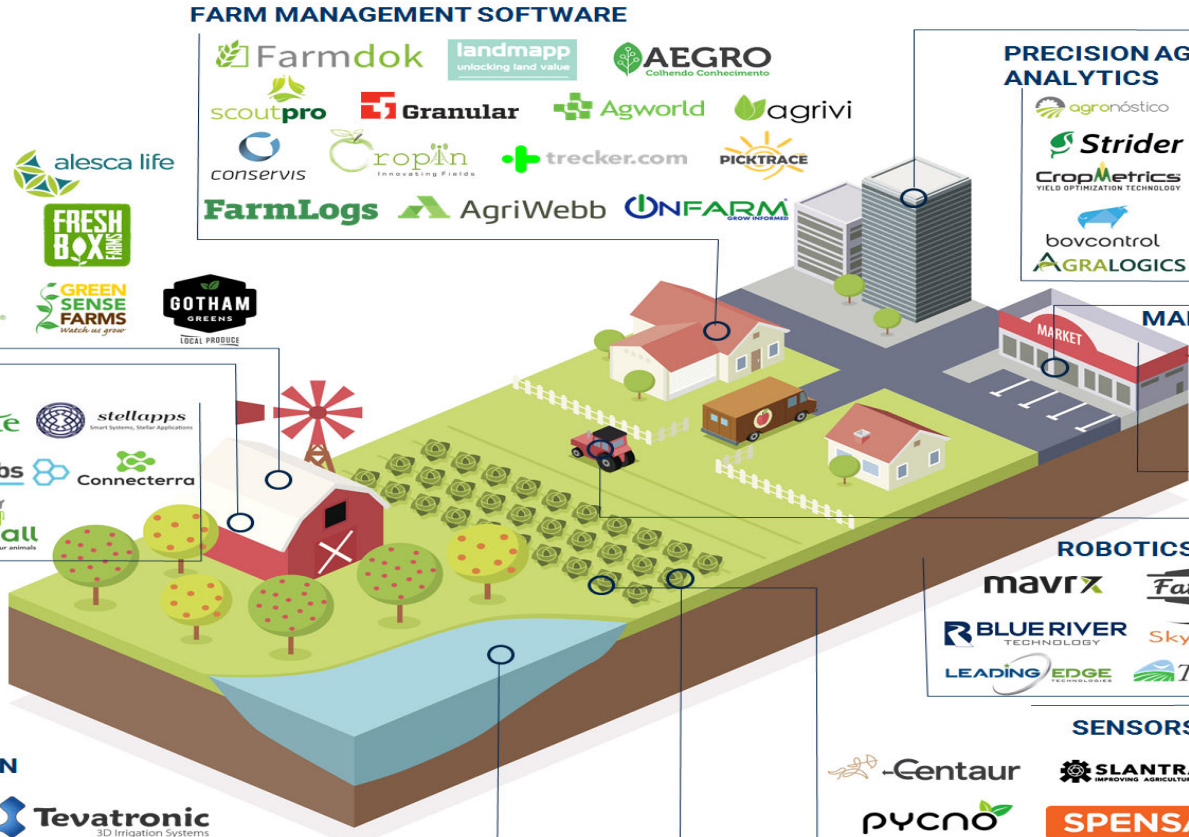
Agriculture is still behind other Industries in Digitalization

DIGITAL ADVANCEMENT BY SECTOR





AG TECH: 100+ TECHNOLOGY COMPANIES CHANGING THE FARM



FARM MANAGEMENT SOFTWARE



PRECISION AGRICULTURE AND PREDICTIVE ANALYTICS



MARKETPLACES



ROBOTICS AND DRONES



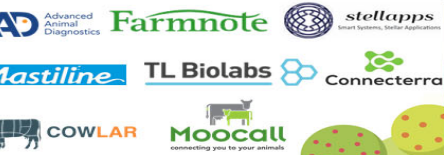
SENSORS



NEXT GEN FARMS



ANIMAL DATA



SMART IRRIGATION

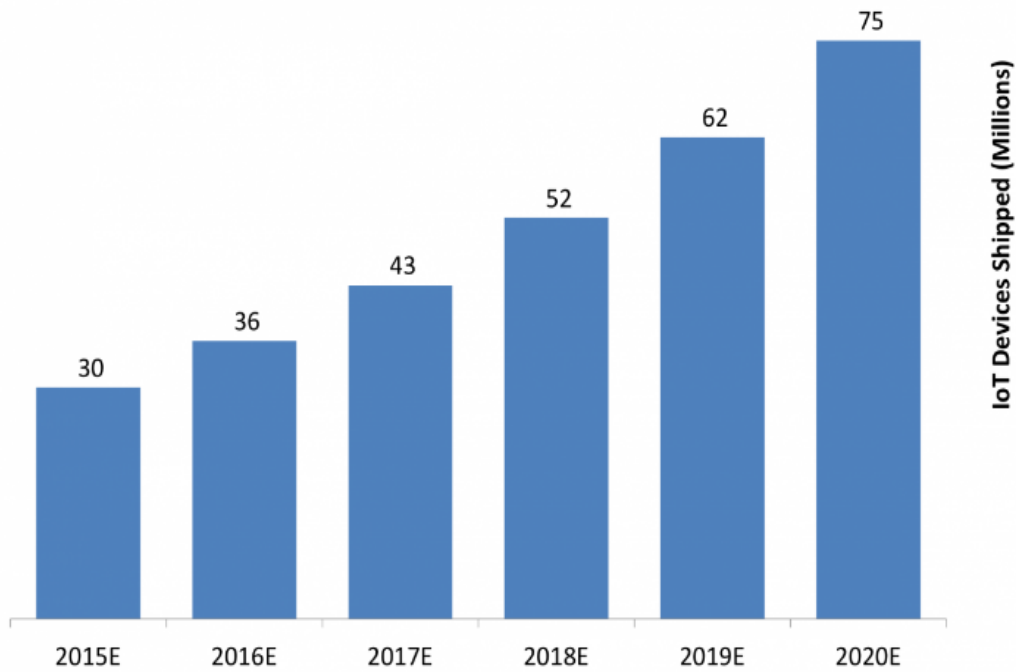


PLANT DATA/ANALYSIS



Internet of Things and Data

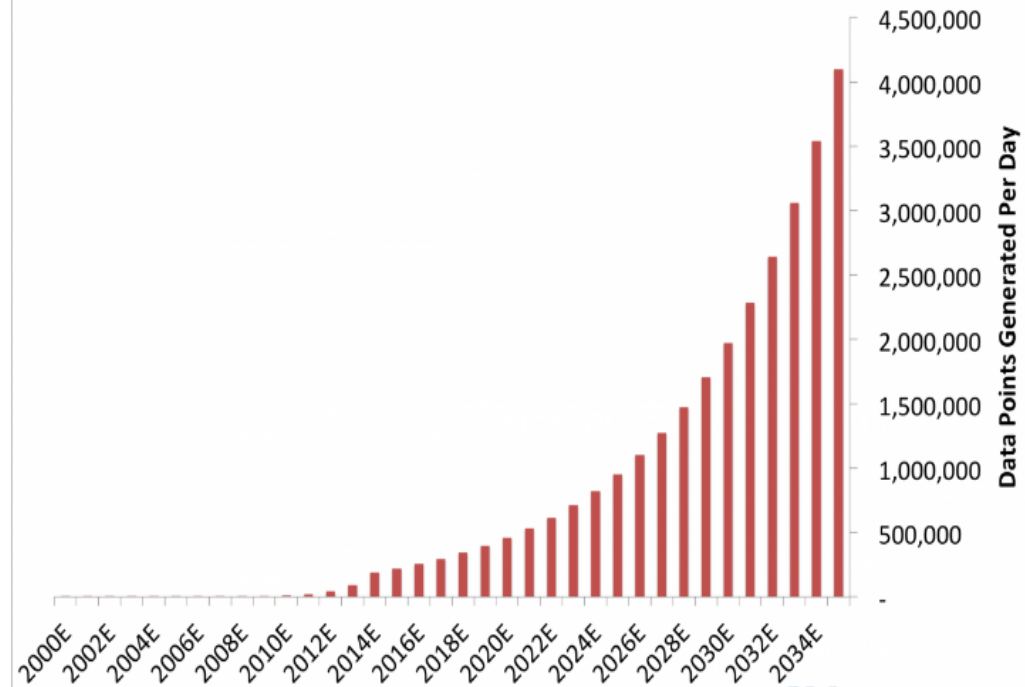
Estimated Agricultural IoT Device Shipments
Global



BI INTELLIGENCE

Source: BI Intelligence Estimates, 2015

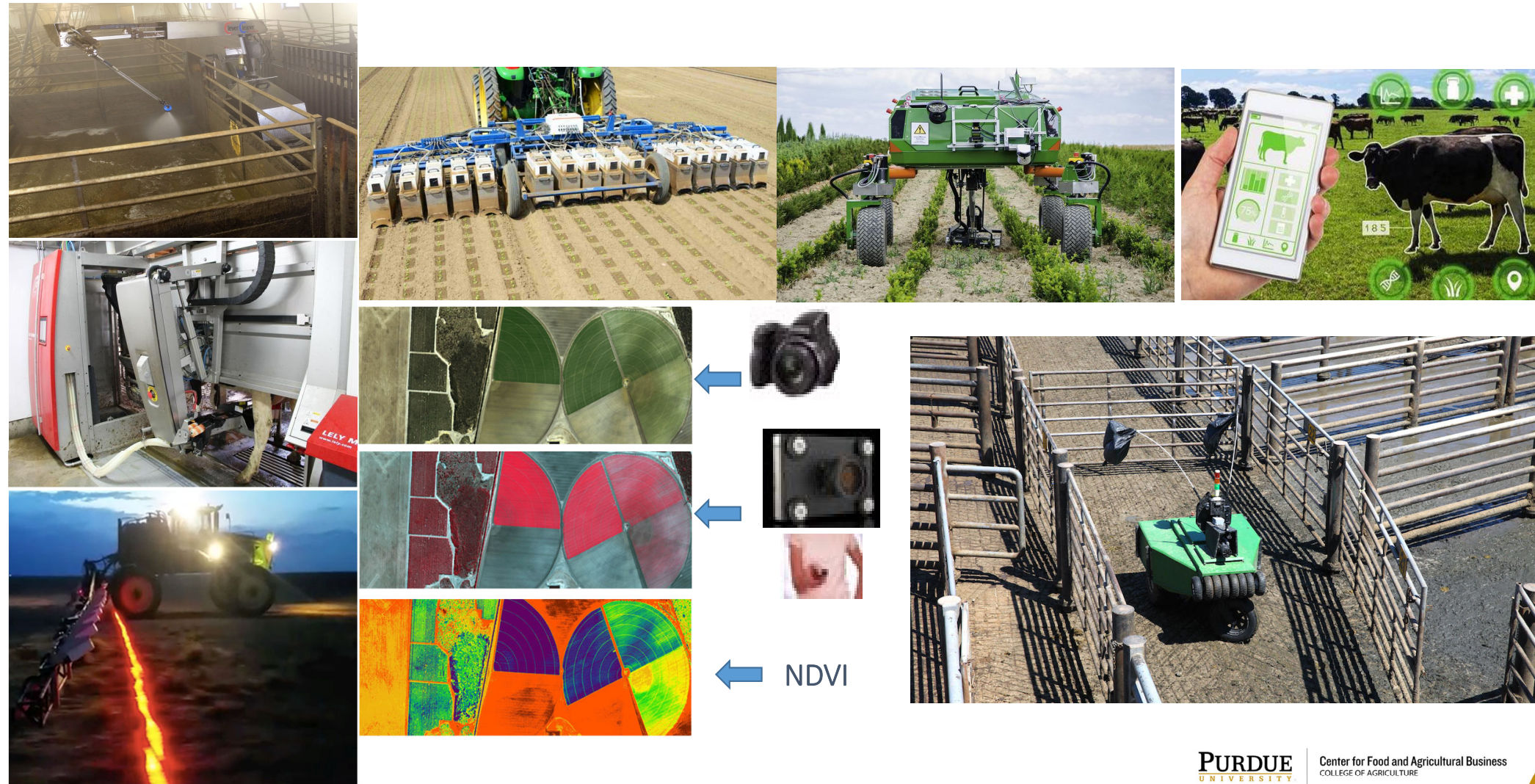
Estimated Amount Of Data Generated By The
Average Farm Per Day



BI INTELLIGENCE

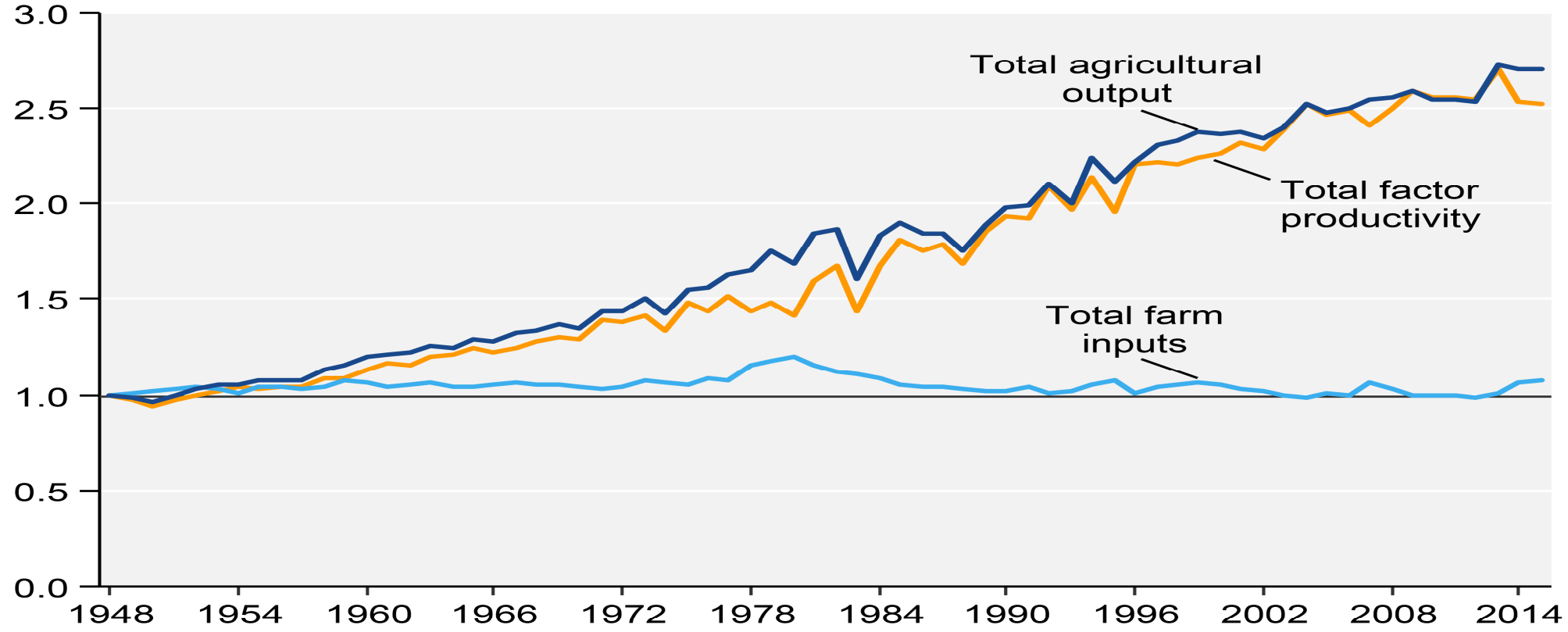
Source: OnFarm, BI Intelligence Estimates, 2015

Who/What Gets the Job Done?



U.S. agricultural output, inputs, and total factor productivity

Index, 1948=1



Source: USDA, Economic Research Service, *Agricultural Productivity in the U.S.* data series, as of October 2017.



“Farming is all about maximizing yield and managing costs. Good farmers know when to fertilize, when to plant, when to spray, and when to harvest, meaning they get more of whatever they plant. And they don’t waste water, fertilizer, fuel or time.”



“Think of a wise old farmer, walking through a field and touching the ground to feel for moisture, or eyeing the clouds trying to determine the best time to plant, water, or harvest. Now imagine any farmer, getting the same information from sensors and sophisticated weather forecasts.”



OLD FARMER’S ALMANAC TREASURE #7

He that makes himself an ass,
must not take it ill if men ride him.

--1795



CELEBRATING 225 YEARS!

The 2017 Old Farmer's Almanac available now

John Carpenter, Forbes Magazine

I grew up driving this 4440 on my farm in Texas
Circa 1989



Today's Equivalent Tractor
Circa 2019



Closing Thoughts

- Digitization of everything is not coming it is here. The key is innovation and technology adoption at the farm level that does the following:

Increases Productivity – maximize the productivity of every asset. This is an insights pyramid problem.

Digitization of everything on the farm is how you get to the top of the insights pyramid.

Improves Sustainability – technologies/practices that focus on soil health, animal health, water quality, and air quality. These are sensible technologies that help us drive productivity responsibly. This is being required of us by society in the broadest sense. We should lead this revolution with smart technology, best practices, diligent measurement, and transparency.

