

# ACCELERATING BIG DATA AND IOT FOR FARM SOLUTIONS

July 29, 2015

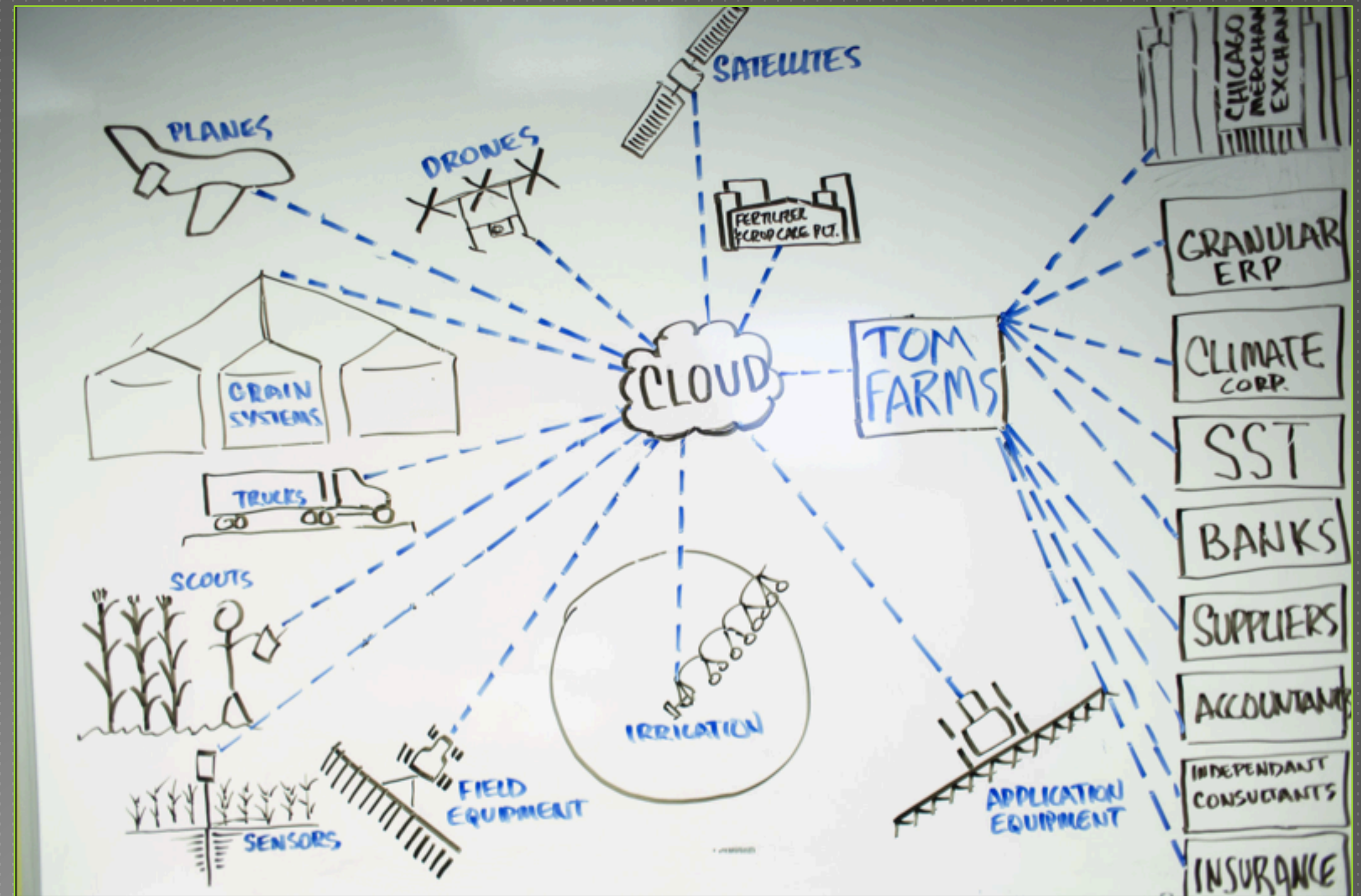
# IoT

ENABLING INFORMATION  
TO DO A JOB WELL

# EARLY ADOPTER FARM

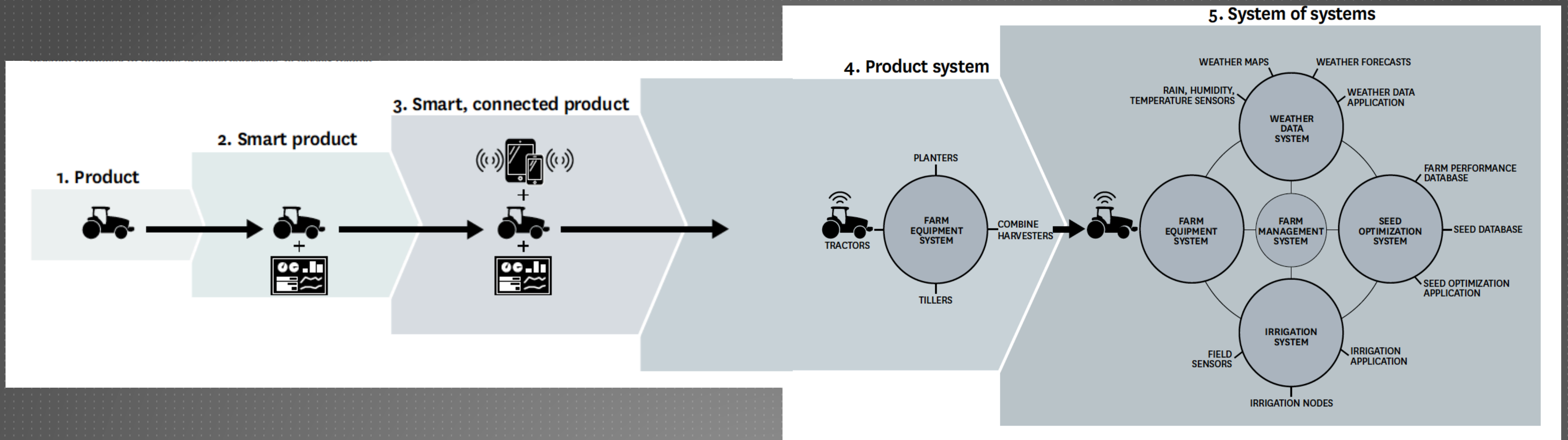
## CONNECTED FUTURE FARM

- Equipment
- Seed and Crop Protection
- Planting and Application
- Soil and Irrigation Management
- Imagery
- Scouting
- Transportation
- Storage
- Finance & Record Keeping
- Insurance and Bank Relationships
- Commodities Trading





# NEXT STEP: INTEGRATION

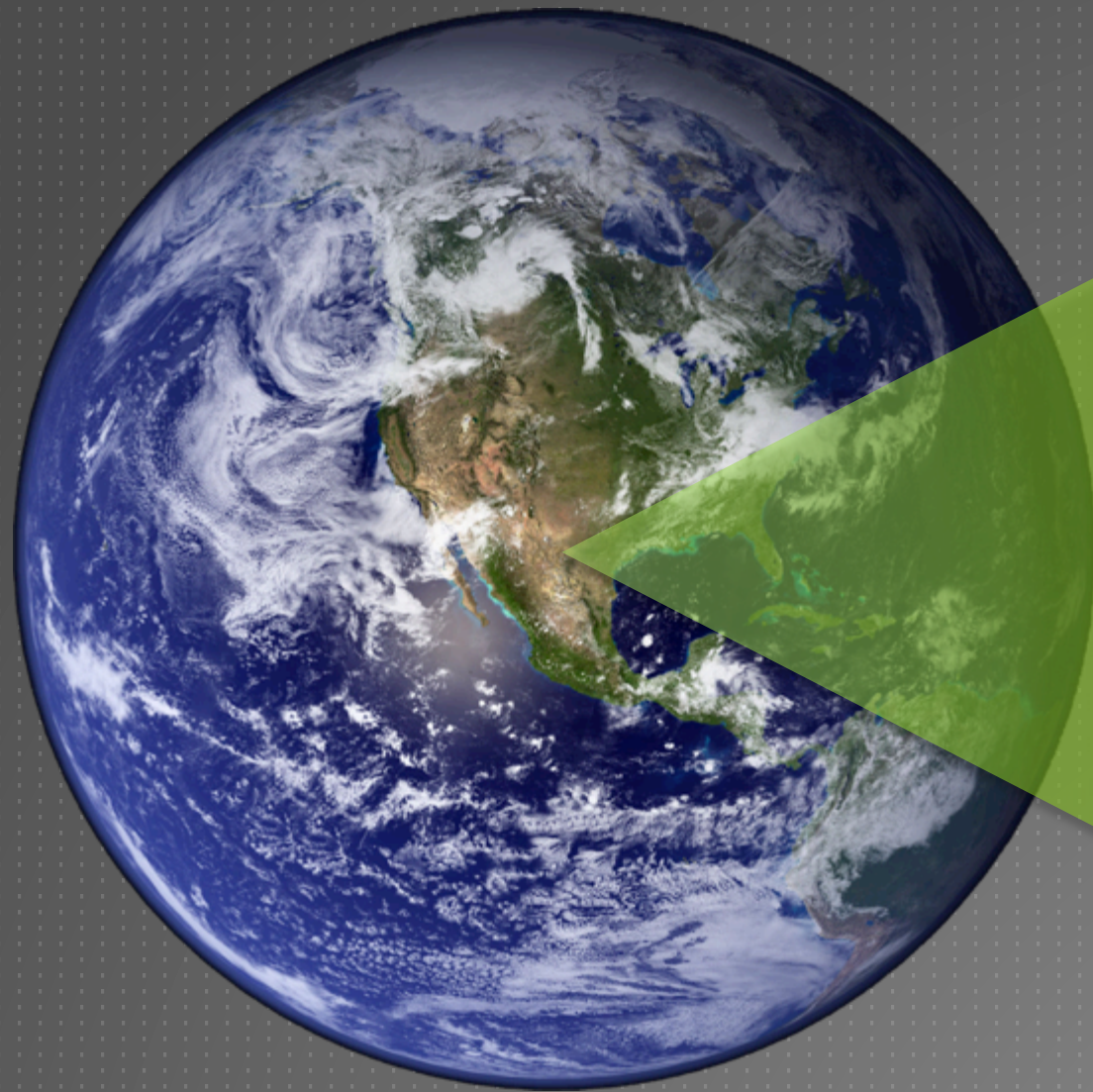


# TRENDS

WHAT'S GOING ON?



# NOT TOO DISTANT FUTURE



Kilometers



Fields

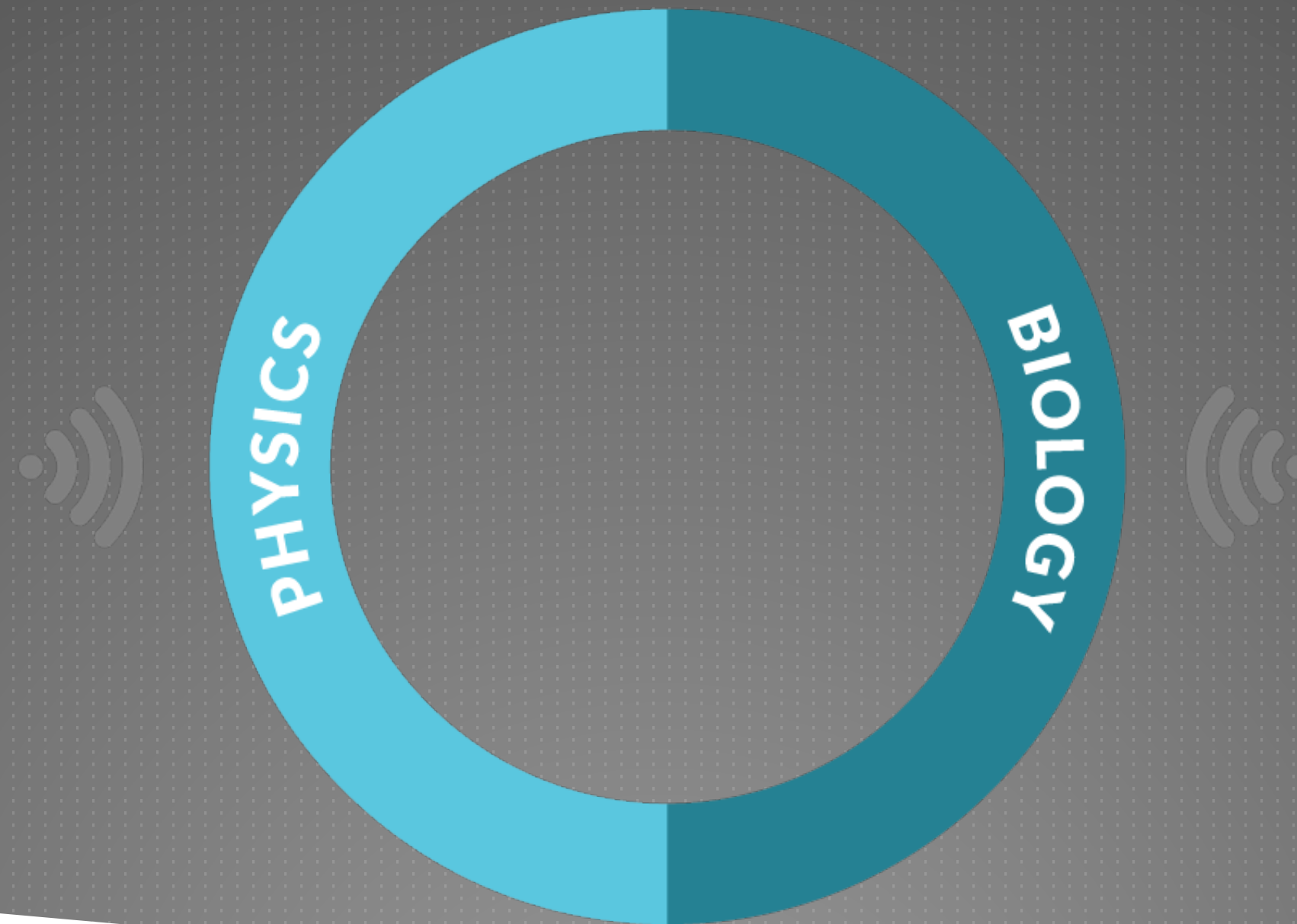


Plants



# DRIVING EFFICIENCY & YIELD

Equipment produces 98% of crop production data



# FARMER HAVE COMPLEX INFORMATION

## CONTROL

- Equipment
- Seed
- Crop Protection
- Irrigation
- Land Prep
- Workforce

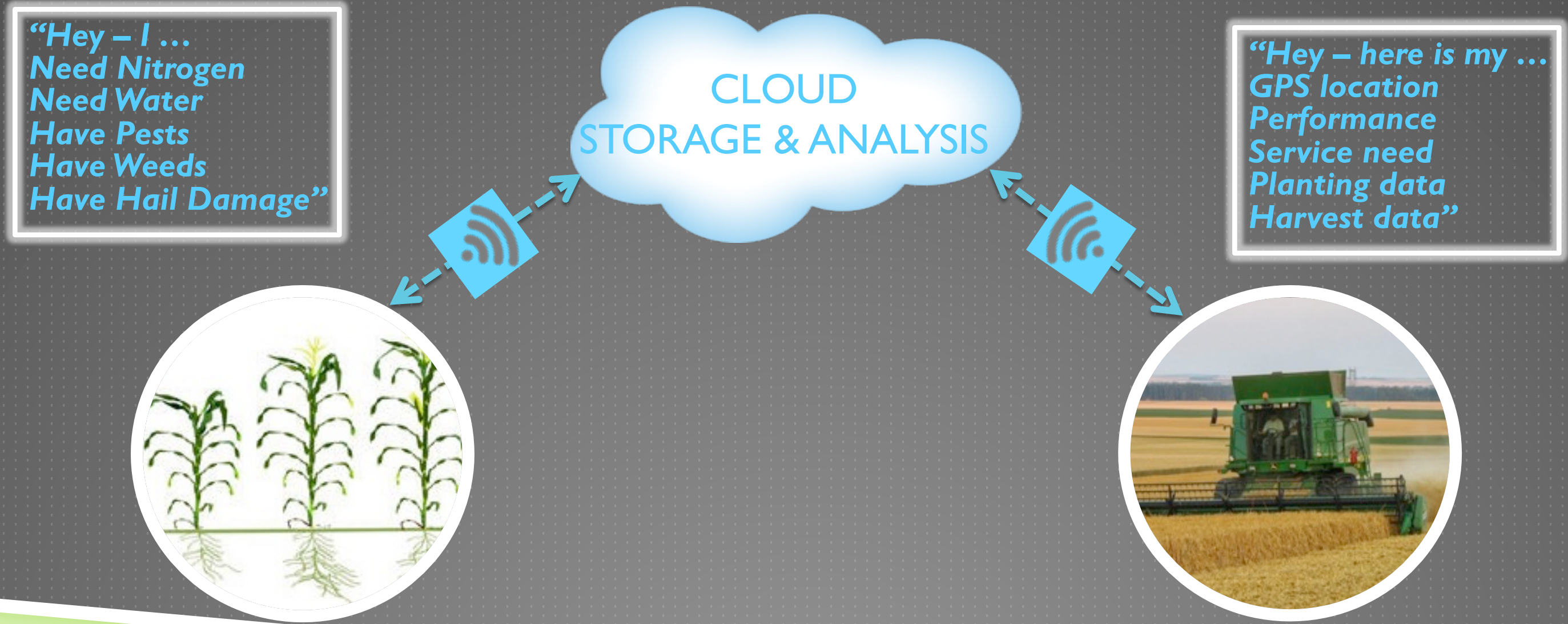
## NO CONTROL

- Weather
- Pests
- Input costs
- Commodity Prices
- Regulatory
- Water Availability





# SENSORS – CONNECTIVITY - ANALYTICS



# 4 HOURS+

TIME FOR AGRONOMIST TO  
BUILD A FIELD PRESCRIPTION



# TODAY – PEOPLE INTENSIVE

## AGRONOMIC CHOICES

- Made by Human Brain
- Field Experience
- Farm Size

## TOOLS PREDICTIVE

- Not in Farmer's Toolbox
- Incompatible Data Input
- Limited Analytics Success





# TOMORROW - DECISION SUPPORT SYSTEMS

## AGRONOMIC CHOICES

- Cost vs. Quality Decisions
- Historic Field Analytics
- Plant Level Optimization

## PREDICTIVE TOOLS

- Workflow Priority
- Fully Integrated
- Rapid Response and Alerts





# WHERE TO NEXT?

# US MILITARY—GROUND SENSOR NETWORK

- Anomaly Detection
- Perpetually Powered
- Wireless
- Self-organizing
- Self-learning
- Self-healing





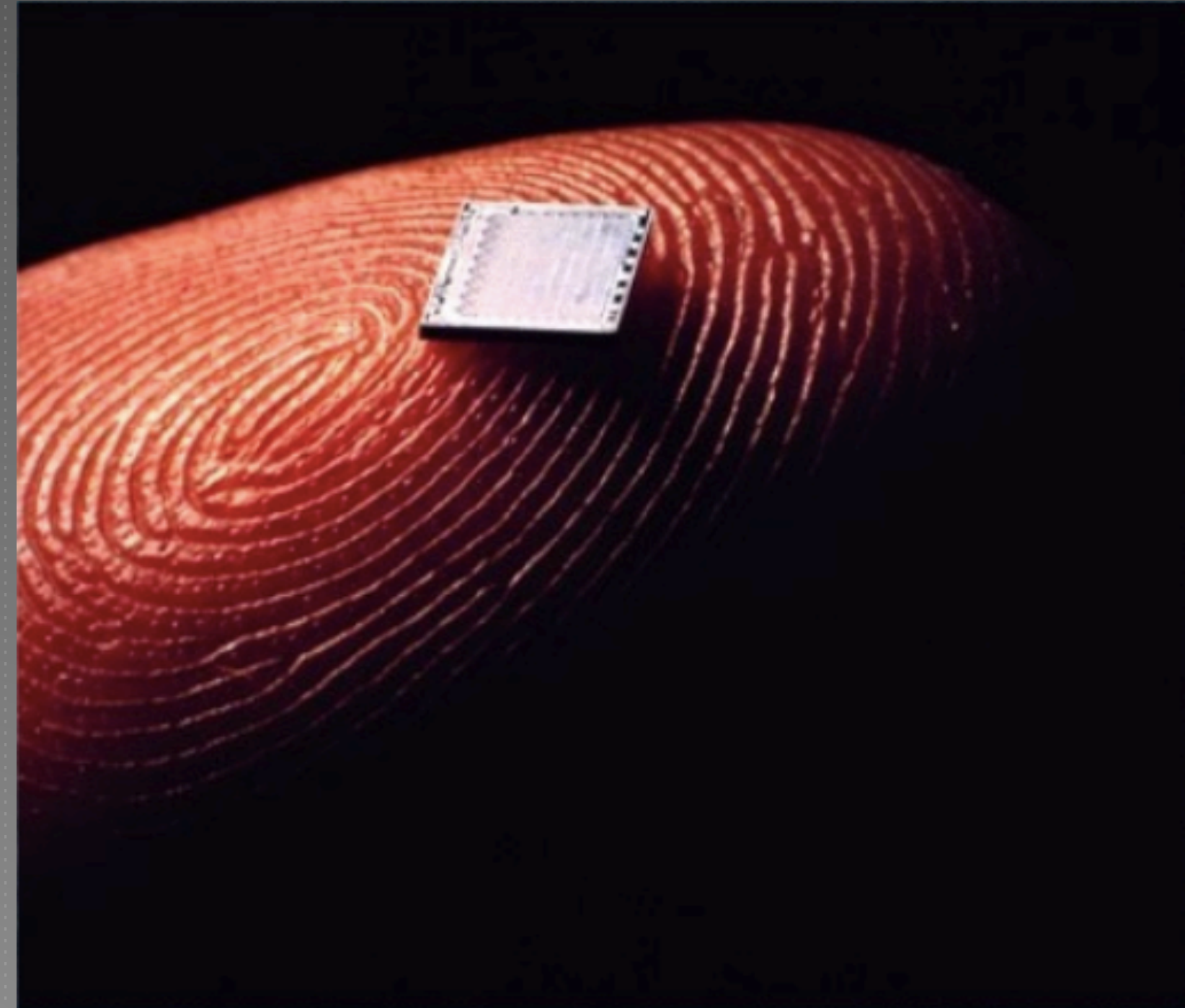
# LPWAN – LONG RANGE IOT

- 10 Years
- 10+ Miles
- Billions
- AES128



# “SMART DUST”

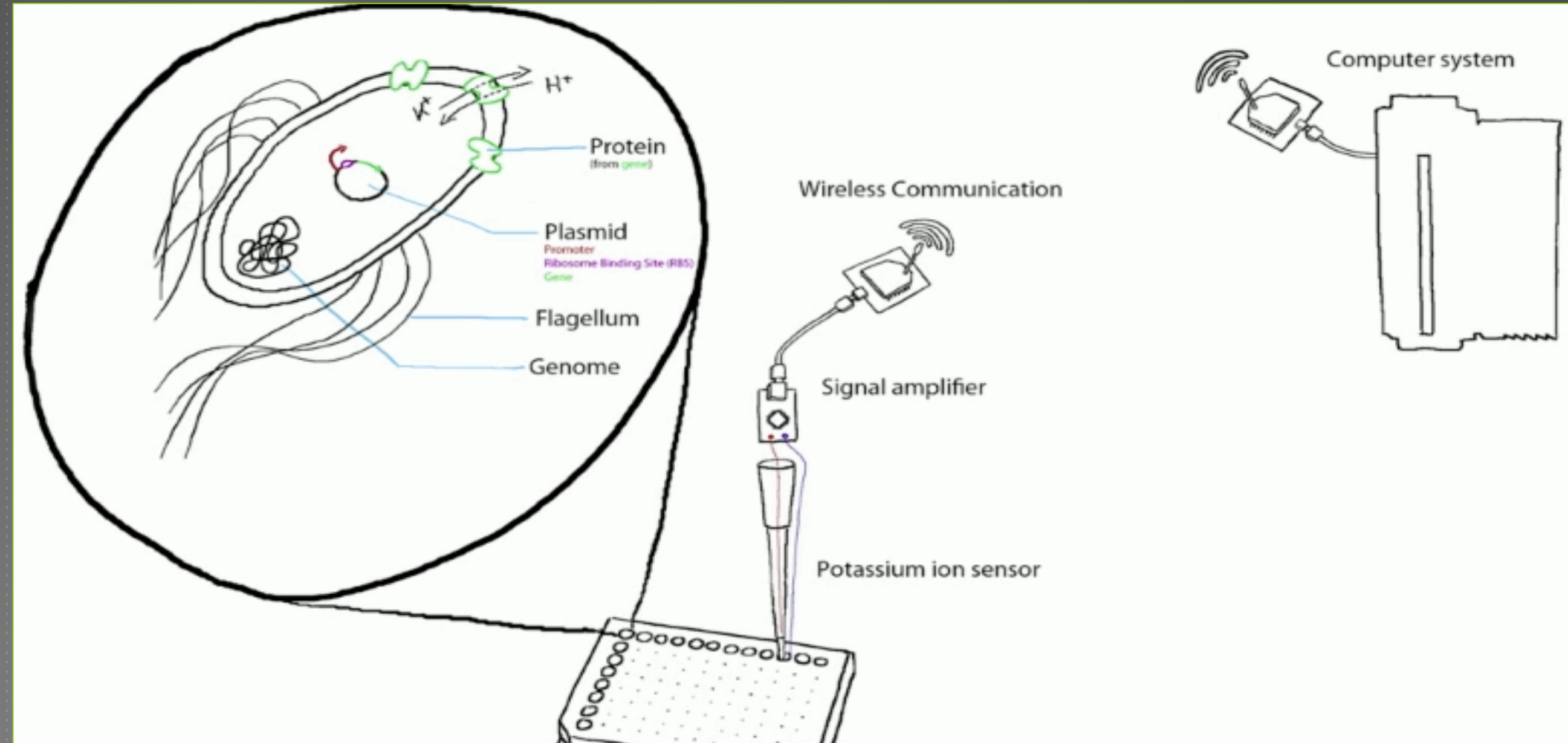
- Sense and monitor environment
- 20 meter range, 5mm
- Base station or other motes
- One week life in continuous operation
- 2 years with 1% duty cycling
- Cisco and IBM leading investment
- Application: Forest Fire Detection





# “SYNTHETIC BIOLOGY IS THE NEW DIGITAL”

## Sensors: Programmable Behavior in Biology



# TOO MANY?

## PLATFORMS



# GROWING NUMBER OF PLATFORMS



# THE FARMER'S DATA

## SECURITY & PRIVACY



# DATA PRINCIPLES: PRIVACY & SECURITY

## PURPOSE

Make farmers comfortable about their data while encouraging innovation in precision agriculture solutions

1. Ownership
2. Collection, Access and Control with Consent
3. Notification of Third-party Access and Use
4. Transparency and Consistency
5. Choice
6. Portability
7. Data Availability
8. Market Speculation
9. Liability & Security Safeguards



# FOUNDATIONS

## DRIVING CONSUMER DEMAND



# EDF + WALTON FOUNDATION

## 2020 GOALS AND COMMITMENTS

- Engage farmers to optimize fertilizer practices
- Work with food companies and agribusiness to incentivize farms
- Partners: Field to Market, General Mills, United Suppliers, Walmart, WWF

## OBJECTIVES

- Implement nutrient use optimized efficiency targets
- Measure and verify sustainable nitrogen and water use
- Leverage industry solution providers



# GROWERS

## WANT



# GROWERS WANT SIMPLIFY OPERATIONS AND INCREASE FARM PROFIT

- Share Choice
- Frictionless
- Secure Central Storage [CLOUD]
- Use Data to Make Smart Decisions



# THANK YOU!