

# Platforms, AgTech, and Work in US Agriculture

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Firms”)

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# Motivation

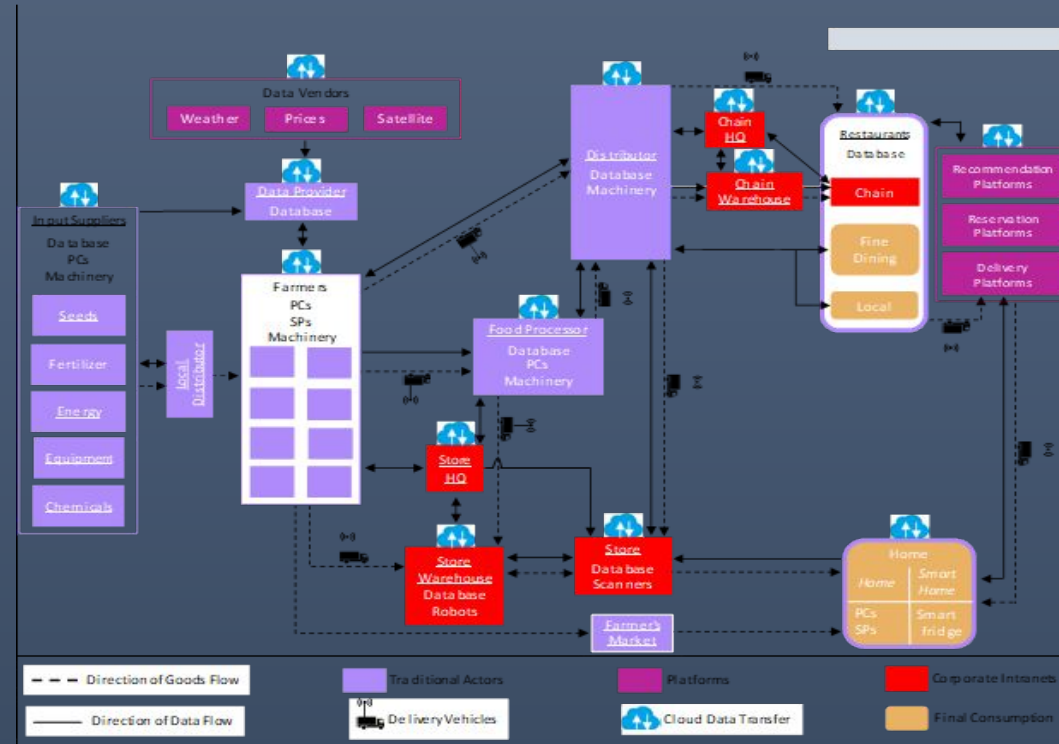
- Agriculture and the food system in the US is entering the world of platform economics
- These marketplaces initially specialized in agricultural equipment and inputs
- These marketplaces involve intermediate consumption and agricultural production - meaning they have the potential to replace wholesale markets
- RQs: How will the California agricultural sector adjust to the ongoing AgTech revolution? What opportunities and challenges do AgTech digital tools and platforms pose for the farm labor structure?

# Research Approach

- Today's presentation drawn from recently initiated research project focused on platforms in California Agriculture and beyond
- A three year multidisciplinary study that is considering the impact of digitization and automation in Agriculture and its impact on the industry in relation to labor supply, cost, training, and safety
- Utilizes secondary data on jobs in US agriculture and in-depth case studies of particular technologies and platform types alongside the on-farm experience to understand these impacts

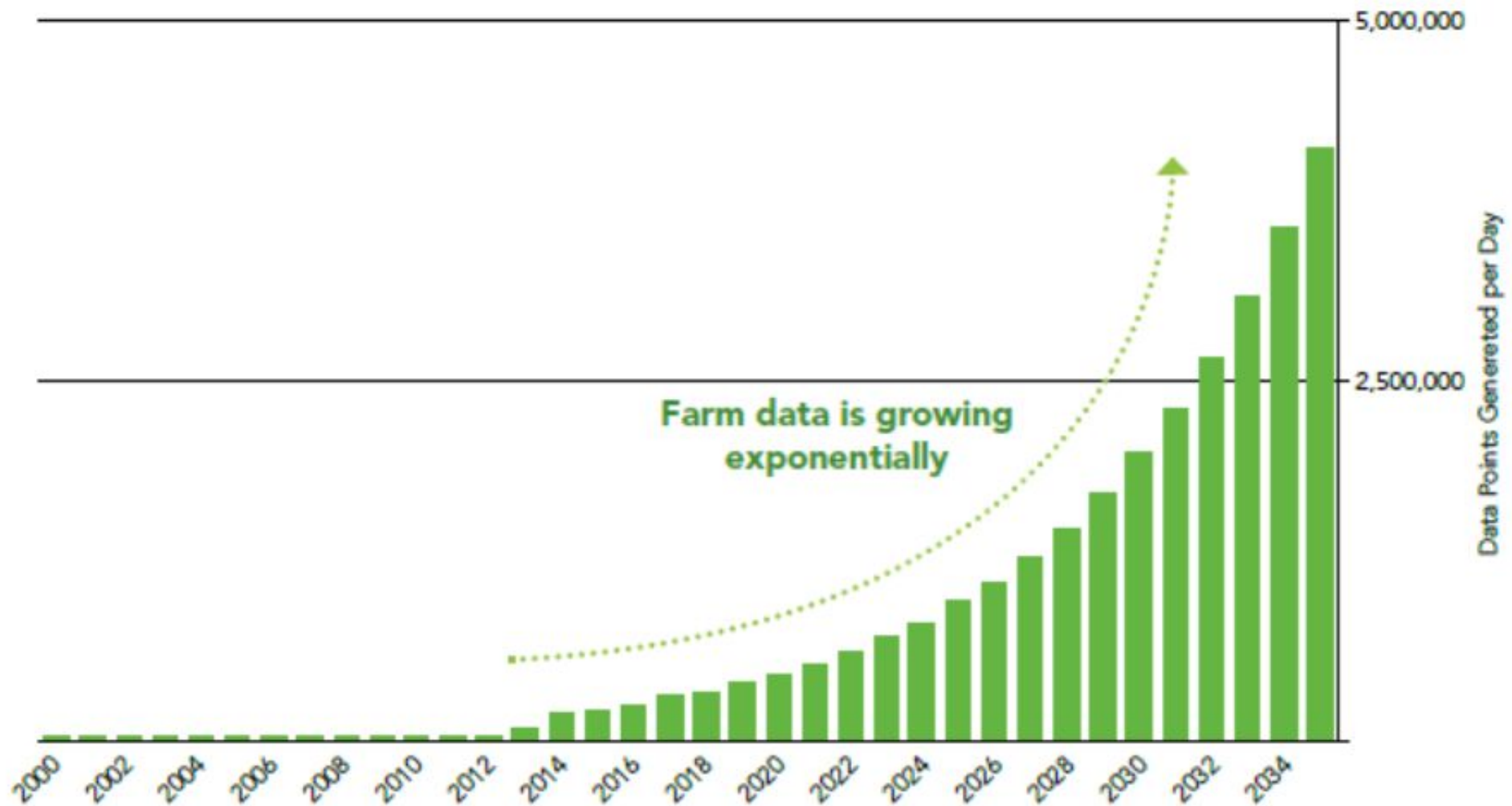
# Agri-Food System Digitizing

- Food Value chain – everything is digitizing
  - Inputs
    - Machinery
    - Seeds
    - Fertilizers
  - Outputs
    - Food
    - Industrial products
- Data is an input and output



# Data, Data, And More Data

Estimated Amount of Data Generated by the Average Connected Farm Per Day

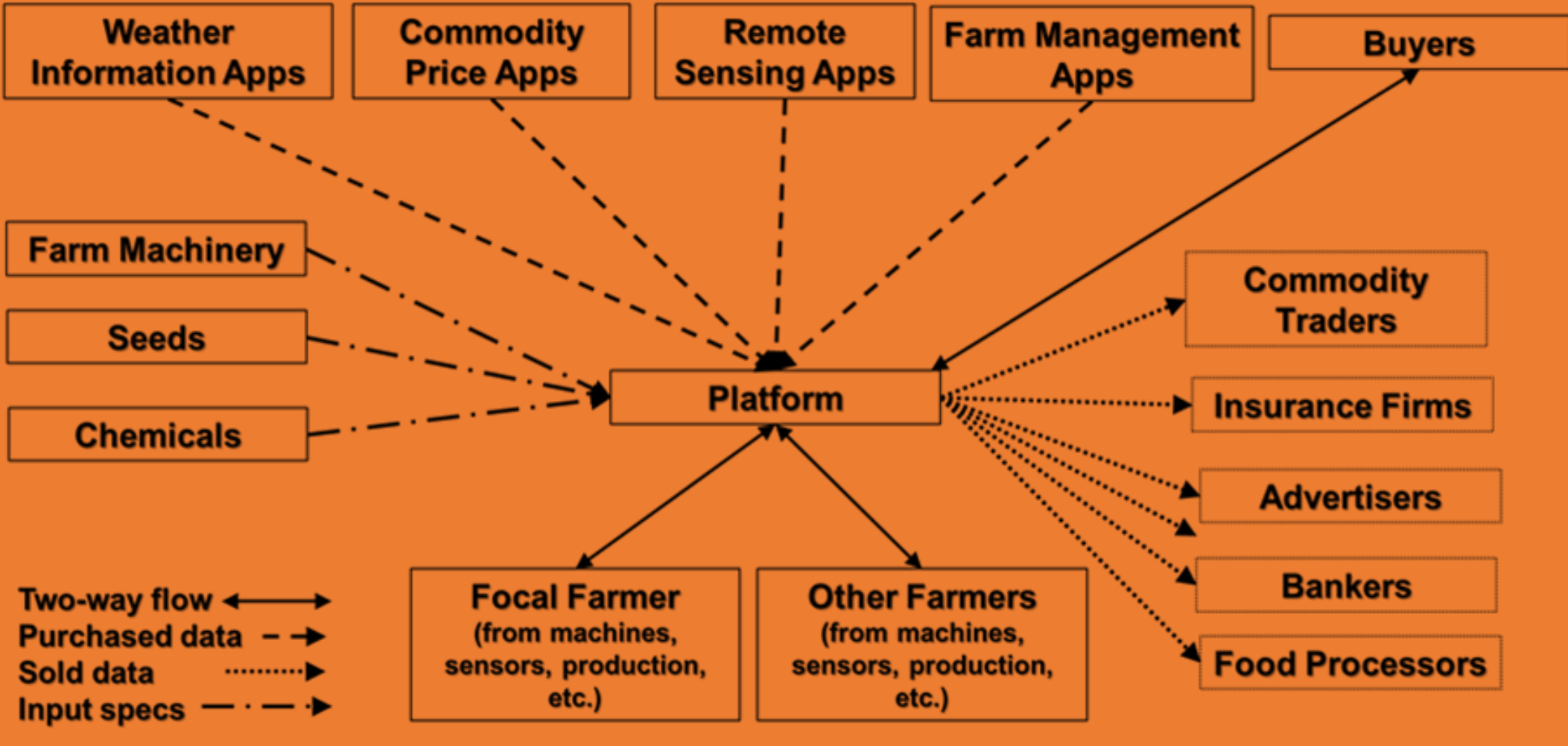


Source: Onfarm, BI Intelligence Estimates

# Data Sources

- Farm management software
- Machinery collecting data field location, temperature, protein and moisture content, yield, impurities, etc.
- All machinery
- GPS exact location
- Drones/remote sensing data on plants/animal and environment
  - Crop health
  - Water, nitrogen etc. in soil
- Weather stations in field

# Opportunities to Create Platforms are Abundant



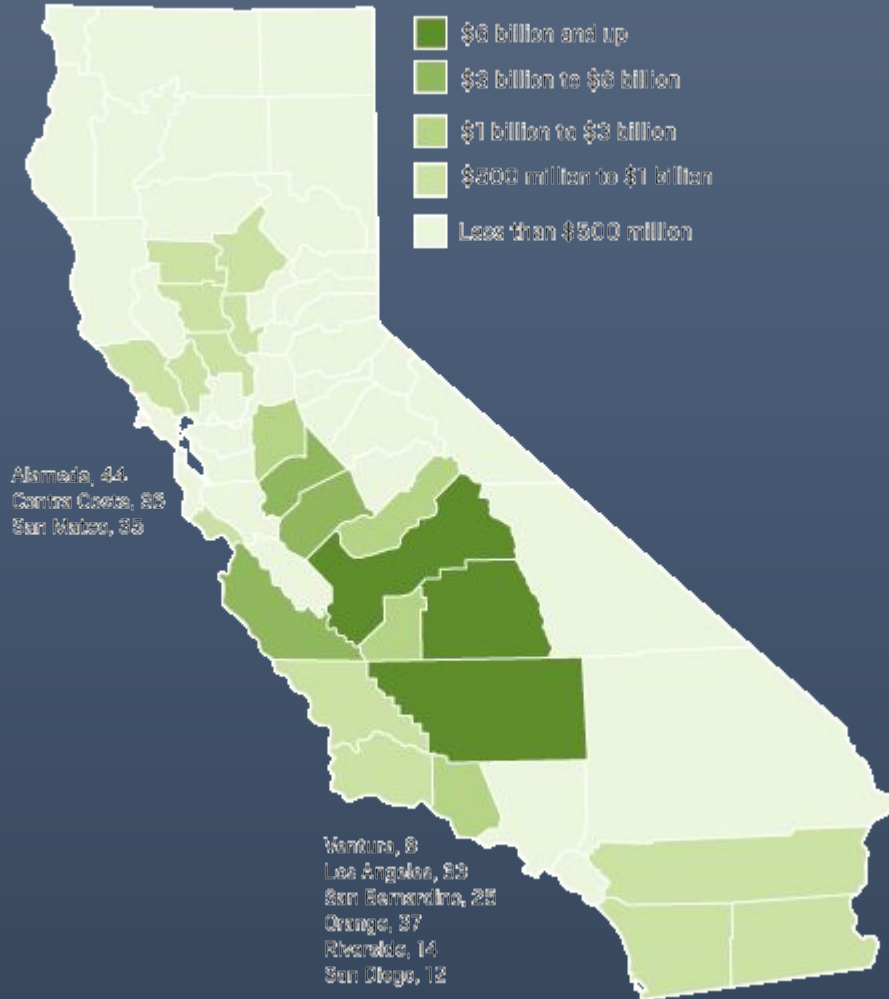
(Kenney, 2020)

# Types of Platforms in the Agriculture Industry

- New marketplaces
- Collaborative Sites
- Trade and Sharing
- Professional and Private individuals
- CrowdFunding
- Peer to Peer Sites



# California Agriculture and Increasing Automation and Digitization



- Significant increase in the adoption of software based crop management tools and smart equipment
- New challenges related to this adoption:
  - On-farm operations
  - Demand for on-farm labor as well as the job structure across the industry
  - On-farm work procedures and processes

# Impact of On-Farm Work Operations

- New digital technologies require changes in:
  - 1) Work Routines
  - 2) Physical infrastructure (i.e. rural broadband internet)
  - 3) Physical layout and reorganization to support the digital operation
  - 4) Cultural shifts on farms
    - Digital representation of their farm land and machinery operations
    - Experience and understanding of working with machines themselves
    - Tech adoption patterns and incentives

# Impact on On-Farm Operations and Procedures

- Similar to the experience of other industries significant labor displacement or redeployment may be necessary (Rotz et al., 2019).
  - Example: Milking robots, automation of strawberries, and tomato harvester (Tse et al., 2018).
- Technologies and platforms may also create new possibilities.
  - unmanned aerial vehicles (UAVs) pose implications for job demand and worker safety (Klemas 2015; Hill, 2018).
  - Complete automation of harvesters
  - Deploying smaller equipment (Karsten, 2019)

# Impact on Agricultural Labor Markets

- Digital technologies may impact types and quality of jobs in ways that may increase worker displacement, promote job polarization, and influence wage and income inequality in local labor markets (Visser, 2019).
- Platforms and increasing digitization can impact agricultural labor markets by:
  - Helping address continued labor shortages and workforce demographic changes
  - Create of new jobs – particularly the rise of consultants
  - Retraining on a significant scale
  - Reconceptualization of what farm labor is and what farming can be

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# Implications

- Rapidly changing technologies and increasing adoption of technologies by farmers and agricultural actors present unique opportunities to understand impact of platforms in Agriculture
- Implications for workers, labor markets, and the industry carry important consequences for equity and socioeconomic inequalities at the local and regional levels
- In-depth grounded inductive analysis alongside secondary analyses of trends in the industry can help provide important insights for public policy, economic development and workforce development initiatives

# *Thank you*

For more information or any questions:

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Or visit/follow our project updates through this website:

[laca.ucmerced.edu](http://laca.ucmerced.edu)

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