

8th International OFEL Conference



SOCIAL INNOVATION IN AGRICULTURE: DIGITAL PLATFORMS FOR WHOM?

Hiam Serhan, AgroParisTech, Paris, France

hiam.serhan-murray@agroparistech.fr

Martin Kenney, University of California, Davis, USA

mfkenney@ucdavis.edu

OFEL
INTERNATIONAL CONFERENCE

17th - 18th April 2020

Dubrovnik, Croatia

Platform Economy

**Reorganization of the global economy in which
digital platform owners are developing power
that will be as formidable as that of the factory
owners**

**in the early industrial revolution
(Kenney and Zysman, 2016)**

Implications for agriculture??

Platforms Have Power

- **Functions: data, networks, websites**
- **Governance – inclusion or exclusion, shape behavior**
- **Surveillance – all action on platform is observable**
- **Decision-making – unilateral by platform, shaped by algorithmic analysis**

Specificities and Digital Technologies

- **Agri-food Systems (AFS) are social constructs (Malassis, 1994)**
- **Remarkable diversity and complexity due to:**
 - **Relationship to resources: water, soil, air, forests (Trystram & Serhan, 2020)**
 - **Inputs - labor, chemicals, seeds, machinery, etc.**
 - **Outputs - field crops, trees, animals, etc.**
 - **Actors - farmers, food processors, distributors, consumers, etc.**
 - **Digital technologies as “actants” (Latour, 1994)**
- **Unsustainable current dominant AFS (FAO, 2018)**
- **Diversity of sustainability issues and needs (Trystram, 2012)**
- **Uncertainty and complexity in AFS to achieve sustainability**

Digital platforms and smart machines as eco-innovations (FAO, 2019)

Dominant Agri-Food System

- Food Value chain - digitized

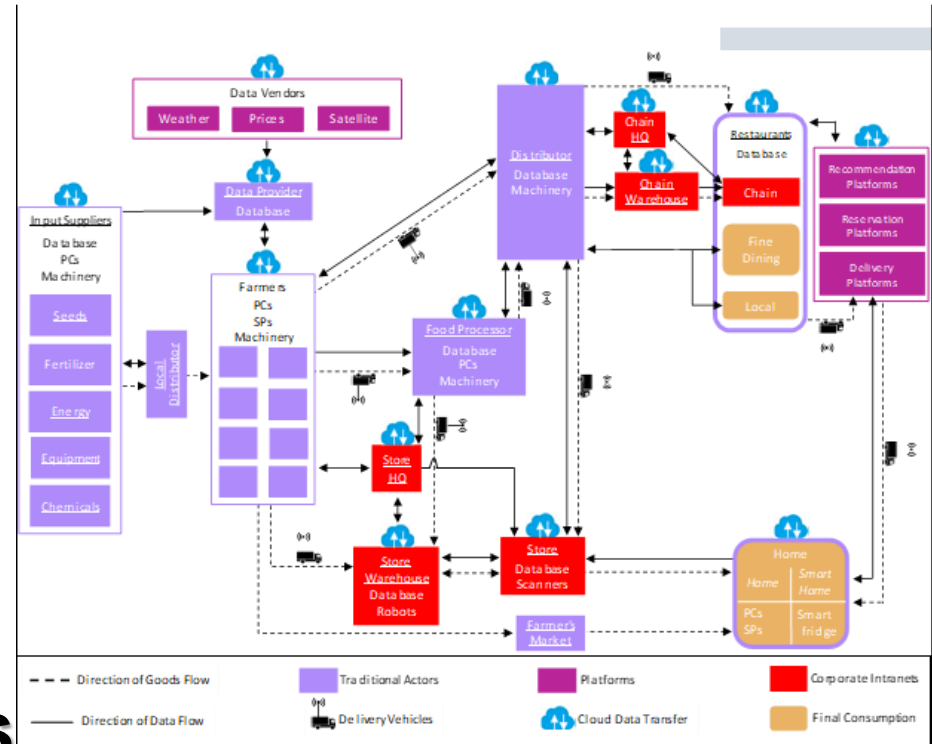
- Inputs

- Machinery
 - Seeds
 - Fertilizers

- Outputs

- Food
 - Industrial products

- Data is an input and output



Agriculture and Data Collection

(Serhan, Kenney & Trystram, 2020)

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

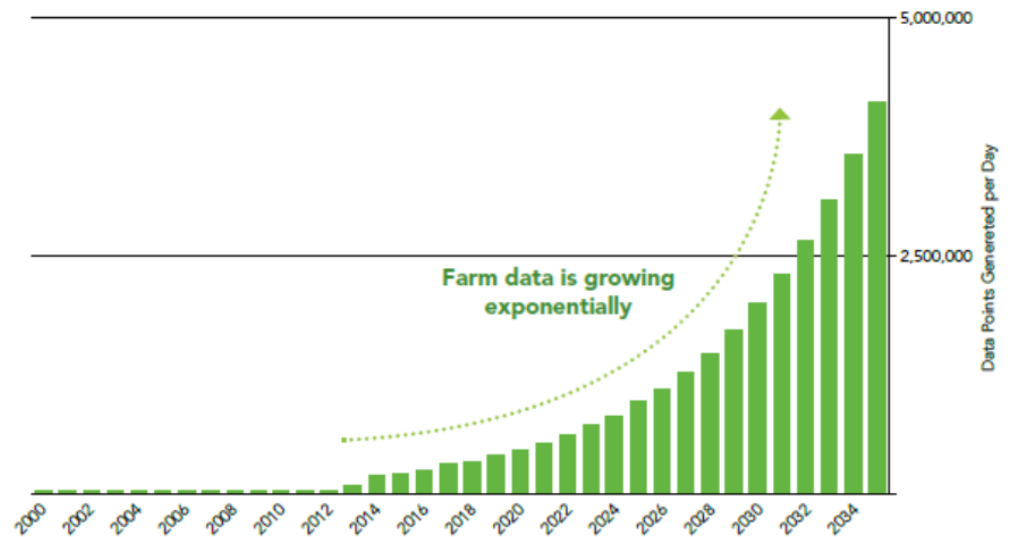
Who owns and controls this data?

Digitization

Digitization is proceeding in all productive activities

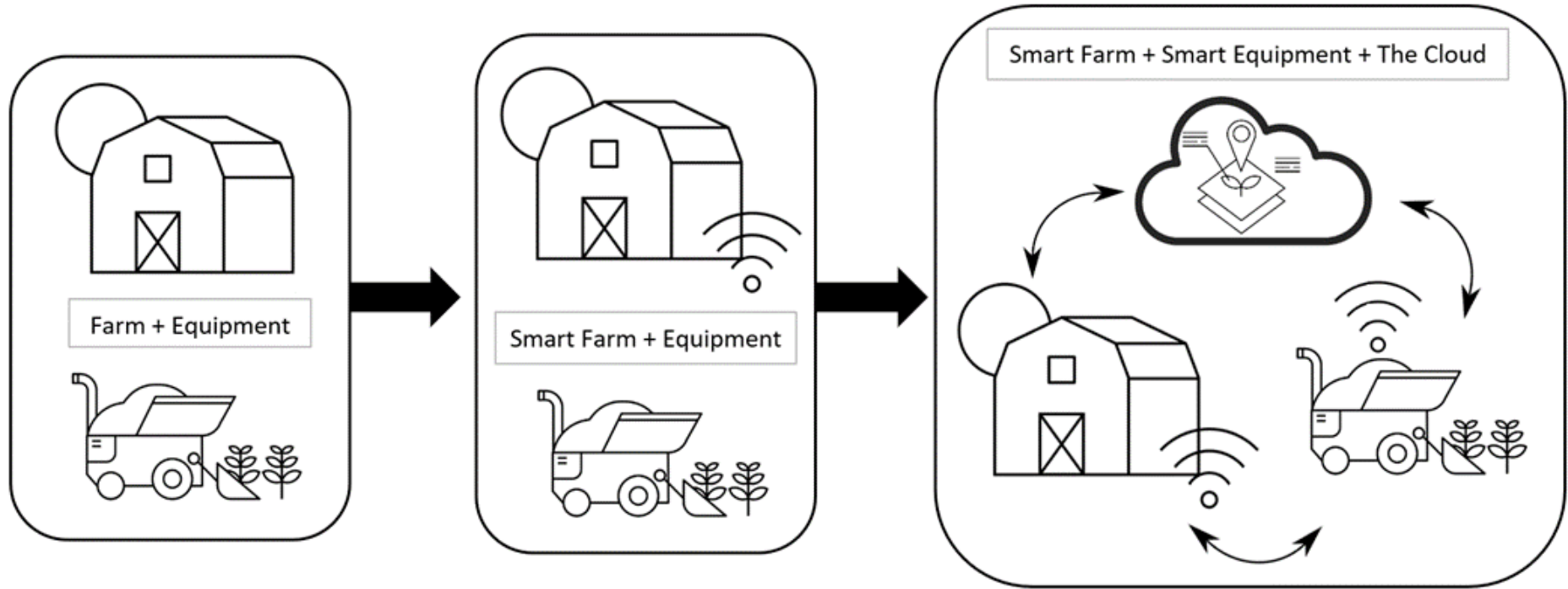
- Machinery can sense, process, and communicate**
- Farm management software**
- Drones**

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



Source: Onfarm, BI Intelligence Estimates

From Farm and Equipment to Connected, Smart Farm and Equipment



Source: Adapted from Porter and Heppelmann, 2014.

Platforms as Social Innovations

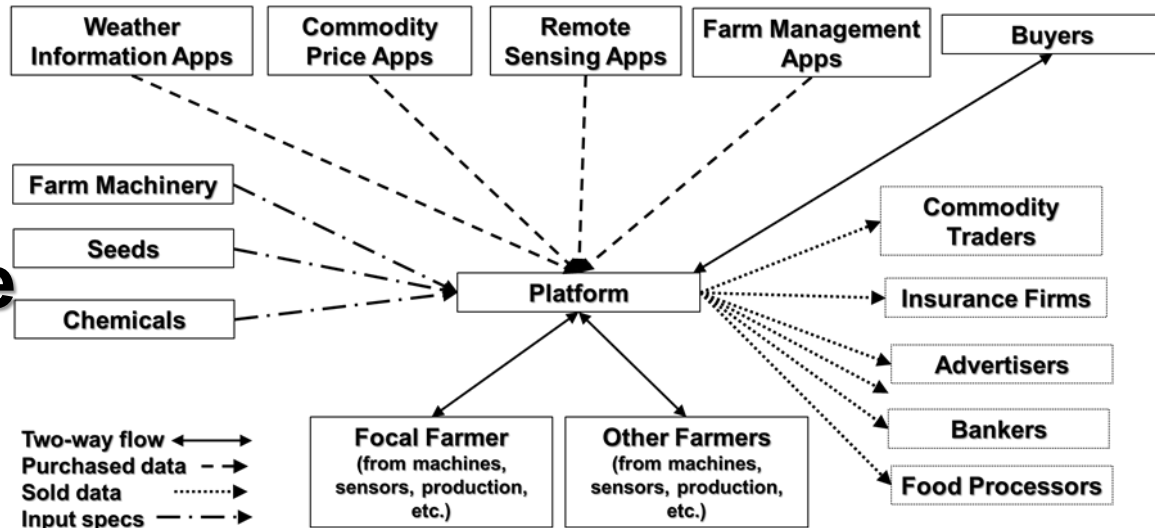
- **Intermediate between “sides” of the platform**
- **Provide resources and services to sides**
- **Facilitate innovation, in particular, generativity**
- **New value creation and concomitant capture**

Agricultural Platforms

Unifying the Data

- Platform owner is intermediary and as such has power to:

- Structure action
- Observe all actors
- Unilaterally change parameters
- Exclude actors



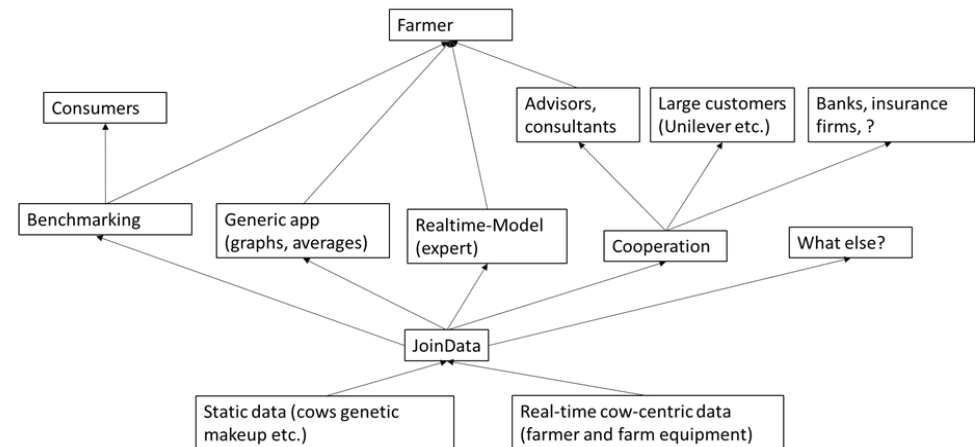
Platform Business Models in Agriculture

- **Venture capital-funded startups - FBN etc.
(Disruptive business models)**
- **Agri-input firms – Bayer, John Deere, etc.**
- **Cooperatives – InVivo, etc.**
- **Existing platform firms - Google, Amazon, Microsoft, IBM (Software & Apps)**
- **Specially-formed entities – e.g., SmartDairy**

Example – SmartDairy and JoinData Innovative Organizational Solutions

- Joint venture government, research orgs, university, cooperatives, firms
- Clearinghouse model – does not retain data
- Farmers choose organizations to share their data

Data Flow Pathways



Source: Adapted from Van der Aaker, 2020

Benefits to Sharing Data

- **Big data – improved decision-making**
- **Greater efficiency/Less environmental impact**
 - **Less use of pesticides and seeds**
- **Fields as datasets for experiments and improvement**
 - **Chemical and seed applications**
 - **Machinery**
- **Improved traceability**

Current Situation

- **Digital platforms are and can facilitate social innovation**
- **Promises:**
 - **Improve resource efficiency and sustainability**
 - **Increase profits?**
- **Threats/Drawbacks**
 - **Platform organizes market and extracts value**
 - **No platform has tipped market**
 - **Farmers are suspicious**

Technology vs human labor or knowledge-augmented farmers and agriculture?

Social Solutions to Platform Power?

- **Codes of conduct sufficient?**
- **Local vs global platforms?**
- **Are contracts that allow farmers to retain control of their data enforceable?**
- **Can alternative arrangements such as coops tip the market?**

THANK YOU

We express the highest appreciation for the conference team's efforts and determination to pursue the conference program despite the extremely challenging times and conditions.

References

- Cutolo, D. & Kenney, M. (2020). Platform-dependent entrepreneurs: Power asymmetries, risks, and strategies in the platform economy. BRIE working paper 2019-3. Berkeley Roundtable on the International Economy.
- FAO (2019). Digital technologies in agriculture and rural areas. FAO, Rome, 26p.
- FAO (2017). *Information and Communication Technology (ICT) in Agriculture: A report to the G20 Agricultural Deputies*, Rome.
- Serhan, H., Kenney, M. & Trystram, G. (2020). Digitization and Platforms in Agriculture: Power Asymmetry, Organizations, and Collective Action Solutions. BRIE Working Paper.
- Kenney, M. and Zysman, J. (2016). The Rise of the Platform Economy. *Issues in Science and Technology* 32 (3): 61-69.
- Kenney, M & Zysman, J. (2019). Work and value creation in the Platform Economy. In Kovalainen, A. & S. Vallas (Eds.) *Research in the Sociology of Work* (pp. 13-41). <city> Emerald.
- Latour, B. (1994). Une sociologie sans objet? Remarques sur l'interobjectivité. *Sociologie du Travail*, 36(4), 587-607.
- Malassis, L. (1994). *Nourrir les hommes, Un exposé pour comprendre, Un essai pour réfléchir*, Dominos, Flammarion, Paris.
- Porter, M. E. & Heppelmann, J. E. (2014). How smart, connected products are transforming competition. *Harvard Business Review*, 92(11), 64-88.
- Trystram, G. (2012). Les enjeux de la durabilité : Comment concilier ces nouvelles contraintes avec les exigences actuelles », dans C. Esnouf, J., Fioramonti et B. Laurieux, *L'alimentation à découvert*, CNRS éditions, p. 281-282.
- Trystram, G. & Serhan, H. (2020). Déterminants des systèmes alimentaires et relations aux ressources agricoles. *Annales des Mines – Réalités Industrielles* (Forthcoming, May 2020).
- Van den Akker, A. (2020). Smart dairy farming. *PowerPoint presentation*. (January 27, 2020) On file with the authors.
- Zysman, J. & Kenney, M. (2018). The next phase in the digital revolution: Intelligent tools, platforms, growth, employment. *Communications of the ACM*, 61(2), 54-63.