Outline

• Review Mechanized Progress of Agriculture
• Examples of Integration in Agriculture
• A Fundamental of Precision Agriculture
• Tools to enable Integration
Mechanized Progress in Agriculture
Change from Horses to an 218hp tractor (1973) – technology moving fast
Mechanized Progress in Agriculture

• 1862-75 – change from hand power to horses
• 1890s – agriculture increasingly mechanized
• 1892 – first gasoline tractor built
• 1918 – International Harvester first to market with PTO (was a competitive advantage)
• 1919 – Case introduced PTO option on some models with other manufactures starting to follow
• 1927 – PTO standardized
• 1949 – Hydraulic control cylinder dimensions standardized
Mechanized Progress in Agriculture - continued

- 1945-70 change from horses to tractors (second American agriculture revolution)
  - Five horses and a two bottom plow – 1.5 hours per acre
  - 27-horsepower tractor and a moldboard plow – 30 minutes per acre
  - 35-horsepower tractor and a moldboard plow – 15 minutes per acre
  - 425-horsepower tractor and a fifteen bottom plow – 3.2 minutes per acre
  - World record set in 2005 with 500 horsepower tractor and twenty furrow plow - 792 acres in 24 hours
  - Today we are plowing about **122 times** faster than in the 1800s

- Two key takeaways-
  - Technological advances = more work accomplished per day
  - Standardizations of connection points allowed for integration of different brands of equipment
Progress in Mechanization in part due to standardization of equipment connections
Integration in Agriculture
Value of Connected Products

Imagine the impact to progress if implement connections were limited to same brand?

Why the limits to software connections?
Implement built in – consider this?

Consider that much of the software we use today has the same limitations as having the implement built into the tractor
Connected Products Are Transforming Competition (Harvard Business Review)

“connected products dramatically expand the range of potential product capabilities and features.

companies should identify those technology layers that offer the greatest opportunities for product insight, future innovation, and competitive advantage, and outsource those that will become commoditized.

early movers that choose in-house development can overestimate their ability to stay ahead and end up slowing down their development time line.

closed [system] approaches become more challenging as technology spreads and customers resist limits on choice.”
Connected Products Are Transforming Competition – continued

And when companies get into a features and capabilities arms race, they end up blurring strategic differences and creating zero-sum competition.” — Porter, Michael E. and Heppelmann, James E. (2014, November) How Smart, Connected Products Are Transforming Competition Retrieved from www.hbr.org (Harvard Business Review)

• Key takeaway
  – Outsource technology layers that will become commoditized
  – Do what you do best – your competitive advantage
Fundamentals of Precision Ag
Focus on the Fundamentals

• The fundamentals win games….

“Gentlemen, this is a football” - Vince Lombardi

Maybe a focus on one of the fundamentals for precision ag could help your organization?

• Organized and consistent data collection
Who is AgIntegrated?
Who is AGI?

• 17 years of precision ag experience
  – Diverse educational background
  – Ground up understanding of precision agriculture
• Privately held, independent
• Sister company, Skyward Apps, based in Columbia, MD
• 57 employees
  – 5 development teams (self contained systems, architecture, PO, scrum master, QA, and development) and 2 business management teams
Who does Onsite serve?

- We serve most of the agricultural supply chain including
  - Ag Retail / Cooperatives
  - Independent Software Vendors (ISVs)
  - Independent Crop Consultants
  - Soil/Tissue Labs
  - Equipment & Precision Equipment Manufacturers
  - Crop Insurance (AIPs)
  - Crop Inputs (Seed, Chemical, Fertilizer)
Overall Vision

Integrating Agriculture

- People
- Field data (planting, harvest, application)
- Equipment data (fuel, fleet management)
- Soil probes
- Irrigation
- Farm management apps
- Work order
- ERP
- Wx
- Imagery
Onsite Field Data Adaptor (FDA) Translation Services

• Project began in 2013 for prescription writing and harvest data
• Expanded to support As-Applied and Planting data in 2014
• Supports 100+ file formats including prescriptions, boundaries, guidance lines, and FMIS exports
• Cloud hosted service on AWS
• Automatically scales up with increased demand

• Handles over 30,000 conversion requests per day in peak season
  – 80,000 requests per day on heavy usage days
  – Over 4 million processing requests handled to date (5 million if Staging is included)
  – Over 46 million individual files processed to date (63 million if Staging is included)
  – 13 TB of data processed (compressed size)

• 35+ independent software vendors leveraging FDA services
Progress some of our clients are making?

- FMIS: Connecting into mixed fleet equipment, mixed software, and labs to move, translate, clean data more efficiently for seed/fert recs & analytics
  - FieldReveal
  - Growmark FS AIS
  - Farmers Edge

- Big Iron: More efficient collection and translation of mixed fleet equipment data. Better service their grower and retailer customers by providing mixed fleet support.
  - CNH
  - AGCO
  - Deere
Progress some of our clients are making in the industry today - continued

• Leveraging and integrating best of breed technologies and seamless data sharing with retailers and their grower customers
  – Servi-Tech

• Seamless integration and data translation of planting & harvest data for crop insurance acreage reporting to the RMA
  – QBE NAU

• Leveraging and integrating best of breed technologies for their E-luminate digital ag platform
  – Syngenta

• Seamless integration and data translation of field data to help growers with return on investment decisions
  – Conservis
We have the tools & the Lego blocks are built
QC Pro: Data Collection, Storage/Organization, Editing & Integration
What is Onsite?

• Onsite does…
  – Enable data to move between people, equipment/sensors, and software
    • Connect
    • Organize
    • Translate
    • Validate
    • Integrate

• Onsite does not…
  – Make agronomic or business decisions
  – Does not provide answers
  – Does not store GPS field data (Customer owned AWS accounts)
  – Does not sell data
Partnership Development

• SatShot
  – Expand data integration with imagery processing/delivery technologies through Onsite

• ESRI
  – Integration of mapping layers and publishing clean data from Onsite to ESRI platform
Summarize of the value of software integration?

- Integration for a Retailer /Agronomist means
  - Connecting directly to a third party software i.e. moving a boundary file to a scouting app without having to download and upload

- Integration for a software vendor means
  - Connecting to a third party API (application programming interface) to get a file translated from proprietary format to common format without download/upload to a desktop solution

- A value of integration for both of these is time and cost savings
  - For the retailer it is labor/time savings
  - For the software vendor it can mean development cost savings and speed to market

- Integration allows companies to work together solving problems for the benefit of the user and the industry as whole
Questions?
• https://www.agclassroom.org/gan/timeline/farm_tech.htm
• http://www.livinghistoryfarm.org/farminginthe20s/machines_08.htm
• http://www.lib.niu.edu/2001/iht810102.html