Digitalization and Big Data from the John Deere Perspective

Dr. Thomas Engel, Manager Technology Innovation Strategy

Content

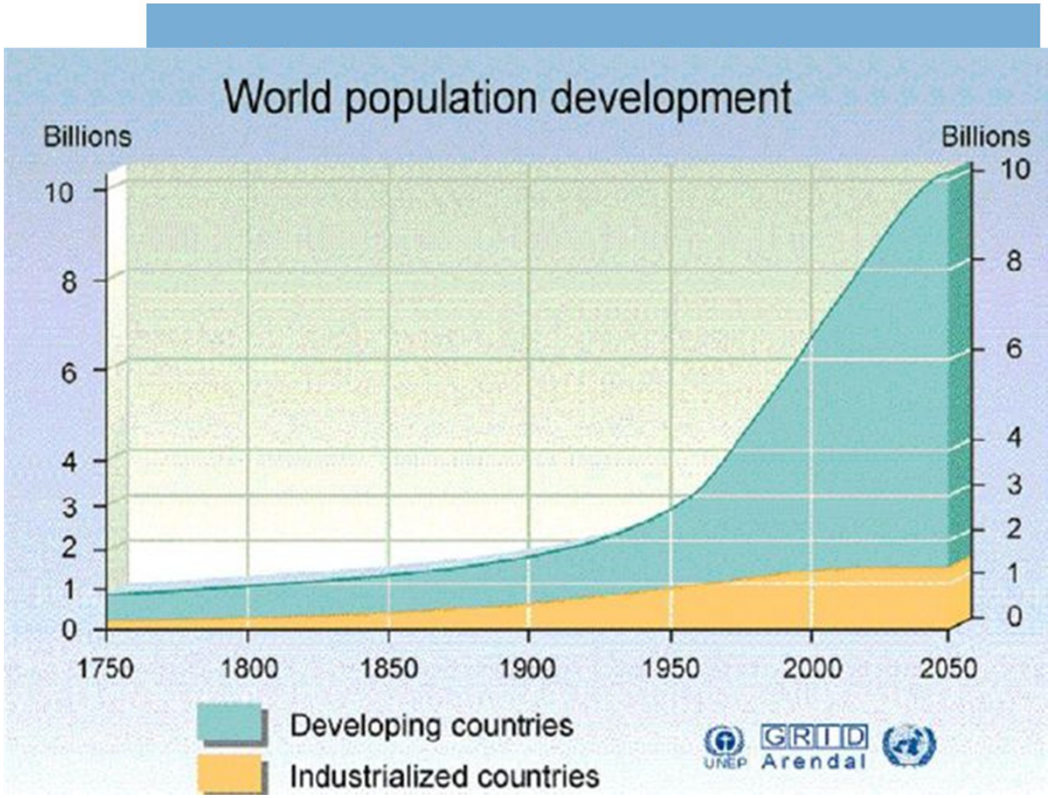
- Challenges for Agriculture
- Automatic Steering Systems
- Site-specific Farming
- Cloud-based Connectivity / Farming 4.0
  - Value Proposition & Benefits
  - Implementation Challenges
- Summary

Challenges for Agriculture

JOHN DEERE

Challenges for Farming Industry

- **Limited Ressources**
  - **Land**
  - **Water**
  - **Nutrients**
  - **People**
- **Population**
  - **Growth**
  - **Diet**



Digitalization (Smart Farming)

JOHN DEERE

Digitalization / Smart Farming

Use of modern automation and information technology to increase the productivity and efficiency of modern farming in a sustainable way with minimal impact on the environment

JOHN DEERE

Automatic Steering Systems

JOHN DEERE

Automatic Guidance Solutions

- **Highly adopted by customers**
- **Far ahead of automotive industry**

JOHN DEERE

Site-specific Farming

JOHN DEERE

Site-specific farming (Variable rate)

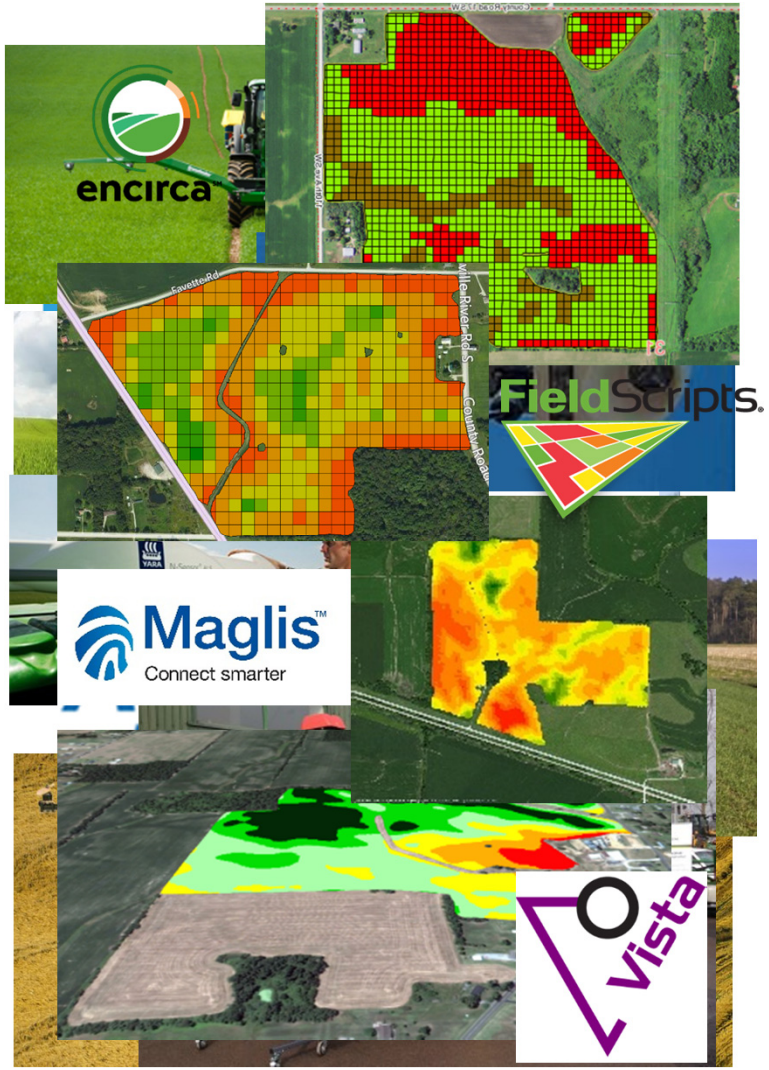
Adaptation of the cultivation to the heterogeneity within the field (soil, landscape, microclimate)

- Maximize yield potential
- Improve crop quality
- Reduce amount of inputs
- Reduce environmental impact

Site-specific Farming (Variable Rate)

Reasons for growing interest:

- Lower investment hurdle
- Good progress in communication standards
- Availability of online sensors (weeds, biomass, nitrogen)
- New opportunities to get spatial information
- Growing number of service providers for variable rate advice



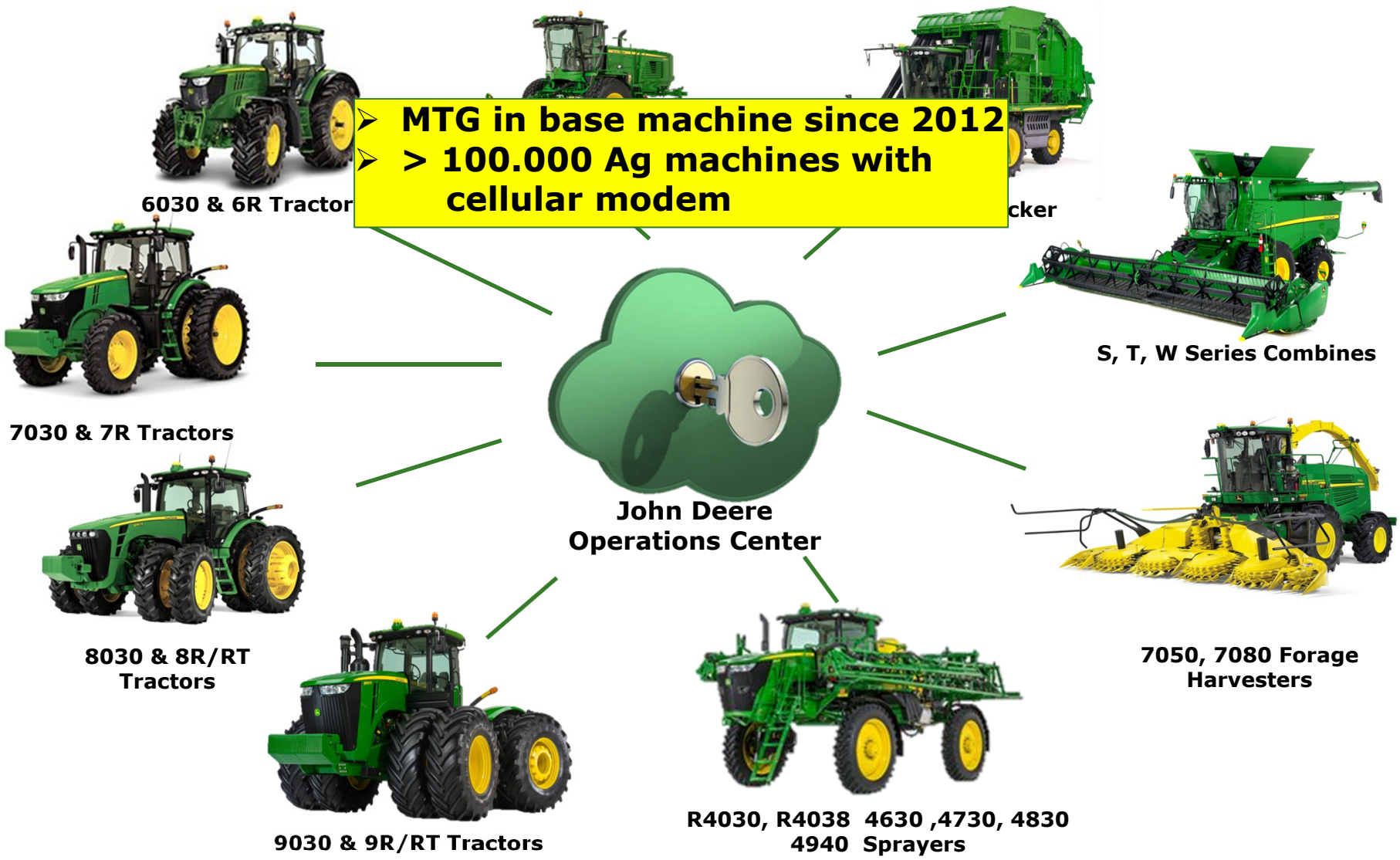
JOHN DEERE

Cloud-based Connectivity

Farming 4.0

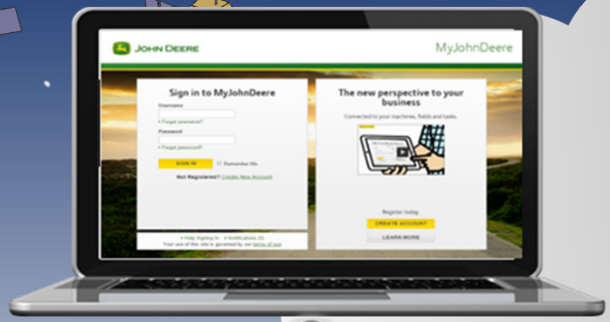
JOHN DEERE

Cloud-based Connectivity



JOHN DEERE

MyJohnDeere Operation Center



MyMachineConnect

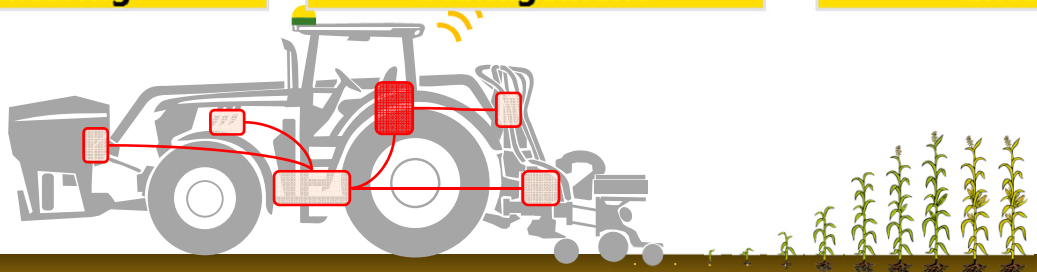
Machine & Fleet Monitoring

MyJobConnect

Operator & Job Management

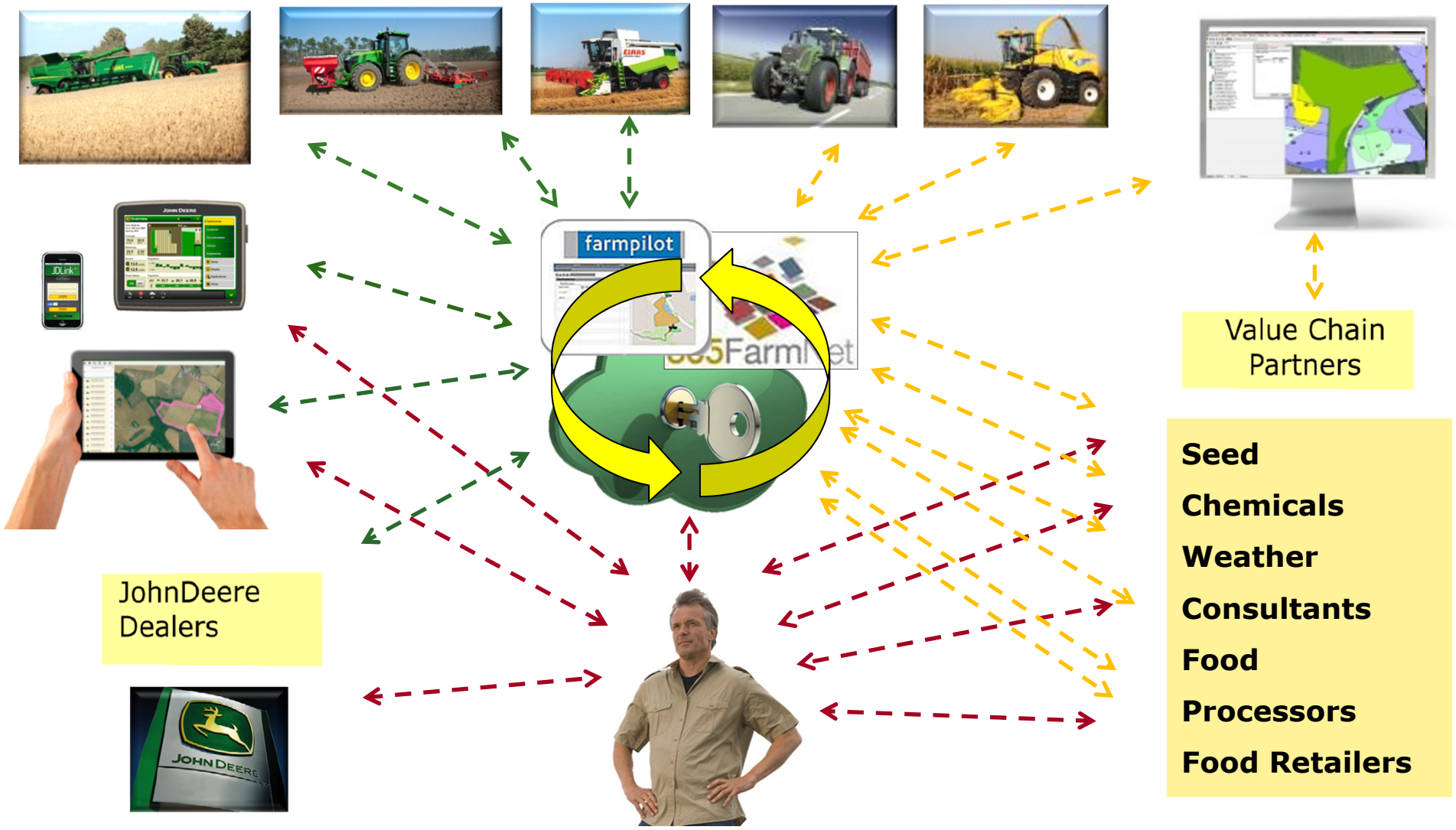
MyFieldConnect

Plan/Analyze/ Interpret



JOHN DEERE

Cloud-based Connectivity



Value Proposition & Benefits

- **Company**
- **Dealer**
- **Customer**

JOHN DEERE

Company Benefits

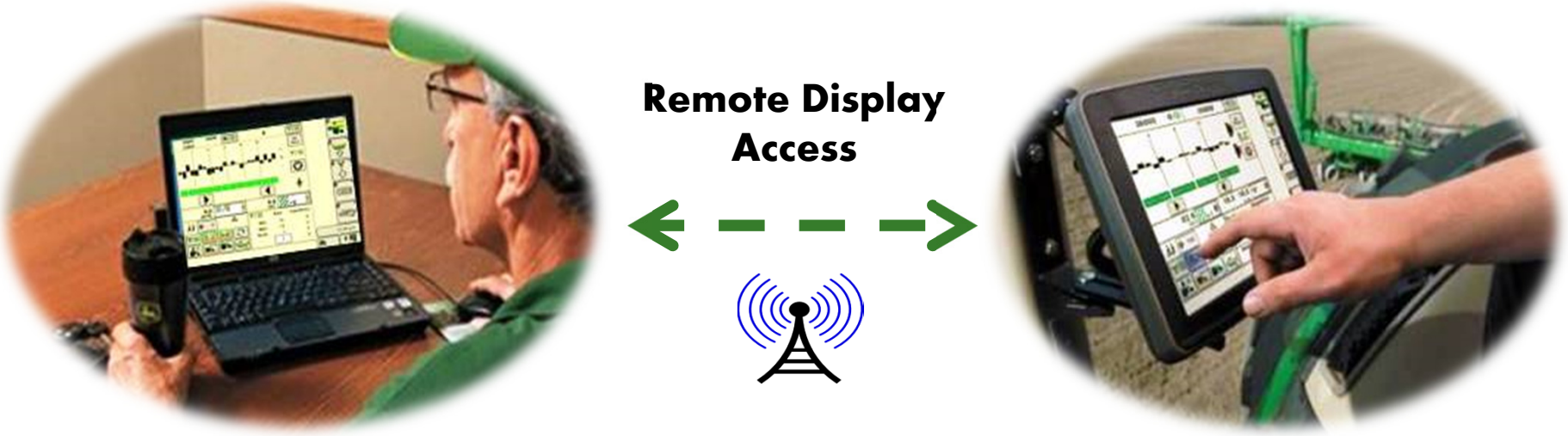
Business question:

- Which engine is optimal for 4630 Sprayer?
- Choice between 4.5l or 6.8l
- Telematics showed customer usage.

Selection of 4.5l engine.
$1.2 M saving

Dealer Benefits

- Preventive Maintenance Planning → Uptime is critical
- Uploading controller software updates without visiting the machine
- New value added service offerings:



JOHN DEERE

Benefits for Contractors

- Support of driver from the office (Remote display access)
- Machine logistics optimization
- Overview of fleet performance
- Insight into machine and driver‘s performance

Benefits for Farmers

"What my machines collect will be on MyJohnDeere.com …"

JOHN DEERE

Benefits for Farmers

- Easily exchange data with consultants and agronomists → information enabled agriculture
- Higher crop yields with lower costs and less environmental impact

JOHN DEERE

Implementation Challenges

JOHN DEERE

Implementation Challenges

- Data privacy and data security laws
- Building customer trust
- Big data hosting
- User interface and ease of use
- Partnering with companies in the value chain
- Standardization of interfaces (API)
- Business model change
  - From products to solutions
  - From sales to services

Summary

Summary

- Digitalization in agriculture will play a key role to address the needs for food of our growing population in a sustainable way.
- We are already in the middle of the digitalization of Agricultural machinery.
- More and more players provide services and offer big data based prescriptions. This will foster the adoption of smart farming.
- Smart Farming can only be successful with cloud-based seamless data exchange and partnering of the companies in the value chain.

JOHN DEERE

Questions?