

# **Digital solutions for agriculture**

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# **prospects & challenges**

Alexander Haus, Mechanical Engineering Industry Association (VDMA)  
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# Digital farming

Consistent linking of individual process steps with digital information

Example: plant production process



Tillage  
soil cultivating

Planting  
seeding

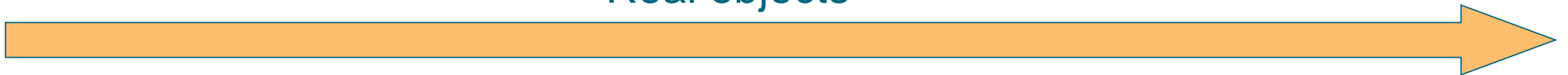
Fertilizing  
spreading

Crop protection  
spraying

Harvesting  
chopping

Transporting  
logistics

Real objects



Real object data = digital representation of real objects

# Digital farming

Consistent linking of individual process steps with digital information

Example: animal husbandry process



Breeding

Feeding

Milking

Fattening

Transporting  
logistics

Slaughtering

Real objects

Real object data = digital representation of real objects

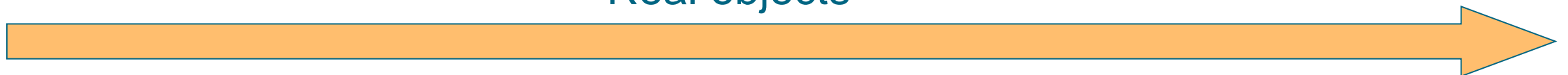
# Digital farming

Consistent linking of individual process steps with digital information

Example: processes along the food value chain



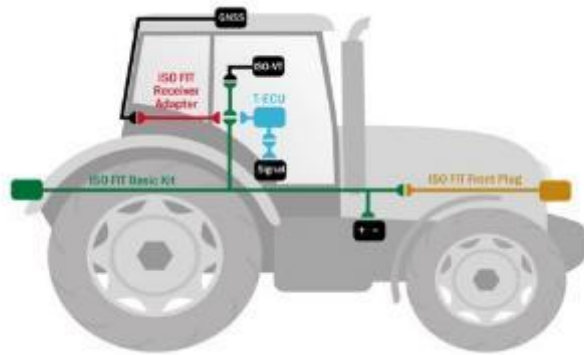
Real objects



Real object data = digital representation of real objects

# Connecting mobile agricultural machines

## Ultra-Short Range



## Mid Range



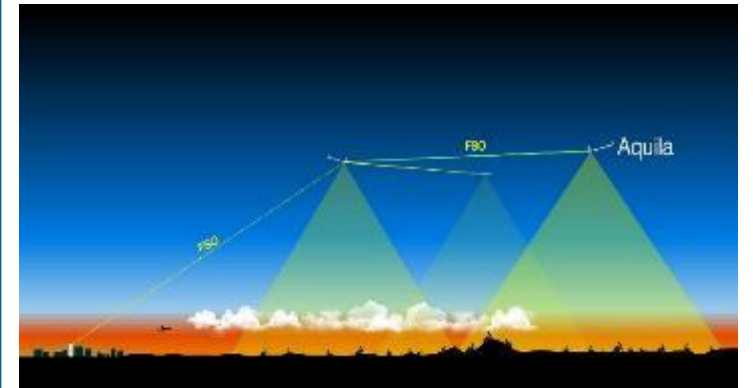
## Long Range



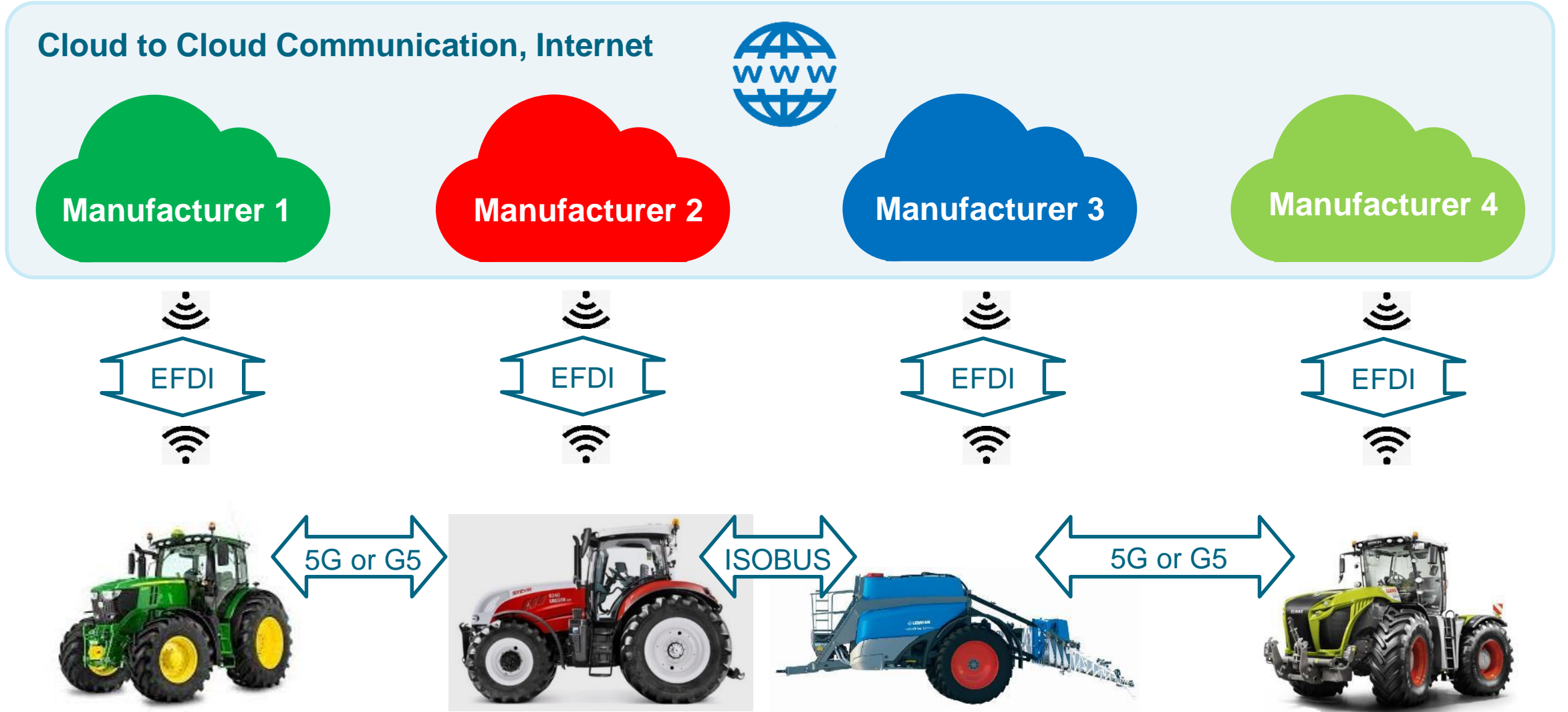
## Short Range



## Ultra-Long Range



# Machine to cloud communication



Source: ISO 5231 Extended Farm Management Information Systems Data Interface (EFDI)

# Use case 1

Replacing wired field buses between tractor and sprayer



# Use case 2

## Harvesting machines

< 10  
2 km  
20 km/h

machines  
range  
velocity

10 mm  
2 ms  
0,5 Mbit

reaction distance  
reaction time  
control command

0,25 Gbit/s

data rate





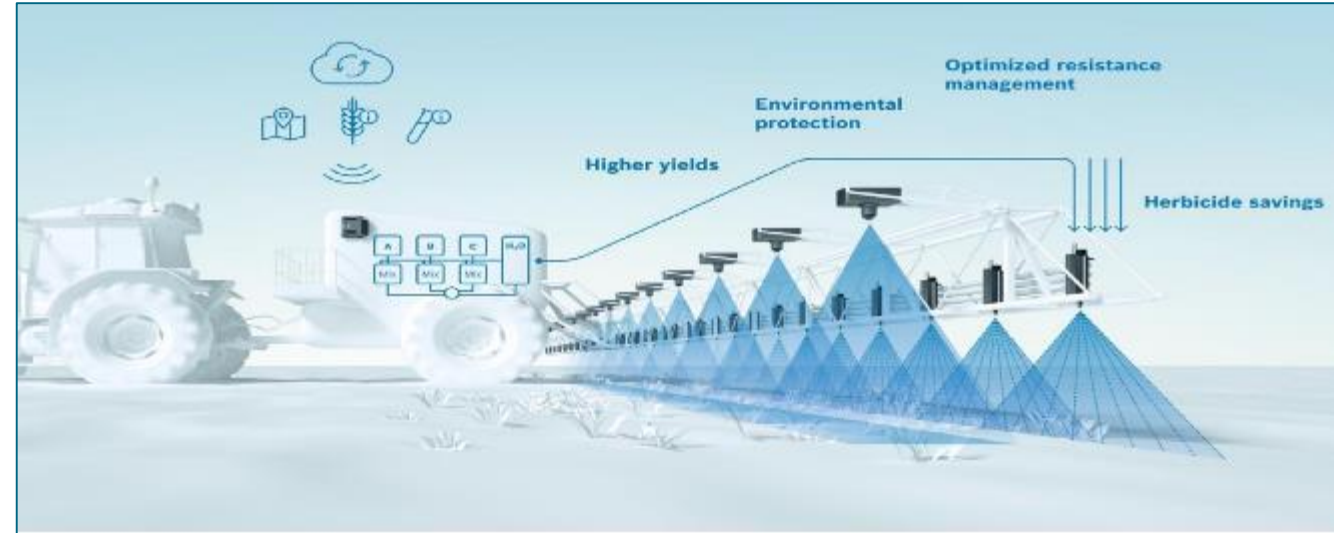
# Use case 3

## Crop protection sprayer

100 cameras / sprayer  
20 km/h velocity

100 mm reaction distance  
20 ms reaction time  
0,1 Mbit features / picture

0,5 Gbit/s data rate



# Use case 4

## Agricultural drones

- Mobile radio network
  - Antenna
  - Edge cloud
- Remote sensing
  - Multi-spectral observation
  - 3D field mapping
  - Field accessibility
- Spraying on hillside locations
- ....



# Agricultural experimental fields



## 14 test fields

- 8 farming (green)
- 3 ranching (orange)
- 3 mixed


## project data

- 2020 started
- 3 years
- 60 Mio. € funding
- 100+ projects

**see website**



**AgTechInventum**



АССОЦИАЦИЯ  
ДИЛЕРОВ  
СЕЛЬСКОХОЗЯЙСТВЕННОЙ  
ТЕХНИКИ



**VDMA**  
Agricultural Machinery  
Association

# AgTechInventum

Russia's first non-profit platform for  
AgTech startups

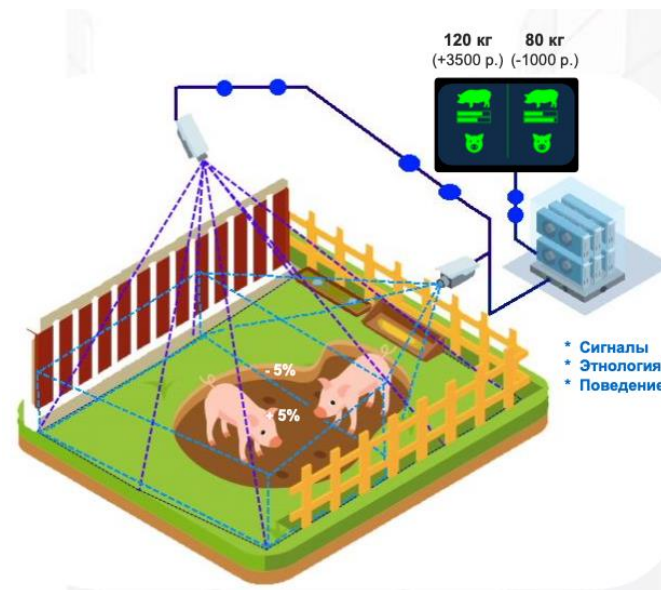
## AgTech in Russia: specific features

- Adoption of precision farming solutions in arable and livestock sectors over the last 10 years
- Expected disruptive growth in the next 5 years (similar to FinTech 2015-2016)
- Conservative customers: innovation is driven by input suppliers (plant protection, seeds, fertilizers, ag machinery manufacturers and dealers, etc.)



## AgTech in Russia: obstacles

- Limited outlook: many startups focus only on fewer target groups, e.g. progressive ag holding and local enterprises
- Weak link between science and business: science does not know how to create a product and sell it. Business is not ready to invest in a mere idea
- Little investment and resources: no systemic industry infrastructure for development





# 3<sup>rd</sup> Pitch Session – General information

**Date & Venue:** August 11<sup>th</sup> in Ekaterinburg, hybrid format as an official event within the All-Russian Field Day supported by MCX and Rosagroleasing (tbc)

## **Audience target groups:**

- Agricultural enterprises and farmers
- Manufacturers, dealers of agricultural machinery - members of **ACXOD** and **VDMA**
- Technological companies and startups
- Banks and investment companies
- Media

## **Benefits for start-ups:**

- Presenting the idea in front of **potential investors**: ag machinery manufacturers, advanced start-ups, banks and financial institutions
- Presenting the idea in front of **potential clients**, e.g. ag enterprises, farmers, manufacturers and dealers (**entry point**)
- Interesting and relevant proposals can be offered a possibility to test their idea at farms or dealer network recommended by ACXOD (**implementation point**)
- The top winner will get an invitation to an international conference at Agritechnica 2021
- All participants of the Pitch Session will be awarded by **a certificate of Expert Council**





**Thank you for your attention.**