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London
June 2019

TSS from Smart Farming Systems

Why are farmers interested?

- Improve efficiencies
- Enhance input allocation and use
- Improve practices implemented
- Informed decisions and new insights
- Benchmarking / Comparative learning
- Prescribed usage of fertilizer, water, pesticides, etc.

- Agricultural area utilized for farming
- Area by crop/plant type
- Number of animals (Cattle, Sheep, Goats, Pigs, Poultry, Rabbits) split into subcategories
- (Details on animal housing)
- (Socio-demographic information of the manager/holder)
- Data on irrigation (area, method, source)

- On-site data:
 - Machine data location, time, activity, engine data, ...
 - Amount of seed, fertilizer, pesticides, water from sprayer
 - Crops (size, pest indicators, nutrient deficiency symptoms)
 - Yield – amount harvested
 - Sensor measurements for animals
 - Soil measurement (chemical and physical)
- Off-site auxiliary data:
 - Remote sensing
 - Weather

- A *farmer* who collects data to understand a field's unique characteristics could claim it as a trade secret.
- Belonging to *service provider* or *manufacturer*, since they are providing the unique pattern, method, technique.

- Farm management system (may include):
 - Use of different kind of machine data
 - Use of external data sources (imagery, weather, ...)
 - Make suggestions for fertilization, irrigation, amount of seed
 - Should be able to be able directly provide many variables from the FSS

- Livestock management system
 - Tracks livestock numbers, locations
 - may track health status variables with input
 - Again this systems should be able to provide necessary information on animals (and already do so in the Austrian case to AMA (Austrian regulator) and we receive data from them)

- Data aggregator / router
 - Since there are many players, system or manufacturers on the market, data routers try to facilitate communication between them.
 - The farmer should be able to use any of these systems and exchange data between them easily.

- Poland:
 - National Support Centre for Agriculture (KOWR). One of the key task of KOWR is management of the agricultural property of the State Treasury through lease and sale of agricultural land. At the meeting it was agreed that KOWR would provide them with data regarding yields from specific fields (leased to farmers) including also information on the use of smart sensors placed on the combine harvesters.
 - Grain and Feed Chamber - organization, which associate about 60 companies from the sectors of feed production, oilseed industry, milling and storage and the national and international turnover of feeds and feed raw materials. The arrangements were similar to those of the previous one with KOWR - they will receive data about the yields from specific fields and usage of the combine harvesters equipped with smart sensors.
 - Polish branch of the DeLaval company regarding information about Automatic Milking Systems and Feeding Machines - description of the system, database structure etc. and also with the proposition to organize a meeting.

- Austria:
 - Ministry for agriculture: we will receive more detailed information from the Invekos database, shape files of the parcels and aerial imagery but nothing really on smart farming.
 - Agrirouter (also contacted by Germany) Phone contact, they don't store data, but provide interfaces between different system, one of these systems could be a NSI, but initially promised additional information was not provided. We need to follow up on that.

- Research study on usage of German farmers suggest low digitalization rates (mostly used feature = GPS tracking). 2/3 of German farmers keep track of usage of fertilizers and pesticides by hand.
- Many different solution providers for the management systems => Country-wise approach needed?
- Similarities to accounting systems in businesses and direct NSI reporting facilities in them?