INTERNET OF FOOD & FARM

# D4.9 IOF2020 USE CASE BUSINESS MODELS

**(Public version)**

**WP 4**

January 31st, 2019

Second overview of business models for all 19 IoF2020 use-cases based on sessions on value proposition, product description and challenges.

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# EXECUTIVE SUMMARY

After the first successful 2 years of IoF2020, it is time to give you an overview on the prevailing business models, distribution trends, sector challenges for the economic uptake of IoT and some suggestions on a more effective innovation accelerating ecosystem in agri-food based on the achievements and infrastructure of IoF2020.

In the field of business models, we see a majority of use cases implementing the software-as-a-service (SaaS) model with monthly or yearly subscription. The end-user knows these business models already from mobile applications and many other office applications and the acceptance is already so high that it is basically expected by the farmer. In the classical B2B field, the service provider uses subscriptions and licenses side-by-side. Next to these rather expected business models, the improving connectivity and availability of real-time data enables and sometimes even requires more advanced business models with disruptive potentials for certain traditional industries like the machine manufacturers. The business model that we discuss and see reflected in the **business models of the 19 IoF2020** use cases are:

- Asset-sharing model
- IoT data & knowledge monetization
- Door-opener model
- Output or performance-based model

A clear trend in the **distribution of smart farming services** goes towards digital marketplaces for smart services on farm management information systems (FMIS) that already manage the master data and bureaucracy of the farm. For a long time, especially larger players tried to come up with a full features solution for the farmer and bound them in some kind of vendor lock-in to their hardware products or side services. This time is more or less over and service providers see the value of FMIS marketplace for a quick uptake and reach for new farm service. The time of farming app stores like we have them in the mobile field is ahead and Europe needs to find central platforms for certain sectors soon as infrastructure for a proper IoT uptake in farming.

Even more than a proper distribution platform, the industry requires a **data exchange solution** to make data from different sources in a simple way available for innovative farm services. This is still a question of standardization, but also of sustainable data business models to keep all actors investing in security and comfort. Therefore, we discuss some of the leading approaches on data sharing and their business models in the farm machine sector:

- IoFIeld Gateway by CNHi, Kverneland, AGCO, AgroIntelli
- Agrirouter by DKE Data (AGCO, Amazone, Excel Industries, Grimme, Horsch, Krone, Kuhn, Lemken, Pöttinger, Rauch and SDF)
- JoinData by Dutch companies and research institutions (e.g. Wageningen, Akkerweb, TNO)
- IoF2020 WP4 Approach (suggestion of an adapted business model)

In the light of stricter environmental regulation to improve the sustainability of farming in the future, there is an increased need of smart farming services and especially farm management information systems to have access to national, regional and local regulations for the application of fertilizier and pesticides. Therefore, a major request of IoF2020 towards the EU and the member states is the standardization and digitization of regulations and application processes for subsidies. IoF2020 stresses the need for a **data platform on governmental regulations** that makes requirements on-time available in a standardized digital format all over Europe.

While all the points above reflect on the econimical infrastructure for a proper exploitation of smart agrifood solutions, WP4 also developed **an approach for the implementation of a connected innovation ecosystem** composed of accelerators & innovation hubs, corporates, investors, universities and governmental autorities. The basic idea is to transform the pool of test sites of IoF2020 into a sustainable test farm network that helps validating hig-potential solutions of startups or SMEs in a fast

pace and deliver these validation services on paid basis to corporates and investors to justify their partnerships or investment.

From this rather holistic view, this deliverable dives back into the IoF2020 use-cases and describes the **business readiness classification** of WP4 to monitor the progress and support needs of the use-cases. This classification shows a rather heterogenous picture of the use-cases economic readiness to sustainably exploit their services and products. It rates in sub-categories the following readiness fields:

- Product Readiness
- Exploitation Readiness
- Business Model Readiness
- Market Readiness

After this rather methodological introduction to the business model status of the 19 IoF2020 use-case, the document delivers finally detailed insights into the revenue models, pricing and distribution strategy for each of the 37 products and services[1]. If possible, it gives as well information on the cost structure, internal resources, horizontal activities and partner networks. Some use-case changed and adapted their product description and value proposition after feedback from WP4 on the user acceptance and the cost structure.

A good example is use-case 2.1, Cow Grazing Monitor, which extended its service from the initial monitoring and grazing management of dairy cows on pasture towards a grazing, health and tracking manager for large remote herds. This change was implied by WP4 because of the rather expensive solution of Sensolus tracking devices compared to the lower added value for the farmer. With this new focus the hardware can play out its full benefits on battery lifetime and precision and create a huge benefit on reducing the work load for farmer of large roaming herds.

Another big issue that nearly all IoF2020 use cases had to take into account while designing their business model was the low spread of IoT sensors and connected equipment. Under these conditions, the simple test of smart farm service by a farmer requires an average investment of €8.000-€12.000. This creates a huge barriers for adoption of IoT services and WP4 work together with the use-cases on pre-financing solutions for equipment like collars, weather stations and sensors. In many cases it is now possible for the farmer to receive the hardware as a service and just pay a higher subscription fee. This reduces the entry barrier for farmers to try new services where the actual benefit for their specific farm is not yet clear.

In the coming 2 years, the business support of IoF2020 will work on the validation of the proposed business models. With the introduction of MVPs for nearly all IoF2020 use-case in 2019, WP4 has for the first time the possibility to receive broader customer feedback. Next to this, WP4 will integrate together with WP3 the data marketplace by FIWARE and service monetization tool Coat Rack by ATB in selected use-cases and validated their economic viability.

[1] Note that this is not available in this public version of this deliverable.

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# 1. INTRODUCTION

While a major objective of IoF2020 is fostering the technical validation and the further spread of IoT technologies in the agri-food sector all across Europe, all of these ambitions can only be reached based on sustainable and innovative business models that generate revenue for several connected parties. Therefore, IoF2020 validates as well new data business models that either extend classic exploitation methods like SaaS or Pay-per-use by additional revenue streams or basically enable data exchange across hardware providers and service developers.

In this 2nd version of the IoF2020 business model report, the business model support team of IoF2020 presents a holistic overview of general business model trends and market challenges in the agri-food sectors before it gives latest insights into the monetization models, distribution plans and cost structures of all 19 IoF2020 use-cases with their 34 products and services. All findings are based on the practical work of the business support team with the IoF2020 use-cases, their corporate partners as well as external stakeholders. The report is designed as an evolutionary document that is extended every 12 months by additional business model components and challenges faced in the process.

In the first section, this report introduces the reader to the 6 most popular business models that are applied by IoF2020 use-case and explains briefly the economic implications for each of them. Followed by short presentation of two key distributions strategies that especially important for SMEs and start-ups companies.

The second section elaborates further on the importance of platforms on the different levels of the agri-food value chain not only for distribution purposes, but also for seamless data exchange from machines to services, transparency and legal compliance of farmers in a period of continuous change of regulation. In this context, the report sheds some light on the business model of data exchange platform initiatives like the German Agrirouter[2] by DKE Data GmbH or the Dutch JoinData[3] cooperative, discusses their strength and weaknesses and draws a line to the UC1.4 of IoF2020 on farm machine interoperability.

It further reflects on farm machine information systems (FMIS) turning more and more into infrastructural marketplaces for the distribution of third-party applications like e.g. 365FarmNet, NextFarming, FarmFact or Akkerweb. They will play a key role in the future consolidated market as digital distributors with their high reach and comfortable marketplaces that offer sales, customer service, accounting and relevant third-party data in return for a revenue share. Finally, this section shows the need of all services providers for a platform that offers information of current regulations and directives for e.g. fertilizer application or the use of plat protection agents in a standardized format.

In the last part of the holistic business overview, the IoF2020 business support team presents a sustainable concept for a connected innovation accelerating ecosystem composed of accelerators, investors, corporates, universities and governmental authorities. In this concept IoF2020 would connect interested test farms equipped with IoT sensors to a network and offer this infrastructure to corporates and investors for the validation of service before entering partnerships or investments. Furthermore, it shows the benefit of public benchmarks of smart farming solutions to show transparently which are the best performing services out there in the market.

After these rather broad topics, the reader is invited to dive deeper into business model methodologies applied by WP4 and finally the detailed monetization and distribution strategies for each of the 34 IoF2020 products or services[4]. The report presents as far as possible the detailed exploitation

[2] https://my-agrirouter.com/nc/en/
[3] https://www.join-data.nl/en/
[4] Note that this is not available in this public version of this deliverable.

structures, distribution plans and partnerships as well as the monetization model for each service or hardware product. Here are the areas that were updated in this version of the report:

- Updated product description and value proposition
- Revenue streams & payment methods
- Distribution channels & partners
- Cost structure & internal resources

The report concludes with a few lessons learnt in the way to work on business models within IoF2020, but also from trends and challenges in the market itself. It closes with a brief overview of the major next steps in the business model support of IoF2020 and shows the elements that will be updated in the next version of this report.

# 2. HOLISTIC BUSINESS OVERVIEW

## 2.1. BUSINESS MODEL & DISTRIBUTION TRENDS FOR AGRIFOOD SERVICES

### 2.1.1. Business model trends

IoF2020 unites 100+ partners and 50+ exploitable IoT services in 5 sectors of the agricultural market. This unique position together with the application of reusable software components that enable data or service monetization allows us to give a rather holistic overview of the business models currently applied by our 19 use cases. In the following sections, each business model applied by a partner will be described in general. For the specific description of the business model applied by a certain use-case, we refer to Section 4. Use-case business models.

#### 2.1.1.1. Subscription model

Since most IoT services for farmers have a 24/7 connection, service providers can leverage that connectivity to develop a recurring-revenue business model. Now instead of offering a one-time license deal, they can offer a subscription model in which the farmer pays a fee in return for continuous value (Figure 1).

A subscription model offers a farmer an easy entry for temporarily trying out a potential solution on the farm with the opportunity to simply terminate the service subscription, if it does not provide the expected benefits. Together with a proper pre-financing model, the subscription model can also reduce the entry barrier of the expensive IoT hardware investment. Basically, service providers can introduce an “as a Service” business model for a system that includes both software and hardware. In this hardware or infrastructure as a service model, the farmer does not become the owner of the hardware, but simply pays a subscription fee for its usage.

By using SaaS, service providers can also explore further creative ways to monetize their product, not only with a monthly subscription, but also by providing paid upgrades or even implementing a “freemium” model, if the strategy and value creation is based on large user base.

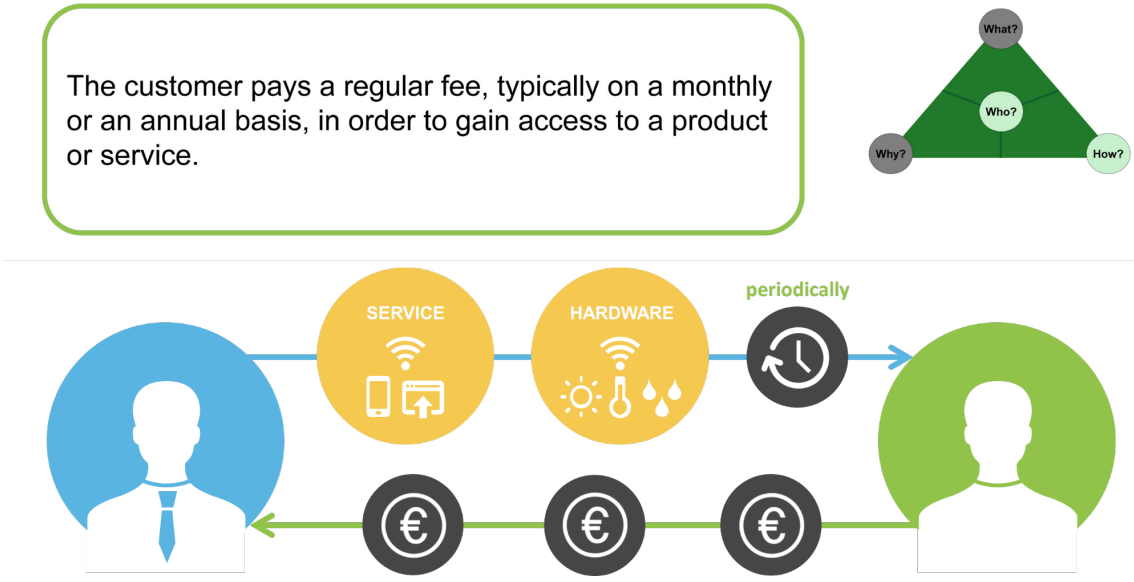


*Figure 1: Subscription business model*

Another benefit of this IoT business model is that it empowers companies to foster a more active and continuous relationship with farmers or their respective end-users. In the past, hardware manufacturers used to “throw their products over a wall”, meaning that once they completed the sale, they rarely interacted with their customer again. IoT products break down that barrier. As IoT devices gather more data in customer’s surroundings, service providers are able to learn more about individual processes and provide more valuable features tailored to these specific farm needs. Some common IoT applications using the subscription model include “sensing as a service”, “monitoring as a service” and “predictive maintenance as a service”.

#### 2.1.1.2. Pay-per-use

Specific services like the creation of yield or soil maps out of IoT data are simply exploited on B2B-basis as a remote cloud service with payment for each created map (Figure 2). This approach reduces the complexity of the product development as no interfaces or further software integrations are needed. The algorithm is available as a web-service with an exploitation instance in front like the ATB Coat Rack. This tool tracks the number of times that a service is called e.g. by another service provider and automatically files an invoice per month for the usage.

In other cases, having sensors on a hardware device gives the opportunity to monitor customer’s environment and how much they use the product. This opens the door to an innovative IoT business model where a service or hardware provider can charge their customers for the amount of time they are actively interacting with a product. In this IoT business model, the goal is not to make money on the device itself. Instead, service providers are using the data produced by the IoT device to track usage.

Here’s a good example of this IoT business model in the insurance sector:

Metromile is a San Francisco-based insurance company. Their goal was to create an innovative pricing structure for their car insurance product while solving the challenge of San Francisco residents who don’t use their car very often. The solution was to create an IoT product that tracks how much people use their car. Using these data, they can calculate risk and therefore provide a per-mile price for the insurance. Notice that in this example, the customer is not paying for the usage of the IoT product itself (an ODBC adapter). Instead, customers pay for the usage of the device monitored by the IoT product (the car).

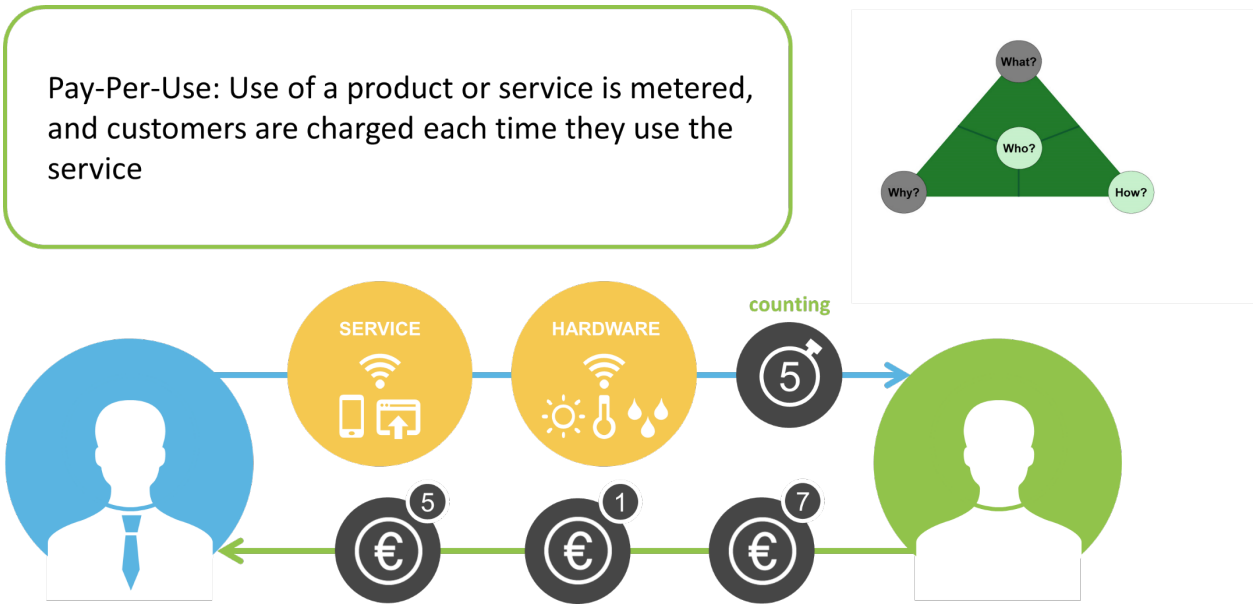


*Figure 2: Pay-per-use business model*

#### 2.1.1.3. Output or performance-based model

The output or performance-based IoT business model offers customers to pay for the actual output or benefit a product or service provides, as opposed to the product itself (Figure 3). Imagine a farmer does not buy a harvester anymore, but pays for the amount of crop harvested in a certain period of time. The hardware manufacturer or a hardware service provider could offer machines based on the performance and takes over the risks of maintenance and servicing of the machines to assure the performance guaranteed.

Smart farming services of the future could also assure a certain level of soil nutrition for the farmer or a specific output of a vertical farm or a greenhouse. Being closed environments with the potential to be fully controlled by a service provider, vertical farms are especially interesting for output-based business model as the production risk is under full control.

In the farm machine sector, these business models are only practicable when manufacturers have sufficient predictive insights in their machinery and the machinery can be offered to several farmers not bound to similar harvesting times. Therefore, these business models could be interesting for smaller robots or drones that are offered by flight hours with operators.

The major advantage of this business model, is that it can reduce the customer's objection to buying expensive equipment and enable a more sustainable usage of equipment. With regard to sustainability it should not be forgotten that there is quite an amount of CO2 emission going along with the production of a machine. Therefore, the industry could become more efficient in making more use of the same machines.

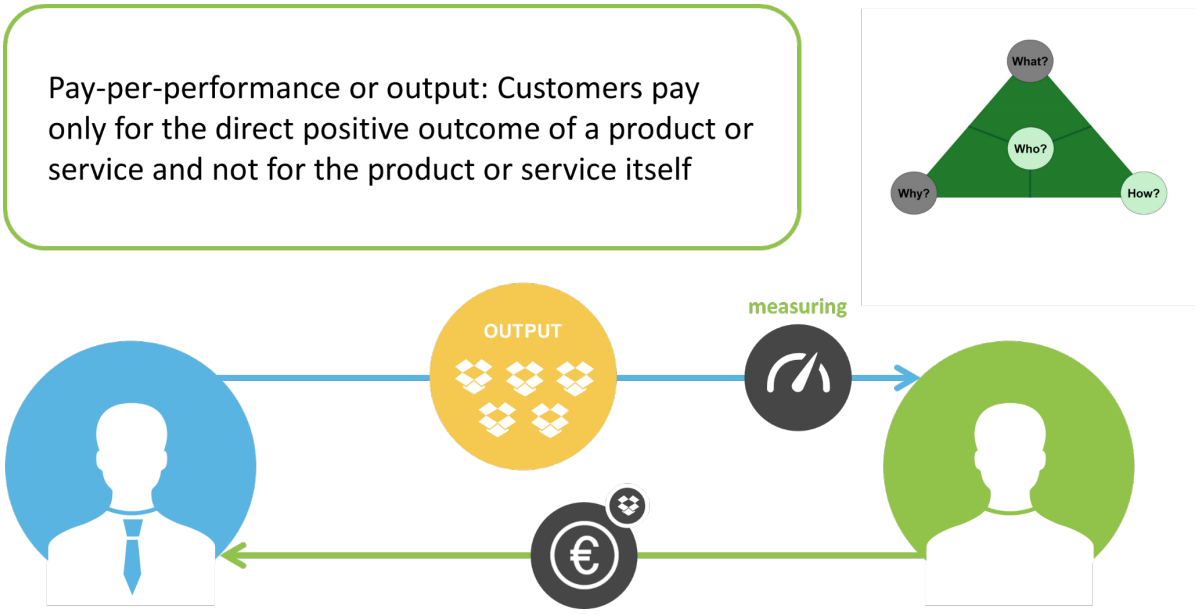


*Figure 3: Pay-per-performance business model*

#### 2.1.1.4. Asset- sharing model

A big concern when buying expensive equipment is whether the customer will be able to utilize the equipment to its maximum capacity. This is where the idea of sharing assets comes into play (Figure 4). We are starting to see this IoT business model already with farm machine-sharing companies like Mermix in Greece. The major objective is to share overcapacities of machinery, equipment or IT resources to either afford high-tech solution or to minimize the trade-off if the ideal size or capacity that you need is not available in the market. IoT has the potential to solve this problem, and we are already starting to see solutions with self-driving cars, virtual power plants, shared drones, etc.

This IoT business model revolves around selling your extra capacity back into the market. The goal is to maximize the utilization of your IoT product across multiple customers. In that way, each customer pays a reduced price and you are able to get faster market penetration, compared to when a single customer has to pay for your complete product.

An example for this model is trading extra power storage capacities to a grip provider, when farmers buy batteries for solar panels on a farm. As batteries are sometimes only available at certain capacity levels that are not ideally matching the power production of the solar panels or the wind turbine. The spare capacity can be sold to a grid provider to save and leech power and to stabilize the decentralized power grip of renewable energy sources. This way the extra income helps to finance the equipment.

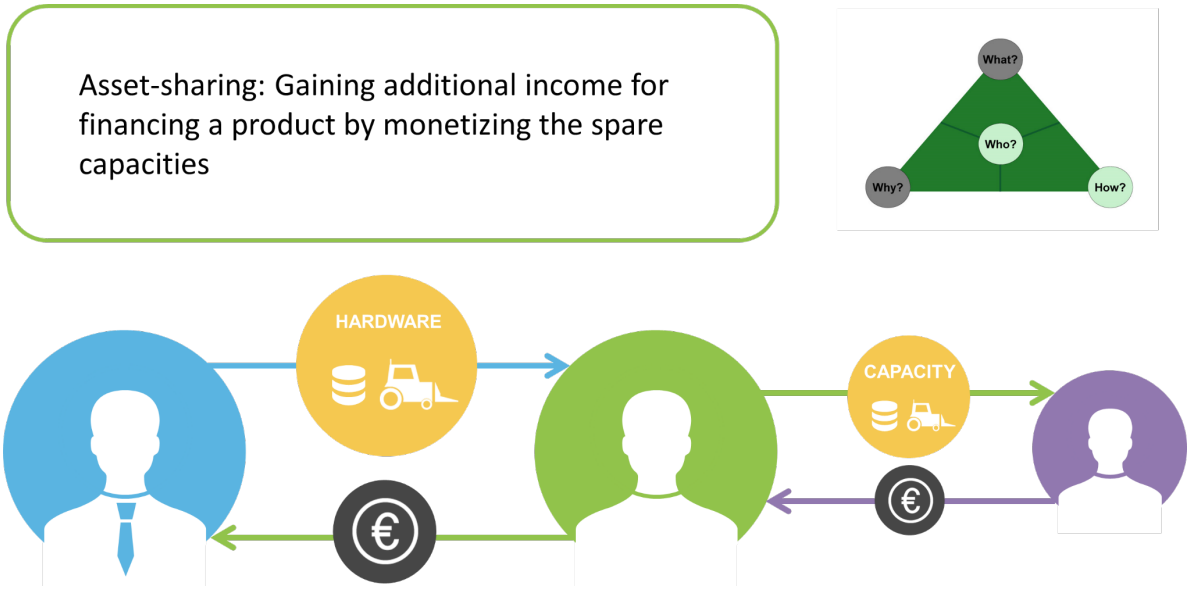


*Figure 4: Asset-sharing business model*

#### 2.1.1.5. Door-opener model

Through the implementation of an IoT service or product a company can offer a different service that is not necessarily connected to the IoT field to their customers. This does not mean digital services as they are covered in the subscription model, but real labour related offers. In this IoT business model, the IoT product can be an enabler and differentiator for your company to sell a service (Figure 5). Here are a few examples of this IoT business model:

- Use an IoT product to monitor machinery, predict maintenance, and then sell a maintenance contract.
- Implement IoT device for health tracking on an animal farm and offer an improved veterinarian service to treat animals
- Install IoT devices in a smart building to measure energy consumption. Then sell an energy audit and energy optimization services.

This model offers endless possibilities on how to use IoT products for gathering data, and then provide a service using the insights collected. Combining this IoT business model with any of the previous described model can help to increase profits make also traditional service attractive again. For example, a service provider can sell the hardware, monetize the data, and then offer a service based on insights.

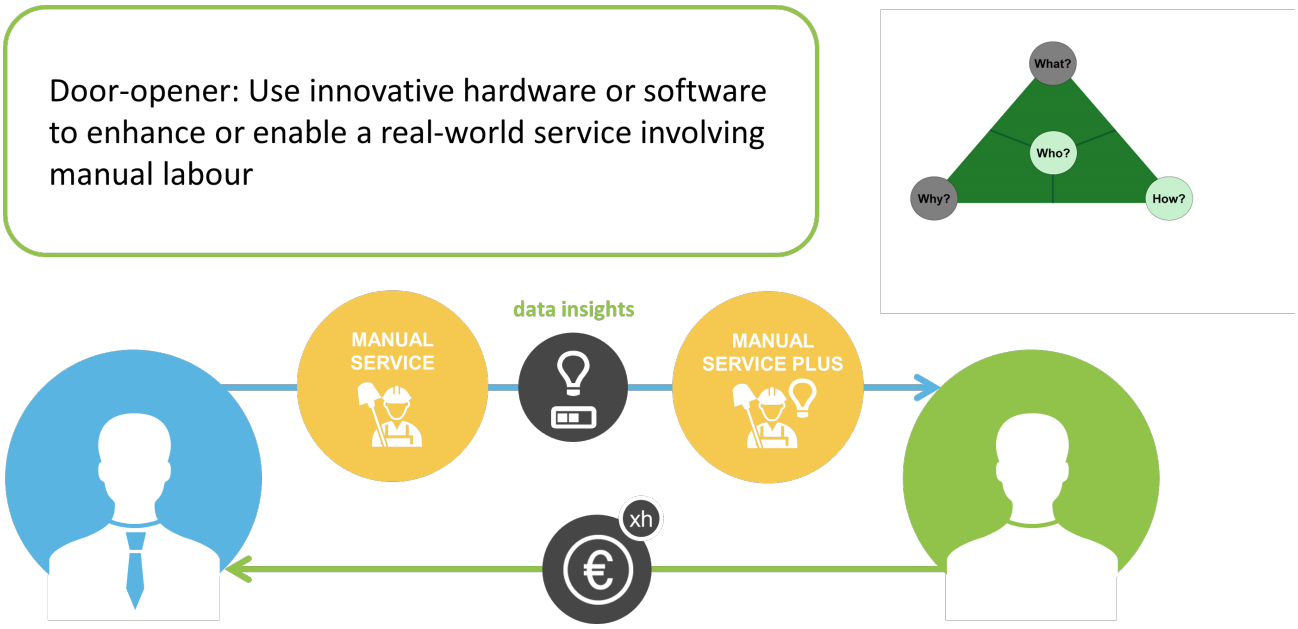


*Figure 5: Door-opener business model*

#### 2.1.1.6. IoT data & knowledge monetization

With the increasing complexity of simulations and prediction algorithms there is a growing need for external and third-party data to improve the knowledge creation and the provision of proper advice for complicated situations. Therefore, the monetization and data-for-data exchange will increase in the future. This way data of one industry can create added value in a completely different sector.

Furthermore, large data sets are important for the training of deep learning algorithms to identify patterns.

In one scenario, the service provider could build a product to provide value to the end user and also to collect valuable data that can be sold to a third party. In this approach, service providers can offer their IoT device at no cost to eliminate the buying friction for the end user. The goal is to deploy as many devices as possible to collect data. This is all about building a network effect. The more devices the company puts out there, the more attractive the data proposition will become to third parties.

There are many examples of products leveraging this IoT business model. Think of energy efficiency devices installed in buildings to monitor their energy consumption. The building manager benefits from this data, but utilities or other aggregators can pay a hefty sum to receive aggregated data from thousands of buildings. The same is true with devices that monitor driving habits. They provide drivers with some interesting insights, but insurance companies get the most value, as they are able to understand driving patterns for thousands of people.

This model can be a line extension of the core business, meaning a service provider can start by solving the needs of their end user, and later can decide to branch out into monetizing their data. These two models don't conflict with each other as long as the service provider makes their customers aware of how their data will be used and make sure to safeguard their privacy.

However, service providers should keep in mind that sharing aggregated data with other companies is not just an add-on to their existing IoT solution. It's a complex product that requires full understanding of the data governance for third-party users, the data flow and transparency guidelines towards data providers and its impact on the overall infrastructure. Furthermore, if a company plans to open APIs for

their customers to access data, it's important to think of that API as its own product and ensure to provide a good developer experience.

### 2.1.2. Distribution trends

#### 2.1.2.1. Service marketplace distribution

One of the major trends for the future years is the distribution of smart farming services through marketplaces on existing farm management information systems. The farmer clearly wishes to have one major service platform on the farm that manages the farm master data and offers all relevant services around it. This distribution infrastructure is a driver for quick take-up of smart services and a faster validation of new solutions in practice on the farm.

The established FMIS platforms like 365FarmNet tend to build up professional APIs for third-party services to establish data connection and to assure a seamless integration into the FMIS suite. The developer environment gives access to test data of a virtual farm and can be freely used by developers to test software.

#### 2.1.2.2. Industry portfolio partnerships & acquisitions

The established corporates in the agricultural sector reaching from farm machine and equipment manufacturers to chemicals and seed suppliers understood that innovation for the digital future of farming will not only come from within their own organizations, but also from the thriving startup world with its faster innovation speeds. In order to participate from this rich source and to enrich the product portfolio as well as digitize internal process, corporates are sealing more and more partnerships with startups. These can be simple distribution deals, where the corporate can offer their established distribution and customer service infrastructure in return for a significant revenue share of innovative third-party products and services. More complex deals will be described in the next update.

Agriculture being a rather traditional industry, it is very hard for new players to establish brand recognition and trust among the critical farm community. Therefore, a professional cooperation between the startup world and established corporates is a backbone of the competitiveness through digital innovation in Europe. A connected innovation accelerating ecosystem of accelerators, competence centres, corporates, investors, research institutions and governments could ensure this high-speed validation of new solutions and support this distribution trend.

## 2.2. PLATFORM OF PLATFORM APPROACH FOR AGRICULTURE AND FOOD

The core building blocks of a future data economy are interconnected platforms that standardize the information exchange and centralize/structure the services offered by a fragmented market of application providers. IoF2020 identified 4 major platform dimensions for the future agri-food sector that will contain most of the relevant platforms for the market:

- Production
- Processing
- Logistics
- Retail/End-Consumer

As you can see these dimensions are actually value chain areas that are defined by their own set of players and rules still being of course interconnected. For each of these dimensions, a certain set of interconnected platforms is required to ensure the following core activities in order to generate value:

- Distribution of software services (Service Marketplace)
- Application of latest governmental regulations (Regulation Platform)

- Standardized data exchange (Data Marketplace)

Now let's have a deeper look at the actual player in the currently target production market that could represent the above-mentioned activities in each of the identified dimensions.

### 2.2.1. Service marketplaces in the production dimension

The distribution platforms for software services in the production dimension are already existing and growing in form of farm management information systems (FMIS) with an attached service marketplace. These platforms are very much comparable to an early Google Play Store or Apple App Store. They are mostly offering basic management services for specific farmers like arable farmers, dairy or meat producers based on farm data coming from various equipment and sensors. Furthermore, they are offering APIs to integrate third-party services to the FMIS and publish them after a proper quality check via a service marketplace to their connected farmers. It is a win-win-situation for both sides. The FMIS receives a share of each transaction taking place on the marketplace like a farmer booking a monthly subscription of a service for disease detection or just requesting a single yield map paid only once. In return the service provider reaches with its service in an instant a large audience of digital-affine farmers and might even benefit from an established professional customer care system.

A perfect example for this business model is the IoF2020 partner: 365FarmNet

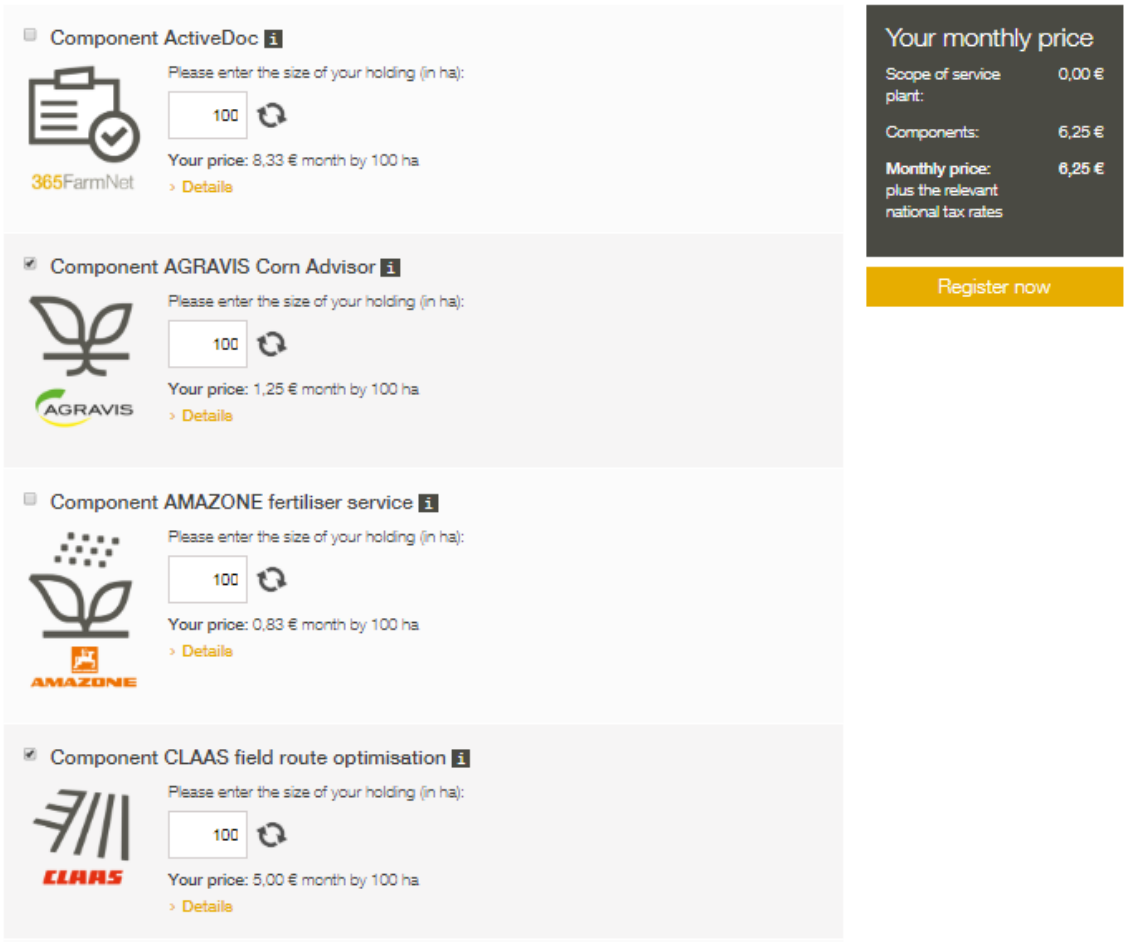


*Figure 6: 365FarmNet Marketplace for third-party Smart Farming Components*

### 2.2.2. Regulation information platforms in the production dimension

Many activities performed on a farm have to be carried out in respect of many regional, national or European regulations that are constantly changing due to environmental or safety constraints. These regulations contain for example the maximum amount of manure to be brought out per hectare or the distance that a sprayer has to respect from surrounding nature or housing when applying pesticides on the field. Currently, these regulations are published in many different standards reaching from simple PDF documents available for download on a website to web services issuing a JSON data object.

IoF2020 strongly encourages the establishment of common standards for publishing agricultural regulations and their decisive parameters at first in national and later European open data platforms that are freely accessible by digital services. This way governments can assure that changed regulations are immediately carried out on the field and farmers are safeguarded from conflicting with rules that just changed or that simply are not known to the farmer.

Due to the lack of standardization in the publishing of regulations, digital service providers as well as farm management systems have to either buy this data from information collection companies or invest quite a lot of financial effort to retrieve the information themselves. This current situation adds additional costs to digital IoT solutions in agriculture and makes them less accurate or in worst case even responsible for conflicting with agricultural regulations. Therefore, the absence of an open data platform for governmental regulations limits the uptake of IoT solutions in agriculture.

The other side of the coin is that farmers in all sectors have to provide proper documentation and reporting towards the governmental authorities in order to receive agricultural subsidies (e.g. direct payments). Currently, more and more of the EU bureaucracy can be already handled digitally which will be further improved though the implementation of the geo-spatial aid application (GSAA). However, for many subsidies the digital reporting is still impossible and there are regional differences in the format required by reports for one and the same support payment.

Therefore, IoF2020 encourages together with all FMIS and service provider attached to develop a common approach throughout all member states of the EU to agree on certain standards in the digital reporting for agricultural subsidies. A common platform through which the member state's managing authorities could handle the application process for EU subsidies and apply even local differentiations in the application requirements would be highly beneficial for the digitalization of agriculture in general. A quick and simple way of digitally applying for EU subsidies would be a key value proposition for the farmer to buy and implement digital solutions like farm management information systems coupled with IoT sensing systems. The member states could create a huge sales argument for digitalization in agriculture, if their managing authorities for distributing EU subsidies would become fully digital themselves.

### 2.2.3. Data exchange platforms in the production dimension

In the production dimension, the data for algorithms and monitoring services derives mainly from farm machinery, technical equipment and sensors in the field or barn. The machinery on a typical European farm comes usually from various manufacturers as the market is rather fragmented and manufacturers are specialized on certain machinery and problem solutions. This brings a huge challenge for service providers to integrate the data from the different vendor sources as this data usually goes to an OEM cloud first and is not openly available for third-parties. The solution is the development and an agreement on sector specific standards and semantics for the data exchange carried and further developed by the machine manufacturers.

***IoF2020 IoFieldGateway***

IoF2020 is one of three major initiatives working on this topic and concentrates in use case 1.4 together with CNHi, Kverneland, AGCO (Fendt, Challenger, Masey Ferguson, Valtra) and Agro Intelligence on the development of a data standard for the 2-way exchange of data from several farm machines to a

central farm management information system, in this case 365FarmNet. The new standard which would replace the ISOXML format is based on the ADAPT standards framework introduced by AgGateway. The aim is to find a common language for the individual OEM clouds to exchange data among each other and to offer standardized APIs for external services that the farm would like to connect the farm equipment to. This approach does not foresee a central routing platform that service providers connect to and receive data and therefore also no specific business model for the data exchange.

If a software or platform provider would like to gain access to farm machine data and gain the ability to directly communicate with farm machines of their clients, they need to agree to the terms of the farm machine manufacturer platform. Some of them will ask the software companies a data access fee, some of them are integrating it in services sold to the farmer, and others consider data streams a product feature for which no additional fees should be charged.

Telematics Gateways on Farm Machinery will be mostly OEM-specific for various reasons;

- Safety, Security, and Liability (the OEM has to ensure this in the first place)
- Remote Servicing, Remote Display, Firmware updates over the air
- Specific machine settings and optimizations

As such these OEM specific Telematics Gateways will be used for first and above all a secure data communication path to the OEM Cloud Portal, providing different data communication streams;

1. Telematics and Machine specific data capture (OEM interest)
2. Wireless data exchange of Task/Field Data (Farmer or Contractor interest)
3. Fleet Management data (Contractor interest)

Through the IoF2020 standard, each manufacturer has the opportunity to exchange data in an understandable format with all market actors and it also ensures that third-party data like variable rate application maps (VRA) can be seamlessly executed on the machine (Figure 7). Just this development makes actually smart farming with high level automation of machinery possible and is a backbone for the further uptake and impact of IoT solutions on the agricultural production.

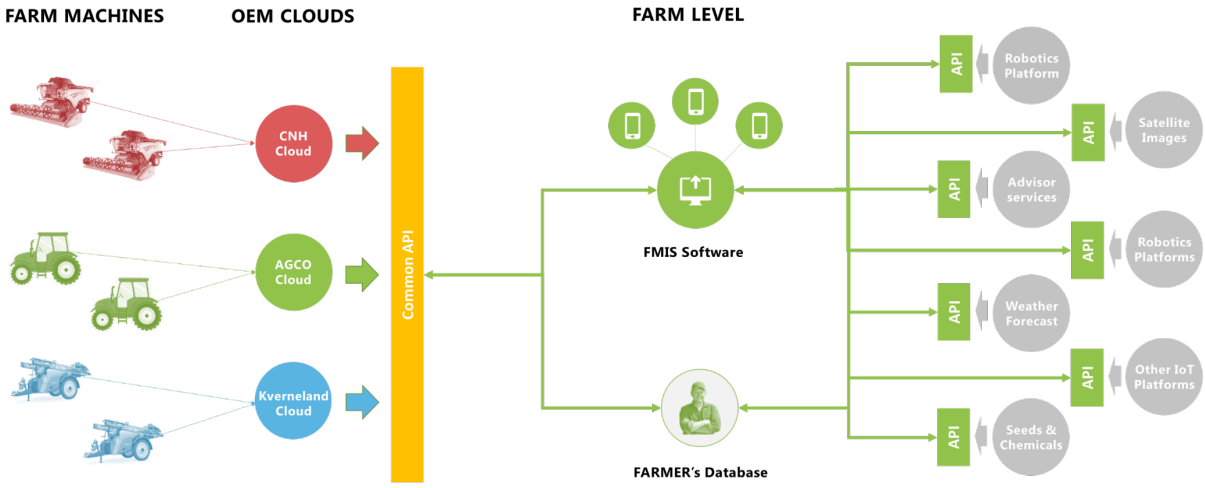


*Figure 7: IoFieldGateway - Distributed Cloud Platforms and Services*

### *DKE Agrirouter*

Another approach for the data exchange challenge is the Agrirouter coming from a consortium based in Germany called DKE. The DKE-Data GmbH & Co. KG is in joint ownership of the following farm machine manufacturers: AGCO, Amazone, Excel Industries, Grimme, Horsch, Krone, Kuhn, Lemken, Pöttinger, Rauch and SDF.

The Agrirouter intends to serve as a neutral instance that enables farmers and agricultural contractors to exchange data between machinery and agricultural software applications from a wide variety of vendors. Each user can set up their own personal Agrirouter. They only need to use the Control Center to set the routes to be used for transferring their data. Even older fleet machinery can be made compatible with Agrirouter through telemetry units that are available on the market.

The Agrirouter does not establish a new standard for the data exchange, but serves as a translator of serval different IOSXML dialects and other standards (Figure 8). The platform translates the data passing through it on to a service provider that the farmer intended to receive the data. The Agrirouter allows the farmer to keep full control of the data flows towards third-party applications. Only machines connected and authorized by the farmer exchange information and the farmer can at any time cancel a connection without notifying the service provider. However, this is not the same for the data that flows to the OEM cloud of the machine manufacturer. This is usually a requirement by the farm machine manufacturer in order to be able to pass on data from the machine.

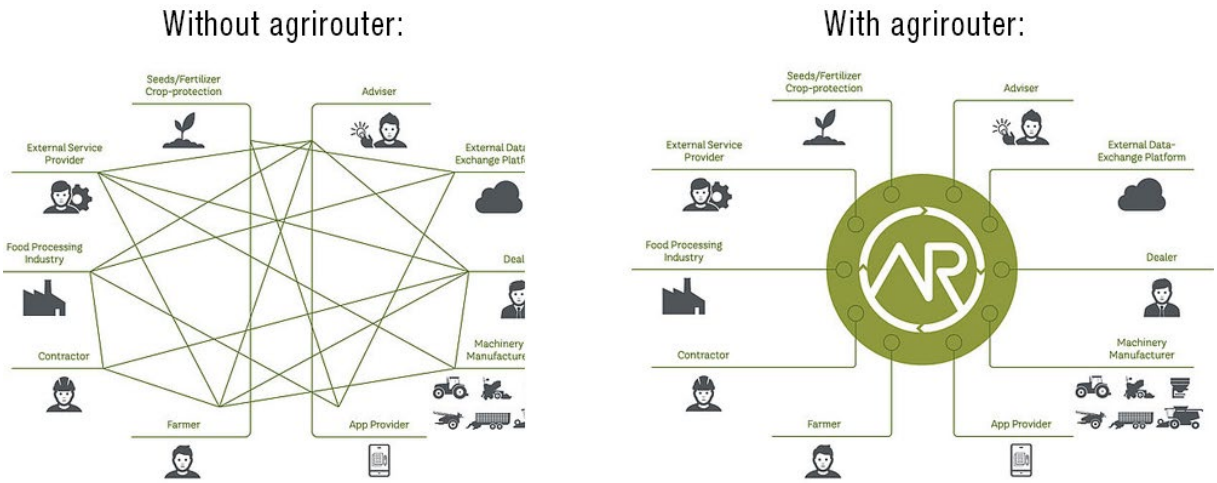


*Figure 8: Agrirouter - Data routing approach*

Here is in short how the Agrirouter works. If a farmer decides to use a certain digital service on the farm, which requires data from the machine, the service provider sets up an Agrirouter account for the farmer. Through this account the farmer can add all machinery that is allowed to deliver data to the service provider and even set the sort of data that the machine should exchange. The service provider can integrate the Agrirouter frontend directly into the actual service and let the farmer manage the machine authorization without an additional registration. This approach assures full transparency and full control of the data flow for the farmer (Figure 9).

Now that we know in general how the Agrirouter works, lets shed some light on the management structures and the business model of this data exchange platform. The DKE-Data GmbH & Co. KG which manages the operation and development of the Agrirouter is owned by farm machine manufacturers that made an investment according to their revenue with farm machines and have each a single vote in the shareholder assembly. The participation in the company is open to any other farm machine manufacturer if the new shareholders pay as well an initial investment according to their revenue with farm machines. This structure is currently the highest barrier for other manufacturers to join the consortium as a larger player would have to quite significant million-euro investment to join DKE.

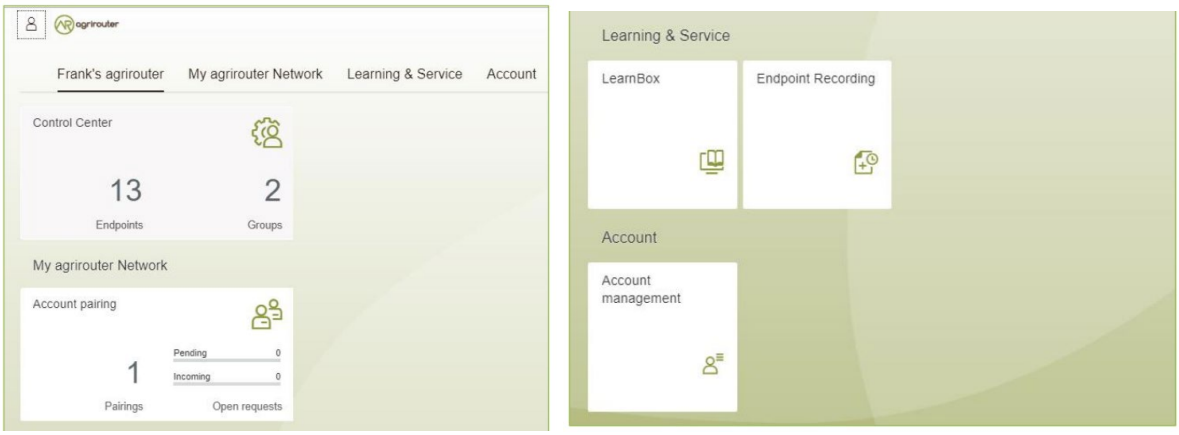


*Figure 9: Agrirouter – Data authorization interface*

Other than the IoField Gateway, the Agrirouter has a clear business model for all actors (Figure 10). When the service provider sets up an account for the farmer it includes a certain data volume. This data subscription is available in packages from 0,2GB to 2,5GB per year for a yearly payment that ranges from 13€ to 113€. This results in prices per GB between 65,00€ and 45,20€. For larger service providers with many clients the Agrirouter offer specific data agreements that include a certain number of accounts and a certain data transfer volume for a discounted price.

The revenue of the Agrirouter flows sole in the provision of the operation and development of the data exchange service. The DKE-Data GmbH & Co. KG is a non-profit company and does not forward any revenues to its shareholders.

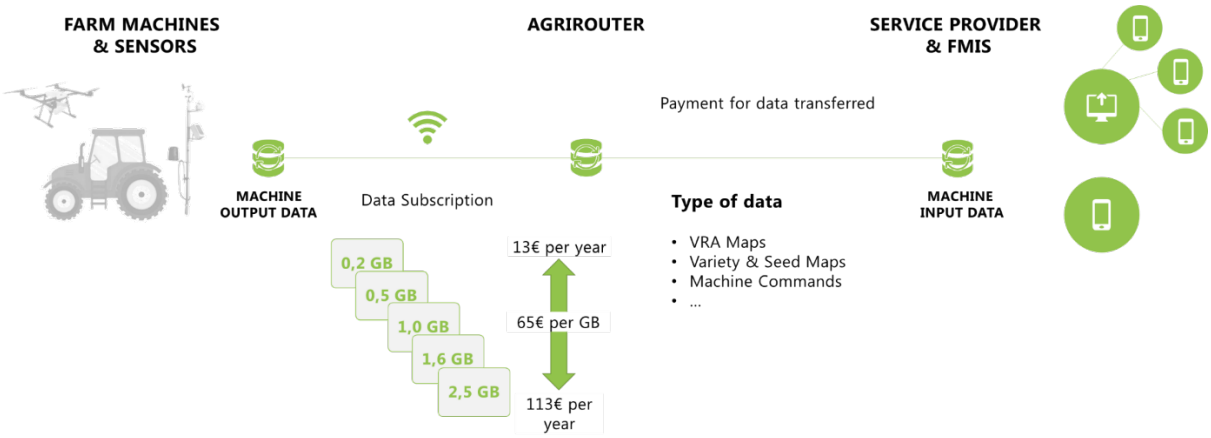


*Figure 10: Agrirouter - Business model*

### *JoinData*

JoinData is an independent non-profit data platform for the Food & Agri sector. Companies, knowledge institutes and agricultural entrepreneurs work together to stimulate sustainable entrepreneurship and innovation. The JoinData cooperative is working towards a secure and transparent data platform for the Dutch agricultural sector. Commercial enterprises, knowledge institutions and agrarian businesses are already using the data platform to develop innovative digital working methods in the field of sustainability, efficiency and nutrition. The first connections to the platform are available already since the start of 2018. From that starting point, JoinData plans to expand the data highway, and encourage businesses

to develop innovative applications (apps) using the data available, so that farmers can manage their activities even more effectively. “Our goal is for data to be actively shared within the agricultural sector, thereby encouraging innovations, which will eventually result in improved performance in terms of sustainability, profitability and welfare,” explained Sener Celik, Director of JoinData.

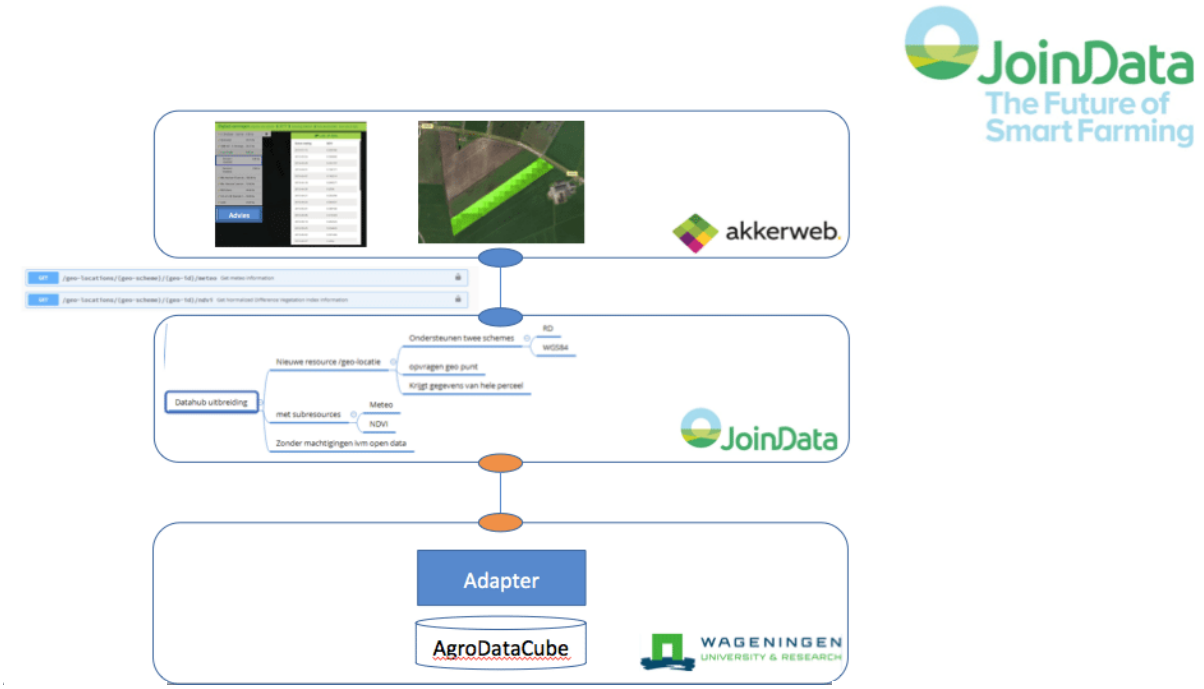


*Figure 11: JoinData - Data exchange approach*

JoinData has a completely open approach without monetary implications. The approach is to set the farmer in full control of the data that flows from the farm equipment to certain applications. Currently it is not clear which equipment is already compatible with JoinData and which service are already using the JoinData platform. The open approach is for sure also an approach to be followed.

***IoF2020 WP4 Approach***

The proposal of WP4 carefully considered all approaches and is in favour of a combination of models of the IoField Gateway and the Agrirouter with a slightly adapted revenue model and legal construction. The proposal of this business model foresees the formation of a company that acts as an independent collection agency on behalf of its stakeholders. Manufacturers sign up to the platform and register all their connectable devices to the platform catalogue. If the farmer wishes to connect any of the farm machines there are two options:

- Option 1: Monetize data and share with third party services (Data Marketplace)
- Option 2: Connect the machine to specific service (Data Subscription Plan)

***Option 1***: The first option is that the farmer simply wants to monetize or share part of the farm data via the data marketplace of the platform. The farmer defines the sharing criteria that will then be part of the license under which the data is offered. The data flows in return for a regular fee or on-time payment by a third-party service or can be offered for free by the farmer. If there is money flowing back to the platform again 50% of the revenue flows to the platform, while the other 50% are equally shared between the farmer and the manufacturer.

***Option 2***: If the farmer wants to use a specific service for example a disease detection system, he simply registers to the service, connects all necessary machines and sensors requested by the service to work properly and gives the service permission to use the data for this specific purpose. In return the farmer pays the fee for the service to the service provider. There is no contractual relationship with the farmer.

The service provider automatically signs a subscription plan for the farmer with the fitting amount of data to transfer per month or year. When the farmer pays the subscription, the service provider transfers the data subscription fee to the platform. The contractual relation between the service provider and the platform stays active as long the farmer keeps the machines registered and data is flowing.

50% of the subscription fee remains with the platform to cover its running costs and further development. The other 50% flow directly to the manufacturers of the connected machines or sensors. The share would be divided by the manufacturers of the devices registered by the farmer either equally by the number of devices, the amount of data transferred or the quality of the offered data. This is will be tested within the IoF2020 project and is still under assessment.

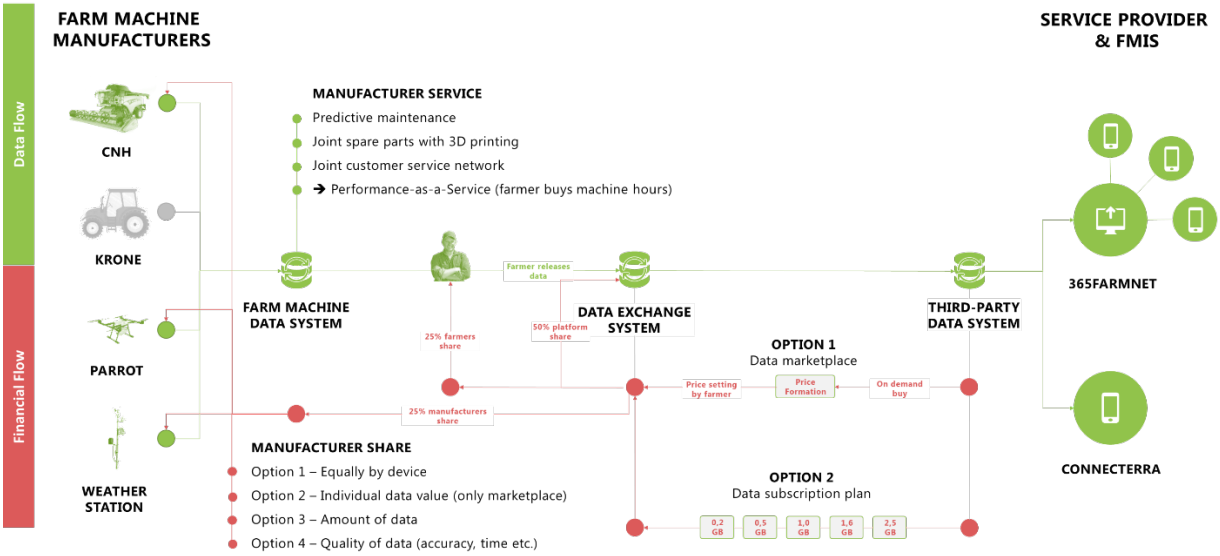


*Figure 12: IoF2020 WP4 data exchange model*

This was a short overview of 4 different approaches for data exchange platforms in the production dimension of the agri-food sector. IoF2020 will continue experimenting on this topic and intends to discuss and extend the successful models from the farm machinery to barn and greenhouse equipment manufacturers as well. The idea is to initiate discussion rounds among service providers and hardware manufacturers to find a win-win solution for all involved parties to profit from the digitalization of agriculture and make a seamless data exchange possible in the near future.

## 2.3. CONCEPT FOR AN IOT INNOVATION ECOSYSTEM IN SMART FARMING

The current innovation landscape of the agricultural sector is in all aspects diverse, immature, inefficient, slow and crowded. On the one hand, the market is full of half-baked IoT solutions with expensive hardware due to low scaling effects and a large number software service to manage the same farm. On the other hand, we see an increasing concentration of market power on the side of the chemical industry, machine manufacturing and the seed production with low disruption interest.

This crowded market of various immature solutions from all over Europe with nearly no chance for the farmer as well as for investors to make an informed purchase or investment decision. Many software solution providers are also hardware integrators as the necessary equipment is not available, data from existing machines is not available or larger companies are not offering an open data ecosystem. This way the current impact of technology is rather low, developments are rather local and it is very hard for each player to grow internationally.

Therefore, it is time to install a fully connected innovation ecosystem that identifies all over Europe the most promising ideas, ensure a development process according to industry standards, validate the solutions quickly on a large scale and make them available through established distribution systems by manufacturers or service marketplaces.

In order to make the current innovation ecosystem more effective, we need to understand the different players and modules of the current ecosystem and see how they need to be transformed to form a new IoT innovation ecosystem for smart farming and food production.

## Innovation Network – Structure and components

### *Accelerators and incubators (Digital Innovation Hubs)*

Europe has a flourishing landscape of about 27 larger accelerator and incubation programs[5] that focus on agriculture, AgTech or food. All these accelerators are backed either by corporates or large VC funds. The methodology of the acceleration is usually offering temporary mentorship and training offering office space for the time at specific location. However, the acceleration programs differ widely in terms of time (6-weeks – 6-month) and the initial investment (€10k – €500k).

The shorter programs with smaller investments focus sole on early stage startups to develop and validate a first MVP and prove the market acceptance of an idea. The longer programs with higher investment volumes usually aim at multi-stage companies or rather scale-up that are just seeking to expend their current reach by internationalizing their distribution.

Most of the accelerators operating in Europe are already managed and setup by professional acceleration service companies that tailor an accelerator setup to the requirement of a partner company. This way they can fertilize established mentor networks, a location and an accelerator brand for several companies that are saving costs for building up this infrastructure and recognition in the startup scene themselves. While this efficiency gain makes very much sense, there is tendency for accelerators to be backed mainly by one or two larger corporates aiming at a large range of challenges and topics. Smaller companies with specific challenges have rarely a chance to setup quickly an innovation programme to source a solution in the startup world.

Therefore, it would make sense that a couple of acceleration services focus on specific sectors or challenges of a specific value chain still offering rather general business and product development expertise. For every round they would decide on a topic or challenge together with the corporate community of larger and smaller corporates of their target sector and select fitting corporates to back the acceleration round. The specific knowledge needed to accelerate the selected startups comes through people directly from the corporate and competence centres. This way the whole agri-food sector would be enabled to gain access to latest digital innovation that are relevant to their business while getting constant support and advise from objective consultants in the incubators or competence centres. We would name this approach an accelerator-as-a-service model that makes innovation and

[5] Accelerator and investor overview in the annex on Basecamp (https://3.basecamp.com/3618432/buckets/2138378/vaults/1613768185)

acceleration service available also to groups of SMEs with comparable challenges and even just for a shorter time span of 1 or 2 acceleration rounds only.

Furthermore, IoF2020 carried out an intensive research on all currently active European and international acceleration programs in AgTech and food listing the locations of the accelerators, their offer in terms of services and investment and their corporate network. The map below is a visualization of this research work and shows 26 accelerators with their locations all over Europe (Data Pitch is an exception as it is a fully virtual data accelerator that has no specific location):

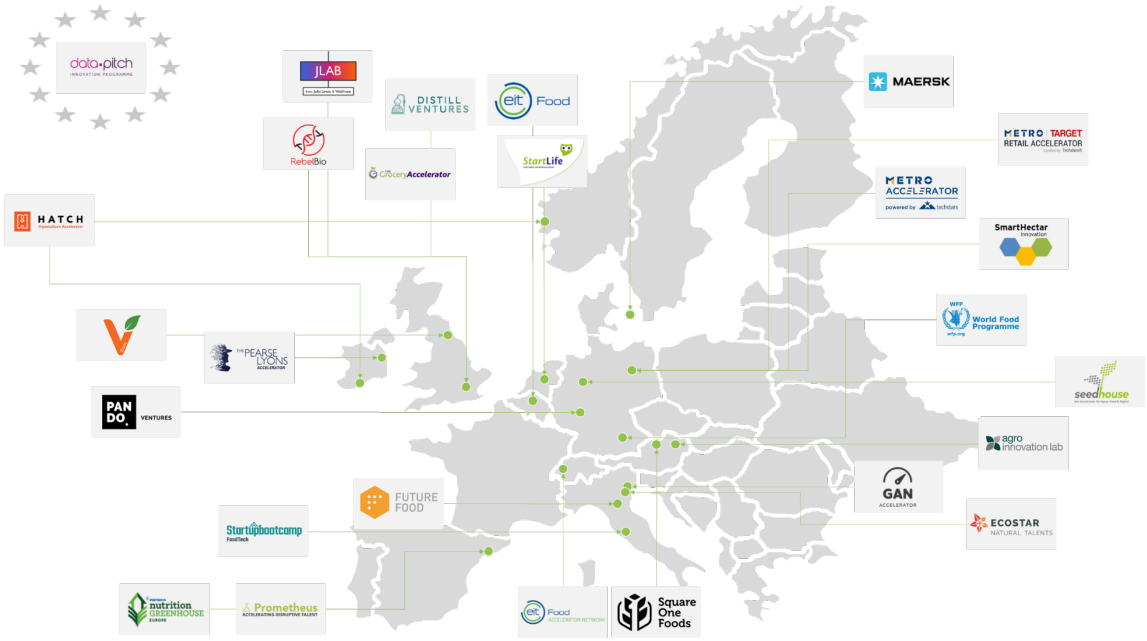


*Figure 13: European accelerator ecosystem for AgTech & Food*

### *Competence centers*

The EU project SmartAgriHubs is currently building up a first European network of digital innovation hubs and competence centers. These centers are usually based at a research institute or R&D facility of a company and brings a group of experts from different entities together to tackle a specific competence field in the farming and food industry. Competence centers could be technological, economic, environmental, social or legal oriented and focus on topics like robotics, data-business models, energy consumption, digital ethics or data privacy.

Each accelerator would be able to connect with a competence center and receive certain expertise for their startups through workshops, calls or just feedback from experts. As the competence centers unite researchers and corporate-level experts there is already right from the beginning a professional support for startups guaranteed and interested corporates as potential clients or distribution partners could establish early relations to startup teams.

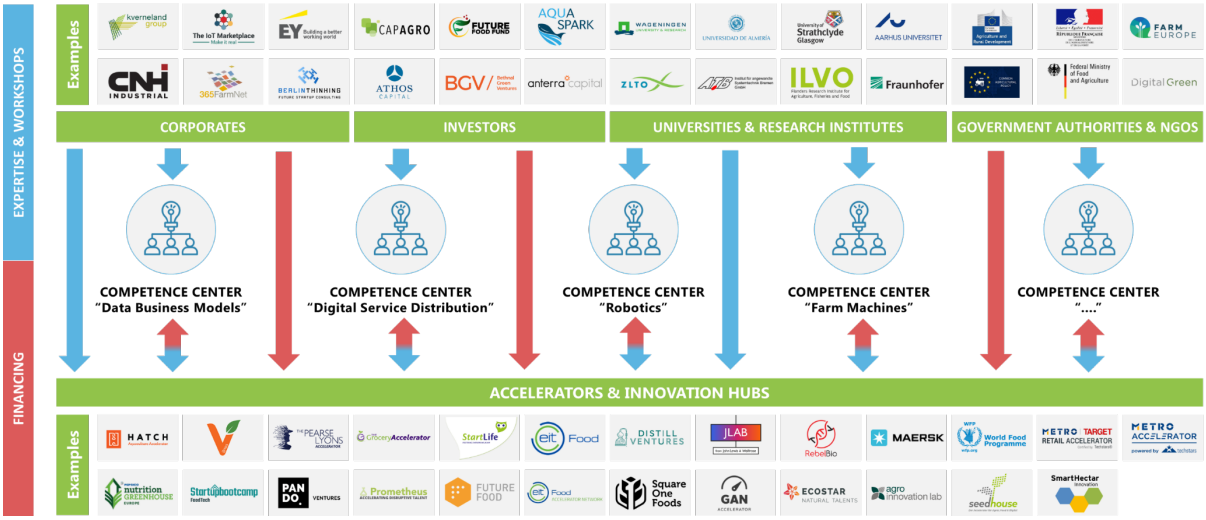


*Figure 14: Competence centers for accumulation & exchange of specific know-how*

### *Test site network*

IoF2020 is currently equipping 100+ test farms and sites all over Europe with latest IoT equipment to validate 50+ IoT services deriving from the 19 old IoF2020 use-case and the 14 new use cases that entered IoF2020 in 2019 through an open call. In order to ensure the significance of the KPI data measuring the actual impact of the IoT solution, the project developed a comprehensive catalogue of KPIs and a practical methodology to measure them on the IoF2020 test farms. This experience as well as the test farm infrastructure should to be sustained beyond the duration of IoF2020 and made available as a validation backbone for a connected innovation ecosystem.

At the same time, corporates and universities already run their own testbeds for either the validation of private product/service or for research purposes. These test farms are usually rather locally organized close to the headquarter of the company or the university and are not very well connected and merely cross-fertilized by other players in the market. Therefore, this rather expensive infrastructure is used highly inefficient and is kept available only for a couple of players in the market.

Therefore, we propose a connected network of professional test farms that receive a financial remuneration for their test service from the organization that initiates the test run. Depending on the type of the test facility (arable farm, animal farm, vineyard etc.) the duration and costs of a test run varies.

This way corporates and investors could decide by themselves or together to validate a startup that is potential investment or partnership subject. Even larger corporates or VCs do not command a network of test farms of a specific sector in all relevant climate zones and regions in Europe. Therefore, an on-demand access to a European test farm network would be highly beneficial for corporates to quicker validate potential partnership deals that could lead to a distribution of a startup innovation as well as for investors that could compare and validate potential investment opportunities before a larger series A or B funding.

The test farm network should cover all important large-scale agricultural sectors from pig production over wineries to greenhouses and arable farms as well as most relevant climate areas in Europe.

The purpose of this test site network is to selected services of startups deriving from pre-selection on the accelerator level. The most promising solutions on the small scale receive the opportunity to validate their impact also on a large scale and prove this impact to potential customers, partners and investors.


*Figure 15: Example case for test farm network*

### *IoT Next Club*

This club is an initiative of the large-scale pilot Synchronicity and intends to bring IoT startups from different IoT domains together and enable exchange. Furthermore, it intends to offer:

- Access to funding
- Network for partnerships
- Domain expertise
- Calibration of market offering

It also foresees also the possibility for high-potential startups to get promoted to the IoT Next Plus status which would give access to test beds, access to corporate partnership programme, entry in the investor book and a seal of excellence.

The first step is the foundation of a Slack channel to connect SMEs and experts.


*Figure 16: Logo of IoT Next Club*

***Corporate partner groups:*** These groups unit corporates with a common challenge or interest that are looking for validated external innovations from startups.

## Innovation Network - Proposed activities

### *Lighthouse competitions*

The idea of these competitions is to run solutions on test farms under as far as possible controlled circumstances for specific problems against each other and objectively rank the services by their impact.

These competitions are open for all partners of the ecosystem reaching from corporates over startups to research teams and individuals as long as they passed through one of the specialized accelerators and got selected.

The test could be supervised by the competence centres with price money for the winner coming from the sector companies or a sponsor. The test results would be published in all sector specific media in order to inform other potential competitors about the current state of the art in market. This way startups have an orientation for the performance of their product and can early decide if make sense to continue with the development of service or focus on a new field.

***Development of corporate business models for distribution-as-a-service and customer care or maintenance-as-a-service:***

Agriculture is a traditional sector and mature market with many established players in areas like equipment and machine manufacturing, seeds & chemicals, whole sellers, food processing industry and service provision. Therefore, it is very difficult and expenses for new players to enter the market, build up a brand recognition among farmers and establish a distribution network.

Therefore, it is very interesting to win established corporate as distribution partners for startup companies and use the even the corporate customer relation infrastructure to serve startup clients.

In order to make this happen, corporates need to learn how to adept their internal distribution, marketing, customer service and maintenance structures to open them as a flexible service to SMEs that could potential enrich the corporate product portfolio with their services.

# 3. METHODOLOGIES

## 3.1. IDENTIFYING SUITABLE BUSINESS MODELS

Finding a suitable business model evolves around the question of how to create, deliver and capture value through the design of nine business model building blocks. The first step in the search of this business model is finding out how to create value: what value do your prospected customers seek and how can this be translated into a product or service? Without a match between your product or service and the interest from a specific customer group in this, it is impossible to develop a successful business. The first two building blocks to design and validate are the customer segments and value proposition.

Deliverable 4.3 demonstrated that this is not an easy task: various use cases experience challenges in how to convincingly communicate the added value of their service to their prospected customers. Work Package 4 developed a template with key questions that assist the use cases in finding out their customer segments and value proposition. In this template, use cases were assisted in developing a product fact sheet, provide product impressions, create a user story, do a competitor analysis and create an MVP-plan. Table 1 shows an overview and a short description of these elements. This deliverable present for each use-case the outcome of this exercise, describing the value chain position, product description, value proposition and the current status of the use case.

| Table 1. Elements to Identify Customer Segments and Value Proposition | |
|---|---|
| **Value Chain Position** | Visualisation of the targeted customer segment and the major added-value for the value chain. |
| **Product Fact Sheet** | Full, but short description of the product/service including core features, mayor challenge the product/service helps solving, quantified KPIs regarding the core impact of the product/service for the prospected customer |
| **Product Value Proposition as User Story** | Practical description of the benefit of the product in a real-life situation. For a specific customer segment, a daily challenge is described as well as how the product/service improves this situation. It includes a clear description of the customer segment and the core challenge they face. |
| **Product Impressions** | Visual impression of the user interface of the product. Please find these impressions in the presentation accessible via link provided for each use-case. |

It must be noted that while the search for the customers segments and related value proposition is a first step, it should not be considered finished after the completion of the template. An important step that many use cases still need to take is the validation of these value propositions through direct feedback from their prospected customers. This feedback will undoubtedly lead to adjustments in the value proposition.

Furthermore, improving the value proposition and gaining a better understanding of the customer segments is a continuous task. Sustained attention to the creation of customer value will allow

the organisation to adapt to changing needs and interests of the customers. This ability to adapt is one of the important factors for sustained business success.

## 3.2. ECONOMIC MATURITY CLASSIFICATION OF IOF2020 USE-CASES

One of the core objectives of WP4 is to monitor and document the progress of each IoF2020 use-case in terms its economic development. At the beginning this was done through evolutionary template presentations visualizing the business model and written reports documenting concepts and action points. However, with the further progress of the use-case and the rather complex support topics of business modelling, product development, user acceptance testing and impact measurement, WP4 developed a condensed and concise format for comparing the use-cases and indicating their current development status.

This maturity classification lists all products of all 19 IoF2020 use cases next to each other and applies to them the current maturity rating of each criterion. This way each team member of WP4 gets an easy and simple indication on which use-case still needs specific support in their domain and how to distribute their support efforts among the use-cases. The rating was filled in by the support team of WP4 after several individual support calls with each use-case. Based on the ranking in the classification, WP4 distributed the use cases among the support experts and dedicates now increased support to the aspects of each use-case with the highest development potential.

Currently the maturity classification is still in a test phase within WP4 with ratings for all 19 use-cases and their 36 products already filled in. Furthermore, the individual rating results are planned to be shared with the use-cases for their feedback, but also as a feedback tool. WP4 reviews the application and structure of this classification again in February 2019. Provided that the WP4 team rates the tool as helpful, it will be applied as well to the 14 new use cases joining IoF2020 in January 2019.

### 3.2.1. Structure and logic of the maturity classification

In order to give a comprehensive picture of the use-case's economic maturity, the classification looks at the following aspects:

- ***Exploitation readiness***
  - Revenue Allocation Structure
  - Private Investment Triggered
  - Sales Experience & Abilities
  - Profitability

- ***Business model readiness***
  - Value Proposition
  - Payment & Pricing
  - Online Distribution Structure
  - Offline Distribution Structure
  - Online Customer Service Structure
  - Offline Customer Service Structure

- ***Product readiness***
  - Input Data Integration Status (Sensor data, input by farmers, machine data etc.)
  - Output Data Integration Status
  - User Interface Status
  - User Acceptance
  - MVP Cycle Status
  - MVP Rollout

- ***Market readiness***
  - Market Targeted
  - Customers with necessary infrastructure
  - Number of active users
  - Number of paying clients

For each of these performance indicators, we defined 5 steps of maturity connected with a point rating and applied a certain weighting to each sub-criterion as well as to each overall maturity aspect. If the maturity status for a certain sub-criterion would be very high, the use-case would receive 4 points. If the criterion is not developed at all it would score 0 points. For the criteria of the Revenue Allocation Structure it would look like the following:

| 3rd Level Weighting | KPI Values | Points |
|---|---|---|
| **40%** | Full agreement among all value adding partners on revenue share | 4 |
| | Contracts (licenses, patents etc.) under legal revision | 3 |
| | Agreements with core partners reached - not signed yet | 2 |
| | Negotiation with partners / agreement under construction | 1 |
| | The exploitation is undetermined | 0 |

*Figure 17: KPI rating as part of use-case classification*

All scoring for the sub-criteria combined with its individual weighting results in a total score for its overall readiness category. All overall readiness scores combined again with their individual weightings results in a total economic maturity score for each use-case. In order to improve the visual orientation within the classification overview the scores are represented as well by different colours to quickly identify use-case that still need support.

The full use-case classification can be reviewed in the Annex on Basecamp (https://3.basecamp.com/3618432/buckets/2138378/vaults/1613768185).

# 4. USE-CASE BUSINESS MODELS

*For reasons of confidentiality this chapter is empty in this public version.*

# 5. CONCLUSIONS

## 5.1. LESSONS LEARNT

### 5.1.1. External lessons

#### 5.1.1.1. Sector-specific service marketplaces are backbone of successful scaling

Even so many IoF2020 solution have sealed distribution agreements with established corporates in the market, the quick uptake in this rather fragmented market of farming service on a European scale is currently rather impossible. However, most services need a certain critical scale to create additional value through AI algorithms running on big data piles and to be offered at a low price to the farmer. These quick scaling effects are only possible if Europe together takes actions to build common distribution platforms for farming services. Europe needs to come up first with the Google Play Store or Apple App Store in agriculture and food.

#### 5.1.1.2. Information on governmental regulations in agri-food needs to be digital

All smart service that function as advisors to the end-users need to take into account the current legislation and regulations. As food and agriculture are sectors with immanent impact on the environment and the health of consumers, they are heavily regulated and in times of higher emphasis on sustainability, animal welfare and health these regulations change in a high frequency. In order to keep the advice of decision support systems and transparency solutions always in line with the current regulation, governmental authorities need to make data on these regulations available in a digital form in standardized data format and thought common APIs.

#### 5.1.1.3. Pre-financing of equipment to offer hardware-as-a-service

There was a major interest by use cases on the opportunity to pre-finance the necessary sensing equipment for farms and offer it to the farmer as a service. This interest requires now from the business support to build up expertise and solution on options for debt or equity financing of hardware through third-party financiers.

#### 5.1.1.1. Growing interest in private investment as MVPs are coming out

The IoF2020 use-case show a growing interested in private investment to scale their activities now that the first MVPs are about to enter market. Next to that larger corporates are more and more interested in IoF2020 use-case. The service provider Porphyrio of use-case 5.1 und 5.2 for example was recently acquired by Evonik, a corporate active in animal nutrition. Therefore, WP4 has to make expertise on the fields of investment negotiation and takeovers available as well as plan for activities and events to facilitate the pitching of IoF2020 use-case to investors.

### 5.1.2. Internal lessons

#### 5.1.2.1. Setup a team of individual business model experts

Due to the high workload, WP4 spread the business model support work onto the shoulders of 5 business model experts. The core team consists now of consultants from WUR, Etventure and Bolt. This spread of work increased the quality of the business model consulting even so some experts might need to be replaced soon due to staff shortage at partners and missing expertise in some fields.

#### 5.1.2.2. On-demand support increases acceptance

WP4 is tailoring many activities towards the actual needs of the use cases. Our team initiated for example a poll among all use cases on the most important and pressing product development topics that they would need support in. The same method is used to find the best way of how to offer this support by discussing this in trial meetings or collect feedback via Basecamp with automatic check-in questions.

This way of composing the business support makes it more attractive to the use cases and increases the acceptance of our activities even so it consumes work-time from the use-case teams.

#### 5.1.2.3. Use-cases requested a bit more push than pull from WP4

As described in the point above, the major attitude of WP4 is a pull approach that follows the needs of the use cases. However, there some rather uncomfortable topics like user acceptance testing to receive honest feedback on the quality of an application, legal structuring of exploitation entities, but also of contracts with data owners and processors. These topics are not naturally demanded by the use cases and need rather a push approach to motivate the use-cases dealing with these topics.

To the surprise of the WP4 team this push attitude was through the business chairs also demanded by the use cases. Therefore, the WP4 team will offer its support as a balanced mix of demand-driven consulting and goal-driven interventions and checks to assure product quality.

## 5.2. NEXT STEPS

In 2019/2020 many use-cases will finally launch their first MVPs to the market and WP4 will support the use-case actively on collecting end-user feedback and monitor the acceptance of the business model. Furthermore, the business support team plans togethers with WP3 implementations and experiments on data monetization through market places and service monetization through data stream APIs.

The goal is to implement the following reusable components in selected use-cases:

Data Marketplace CKAN by FICODES

This marketplace derives from a FIWARE project called Opplafy, which is an advanced open data portal for cities to exchange, publish and monetize city data based on the NGIS standard of FIWARE. This marketplace is now available as a reusable component for IoF2020 use-cases and will be implemented by WP3 with at least one use-case in IoF2020. The business support team prepared already a business model concepts that they want to verify and develop further in terms of pricing and legal aspects.

Coat Rack – Service Monetization by ATB

The Coat Rack implementation enables the simple integration of monetization features for a standalone service and offers secure authentication, payment processing, statistics and multi-tenant access control. This reusable component offers use-cases with standalone services that are not integrated into app marketplaces the opportunity to monetize the service itself even on a B2B-level in a simple and secure way. WP4 is looking forward to support the implementation of this components at a selected use-cases from IoF2020.

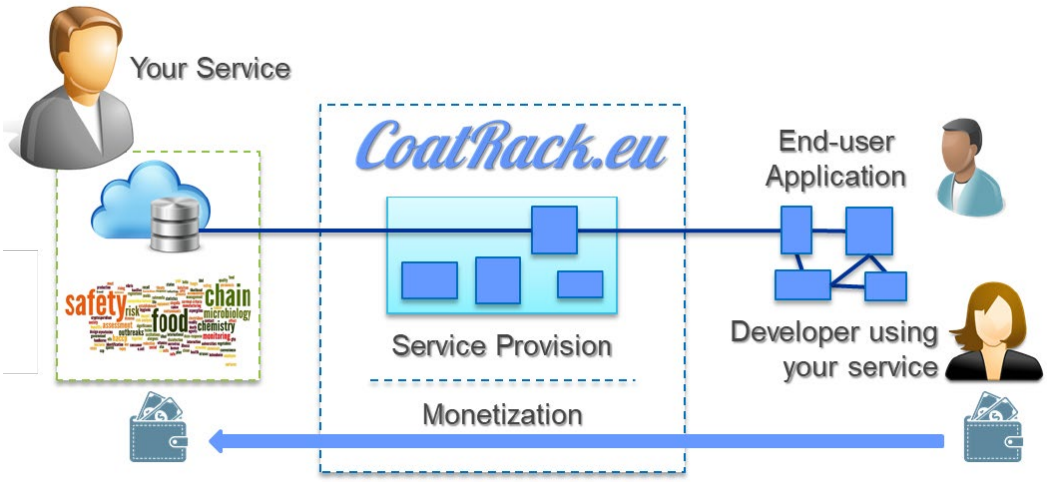


*Figure 18: Service Monetization with Coat Rack*

Regarding the update of this deliverable, it is recognized also in the coming period as a living document and will be updated based on new inputs from the validation of business models after the MVP launches as well as extended with information on the following topics:

- Additional data revenue models
- Customers & end-user relations
- Partner network & horizontal activities
- Internal resources

The presented information shows that all use cases are already quite advanced in their business planning. Some use cases are at the right pace of development while others need some more support, especially regarding distribution and additional business models. The coming period WP4 will focus on providing this support.

As this is a living document and the information in it needs to be updated, WP4 will keep on collaborating intensively with the use cases. Therefore, regular one-to-one meeting will be organized. In these meetings a business building expert and a product testing expert will have interaction with the use cases to drive them forward. Based on these meetings other experts can be linked to use cases to provide additional support. With this intensive support the use cases will create new, innovative and viable software solutions that fit the needs of their target market.

# 6. TABLE OF FIGURES