Deliverable D400.14

Technical definition of the Open Call

WP 400

Project Acronym & Number:	FIspace – 604 123
Project Title:	FIspace: Future Internet Business Collaboration Networks in Agri-Food, Transport and Logistics
Funding Scheme:	Collaborative Project - Large-scale Integrated Project (IP)
Date of latest version of Annex 1:	03.10.2013
Start date of the project:	01.04.2013
Duration:	24
Status:	Final
Authors:	Lorea Gómez, Elies Prunés, Mª Isabel Martínez (ATOS)
Contributors:	**ATB**: Harald Sundmaeker **ARC**: Koç Hande, Haluk Gökmen, Onur Güreş **CENTMA:** Gerhard Schiefer **DLO**: Cor Verdouw, Daan Goense, Johan Bremmer, Robbert Robbemond, Timon Veenstra **EUROPOOL**: Robert Reiche **GS1**: Tim Bartman **MRTK**: Marianne Hagaseth **NKUA**: Sokratis Barmpounakis **PLUSFRESC**: Marta Torrellas **UPM**: Ramón Alcarria **WU**: Huub Scholten
Document Identifier:	FIspace-D400.14-OpenCall-Requirements-Final-V004.docx
Date:	15.10.2013
Revision:	004
Internal Quality Reviewers	- Rod Franklin (KN) - Sjaak Wolfert (DLO)
Project website address:	http://www.FIspace.eu

The FIspace Project

Leveraging on outcomes of two complementary Phase 1 use case projects (FInest & SmartAgriFood), aim of FIspace is to pioneer towards fundamental changes on how collaborative business networks will work in future. FIspace will develop a multi-domain Business Collaboration Space (short: FIspace) that employs FI technologies for enabling seamless collaboration in open, cross-organizational business networks, establish eight working Experimentation Sites in Europe where Pilot Applications are tested in Early Trials for Agri-Food, Transport & Logistics and prepare for industrial uptake by engaging with players & associations from relevant industry sectors and IT industry.

Project Summary

As a use case project in Phase 2 of the FI PPP, FIspace aims at developing and validating novel Future-Internet-enabled solutions to address the pressing challenges arising in collaborative business networks, focussing on use cases from the Agri-Food, Transport and Logistics industries. FIspace will focus on exploiting, incorporating and validating the Generic Enablers provided by the FI PPP Core Platform with the aim of realising an extensible collaboration service for business networks together with a set of innovative test applications that allow for radical improvements in how networked businesses can work in the future. Those solutions will be demonstrated and tested through early trials on experimentation sites across Europe. The project results will be open to the FI PPP program and the general public, and the pro-active engagement of larger user communities and external solution providers will foster innovation and industrial uptake planned for Phase 3 of the FI PPP.

Project Consortium

- DLO; Netherlands
- ATB Bremen; Germany
- IBM; Israel
- KocSistem; Turkey
- Aston University; United Kingdom
- ENoLL; Belgium
- KTBL; Germany
- NKUA; Greece
- Wageningen University; Netherlands
- PlusFresc; Spain
- FloriCode; Netherlands
- Kverneland; Netherlands
- North Sea Container Line; Norway
- LimeTri; Netherlands
- Kühne + Nagel; Switzerland
- University Duisburg Essen; Germany
- ATOS; Spain
- The Open Group; United Kingdom
- CentMa; Germany
- iMinds; Belgium
- Marintek; Norway
- University Politecnica Madrid; Spain
- Arcelik; Turkey
- EuroPoolSystem; Germany
- GS1 Germany; Germany
- Mieloo & Alexander; Netherlands
- OPEKEPE; Greece
- Innovators; Greece

More Information

Dr. Sjaak Wolfert (coordinator)
LEI Wageningen UR
P.O. Box 35
6700 AA Wageningen

e-mail: sjaak.wolfert@wur.nl
phone: +31 317 485 939
mobile: +31 624 135 790
www.FIspace.eu

Dissemination Level

PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Change History

Version	Notes	Date
001	First version	30.08.2013
002-3	Internal working versions	30.09.2013
004	Updated version for the open call	15.10.2013

Document Summary

This document is intended to provide the necessary functional and technical requirements to the organisations that will participate in the Open Call for development of new applications for the project. The project contains 8 trials and each of them has proposed a number of Apps to be developed via an open call.

This document starts by listing the applications subject to the open call; then an introduction to each of the new Apps to be developed, followed by a list of functional and technical requirements the proposers should comply with. This information is organised by trial.

Finally, a short diagram of the phases to include the new partners in the project is highlighted.

Abbreviations

App	Software Application		IPR	Intellectual Property Rights
D	Deliverable		KPI	Key Performance Indicator
DoW	Description of Work		M	Month
EC	European Commission		PMO	Pool Management Organizations
e.g.	Exempli gratia = for example			
EU	European Union		RTD	Research and Technological Development
FIA	Future Internet Assembly		RTI	Returnable Transport Items
FI PPP	Future Internet Public Private Partnership		SME	Small and Medium Sized Enterprise
FP7	Framework Programme 7		ST	Sub-Task
GA	Grant Agreement		T	Task
ICT	Information and Communication Technology		WP	Work Package
i.e.	id est = that is to say			
IP	Intellectual Property			

FIspace
Business Collaboration

Table of Contents

List of Figures

List of Tables

1   Introduction

FIspace will deliver an Open Business Collaboration Space that enables seamless collaboration in open cross-domain business networks and allows establishing an ecosystem of users from various industrial sectors as well as IT solution providers.

FIspace will provide complete platform which will facilitate to get focus on functionalities and business interoperability making easy the technical part and develop new App.

The way to success is developing strong and stable foundations, reusing common functionalities and making transparent to developers basic operations. However, developers don't navigate lonely because they are accompanied by FIspace Studio. FIspace Studio is an Integrated Development Environment with a complete software developer kit (SDK), tutorials, HOWTO, utilities, examples and knowledge bases area.

The FIspace user will have available a personalised page to easily select and access his favourite Apps, notifications, contacts, etc. to improve business processes with other organisations
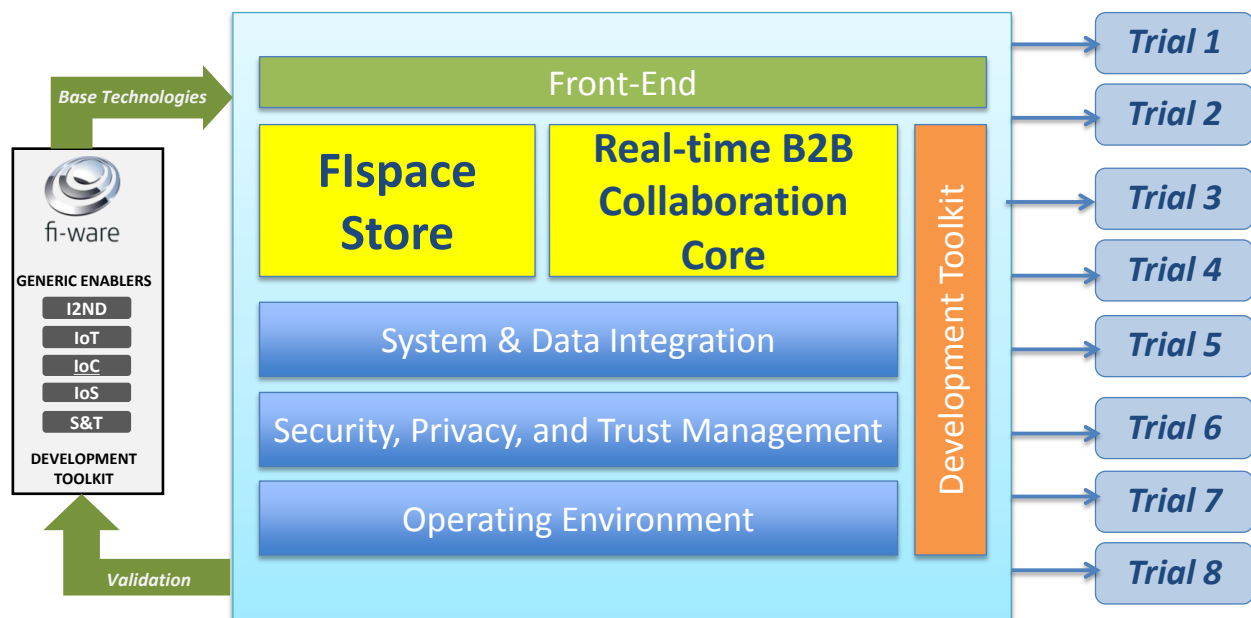
Figure 1.   FIspace Platform High Level Architecture

Figure 1 shows the FIspace high level architecture. Following there is a short summary of each of the software modules.

FIspace Front End

The FIspace Front-End builds the main access point for end-users of the FIspace platform, whereas this is not limited to the user interface, with which the end-users directly interact, but also encompasses server-side components that are closely related to the user interface. Through the integration of external user interfaces (e.g., from the store, externally developed Apps or other external providers), the Front-End facilitates an 'all you need in one place' user experience and create a central access point. To support the diversity of FIspace users and devices the Front-End user interface will adapt to specific needs. This allows ubiquitous access and is enabled by backend components of the Front-End. Beyond the adaptation to different devices, the Front-End also supports the configuration of the user interface. This allows the interface personalization in order to address specific user needs or enable custom brandings for companies. The Front-End also enables users to create relations to business partners to facilitate the communication among them (comparable to modern social networks). The Front-End will also visualize such relationships and by this, facilitate the analysis of business networks.

FIspace Store

The FIspace Store that provides the tool-supported infrastructure for providing, finding, and purchasing FIspace Apps that provide re-usable IT-solutions for seamless business collaboration and can be used and combined for the individual needs of End-Users

FIspace B2B

The FIspace B2B component is the responsible to orchestrate the different processes from different stakeholders and assure the correct sequence of the tasks execution. The FIspace B2B is based on the entity-centric approach

FIspace System & Data Integration

The FIspace System & Data Integration allows for the integration and continued usage of existing legacy and business systems as well as the integration of external systems and services, including support for:

- Connecting business and legacy systems used by individual users by means of Tool-supported mechanisms to allow the easy creation of adapters to business and legacy systems, as well as defining a set of standard channel types

- Handling heterogeneous data by means of API for data mediation

- Connecting external Systems and Services (e.g., IoT systems, 3rd party and public services) by means of APIs for importing / exporting data from connected business & legacy systems into the FIspace.

There are also some common modules to ensure *security and privacy* related aspects as well as a place to provide an *operating environment* to run all modules.

This module makes use, in a transparent way for the user, of some common software modules, called Generic Enablers, provided by the FIWARE project.

Trials and Apps

Trials are using the features provided by FIspace to run the applications they have defined.

FIspace aims to develop and test two types of FIspace Apps. At a first stage, the related FIspace partners shall develop an initial set of Apps that provide general business and/or domain-specific capabilities exploiting the features and envisioned future support for business collaboration.

In a second step, a set of trial specific Apps that support the tasks of the specific mixed use case scenarios shall be elaborated in the trials. For that purpose an open call is launched to involve development partners (including SMEs) to begin rapid development of trial Apps that will also lay the foundation for a robust ecosystem for the targeted main FIspace domains (i.e. transport, logistics and agri-food), as well as to build a critical mass for large scale expansion in Phase 3 of the FI-PPP programme and beyond the initial domains, also facilitating further mixed use cases in collaboration with the complementary FI-PPP projects .

The realization of these trial-specific Apps needs to be based upon the consolidated conceptual design of the FIspace platform and accomplishing the definition of mixed use case scenarios and related cross-domain trial experiments. The envisaged additional partners will be involved to realize this, also reaching a significant impact and relevance of the envisaged solutions within the addressed usage areas. The involvement of local solution providers and system integrators is considered as an ideal measure to assure the achievement of the project objectives.

Objective of this deliverable

In this deliverable the main technical specification for the open call is defined, covering the functional and technical requirements of the Apps defined by the trial teams, to be followed by applicants, and a description of the tasks to be carried out when a new partner is involved in the project.

2   Open Call Objectives

Trials will get added value and recapitalize from FIspace platform by the implementation of their specific use cases and usage of common functionalities. That fact will warranty the investment by a quick monetization and short return of investment. Additionally, trials will be used as a first test for upscaling, mainly targeting SMEs. In addition, a determined outreach program is planned to generate awareness, and the early releases shall help generating interest and uptake by external parties

> **OPEN CALL OBJECTIVE:** The main aim of the FIspace Open Call will be the development of Domain Specific Apps for trial experimentation that will complement the ones developed by initial Project partners

The FIspace project consists of eight trials, and each of them has defined a set of Apps so as to complete the trial experimentation. Following there is a summary of each trial. The reader could get additional information from the document D400.1 "Detailed experimentation plans and initial work plans, including App Development" provided as part of the Open Call documentation.

There are **two trials that address food production issues at the farm level using FI technologies**:

T421 Crop Protection Information Sharing
This trial concerns the use of field sensor and satellite data to intelligently manage the application of pesticides for maximum crop protection.

T422 Greenhouse Management & Control
This trial concerns the use of sensors to monitor key growth factors (UV radiation, moisture and humidity, soil conditions, etc.) and to feedback data to control systems to modify the growth environment for maximum yield and optimal quality.

Then, three trials grouped as Intelligent Perishable Goods Logistics. They concern the monitoring and environmental management issues of perishable goods as they flow through their supply chains so that waste is minimized and shelf life maximized.

T431 Fish Distribution and (Re-)Planning
This trial focuses on the planning of logistics and transport activities, including transport order creation, transport demand (re)planning and distribution (re)scheduling.

T432 Fresh Fruit and Vegetables Quality Assurance
This trial concerns the management of deviations (transports, products) that affect the distribution process for fresh fruit and vegetables (transport plan, food quality issues), either deviation from the plan or other external events requiring re-planning.

T433 Flowers and Plants Supply Chain Monitoring

This trial concerns the monitoring and communication of transport and logistics activities focusing on tracking and tracing of shipments, assets and cargo, including quality conditions and simulated shelf life. Focus is with Cargo and Asset Quality Tracking ("intelligent cargo"), Shipment Tracking ("intelligent shipment") and lifecycle information tracking of cargo characteristics/Cargo Integration along the chain.

Finally**, three trials grouped as Smart Distribution and Consumption** thematic area. Their objective is helping consumers to obtain better information on the goods they purchase, and producers to better control the flow of their goods to the consumer,

T441 Meat Information Provenance
This trial concerns ensuring consumers, regulators and meat supply chain participants to have accurate information concerning where a meat product originated (production farm) and how it was affected by its distribution (quality assurance).

T442 Import and export of consumer goods
This trial concerns the intelligent management of inbound materials to a production site and the smart distribution of finished goods to consumers.

T443 Tailored Information for Consumers
This trial concerns the provisioning of accurate information to individual consumer's needs and feedback of this information to the producers.

Following table lists the Apps to be developed for each trial. They are described later in this chapter.

Table 1: List of Apps to be developed for each trial.

Task	Trial	Apps	
T421	Crop Protection Information Sharing	T421.1 -	Formulation of weather scenario's
		T421.2 -	Bad weather alert
		T421.3 -	Hiker App
T422	Greenhouse Management & Control	T422.1 -	Greenhouse Crop Monitoring
		T422.2 -	Greenhouse Crop Analyser
T431	Fish Distribution and (Re-)Planning	T431.1 -	Booking Probability app
		T431.2 -	Find Cargo Replacement app
		T431.3 -	Pricing Proposal app
T432	Fresh Fruit & Vegetables Quality Assurance	T432.1 -	Inventory Management of RTI Packaging (BOXMAN)
		T432.2 -	Risk Managemente in the Distribuion of FFV (RISKMAN)
T433	Flowers and Plants Supply Chain Monitoring	T433.1 -	Botanic Info App
		T433.2 -	Time Temperature Sum Planning App
T441	Meat Information Provenance	T441.1 -	Meat Transparency System App-Query EPCIS repositories
		T441.2 -	Meat Transparency System App - Discoreving data sources (EPICS repositories)
		T441.3 -	Meat Transparency System for agregating traceability information
T442	Import and Export of Consumer Goods	T442.1 -	Transport Demand App
		T442.2 -	Shipment Status App
		T442.3 -	Manual Event and Deviation Reporting App
T443	Tailored Information for Consumers	T443.1 -	Shopping list & Recipes
		T443.2 -	Augmented reality Product Info
		T443.3 -	Push Information

3   Open Call Domain Apps

The objective of this chapter is to specify the functional and technical requirements that describe the Apps to be developed as part of the Open Call. Proposers should comply as minimum to these requirements. Some of them are optional but desirable.

Each of the 8 trials defined a set of Apps to be implemented by the Project. Some of them are part of the Open Call and complement those implemented by initial Project partners.

Next sections show these Apps organised by trial. For each trial, there is a brief introduction that also contains the desired maximum number of beneficiaries to be involved in the trial, followed by a subsection for each App, which starts with a description and it is followed by its set of functional and technical requirements.

3.1   OPEN CALL Trial T421 Crop Protection Information Sharing Trial Apps

The trial demonstrates the use of Future Internet technologies with functionalities to address social, business, and policy objectives (e.g., optimization of the use of plant protection agents), create environmental benefits, transparency, and food security.

To do this, this trial concerns the use of field sensor and satellite data to intelligently manage the application of pesticides for maximum crop protection. The open call will provide weather forecast information to improve this objective and also an app about information of the crop variety in a field.

Preferably the maximum number of new partners is three.

3.1.1   T421-1: Formulation of weather scenario's App

Weather predictions are delivered two to four times a day by the larger meteorological institutes. Most important are the 12 hours predictions of the European Centre for Medium Range Weather Forecast and the 6 hourly GFS predictions from the National Weather Service from the USA. The output of the latter model is available for free.

Apart from weather predictions also weather observations are made. In the Netherlands this is done by KNMI, but also by some private companies like Dacom and Meteo Consult. Some farmers also operate their own weather stations.

Another source of information is a rain radar application (e.g. Buienradar), which gives the actual and two hours prediction of rainfall. This data is free for non-commercial use.

The **objective** of this open call is to develop a service which delivers weather scenario's for each requested location in the Netherlands in a spatial resolution of minimal one kilometre and a temporal resolution of one hour. The time range is up to maximal one year before the actual date and 8 days after the actual date. (Whether the high resolution is required over all the 8 prediction days will be specified in a later stage). Data to be provided includes the following variables: Temperature (1.5 m), Relative Humidity, Rainfall, Pressure, Specific humidity, Incoming shortwave radiation - direct + diffuse, Sensible heat flux, Height of boundary layer, Wind speed at 10 m, ET0 following Penman-Monteith, ET0 following Makking.

The predictions must take the main run of the GFS forecast as basis and recalculate the forecast for a narrower grid of minimal ten by ten kilometres, taking the topology of the Netherlands into account. Applicants for the open call should specify the recalculated resolution and specify how estimation is done for the minimal one by one kilometre grid points. Applicants should also specify which weather stations or other data source are used for historical weather and how interpolation is done for requested locations.

The server must respond to a request in which a location is specified (in lat/long) the required historical days, the required predicted days and the requested variables. Data should be returned for a location within one kilometre from the requested location.

3.1.1.1 T421-1: Formulation of weather scenario's - Functional Requirements

ReqID	Title	Description
APP421-1_REQ01	User registration	Users of the service must be known. Use can be made of FIspace services, but it must be known that the user is in the register.
APP421-1_REQ02	Type of service	Two types of services are distinguished: • An incidental request for a weather scenario • A subscription to receive weather scenario's at the interval of four times a day for one or more locations. The subscription can be for a certain period. (for example only the growing season) • To receive updates only ones a day could be considered. The end user can specify in his request which of the under Req03 mentioned variables he wants to receive. The user can supply information where data can be found from his own weather station.
APP421-1_REQ03	Data to be delivered	A weather scenario for a certain location comprises of the weather in the past, from a date onwards which is specified by the user, and predicted weather for the next ten days. Meteorological variables to be delivered are: • Temperature (1.5 m), • Relative Humidity (1.5m) • Rainfall, • Pressure, • Specific humidity, • Incoming shortwave radiation - direct + diffuse, • Sensible heat flux, • Height of boundary layer, • Wind speed at 10 m, • ET0 following Penman-Monteith, • ET0 following Makking. The end user can specify in his request which of the above mentioned variables he wants to receive.
APP421-1_REQ04	Regional coverage	Weather scenario's must be made available for the Netherlands and a part of Belgium along the Dutch border
APP421-1_REQ05	Spatial resolution	The weather scenario must be given for each requested location (specified as lat long), but the scenario determined for a nearby location can be used. The distance between requested location and the location for which a weather scenario is determined should not exceed 5 km.
APP421-1_REQ06	Source of the historical data	Historical data must be based on reliable weather stations. The public available data of KNMI must be used, but data from other reliable stations can be added. The past weather must be estimated for locations as specified under REQ5, by means of interpolation, which takes topographical conditions into account. When the end user of the data, or of a service based on that data (like for example an irrigation

ReqID	Title	Description
		advice) has an own weather station, this information should be used, when the user indicates this, including a reliability check with other surrounding stations.
APP421-1_REQ07	Source of predicted data.	The 6 hourly GFS predictions from the National Weather Service from the USA must be used as the basis for the predicted part of the scenario. (When ECMWF data is available against reasonable cost that can be used as an alternative. This is only available each 12 hours)
APP421-1_REQ08	Establishing high resolution prediction data	GFS and ECMWF predictions cover the whole world, but have a resolution of tens of kilometres. The weather scenario module must recalculate the weather forecast with the GFS (eventually ECMWF) data as input with a prediction model which takes topographical conditions of the region into account. Specification of the (re)prediction procedure that will used is a requirement, as it will be one of the criteria in selecting the proposals.
APP421-1_REQ09	Temporal resolution	The temporal resolution for the delivered weather variables is minimal one hour.

3.1.1.2 T421-1: Formulation of weather scenario's - Technical Requirements

Req. N.: APP421-1_TREQ01	Title: Type of service	Must
Rationale		

A web service must be established which is able to handle requests, either incidentally or for a subscription. Data with the request will be provided following SOAP and XML and includes the location in lat long following GML specifications.

The request can specify the meteorological data which must be provided (out of those listed in Req04). This will follow the xsd scheme for Property Variables as specified in EDI-Teelt 4.

Req. N.: APP421-1_TREQ02	Title: Data to be delivered	Must
Rationale		

The response on an incidental request is either immediately, indicates that more time will be required then the timeout allows (so it should be tried later), or that the service is not available with the reason for that.

The response on a subscription is a series of push messages during the subscription period. The response is an XML file which can include a comma separated value (csv) file. The contents of the csv file must be specified in the XML file (an approach adapted from SensorML) and use the PropertyVariable specification of EDI-Teelt and by AgroConnect specified standard coding lists for the meteorological variables. The use of already existing coding lists is considered.

Req. N.: APP421-1_TREQ03	Title: Source of the historical data	Must
Rationale		
Data from weather stations of the end user can be found on the location which is specified in the request. This is available following the PropertyVariable specification of EDI-Teelt and by AgroConnect specified standard coding lists for the meteorological variables.		

3.1.2 T421-2: Bad weather warning App

Spraying activities are not allowed under conditions with high wind speeds and are ineffective when followed by heavy rainfall. A farmer takes this aspect into account when planning his spraying operation(s). This planning will be based on a weather forecast, which can be global of detailed like for example delivered by the "weather scenario" App.

Between the used weather forecast and an actualization of this forecast a not foreseen change in weather conditions can occur, which can hinder actual and scheduled spraying operations.

National Meteorological Institutes use radars to determine the actual location and intensity of rainfall. This data gives a near real time view on weather development, and can also be used to predict the occurrence of rain on specific locations. Apart from radar data, also data on observed weather by weather stations is frequently actualized.

The objective of this open call is to develop an application which warns users for not foreseen unfavourable weather conditions in respect of spraying. For that reason the weather prediction that is used by the farmer must be known. This can either be based on the 3 hourly weather forecast provided by a rain radar (e.g. Buienradar), or a detailed high resolution weather forecast provided by the "weather scenario" App. It is up to the farmer to specify which weather forecast he uses as basis. The farmer specifies also the criteria he uses as non-workable for spraying operations.

The Application must generate a warning for unexpected unfavourable weather conditions for spraying in the coming 24 hour period. It should indicate which hours are unfavourable and the reason for that. (heavy rainfall later on or high wind speed.)

3.1.2.1 T421-2: Bad weather warning – Functional Requirements

ReqID	Title	Description
APP421-2_REQ01	User registration	Users of the service must be known. Use can be made of FIspace services, but it must be known that the user is in the register.
APP421-2_REQ02	User data to be used	The following information must be used: • The user subscribes during a certain period for the service. • The user specifies which weather prediction he uses as basis. This can either be based on the 3 hourly weather forecast provided by buienradar, or a detailed high resolution weather forecast provided by the "weather scenario" App. • The location for which the warning must be given. • The user specifies his criteria for unfavourable weather. This is: 1) wind speed at 10m. 2) Maximum Rainfall intensity in mm/hr, 3) maximum rainfall during a rainfall occurrence. • The user sends an event when he scheduled spraying. This includes a specification

ReqID	Title	Description
		of the data set with weather prediction data he used, and the length of his scheduling period, which is maximal 5 days.
APP421-2_REQ03	Other data to be used	The App must be able to import weather predictions for the location or place nearest to the location specified by the farmer from: • The detailed weather prediction from the "Weather scenario" App • The three hourly weather prediction from buienradar for places in the Netherlands. These weather prediction data will be available every 6 hours. The App must be able to import actual rainfall data based on rain radar data as provided by KNMI for the Netherlands. The App must be able to import actual weather data collected by the KNMI weather stations which are updated every 10 minutes.
APP421-2_REQ04	Data processing	The App calculates workable conditions for spraying for the location specified by the farmer, based on the criteria specified by the farmer and the dataset containing weather predictions as indicated by the farmer. This is done for a three hour periods when Buienradar weather prediction data is used and for a one hour periods when data from the "Weather scenario" App is used. These periods cover a length specified by the farmer with a maximum of 5 days. Continuously the rainfall data from the radar is used and predictions of rainfall are made for the location specified by the farmer for periods of 10 minutes over a length of three hours. Actual rainfall data and wind speed data is estimated for the location of the farmer by an interpolation algorithm from weather observations. Actual estimated measured rainfall is used as validation of predicted rainfall based on radar data and the latter eventually corrected. Actual estimated measured wind speed is compared with the predicted wind speed by the weather forecast and the latter eventually adjusted for observed differences. From, eventually adjusted, predicted weather data for the next three hours the workability is calculated taking the criteria of the farmer into account. When workability deviates from that based on the weather prediction a message is send to the farmer, with a specification of the actual workability. When new weather predictions come in, workability is recalculated, including that by the three our real time prediction. When this result in a deviation from the previous weather data set a message is send to the farmer, with a specification of the actual workability.
APP421-2_REQ05	Regional coverage	Weather warnings must be made available for the Netherlands and a part of Belgium along the Dutch

ReqID	Title	Description
		border
APP421-2_REQ06	Spatial resolution	The weather warning must be given for each requested location (specified as lat long), but the warning for a nearby location can be used. The distance between requested location and the location for which a weather scenario is determined should not exceed 5 km. Estimation of observed weather and predicted weather by Buienradar can be done by interpolation.
APP421-2_REQ07	Temporal resolution	The warning for the first three hours is based on ten minute intervals, the rest of the warning period in hourly intervals.

3.1.2.2 T421-2: Bad weather warning – Technical Requirements

Req. N.: APP421-2_TREQ01	Title: Type of service	Must
Rationale		

A web service must be established which is able to handle subscriptions during a certain time period for a specific location. The subscription will contain information on the criteria used for workability of spraying operations by the farmer. The service must also be able to handle messages from the farmer which contains information on the dataset containing weather predictions which are used by the farmer. Data with the request will be provided following SOAP and XML and includes the location in lat long following GML specifications.

The request can specify the meteorological data which must be provided (out of those listed in Req04). This will follow the xsd scheme for Property Variables as specified in EDI-Teelt 4.

Req. N.: APP421-2_TREQ02	Title: Data interfaces	Must
Rationale		

Data with the subscription will be provided following SOAP and XML. Schemas are based on the drmCrop reference model. For spatial information use is made of GML.

Data from the "Weather scenario" App will be delivered following the drmCrop based standards.

Other weather predictions and weather observations of KNMI can be obtained on a way chosen by the developer of the App.

Responses send to the farmer also have to comply with drmCrop specifications.

Req. N.: APP421-2_TREQ03	Title: Availability	Must
Rationale		

The service is continuously active and warns the farmer as soon as a deviation between the predicted workability for spraying and the updated workability is observed. This works during the subscription period seven days a week round the clock.

3.1.3 T421-3: Hikers App

Sometimes hikers are puzzled what kind of crop is growing on a field or observe something special on a crop they know. With nowadays smartphone technology it is possible to determine the position of the hiker and to show information by means of a map.

Data on agricultural fields with the type of crop grown on them, is documented by the national governments and this information can be made available under the open data policy.

The App should be based on a service which also allows farmers to add information they are willing to make available. Examples of such information are the variety of the crop and the purpose for which it is grown (for example potatoes for seed production, for starch, for french fries, etc.)

3.1.3.1 T421-3: Hikers App – Functional Requirements

ReqID	Title	Description
APP421-3_REQ01	User Registration	Registration of the user will be covered by the "App store". There must be a possibility that a farmer who is willing to provide additional information can register as such.
APP421-3_REQ02	User data to be used	The App uses only the actual location of the smart device on which the App is running.
APP421-3_REQ03	Other data to be used	The App can obtain information on agricultural fields and the types of crops grown from the national authority which documents this information by means of a web service. (Not clear yet whether the Dutch authority will implement a service which is able to select fields by means of an envelope). Farmers must be able to provide additional field information. As the field data obtained from the national authority will be anonymous, the farmer will send his Crop Fields including the spatial information of the border of that field.
APP421-3_REQ04	Data processing	When a user activates the App, fields that are within a range of 500-1000 m must be shown on a map, with the actual position. Colours might be used to indicate crop types. When a user points at a certain field, information should be shown that provides the type of crop and eventually additional information provided by the farmer. As information from the government authority will be anonymous, a match between fields from the government authority and fields with additional information of the farmer must be made on basis of spatial information of the field borders. The service behind the App must keep registration on how often fields are observed and how often information is requested on that particular field. The farmers who provide additional information are informed.
APP421-3_REQ05	Regional coverage	The service must be made available for the Netherlands.

3.1.3.2 T421-3: Hikers App – Technical Requirements

Req. N.: APP421-3_TREQ01	Title: Type of service	Must
Rationale		

The App runs on devices based on Android and iOS and eventually Windows Phone 8.

There is a web service behind the App which allows farmers to provide additional information for their fields. As field data from the authorities will be provided anomalously, identification of fields will be based on geographic information.

Req. N.: APP421-3_TREQ02	Title: Data interfaces	Must
Rationale		

The developer is free in the way he obtains the actual location of the smart device.

Data on agricultural fields with the type of crops grown on it can be requested from the authorities web service following the SOAP specification for those requests as published by AgroConnect. An xsd based on drmCrop, with the relevant elements will be made available by AgroConnect also. For spatial information GML will be used.

Farmers will deliver their field information as a SOAP message to the server of the App. This SOAP message and the relevant xsd are specified by AgroConnect.

3.2   OPEN CALL Trial T422 Greenhouse Management & Control Trial APPs

There are two applications required from the Greenhouse Management & Control Trial for the Open Call. The scenario in the context of which these Apps will be developed is described below:
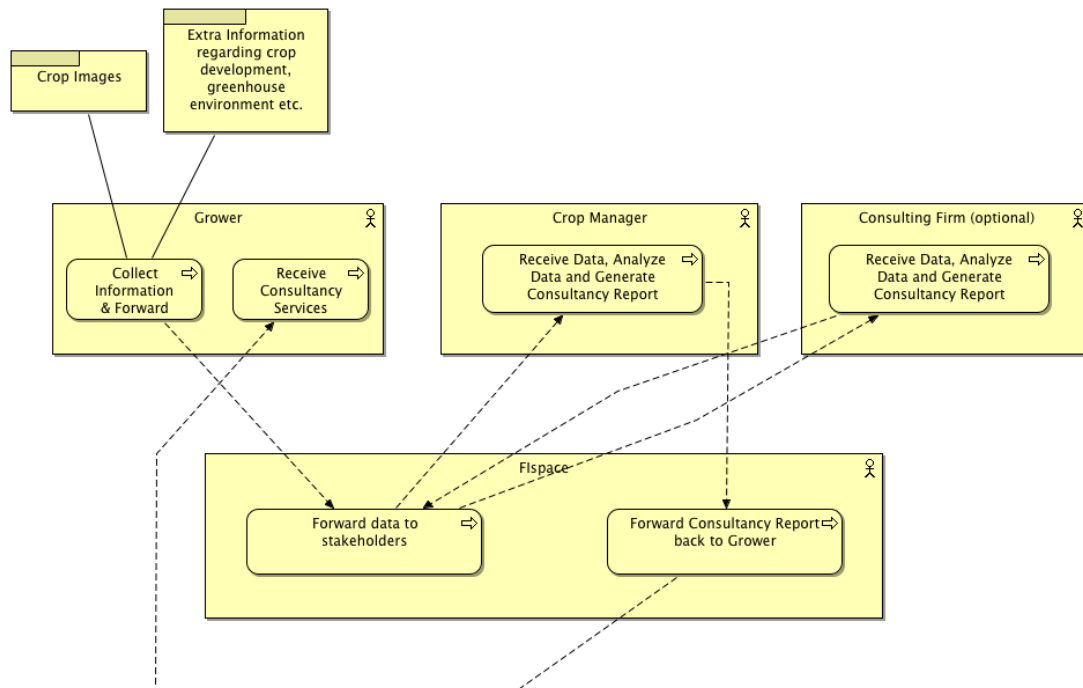
Figure 2.   Scenario in the content of the Apps will be developed

• The crop monitoring process is based on images of the crop taken on several places in a greenhouse. This process can be done manually by the grower using mobile devices. From such an image several features will be derived, like colour and compactness of the head of the plant, the inter node length and flowering speed.

• The photos and information of the system are transferred to the Crop Manager and/or some Consulting Firm (optional), who can see this information in a web-based application, which will be developed.

• Optional:

- The Consulting Firm analyses the data and generates a Report with consultancy services.
- This report is forwarded to the Crop Manager to take into account when generating the consultancy report to be sent to the grower.

• The Crop Manager analyses the overall data and forwards the consultancy services back to the grower.

Preferably the maximum number of new partners is one.

Two applications need to be developed. Their requirements are described in the following sections.

3.2.1   T422-1: Greenhouse Crop Monitoring App

A native Application for Mobile Devices to be used by the grower or by the crop manager "in situ" (inside the greenhouse) needs to be developed. In this App the acquisition of images and other information related to the greenhouse environment and crop development will be integrated. The grower will then forward this data for acquiring consultancy services by the Crop Manager.

3.2.1.1 T422-1: Greenhouse Crop Monitoring App - Functional requirements

ReqID	Title	Description
APP422-1_REQ01	User registration	The Grower/user should be able to register in a central user repository (Cloud-based) before he can use the application.
APP422-1_REQ02	Capturing Growing/Crop information	The application should provide to the user forms to capture data about the Growing and the Crop such as: • Growing variety • Seed / Planting information (Type of seed, planting dates and conditions. • Soil condition (results of soil analysis).
APP422-1_REQ03	Keep calendar of Growing tasks	The application should be able to capture in a calendar-type format, a diary of growing tasks such as: • Irrigation • Application of fertilisers • Application of Plant protection substances • Other growing tasks (e.g. leave removal etc.) For each task the date-time should be recorded by the device as well other properties of the task: (quantity and quality of irrigation, fertilizer amount and composition, substances applied etc.)
APP422-1_REQ04	Keep record of Greenhouse conditions	The application should be able to store information on Greenhouse conditions such as Temperature, Humidity, and Solar Radiation received. The information should be entered and stored on a daily or even hourly base.
APP422-1_REQ05	Image acquisition and allocation to crop	The Grower must be able to take images of the crop using the device's camera. The application should keep track of image time-stamp and automatically link the image to the Crop-Greenhouse location.
APP422-1_REQ06	Info extraction from images (optional)	Information could be extracted from the images like colour and compactness of the head of the plant, the inter node length and flowering speed
APP422-1_REQ07	Extra information integration	The Grower must be able to add extra information regarding the Greenhouse environment and the Crop development at the time of image and integrate this information to the image.
APP422-1_REQ08	Connection with FIspace Baseline Apps (optional)	The App could need to request specific information from the Product Information Service Baseline App
APP422-1_REQ09	Push information	The App must be able to push the information gathered (images + manual extra info) to FIspace and other interested applications (for sure Greenhouse Crop Analyser App)

3.2.1.2 T422-1: Greenhouse Crop Monitoring App – Technical Requirements

Req. N.: APP422-1_TREQ01	Title: Mobile Application - Compatibility	Must
Rationale		
The application must be developed for at least two of the most popular OS / platforms for mobile devices. The application should run on all types of mobile devices for these platforms (Smartphones, Tablets).		

Req. N.: T422-1_TREQ02	Title: Mobile Device Hardware Access	Must
Rationale		
The application must be able to have full access to the mobile device's hardware and more specifically to the Camera for Image and Video Capture and to the device's GPS so that location information can be stored with the image.		

Req. N.: APP422-1_TREQ03	Title: On-Off line use	Must
Rationale		
The App should be able to work even if the device is not connected to the Internet. All information should be stored locally in the device's storage. The application should be protected from unauthorised use by requiring username/password credentials from the user before it allows him/her access.		

Req. N.: APP422-1_TREQ04	Title: Sending Images and Info	Must
Rationale		
The App should be able to use device's internet connectivity to connect to the FI-Space Bus and send the required information (Images and associated data)		

Req. N.: APP422-1_TREQ05	Title: Receiving consultancy Info	Must
Rationale		
The App should be able to use device's internet connectivity to connect to the FI-Space Bus and receive the required information (Consultancy information)		

Req. N.: APP422-1_TREQ06	Title: Storage Capacity	Must
Rationale		
The App should have full access to the device's internal and external USB storage and should not have other storage limitations except the device's physical storage.		

FIspace
Business Collaboration

3.2.2   T422-2: Greenhouse Crop Analyser App

A web-based application needs also to be developed, which will acquire the information sent from the Greenhouse Crop Monitoring App (1st Open Call App), and will provide advice/consultancy services to the Grower.

3.2.2.1 T422-2: Greenhouse Crop Analyser App – Functional Requirements

ReqID	Title	Description
APP422-2_REQ01	**User registration**	The Consultant/user should be able to register in a central user repository (Cloud-based) before he can use the application.
APP422-2_REQ02	**Receive information from Greenhouse Crop Monitoring App**	This App must receive the images, as well as any extra information regarding the greenhouse and the crop, submitted by the grower's mobile App
APP422-2_REQ03	**Keep record of data**	The App must be able to keep historical record of the data received from a specific grower, to take into advantage when analysing the input images/info
APP422-2_REQ04	**Connection with FIspace Baseline Apps (optional)**	The App could need to request specific information from the Product Information Service Baseline App
APP422-2_REQ05	**Provide consultancy services**	The user of the App (Crop Manager/ Consulting Firm) should be able to provide advice/consultancy services back to the grower after analysing the information received by the grower's mobile App.
APP422-2_REQ06	**Format of consultancy**	The report should contain background information about the crop and the images. The report should contain info on the consultant name, firm, date and time. The report should be provided

3.2.2.2 T422-2: Greenhouse Crop Analyser App – Technical Requirements

Req. N.: APP422-2_TREQ01	Title: Web-Based Application	Must
Rationale		
The application must be accessible through a standard web browser, no installation to user's computer should be necessary. The information must be pushed in an attractive and easy to access way.		

Req. N.: APP422-2_TREQ02	Title: Communication with back-end database - storage	Must
Rationale		
The application should be able to store data and information in a remote database (RDBMS or other storage capacity). The information must be pushed in an attractive and easy to access way. The information should also be able to be sent or received via the FI Bus.		

Req. N.: APP422-2_TREQ03	Title: Web Service Interface	Must
Rationale		
The application should provide a Web Service interface (SOAP or REST) that can be used by other applications such as administration-management for automatic information push depending on context information and user profile.		

Req. N.: APP422-2_TREQ04	Title: Response Times	Must
Rationale		
The application should provide a maximum response time for all functions of less than 5 seconds for at least 97% of the time.		

3.3   OPEN CALL Trial T431 Fish Distribution and (Re-) Planning Trial Apps

This trial focuses on the planning of logistics and transport activities in the fish industry, a crucial process for ensuring performance across the whole supply chain, including transport order creation, transport demand (re)planning and distribution (re)scheduling.

The main challenges addressed are low predictability and late shipment booking cancellations, mostly due to lack of collaboration or access to information, affecting directly the resource and asset utilization of service suppliers. Furthermore, data quality at the planning phase is essential for enabling effective monitoring of transport execution.

Preferably, the maximum number of new partners is two.

3.3.1   T431-1: Booking Probability App

The "Booking Probability" App is a domain specific App using Logistic Service Client (LSC) statistics to compute the probability of getting a confirmation for non-confirmed bookings. It can also compute the probability that an already confirmed booking will be cancelled based on tracing information of the cargo to be transported.

For the first computation (going from non-confirmed to confirmed bookings), voyage information is fetched from the Marketplace Operations App, and relevant bookings for this voyage are fetched from the Logistics Planning App (LPA). Then, actual rules that are set up for the Logistics Service Provider (LSP) must be checked, for instance, which voyages should be checked at a certain time (x hours before departure).

For the second computation (going from confirmed to cancelled bookings), the App requests cargo tracing information to find out where the cargo is placed compared to where it is supposed to be regarding the booking. The confirmed bookings to be checked are fetched from the LPA.

The Booking Probability App can also receive notifications on events related to bookings from the B2B Collaboration Core Modules (cargo, voyage, import license, loading list etc.).

The actual bookings with associated probabilities are presented to the LSP and used by them to achieve early warnings on missing confirmations and early warnings on possible cancellations. This makes them capable of handling changes at an earlier time, and to do replanning at an earlier time, when it is still time for it. The next step for the LSP will be to request a confirmation from the LSC or to ask the Marketplace Operations App for replacement cargo to increase vessel utilization.

3.3.1.1 T431-1: Booking Probability App – Functional Requirements

ReqID	Title	Description
APP431-1_REQ01	**Booking information**	The App must get the information on confirmed and non-confirmed bookings associated with a voyage.
APP431-1_REQ02	**Cargo tracing**	The App must get available tracking information for the cargo associated with the bookings.
APP431-1_REQ03	**Client statistics**	The App could use statistics on customer behaviour regarding confirmation of bookings or late cancellations.
APP431-1_REQ04	**Cargo events**	The App should get events related to the cargo handling, like clearance for import/export.
APP431-1_REQ05	**Calculation of booking confirmation probability**	The App must calculate the probability that a non-confirmed booking will be confirmed within the deadline for the voyage, based on available data.

ReqID	Title	Description
APP431-1_REQ06	Calculation of cancellation probability	The App must calculate the probability that a booking will be cancelled, based on available data.
APP431-1_REQ07	Presentation of results	The App must present the results (e.g. booking confirmation probability and cancellation probability) in a structured manner.
APP431-1_REQ08	Security	The App must handle the data in a secure manner; data that the user does not have access rights to should be treated as unavailable.

3.3.1.2 T431-1: Booking Probability App – Technical Requirements

Req. N.: APP431-1_TREQ01	Title: Interface to external data sources	Must
Rationale		

The booking probability App must have access to external data sources in order to fetch relevant data for probability calculations.

1) Bookings: Status of bookings associated with voyage, in addition to the IDs for e.g. tracking and event logs for the cargo.
2) Tracking information: Tracking or other positioning information for the cargo.
3) Event information: Events related to cargo.
4) Historical information on customer behaviour with regard to confirmation of bookings and cancellations.

Req. N.: APP431-1_TREQ02	Title: Interfaces to user system	Should
Rationale		

The Booking Probability App should offer open technical interfaces to the App's functionality, for easy integration with user systems.

Req. N.: APP431-1_TREQ03	Title: Client	Should
Rationale		

The booking probability App should provide a client for user interfaces. The client should give the user access to the result calculations, and could also be used for user input.

3.3.2 T431-2: Find Cargo Replacement App

The "Find Cargo Replacement" domain specific App is used by a Logistics Service Provider (e.g. cargo ship owner) for finding replacements for cancelled orders and filling empty cargo space on the vessel on relatively short notice.

It uses functionality from the Marketplace Operations App and input from backend booking systems to find replacement cargo. The App fetches actual transport demands from the Marketplace Operations App based on two different types of input:

One is that bookings from the backend booking system that have changed to Cancelled are fed into the App and matchmaking is done in the Marketplace Operations App. This will help the carrier to find replacement cargo for cancellations much easier than today. A percentage saying how well the new transport demand fits the cancellation should also be given.

The other is that the carrier wants to use this domain App to find possible cargo to fill up the capacity on a certain voyage. This is done by having this domain App fetching the available capacity from the booking system, and further by asking the Marketplace Operations App for possible transport demands that fits the voyage. The App should also give a percentage describing the match in this case as well.

3.3.2.1 T431-2: Find Cargo Replacement App – Functional Requirements

ReqID	Title	Description
APP431-2_REQ01	User cargo search	The App must be able to handle user input that includes selecting a voyage and start searching for transport demands matching the voyage.
APP431-2_REQ02	Get cancellation trigger	The App should be able to receive a trigger when a cancellation occurs, and start an automatic search for transport demands that can be used to replace the cancelled cargo.
APP431-2_REQ03	Get data on vessel utilization	The App should interact with the user's system for getting data on vessel utilization.
APP431-2_REQ04	Interaction with Marketplace Operations functionality	In order to search for transport demands, the App should use marketplace demand search functionality provided by the Marketplace Operation baseline App
APP431-2_REQ05	Presentation of search results	The results of the search must be presented to the user. This presentation should be in a manner that makes it easy to see how the transport demands matches the utilization of the vessel.
APP431-2_REQ06	Presentation of probability for result usability	The presentation of results (APP431-2_REQ05) could use functionality from the Booking Probability App (discussed above) in order to present probabilities for cargo reaching the terminal within a deadline, and thus the usability of the search result. These probabilities should be listed with the results.
APP431-2_REQ07	User selection of cargo	The user should be able to select transport demands from the search results and automatically create an offer or enter negotiation with the client.
APP431-2_REQ08	Interaction with Logistic Planning functionality	The App should be able to use the negotiation facilities of the Logistic Planning baseline App for negotiation and booking of the selected transport demands.

3.3.2.2 T431-2: Find Cargo Replacement App – Technical Requirements

Req. N.: APP431-2_TREQ01	Title: Receive external triggers	Should
Rationale		
The Find Cargo Replacement App should be able to be triggered by external (i.e. not part of the App or its UI) sources. The App should automatically start searching for cargo that can be used to replace a cancelled transportation order when the cancellation occurs.		

Req. N.: APP431-2_TREQ02	Title: Interaction with other Apps	Must
Rationale		
The Find Cargo Replacement App must be able to interact with the Marketplace Operations baseline App for searching for transport demands that fit a given voyage. The App should be able to interact with the Logistics Planning baseline App for negotiation and booking of the transport. The App could use functionality from the Booking Probability App for calculating the probability that a transport demand will be usable for the voyage given the time constraints on reaching the terminal.		

Req. N.: APP431-2_TREQ03	Title: Interfaces to vessel utilization data	Should
Rationale		
The Find Cargo Replacement App should be able to fetch data on vessel utilization in order to find good matches between free cargo space and the transport demands. The data will likely be protected, and the App must have proper handling of security.		

Req. N.: APP431-2_TREQ04	Title: Interfaces for user system	Should
Rationale		
The Find Cargo Replacement App should offer open technical interfaces to the App's functionality, for easy integration with user systems.		

Req. N.: APP431-2_TREQ05	Title: Client	Should
Rationale		

The booking probability App should provide a client for user interfaces.

From the client, the user should be able to

- select voyage
- start search for matching demands
- select cargo/transport demand
- contact transport demand owner for booking

The client should present

- Result of cargo search
- How the cargo fits the current utilization of the vessel
- The probability that the cargo can reach the terminal within the deadline for the voyage

3.3.3 T431-3: Pricing Proposal App

As a Logistics Service Provider (LSP), I want to have a price proposal App that can be used to propose a price on a transport offer based on a description of the logistics service, statistical information regarding the booking situation, voyage details from the booking system, and on historical information on prices.

3.3.3.1 T431-3: Pricing Proposal App – Functional Requirements

ReqID	Title	Description
APP431-3_REQ01	**External Input**	The App must take input from various sources to be used in the computation of a price proposal
APP431-3_REQ02	**Offer Input**	The App must have the possibility to enter the logistics service offer to be used in the price setting
APP431-3_REQ03	**Price Presentation**	The App must present the proposed price together with a summary of the assessments done to come up with this price.

3.3.3.2 T431-3: Pricing Proposal App – Technical Requirements

Req. N.: APP431-3_TREQ01	Title: User Interface	Should
Rationale		

The pricing proposal App needs a user interface to be able to enter the logistics service offer to be handled, and to give output about the resulting price computed

FIspace
Business Collaboration

Req. N.: APP431-3_TREQ02	Title: API	Should
Rationale		
The pricing proposal App needs an API for entering the logistics service offer to be handled, and also an API to fetch the resulting price computed		

Req. N.: APP431-3_TREQ03	Title: Interface to external data sources	Should
Rationale		
The pricing proposal App needs interfaces to external data sources to be used in the computation, for instance on 1) Bookings: statistical information regarding the booking situation, for instance fetched from the planning baseline App. 2) Voyage details, for instance fetched from the Marketplace operations App 3) Historical information on prices, for instance fetched from the Logistics planning baseline App or from some third party booking system.		

3.4   OPEN CALL Trial T432: Fresh Fruit & Vegetables Quality Assurance Trial App

The FFV Trial addresses challenges of the fresh fruit and vegetable business, which is especially challenging due to the highly perishable characteristics of the product and the related implications on logistics with respect to transport conditions and required speed to assure healthy food and maximise shelf-life. The FFV trial targets at the provision of product related information within the food chain. Both ways of communication in the food chain are addressed, forward from farm to fork as well as backwards. The exchange of such information shall specifically facilitate the realisation of quality assurance and risk management within the supply chain.

The FFV related open call for Apps to be developed is addressing the realisation of tools that shall specifically enable SMEs to participate in the electronic data exchange in the first place. The related Apps shall provide functionalities for SMEs supporting them in their daily business interactions, disburdening SMEs from administrative tasks as well as to provide business relevant information in relation to a current process situation and business context.

Preferably the maximum number of new partners is two

3.4.1   T432-1: Inventory Management of RTI Packaging (BOXMAN)

The utilization on Returnable Transport Items (RTI) has different reasons starting from the reduction of waste up to better handling and less damages because of the stability of the packaging. Within the fruits and vegetables sector foldable boxes are used, maximizing stability and highly reducing space for moving empty boxes, while generally RTI are widely used also in sectors such as clothes-hangers in fashion business, rigid boxes in different sizes in meat business as well as trolleys in flowers & plants business.

In the basic RTI business model, they travel along a supply chain from production towards retail and backwards. These cycles are managed by RTI Pool Management Organizations (PMO), offering RTIs for rent as well as providing a bundle of logistics services to their customers. In the fruit and vegetable business such a cycle includes the farmer as initial stage, different traders in between and a retailer as an end point. The PMO collects the RTI boxes at retail and prepares them for another cycle in their Depots. From there the RTI boxes are delivered to the farmer again. The efficient organization of PMOs is crucial for the logistics in the whole supply network. Especially during season highest availability of RTI boxes at agricultural production and flexible provision of RTI boxes is utmost important to meet the demands of retailers that order their products specifically in RTI boxes of a specific PMO. Since the number of RTI boxes is limited and spread all over Europe, there is a need for timely information of which quantities of RTI boxes are located at which point in the chain.

At the same time, actors in the supply chain need to handle a variety of RTI boxes from different PMOs as well as need to manage the related communication. The majority of actors in the fruit and vegetable business have to manage different RTI boxes, pallets as well as different one-way packing's to serve their customers in their preferred way. Due to different rental schemes, the actors have to report inventories, movements of RTI boxes and reception of RTI boxes to the different PMOs, which is a work intensive task with manual efforts. There are even systems such as Euro Pallets, where every actor has to manage the exchange between all his suppliers and all his customers (so called direct service). Nowadays, this is mostly done paper-based and requires a transfer from paper to electronic systems such as e.g. customer portals of PMOs.

Therefore, the main purpose of the envisaged App is to decrease the administrative efforts as much as possible by enabling automated accounting of RTI inventories, documenting of movements and provision of reports to different PMOs.

3.4.1.1 T432-1: Inventory Management of RTI Packaging (BOXMAN) - Functional Requirements

ReqID	Title	Description
APP432-1_REQ01	**Input of RTI related data (incoming RTI movements)**	Collection of data on RTIs within deliveries (date, time, actor from, actor to, RTI type, quantity (optional: RTI ID)).
APP432-1_REQ02	**Input of RTI related data (outgoing RTI movements)**	Collection of data on RTIs within deliveries (date, time, actor from, actor to, RTI type, quantity (optional: RTI ID)).
APP432-1_REQ03	**Inventory overview**	The users of RTIs can access an overview on all stocks (expected stock = ordered RTIs + incoming RTIs – outgoing RTIs) per RTI PMO (IFCO stock, EPS Stock, LPR Stock,…) and listing of all transactions (like a bank account) + printable Report
APP432-1_REQ04	**EDI declarations of movement to PMOs**	For outgoing deliveries the App should have a functionality to detect the type of RTI and the owner (PMO) and send a quantitative declaration of movement to the right PMO in the PMO's EDI format. The data could be collected manually, based on delivery documents from another App or from an existing legacy system.
APP432-1_REQ5	**EDI confirmation of movement to PMOs**	For incoming deliveries the App should have a functionality to detect the type of RTI and the owner (PMO) and send a quantitative declaration of movement to the right PMO in the PMO's EDI format. The data could be collected manually, based on delivery documents from another App or from an existing legacy system.

3.4.1.2 T432-1: Inventory Management of RTI Packaging (BOXMAN) - Technical Requirements

Req. N.: APP432-1_TREQ01	Title: Import of EDI Delivery Notifications	Must
Rationale		
The RTI Information is usually included in delivery notifications that are send out from stakeholders in an EDI format. A standard interface for the import of these delivery notifications from existing systems has to be realised in order to process them and extract the RTI information for later usage.		

Req. N.: APP432-1_TREQ02	Title: Realising a user interface for manual creation of a delivery note for a specific retailer	Should
Rationale		
A user interface is required in order to enable SMEs to create delivery notifications with a wide set of information, especially including RTI information. It should provide an easy to use UI for the input of delivery related data without interfacing legacy systems.		

Req. N.: APP432-1_TREQ03	Title: Storage service for handling of RTI related content data, as central or distributed storage for several organisations, assuring secure data exchange and privacy of data	Must
Rationale		
The App requires a data storage concept that meets the requirements of the stakeholders regarding privacy and data ownership		

Req. N.: APP432-1_TREQ04	Title: Extraction of RTI Movement Declarations from EDI Delivery Notifications	Must
Rationale		
The App must offer a functionality that recognises RTI types and quantities from electronic delivery documents and extracts them to the data storage.		

Req. N.: APP432-1_TREQ05	Title: Sending a RTI Movement Declaration or Confirmation to a selected RTI Pool Mgmt Organisation	Must
Rationale		
The main purpose of the App is the automated sending of RTI Movement declarations (with the permission of the user) to the right RTI Pool Management Company using an existing defined interface at the Pool Management Company.		

Req. N.: APP432-1_TREQ06	Title: Profile Management for Retailer Interfaces for delivery notifications	Should
Rationale		
The App should contain a Profile Management for managing different Customer Interfaces for the sending of delivery notifications (e.g. recipient address).		

Req. N.: APP432-1_TREQ07	Title: Profile Management for Interfaces to RTI Pool Mgmt Organisations	**Must**
Rationale		
The App must contain a Profile Management for Declaration Interfaces (reporting of moved RTI quantities) of different RTI Pool Mgmt Organisations in order to manage related RTI Stocks (e.g. Euro Pool System, IFCO, LPR, Chep). All these RTI Pool Mgmt Organisations have different interfaces and the App should offer a solution for managing different Profiles.		

Req. N.: APP432-1_TREQ08	Title: Realising the App back-end, for rule based workflow management and message/event creation	**Must**
Rationale		
The App must have a back-end that is managing the workflow, creates messages and events by partly facilitating FIspace capabilities or offer App-specific capabilities such as e.g. integration of e.g. scanner systems initiating events.		

Req. N.: APP432-1_TREQ09	Title: Documentation of / and Overview on the Declarations made	**Must**
Rationale		
The App should offer a UI that presents the latest transactions of Declarations and Confirmations between the App and the RTI Pool Mgmt Organisations.		

Req. N.: APP432-1_TREQ10	Title: Link to PInfS (forward)App for integrating data on deliveries as alternative for the import functionality	**Should**
Rationale		
The App should offer a functionality to integrate data from other FIspace Apps, such as e.g. the PInfS Apps (Farmer App, Trader App, Retailer App), which also contain delivery- and RTI-related information. This should be an alternative to the interfaces to legacy systems in APP432-1_TREQ01.		

Req. N.: APP432-1_TREQ11	Title: Realising the App front end, based on the FIspace platform features	**Must**
Rationale		
The App has to use the FIspace platform capabilities for realisation of the front end by e.g. integrating the notification engine or other relevant features.		

3.4.2 T432-2: Risk Management in the Distribution of FFV (RISKMAN)

A core requirement in the provision of food is the assurance towards customers and consumers that food is safe to eat and of the quality and diversity expected. Providing assurance in food safety/quality is the basis for trust in the suppliers of food. Trust evolves from trust in the *organization of processes* that assure that food that is not safe or not of the proclaimed quality will not reach markets and consumers. In order to be able to give this assurance, every actor in the chain has to monitor processes for potential risks and critical issues. The detection and management of these risks and issues is vital for agri-food companies, because one single critical incident could mean going out of business due to loss of trust in their ability to provide safe food and manage risks in their processes properly.

Data from external sources is required for realizing the risk management that is the basis for quality assurance as well as for the subsequent handling and control of distribution processes with respect to the specific products. This data is provided by different service providers (transport, laboratory, certification), but also by public authorities and laboratories that publish early warnings for specific products.

The purpose of the App is to collect data from internal quality assurance measures as well as from external sources, filter it according to a set of pre-defined rules and finally to inform relevant actors to trigger related reactions.

3.4.2.1 T432-2: Risk Management in the Distribution of FFV (RISKMAN) - Functional Requirements

ReqID	Title	Description
APP432-2_REQ01	**Import of static and dynamic data from public authorities, service providers and private agencies**	Public authorities (National, European…) as well as NGOs and private agencies (e.g. Laboratories) publish data (once a day, every hour, on occurrence) on product recalls on different webpages and in newspapers. This data is relevant for assessing and identification of potential risks for Agri-food companies. This data is the source data for the rule-base evaluation.
APP432-2_REQ02	**Input of risk and quality information**	With the App, customers and suppliers are collecting product, risk and quality related data with respect to the deliveries. The type and structure of information can be configured and adopted to the user preferences.
APP432-2_REQ03	**Send and Receive risk alerts between suppliers and customers**	Customers and Suppliers should be enabled to send risk alerts for specific products on recalls forward and backward in the food chain or network of actors accordingly. This shall work on explicit user request or based on past deliveries (i.e. using data from other Apps). The App should support kind of pre-selection of recipients of potential unsafe products.
APP432-2_REQ04	**Definition of notification rules**	The definition of rules with related criteria for notification is a core functionality of the App. This shall also include basic configuration of rules and reuse the FIspace related user data. Based on different types of basic rules (e.g. If Then) within the App users shall be enabled to define more complex rules that are representing the business-related rules.

ReqID	Title	Description
APP432-2_REQ5	Compilation and storage of data	Compiling data from different sources (news feeds, messages, internal inputs) that is relevant for the specific company (e.g. compare product alerts with product portfolio) and display the highest risks on one screen. A storage concept will be required to support and store the compiled data.
APP432-2_REQ6	Notification functionality	The user shall be notified as soon as a risk alert is detected. The user should have different configurable options (mail, notification in FIspace front end, SMS, …)

3.4.2.2 T432-2: Risk Management in the Distribution of FFV (RISKMAN) - Technical Requirements

Req. N.: APP432-2_TREQ01	Title: Import of published food alerts	Should
Rationale		
The App should have a functionality that allows the definition of specific data imports of publically available food alerts based on e.g. the rapid food alert system of EFSA or the national published lists with food alerts. This data is available as RSS Feeds at the different sites.		

Req. N.: APP432-2_TREQ02	Title: Import of provided food product analysis results from contracted Laboratories	Should
Rationale		
The App should have a functionality that allows the import of Laboratory results from contracted Laboratories via an interface.		

Req. N.: APP432-2_TREQ03	Title: Interface to Legacy Systems	Should
Rationale		
The App should have an interface to import relevant data from the user's legacy systems.		

Req. N.: APP432-2_TREQ04	Title: Matching of results with requirements and identification of deviations	Must
Rationale		
The App must have functionalities that evaluate the imported data using pre-defined filters. As an example, laboratory data should be matched with pre-defined acceptable ranges for specific agents for automated evaluation of a laboratory result. Imported Food Alert Data should be compared with the Company's product listings in order to check, if a food alert is relevant for the Company or not.		

Req. N.: APP432-2_TREQ05	Title: Checking product location with Delivery Documents	**Should**
Rationale		
The App should have a functionality for accessing delivery-related information from other Apps (such as e.g. PInfS Apps) to identify if an identified unsafe product has already been distributed and to whom.		

Req. N.: APP432-2_TREQ06	Title: Message System to send and receive Alerts	**Must**
Rationale		
The main purpose of this App besides identification of hazards is the communication of alert notifications to a selected circle of customers and suppliers that got in contact with the affected product based e.g. on delivery documentation available in other Apps. The message system has to enable sending and receiving of alert messages and to highlight them.		

Req. N.: APP432-2_TREQ07	Title: Storage service for handling of content data with respect to RTI movements and sent/received alerts	**Must**
Rationale		
The App must have a data storage concept that meets the stakeholder's requirements for privacy and data ownership. This data storage should be used to store all required data for realising the App functionalities, such as e.g. send and receive alert notifications to and from other stakeholders, product listings, evaluation rules and configurations or a history of alerts.		

Req. N.: APP432-2_TREQ08	Title: Realising an App back-end for handling of notifications and alerts, based on related rules	**Must**
Rationale		
The App must have a back-end with all required functionalities and integrating FIspace platform features.		

Req. N.: APP432-2_TREQ09	Title: App-front end based on FIspace platform features for user interaction as described in functional requirements	**Must**
Rationale		
The App must have a front end incorporating FIspace platform features such as e.g. the notification engine, and for providing the relevant data to the user as described in the functional requirements.		

3.5   OPEN CALL Trial T433 Flowers and Plants Supply Chain Monitoring Trial App

The main objective of this task is to develop Apps supporting flowers and plants supply chains to track and trace real time the location of the products and to monitor the conditions. Alerts can be given when these conditions exceed threshold values. Combined with information about the product quality product quality alerts can be generated. Together with information produced by quality decay models, real time quality controlled planning can be operated. These developments can be supported by two additional Apps specified in this open call: 'Flowers & Plants Botanic Info App' and 'Time Temperature Sum Planning App'

Preferably the maximum number of new partners is two

3.5.1   T433-1: Botanic Info App

This application enables product owners to register flowers and plants in a sector-specific product information database and any other users including consumers to get access to certain specific product information like botanic information of the cultivar, including taxonomic numbers, product numbers, trade names, botanical characteristics and standardized product picture), treatment instructions, representative pictures of the cultivar or even lot-specific photographs of the product. Also the App will contain features which enables users to add own information such as feedback about the quality or own photographs. That way consumers, retailers or other stakeholders can send product quality feedback to the product owners. Below the functional requirements of this application are specified (these functionalities could also be included in two Apps, i.e. a specific App for product owners and an App for users of the product information).

3.5.1.1 T433-1: Botanic Info App - Functional Requirements

ReqID	Title	Description
APP433-1_REQ01	GTIN Connection	Product owner fills in his GTIN UserID (GS1 company number) and connects to the central GTIN system for Flowers & Plants.
APP433-1_REQ02	Register a new GTIN	The user registers a new GTIN for his product and fills in the required fields (including product name, commercial name, product application).
APP433-1_REQ03	Cultivar + Variety Reference Information	Based on the identified cultivar reference information from the Plantscope database will be presented to the user in an attractive way. Information from Plantscope includes: Taxonomic number, product number, trade name, botanical characteristics and standardized product picture.
APP433-1_REQ04	User Photographs	The user has the ability to attach a picture of the product to the GTIN and to upload this photograph
APP433-1_REQ05	Search functionality	Users can search for cultivars and varieties via a user friendly search method. That way they can access reference information and view the user feedback of other users.
APP433-1_REQ06	Register the required characteristics	The required VBN characteristic codes are presented with their default values. The user selects the applicable values.
APP433-1_REQ07	Register the free characteristics	The free available characteristics for the product are presented. The user selects the applicable values.

ReqID	Title	Description
APP433-1_REQ08	Find similar products	When users look up information of a particular product, either via code or the search functionality, they are given the opportunity to find and compare that product to similar products
APP433-1_REQ09	Profile configuration	Users can create their own profile where they can adjust notification settings and link their account to other social media accounts.
APP433-1_REQ10	Register extra product information	The user registers other free information which describes his product (package type, -colour, accessories).
APP433-1_REQ11	The GTIN information is stored	The GTIN information of the user is stored in the central system and can be presented on screen when the user fills in the GTIN code.
APP433-1_REQ12	The GTIN information is presented	A list of all the registered GTIN's will be presented to the users after login. Users can select a GTIN to view all the detailed data from each GTIN.
APP433-1_REQ13	Management information	Management information is presented based on the logging of the system, presenting total users, total GTIN's, type of products, use of the system...etc.
APP433-1_REQ14	Active/not active	The user has the possibility to set his GTIN's active/not active.
APP433-1_REQ15	External presentation	The GTIN database is opened to the internet by a website where everybody can select and check the GTIN information of the users.
APP433-1_REQ16	Barcode Scanning	External users (e.g. consumers) have to be able to scan the barcodes of flowers and plants to gain access to the cultivar reference information, if the GTIN of the scanned product is available in the database.
APP433-1_REQ17	Are you now at...?	When the application is active, it will check the current location of the user. When this location is near a particular retail shop, the App will ask the user if he/she is at location X. Once the shop is established current product discounts can be shown to the user.
APP433-1_REQ18	Multi platform	The App should be available in all important phone App stores like Google Play, Itunes Appstore, Windows Store.
APP433-1_REQ19	Plant Treatment Advice	Based on the cultivar-variety the user can find treatment suggestions for example time to water plant or add fertilization. Correct the treatment advice of outdoor plants with current and expected weather conditions.
APP433-1_REQ20	Treatment log	Users can keep cultivar-variety specific treatment logs, e.g. for watering, pruning and fertilization.
APP433-1_REQ21	Production Presentation Portal	Growers have to be able to create a company profile that will be added to the growers presentation portal. Here they can explain the growing processes for each cultivar-variety they have in their assortment. Aspects of the processes like sustainable production, biological pest control and greenhouse automation can be elaborated on, for example via promotion stories, illustrative photographs and inspiring video's. Based on the selected product in the App access to the grower's background information will be provided to the App users.

ReqID	Title	Description
APP433-1_REQ22	Cultivar-variety treatment notifications	If the flower or plant is in need of treatment interventions, notifications have to be send to the user. He or she should not have to have the App open and running to receive the notifications on the user's phone.
APP433-1_REQ23	Flexible treatment advice rule definition	Based on scientific progress and new insights, experts should be able to flexibly refine and improve the treatment advice rules that run in the background of the application.
APP433-1_REQ24	User Feedback	Users will be provided with the possibility to give feedback on their acquired products, by scoring the product on a scale from 1-5 on specific product quality characteristics that are relevant for consumers. The feedback has to include the day of the buy. Also an open comment field has to be added for additional remarks.
APP433-1_REQ25	Product wish list	Users can put products on their `whish list`. This will result in notifications if the product is in discount at a particular retail shop.
APP433-1_REQ26	Other users also looked at...	When users look up information of a particular product, either via code scanning or the search functionality, automatically a list appears with some highlighted products that other users that looked at this particular product also looked at.
APP433-1_REQ27	Report end-of-life	When a flower or plant has reached the end of its life, the user can indicate this in the App.
APP433-1_REQ28	My products list	Users can build a list of flowers and plants that they currently have at their home or garden. Per item they can indicate the characteristics of the location, e.g. outdoor or indoor, amount of shadow, type of pot or soil characteristics for outside plants, etc.
APP433-1_REQ29	Sensor data collection	Users have to be enabled to easily add and configure plant sensor devices to the App, for example a device that combines a light, soil moisture and temperature sensor. Also, it should be able to easily connect to the Internet to forward its measurement data, for example via WIFI.
APP433-1_REQ30	Sensor data analysis	Combining the current measurement data and the cultivar-variety reference information, the App can determine if the product has to be watered, fertilized, or that there should be adaptations in the amount of light it receives. Scientifically determined treatment advice rules have to form the baseline for this.

3.5.1.2 T433-1: Botanic Info App - Technical Requirements

Req. N.: APP433-1_TREQ01	Title: Multi Platform	Must
Rationale		
App compatibility for at least Android and iOS devices.		

Req. N.: APP433-1_TREQ02	Title: Notification Services	Must
Rationale		
Platform notification services that run outside normal application UI like NotificationCompat in Android and UILocalNotification in iOS		

Req. N.: APP433-1_TREQ03	Title: Treatment Advice Rules Web-service	Must
Rationale		
Build and provide XSD information for SOAP XML webservice for uploading new treatment advice rule definition by quality experts		

Req. N.: APP433-1_TREQ04	Title: Support Video Embedding	Must
Rationale		
Video embedding (Youtube, Vimeo, etc.) should be possible in the production presentation portal		

Req. N.: APP433-1_TREQ05	Title: GTIN Information Database Web-service	Must
Rationale		
The GTIN information database that links all product information to the GTIN code has to be accessible via SOAP XML web service for uploading product information, and requesting and receiving product information.		

Req. N.: APP433-1_TREQ06	Title: GS1 GTIN Compliance	Must
Rationale		
As the name implies, the GTIN helps automate the trading process – basically buying and selling. GTINs are therefore assigned to any item (product or service) that may be priced, or ordered, or invoiced at any point in any supply chain. The GTIN is then used to retrieve pre-defined information about the item. The key benefit is that information about the item can be retrieved about the product from the GTIN whether it is read in a GS1 BarCodes symbol, exchanged via a GS1 eCom message or accessed from the Global Data Synchronisation Network. (Source: GS1 website)		

Req. No. APP433-1_TREQ07	Title: GLN Compliance	Must
Rationale		
All specific location information for products has to comply with GLN standards and databases.		

Req. N.: APP433-1_TREQ08	Title: Plantscope Database Interface	Must
Rationale		
An interface to the PlantScope Database has to be developed for the integration of product reference information and photographs.		

Req. N.: APP433-1_TREQ09	Title: Social Media Plugins	Must
Rationale		
Social Media Plugins (Facebook, LinkedIn, Google+) should be used all through the application for posting information about the project to		

Req. N.: APP433-1_TREQ10	Title: Barcode Reader Integration	Must
Rationale		
A barcode reader has to be integrated in the UI of the App.		

Req. N.: APP433-1_TREQ11	Title: VBN, VKC, Floricode Compliance	Must
Rationale		
Product coding of product and characteristics has to comply with VBN, VKC and Floricode standards.		

3.5.2 T433-2: Time Temperature Sum Planning App

This 'open call' for App development requests an addition or expansion of the baseline App for logistic planning. The idea is that the baseline functionality is extended with functionality that is useful for Logistic Service Clients and Providers in the Flower sector. The time temperature sum of cultivar varieties is an important factor to take into account when planning logistics in the flower sector. In this open call the time temperature sum will be added to the baseline logistic planning functionality. The basic requirements for the App will be an extension to the baseline App and has to be integrated with it. The additional functional requirements and their association with the already defined requirements for the baseline application are provided below.

3.5.2.1 T433-2: Time Temperature Sum Planning App - Functional Requirements

ReqID	Title	Description
APP433-2_REQ01	Time Temperature Sum Database	A database has to be developed in which post-harvest starting amounts for the time temperature sum of specific cultivar-varieties can be accessed.
APP433-2_REQ02	Remaining Time Temperature Sum Norms	Addition to LPA_R002 and LPA_R006: In the process of creating demand descriptions, additionally, the Logistic Service Client has to define the norms for the minimal allowed remaining time temperature sum amount for each cultivar-variety in the shipment, after the demand fulfilment.
APP433-2_REQ03	Time Temperature Sum Service Estimates	Addition to LPA_R002: The Logistic Service Provider has to give estimated minimal and maximum indications of the Time Temperature Sum consumption for the logistic services they offer.
APP433-2_REQ04	Search and match offers and demands	Addition to LPA_R003 and LPA_R005: The Time Temperature Sum has to be taken into account in the search/match algorithm for offers and demands. This requires access to the initial time temperature sums of the to-be-shipped cultivar-varieties, the remaining time temperature sum norms set by the client and the time temperature sum service estimates defined by the service providers.
APP433-2_REQ05	Set Time Temperature Sum Priorities	Addition to LPA_R004: In the process of prioritizing take the Time Temperature Sum into account
APP433-2_REQ06	Negotiate an acceptable offer regarding remaining Time Temperature Sum	Addition to LPA_R007: In the process of negotiating take into account the remaining time temperature sum as a factor of importance.
APP433-2_REQ07	Impact Change on Time Temperature Sum	Addition to LPA_R011: In the case of changes of plans of the transport chain owner, take the consequences for the remaining time temperature sum of the cultivar varieties in the shipment into account.
APP433-2_REQ08	Replan shipment	Addition to LPA_R014: In the case of replanning take the impact on the expected remaining time temperature sum into account.

3.5.2.2 T433-2: Time Temperature Sum Planning App - Technical Requirements

Req. N.: APP433-2_TREQ01	Title: Logistics Planning App Baseline	Must
Rationale		
Use the Logistics Planning App as a baseline and extent its functionality with additional TTS features.		

Req. N.: APP433-2_TREQ02	Title: Time Temperature Sum Database	Must
Rationale		
A database has to be developed specifically for storing cultivar variety specific time temperature sum reference data.		

Req. N.: APP433-2_TREQ03	Title: Time Temperature Sum Web Service	Must
Rationale		
The time temperature sum reference data from the database has to be disclosed via a SOAP XML web-service that requests time temperature reference data via the VBN/VKC reference code for cultivar varieties.		

Req. N.: APP433-2_TREQ04	Title: Deviation Events	Must
Rationale		
In the case of identification of deviations of norms set, deviation events will be created. Possible data format according to EPCIS. Data has to be consumable by Complex Event Processing Engine.		

Req. N.: APP433-2_TREQ05	Title: Deviation Notifications	Must
Rationale		
In case of deviation, these have to also be communicable via notifications to UI's of relevant stakeholders. These Notifications have to be able to use the devices OS notification service to appear on the device even when the App is not running. Platform notification services that run outside normal application UI like NotificationCompat in Android and UILocalNotification in iOS		

3.6   OPEN CALL Trial T441 Meat Information Provenance Trial Apps

This trial aims at providing and ensuring for various stakeholders (consumers, regulators and meat supply chain participants) reliable and accurate information concerning where a meat product originated (production farm) and how it was affected by its distribution (quality assurance)

Preferably, the maximum number of new partners is two

3.6.1   Required functionalities

In order to achieve the overall goal of the Meat Information on Provenance (MIP) trial, i.e. an efficient, scalable, and decentralized data provision in the meat supply chain that enable tracking (where does a specific meat item come from) and tracing (where are all related meat items), a series of functionalities are described in the following sections.

3.6.1.1   App for populating EPCIS repositories with meat transparency data

Food operators in the meat sector document all traceability relevant steps. To enable traceability data from birth to consumption (i.e. birth, breeding, fattening, slaughtering, cutting, packing/unpacking, sending/receiving and selling) these transparency data generated by the food operator should either be accessible online or passed to a third-party transparency provider/solution provider that will make the data accessible online. The second is a preferred option for small food operators (e.g. farmers) who do not have an internal transparency system. Third-party transparency providers who use the FIspace platform to realise a transparency system provide a web-based FIspace App with which small food operators like farmers can upload transparency data. Data can be formatted using an XSD along with an appropriate documentation. The App should run on devices usually used in the meat industry (i.e. handhelds, PCs and smart phones)

Supply chain actors that have an own (either local or cloud-based) EPCIS solution (i.e. having implemented a repository and the EPCIS interface) do not need this App.

3.6.1.2   App for accessing transparency data by businesses and government (B2B, B2G)

This App shall support standard EPCIS query operations (i.e. queries for specific business locations, processes, products, time intervals, etc.). Moreover the App shall offer a graphical user interface enabling accessing clients to obtain the information they need in a user friendly manner. For instance, by entering or scanning the product and batch/serial number of an end or intermediate product, the solution should be able to provide all information related to that product (e.g. "Where does it come from?" "When did it arrive?" "What raw material was used to produce it?"). Authorized parties such as business partners, authorities or regulators will be enabled to trace where a specific product is – for instance, in case of product recall.

3.6.1.3   Discovery of traceability data sources (incl. administration)

This covers the functionality to discover which business party has information about a specific object (for instance, a product identified via Global Trade Item Number (GTIN) + lot or serial number or a shipment identified via a Serial Shipping Container Code (SSCC)) in order to (re)construct the entire chain of custody of a given end or intermediate product. As such information is of competitive nature, only parties which are both authenticated and authorized shall be allowed to execute such an operation. In this context, an administration application has to be developed in order to allow specifying which companies/authorities (and under which conditions) shall have access to traceability information.

3.6.1.4 Aggregation of traceability information

Based on the functionalities developed in (3.6.1.2) and (3.6.1.3) this functionality covers the automated collection and aggregation of traceability information about a given end or intermediate product and their presentation in a web-based graphical user interface in a user-friendly manner. At least the following information shall be displayed as soon as an authorized requester enters the id of an event that implies a food alert. An example of such an event might be a measured salmonella contagion that exceeds a certain norm. It might involve all products that were at a specific location within a specific time window. In that case the App should receive that event as input and produce all tracking and tracing data that have this event in their "event chain".

    a. place/ date of birth, date/ location of slaughtering of the processed animals

    b. list of all parties who had custody of a product

    c. list of distribution centres/ retail stores a product of concern has been shipped to

3.6.1.5 App for accessing transparency data by consumers (B2C)

This App is a "consumer" variant of the previous App. As a special case of (3.6.1.4), this functionality shall provide an agreed subset of traceability data to end consumers. Thereby, the App consolidates not only dynamic data (date of slaughtering, place of birth, etc.), but also static product (weight, ingredients, e.g.) and party master data (location of the slaughterhouse, e.g.) as well as marketing information (pictures, certificates, videos, etc.) about a given product. It doesn't however allow tracking of products.

3.6.2 EPCIS in MIP

As for a number of reasons (for instance, since EPCIS allows a decentralized, scalable, standards-based approach), the only restriction in order to develop the solution consists in using EPCIS as the underlying standard. EPCIS terms an interface specification for the capture and exchange of dynamic visibility data of objects identified with an EPC. Examples for objects relevant for the agri-food sector encompass products, animals, shipments, documents, locations, returnable transport items as well as assets. It is important to comprehend that EPCIS is data carrier agnostic. EPCIS does not necessarily require RFID technology. It is meant to be complementary to EDI (Electronic Data Interchange, i.e. a standard for electronic exchange of business data from one computer system to another computer system such as orders or invoices).

Each time an EPC identifier is captured, an event is generated containing fine-granular visibility data encompassing four dimensions (Figure 3): what (uniquely identified objects), where (business location and read point), when (time of event) and why (disposition and business process). The events are stored in decentralized databases (EPCIS repositories). An EPCIS repository has a capture interface for storing, as well as a query interface for retrieving event data. The transfer of data through the capturing interface is realized via HTTP, the query interface uses SOAP, XML over AS2 and XML over HTTP(S). All message protocols must be able to use authentication and authorization.

While EPCIS is used to exchange dynamic data (and events are stored in an event repository), static data (i.e. product, location and partner master data) is exchanged separately and is stored in a static data repository (such as an ERP or warehouse management system, e.g.).

What (SGTIN)	Where (GLN)	When	Why
urn:epc:id:sgtin:4000001.011629.2	Dockdoor1, Vendor1	12-12-2013 09:00:00	Goods receiving

Figure 3:   EPCIS data.

The Fosstrak EPCIS Project realised an open source implementation of EPCIS version 1.1 (Figure 4). Additional information on EPCIS can be found at http://www.gs1.org/gsmp/kc/epcglobal/epcis and more on the Fosstrak implementation at https://code.google.com/p/fosstrak/wiki/EpcisMain.

In spring 2014 a new version of EPCIS is expected to be approved that differs from version 1.1 in two major respects. The first will be that next to product identification via SGTIN (Serial Global Trade Item Number) lot based GTINs will be allowed, facilitating to handle products in "lots". The second extension of the EPCIS standard refers to a new EPCIS event type, i.e. transformation event. This enables to handle irreversible events. For instance, a cow can be slaughtered and becomes a carcass, but a carcass can never become a cow again. Many of the events in meat supply chains are in fact irreversible events. Therefore this improvement of the EPCIS standard is essential for the MIP trial.
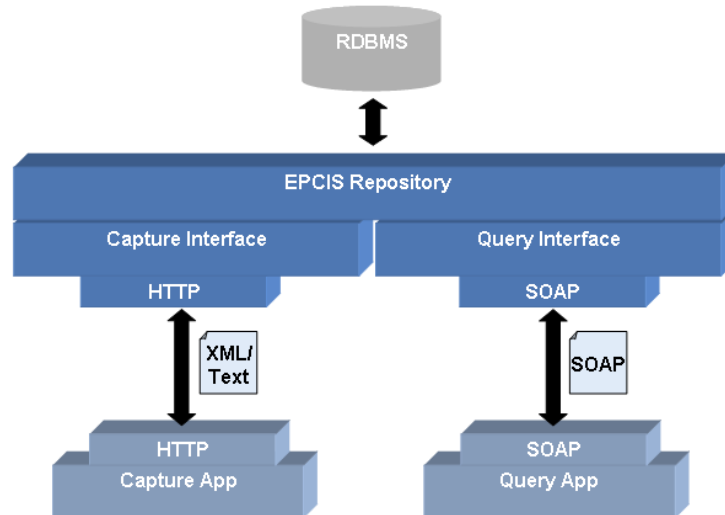

Figure 4.   Overview of the Fosstrak EPCIS Implementation (from http://code.google.com/p/fosstrak/wiki/EpcisMain).

As indicated above, there are five Apps required to (1) capture meat-relevant EPCIS events, (2) to query EPCIS repositories, (3) to discover organizations which have knowledge about a specific object, (4) to consolidate/ aggregate the gathered information, and (5) providing an agreed subset of traceability data to consumers.

Remark: as of end 2013, the new version of the EPCIS standard (V 1.1) will be available which incorporates powerful mechanisms for traceability, especially a Transformation Event, a URI for batch/ lot identification as well as Instance Level Master Data. The FIspace project partners therefore have the opportunity being one of the first implementing these new features.

3.6.3 Trial 441: Opencall_Apps

In section 3.6.1 an overview is given of the required functionalities that enable an efficient, scalable, and decentralized data provision in the meat supply chain. Collaboration between some of the FIspace trials and the development of multi-user Apps in FIspace T450 enable that not all required functionalities have to be developed in the MIP trial or by its new partner(s) that enter FIspace's MIP trial through the open call.

The first functionality that does not have to be developed from scratch within the MIP trial is the *App for populating EPCIS repositories with meat transparency data* (section 3.6.1.1). This functionality will be mainly covered by the Product Information Service – also called PInfS App) that will be developed as multi-user App in T450. This PInfS App should be adapted for its purpose, i.e. populating an EPCIS repository by changing some of the fields and change relevant URI's that guide the EPCIS event to be stored in an EPCIS repository in the cloud.

The second functionality that does not have to be developed from scratch within the MIP trial is the *App for accessing transparency data by consumers* (section 3.6.1.5). An App to provide this functionality will be developed for the TIC trial (T443) by T450. It collects and presents information on product history to consumers. The TIC trial (T443) will adapt it to find the relevant consumer information on a product's history from one or more EPCIS repositories.

The inter-trial collaboration leaves the MIP trial with three Apps to be developed by partners that enter FIspace through the open call (see Figure 5). Table 2 summarizes some details on these three Apps
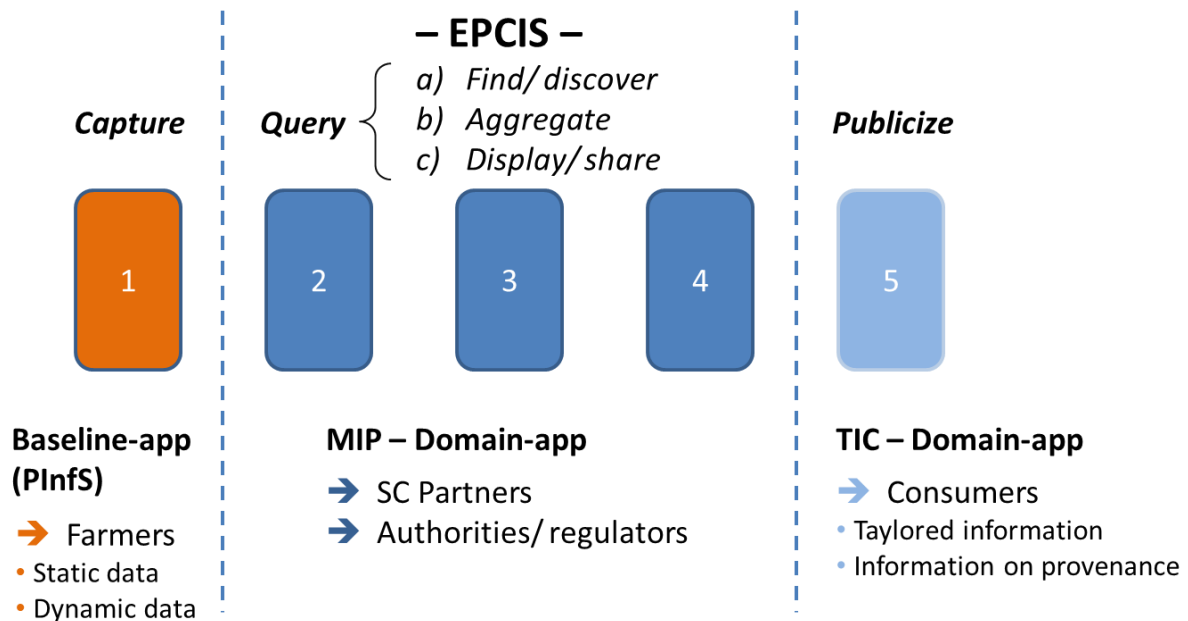

Figure 5:   The functionalities in the MIP trial and the Apps to be developed by partners in the open call.

Table 2: Overview of the Apps to be developed by new MIP partners entering FIspace through the open call.

ID	Title	Description	User	Functio-nality

1	*MeT-raS_App_Que*	Meat Transparency System App for Querying a specific EPCIS repository.
		
		App components:
		⇨ EPCIS repository
		⇨ Database for static product/ party/ location master data
		⇨ User authentication/ authorization
		⇨ EPCIS query interface (SOAP)
		⇨ Graphical user interface which displays – after having entered a product identification + batch/ lot number, the following ques-tions:
		  o "Where does the product come from?"
		  o "When did the product arrive?"
		  o "What raw material was used to produce this product?"
		  o etc.
			Meat supply chain partner, authorities/ regulators	3.6.1.2

2	*MeT-raS_App_Dis*	Meat Transparency System App for discovering data sources (EPCIS repositories) containing infor-mation about specific products. App components: ⇨ EPC Discovery Service which returns a list of addresses of all EPCIS interfaces hav-ing knowledge about a given object identi-fier (an EPC) Remark: a Discovery Service is continu-ously informed by all participating organi-	Meat supply chain partner, authorities/ regulators	3.6.1.3

ID	Title	Description	User	Functio-nality
		zations as soon as an object identifier is either captured for the first time, aggregated/ disaggregated, or transformed into another object identifier) and thus able to ensure chain-wide traceability even if there are multiple aggregation/ disaggregation or transformation processes occurring ⇨ Security Mechanism which ensures that only both authenticated and authorized parties are allowed to see any results ⇨ Administration access to allow all participating organizations to configure which parties are allowed to see which information under which conditions		
3	*MeTraS_App_Agg*	Meat Transparency System App for aggregating traceability information App components: ⇨ Composite service which utilizes *MeTraS_App_Que and MeTraS_App_Dis* (including the security mechanisms) to automatically collect all obtainable traceability information about a given end or intermediate product ⇨ Service which then aggregates the gathered information and presents the information on a web-based graphical user interface in a user-friendly manner. For demonstration purposes, the following information shall be displayed as soon as an authorized requester transmits a product + lot number: a. place/ date of birth, date/ location of slaughtering of the processed animals b. list of all parties which had custody of a product c. list of distribution centres/ retail stores a product of concern has been shipped to	Meat supply chain partner, authorities/ regulators	3.6.1.4

The Apps described in Table 2 are not of equal complexity. The App MeTraS_App_Agg is the most complex one and will require more development effort than the other two.

The MIP team recommends that the two less complex Apps, i.e. *MeTraS_App_Que* and *MeTraS_App_Agg*, should be developed by a single organisation that also can handle the new EPCIS standard version 1.1. The adaptation of the PInfS App can best be done by that organisation and the consumer App will be adapted by the TIC trial. The more complex App, i.e. *MeTraS_App_Dis*, can also be developed by the same or by another IT solution provider.

3.7   OPEN CALL Trial T442 Import and Export of Consumer Goods Trial Apps

The import and export of consumer goods trial addresses multiple types of supply chains that can be differentiated by several dimensions; by the nature of the markets, by product ranges (white goods as well as brown goods) and also by sourcing types (production or trading).

This trial concerns the intelligent management of inbound materials to a production so that only the right material is available at the right time based on consumer demands and the smart outbound distribution to ensure that the finished product is properly positioned to meet consumer demands.

Preferably the maximum number of new partners is one

3.7.1   T442-1: Transport Demand App

Objective:

To improve collaboration between different stakeholders during the transport demand description process and provide the users with visibility on the content of the shipping (transport) units.

Main Features:

The "Transport Demand App (TD)" is used for initial demand description and provides input to "Logistics Planning Services App (LPS)". The main functionality of this App is to store the content of a freight unit (transport demand) and to make it available to users and/or other Apps till the end of the execution of the shipment. It also provides the users with a report which shows the status of the demand description process.

Either shipper or consignee can initiate the process by creating a new transport demand. As a first step, user uploads the information related with the items to be transported to the App either by uploading a file in a specific format or via extraction from back-end systems. Once the items are uploaded to the App, the user should be able to select items to be included in the shipment detail request. At this stage, the status of the process can be viewed as "Shipment details requested". Then responsible user will enter the shipment details in response to this request. Shipment details include preferred transport mode, total gross weight, total volume and total number of packages etc. At this stage, the user can either saves the details and exit or can start planning using a connection to the logistics planning App the shipment if he has a right to do so.

If the user saves the details and exists, the status of the process becomes "Shipment details submitted" and relevant parties are notified about the status change. If the user starts planning the shipment, shipment details need to be forwarded to LPS and then the planning can be done using LPS. In this case the status of the shipment becomes "Shipment planned". The information related with the content of the shipment is stored till the end of the execution process (delivery to final destination point).

3.7.1.1 T442-1: Transport Demand App – Functional Requirements

ReqID	Title	Description
APP442-1_REQ01	User registration	The user should register before using the App
APP442-1_REQ02	User privileges	The user can only be able to perform the actions which he has right to do.

ReqID	Title	Description
APP442-1_REQ03	Identification of status and events related with transport demand description process	Users should be able to track the status of transport demand description process. • Shipment details requested • Shipment details submitted • Shipment is planned
APP442-1_REQ04	Receive notification	Users should be able to receive notification about certain events such as status changes and delays from predefined time limits etc.
APP442-1_REQ05	Request shipment details	Once the purchase/sale order items are uploaded to the App, the user should be able to select the items to be planned and submit a shipment detail request (packing list) for the selected items.
APP442-1_REQ06	Submit shipment details	Users should be able to enter the shipment details manually and save the description in the system.
APP442-1_REQ07	Update transport demand manually	The logistics responsible/user should be able to update the shipping details (if necessary).
APP442-1_REQ8	Submit transport demand to logistics planning App of FIspace	The logistics responsible/user should able to submit the transport demand to Logistics Planning Services.

3.7.1.1 T442-1: Transport Demand App – Technical Requirements

Req. N.: APP442-1_TREQ01	Title: User registration and rights	Must
Rationale		

It should be possible to define user rights and privileges. Rights for the below mentioned activities should to be defined based on user name, occupation, company and role:

- create entry
- view entry
- change entry
- delete entry
- give authorization

Req. N.: APP442-1_TREQ02	Title: Compatibility	Must
Rationale		

The App should be able to run on the most commonly used platforms for mobile devices such as Android and iOS, Windows Phone 8. The App should be able to run on windows explorer and/or chrome.

Req. N.: APP442-1_TREQ03	Title: User Interface	Should
Rationale		

The App should provide a client for user interfaces. The user should be able to:

- select items to request shipment details
- submit shipment details request
- view status of the process
- submit shipment details
- start transport planning (submit transport demand to logistics planning App).

The user interface should be user friendly/easy to use. The screens should be simple and functional to ensure activities can be handled with optimum info processing and minimum clicks.

Req. N.: APP442-1_TREQ04	Title: Store the demand content	Must
Rationale		

App should be able to store data and information such as temporal storage of the content of the freight unit. The database might be one of the most commonly used ones such as Oracle, MS SQL server etc.

Req. N.: APP442-1_TREQ05	Title: Interface to external data sources	Must
Rationale		

The Transport demand App needs input from external data sources. In order to initiate a new transport demand, users have to input information about the products to be transported in the shipment unit. The user should be able to use filtering options to determine the content of input data that will be pulled from the back-end system and/or it should be possible to input the information manually to the App.

Req. N.: APP442-1_TREQ06	Title: Interaction with other Apps	Must
Rationale		

Interaction with Logistics Planning Services App: The Logistics responsible/user should be able to submit the transport demand to Logistics Planning Services Baseline App (LPS) to start the planning process.

Interaction with Shipment Status App: The App should be able to submit the information related with the content of the shipment unit to "Shipment Status App" in case it is requested. Additionally the App should get information about the end of the execution process or alternatively the user can end the process on the App manually.

3.7.2 T442-2: Shipment Status App

Objective:

Provide real-time visibility to the status of the shipment and notify parties according to their points of in-terests.

Main Features:

It is envisioned that this App. will be built upon the features provided by Real-time B2B Collaboration core and can be considered as a report where shippers /consignees track the real time status of their ship-ments. The App provides a searching option by which users can create a list of their shipments of interest to be displayed in a report format. In addition to that users can define their points of interests by subscrib-ing to the predefined events and defining alert rules.

3.7.2.1 T442-2: Shipment Status App – Functional Requirements

ReqID	Title	Description
APP442-2_REQ01	Shipment search	The user should be able to search shipments of interest
APP442-2_REQ02	Event configuration	The user should be able to subscribe to events of interest
APP442-2_REQ03	Transport execution plan	Transport execution plan should be extracted from transport planning App.
APP442-2_REQ04	Cargo tracing and event monitoring	The App must get available tracking and event information for the cargo associated with the book-ing
APP442-2_REQ05	Real-time notifications	The user should receive real-time notifications for requested events and deviations from the plan.
APP442-2_REQ06	Monitor the status of the shipment	The App should provide a user interface that visu-alizes the shipment status together with the notifi-cations in a structured manner
APP442-2_REQ07	View shipment content & status	The users should be able to monitor the status of the shipment of their in-transit stock (products) using this App.
APP442-2_REQ01	Shipment search	The user should be able to search shipments of interest

3.7.2.2 T442-2: Shipment Status App – Technical Requirements

Req. N.: APP442-2_TREQ01	Title: User registration and rights	Must
Rationale		

It should be possible to define user rights and privileges. Rights for the below mentioned activities should to be defined based on user name, occupation, company and role:

- view entry
- change entry
- give authorization

Req. N.: APP442-2_TREQ02	Title: Compatibility	Must
Rationale		
The App should be able to run on the most commonly used platforms for mobile devices such as Android and iOS, Windows Phone 8. The App should be able to run on windows explorer and/or chrome.		

Req. N.: APP442-2_TREQ03	Title: User Interface	Should
Rationale		
The App should provide a client for user interfaces. The user should be able to:		

- search shipments
- view shipments by shipment view
- view shipments by product view
- trigger re-planning

The user interface should be user friendly/easy to use. The screens should be simple and functional to ensure activities can be handled with optimum info processing and clicks.

Req. N.: APP442-2_TREQ04	Title: Interface to external data sources	Must
Rationale		
The shipment status App must have access to external data sources:		

- bookings: status of bookings of the shipment
- tracking information: tracking or other positioning information for the shipment
- event information: events related to shipment

Req. N.: APP442-2_TREQ05	Title: Map services and GeoCodes	Could
Rationale		
The application might have a map service to visualize the location of the cargo on the map. The map service needs to be viewed by the users using web and mobile devices. The visualization of the position of the mobile source on the map can be done online or offline. When the user is not connected to the internet, information about the previous connection can be sent to the server.		
The tracking of the shipment might be done using GPRS data from mobile phones. The geo code information (x,y coordinates) needs to be transformed to meaningful information.		

Req. N.: APP442-2_TREQ06	Title: Interaction with other Apps	Must
Rationale		
Interaction with Logistics Planning Services App: App should get transport execution plan (expected timing of the certain steps in the shipment) from Logistics planning App.		
Interaction with Transport Demand App: The App must be able to get shipment content from Transport demand App and match transport demand detail with shipment status.		

Req. N.: APP442-2_TREQ07	Title: Alerts/Notifications	Must
Rationale		
The user should be define its points of interest and create alert/notification rules and or subscribe to events from a predefined list.		

3.7.3 Trial 442-3: Manual Event and Deviation Reporting App

Objective:

To report shipment status and delay manually in case electronic data extraction from back-end systems is not possible

Main Features:

This application is envisioned to be used by the persons who are responsible from handling the actual execution of the shipment. They are facing the execution process and deviations real-time hence can report them real-time or close to real-time. Also this App is envisioned to reduce the burden of information handling in companies without tracking services.

The user reports the status of the shipment by selecting the status from a predefined list of events. App records the event type and timing of the event. The user can also report a deviation from the plan by selecting the type of deviation from a predefined list and by entering the time period which shows the expected deviation from the initial execution plan. User can also report the reason of the deviation and add notes.

3.7.3.1 T442-3: Manual Event and Deviation Reporting App – Functional Requirements

ReqID	Title	Description
APP442-3_REQ01	Shipment assignment	Once the user logs in, the App might know the shipments assigned to the user. Alternatively the user can enter a unique reference to start reporting.
APP442-3_REQ02	Report events	The user should be able to report the event manually by selecting the event from a predefined list.
APP442-3_REQ03	Send data on events	The App should be to deliver event information to the related components and Apps of FIspace.
APP442-3_REQ04	Report deviations	The user should be able to report the deviation type and how much time the transport execution will deviate from actual plan.

3.7.3.2 T442-3: Manual Event and Deviation Reporting App – Technical Requirements

Req. N.: APP442-3_TREQ01	Title: User registration and rights	Must
Rationale		
It should be possible to define user rights and privileges. Rights for the below mentioned activities should to be defined based on user name, occupation, company and role: ▪ create entry ▪ view entry ▪ change entry ▪ delete entry ▪ give authorization		

Req. N.: APP442-3_TREQ02	Title: Compatibility	Must
Rationale		
The App should be able to run on the most commonly used platforms for mobile devices such as Android and iOS, Windows Phone 8. The App should be able to run on windows explorer and/or chrome.		

Req. N.: APP442-3_TREQ03	Title: User Interface	Should
Rationale		
The App should provide a client for user interfaces. The user should be able to: ▪ report deviation ▪ report event The user interface should be user friendly/easy to use. The screens should be simple and functional to ensure activities can be handled with optimum info processing and clicks.		

Req. N.: APP442-3_TREQ04	Title: Interaction with other Apps and FIspace	Must
Rationale		
The App should be able to submit the status and event information unit to "Shipment Status App" and related FIspace components. The App should be able to get information related with the transport plan from Logistics planning App.		

3.8   OPEN CALL Trial T443 Tailored Information for Consumers Trial APPs

The aim of the Tailored Information for Consumers (TIC) trial is to test and present how we can use all the potential of Future Internet and the FIspace platform to improve food awareness among consumers. This TIC trial aims to develop and experimentation that will help the consumer to be more aware of the food they buy in the supermarket and that they eat. This will be done by focusing on data provision to customers. There are two main information dissemination approaches:

1. The push approach, which enables the retailer to make the consumers aware of information considered relevant for them.
2. The pull approach where consumers get tailored information of a product before/during and after their shopping and getting only the product attributes of their interest according to their consumer shopping profile.

In this trial, the specific Apps to be developed by a new open call partner are the *Shopping list&Recipe App*, the *Augmented Reality Product Info App*, and, finally, the *Push information App*.

Preferably the maximum number of new partners is one

3.8.1   T433-1: Shopping list & Recipes App

This Specific App will allow the consumer to manage its shopping list, and based on product info and consumer preferences, suggest products to elaborate selected recipe.

3.8.1.1 T433-1: Shopping list & Recipes App – Functional Requirements

ReqID	Title	Description
APP433-1_REQ01	Shopping list manage-ment	Add, remove and modify shopping list elements. Different ways to add elements at any place, at any time: scanning picture (product, label...), from a list, from former shoppings…
APP433-1_REQ02	Store the user's shopping list	This list must be storage so that the user can access it at any time and make changes.
APP433-1_REQ03	Recipe storage	Recipes include ingredients (by subcategories of products) and proportions
APP433-1_REQ04	Search a recipe	Search ingredients (products) and proportions to make a recipe. Based on user preferences and product information, products will be suggested
APP433-1_REQ05	Security	All information exchanges should be secured
APP433-1_REQ06	Multi-device	The App should be able to be executed in different devices (smartphone, tablet…)

3.8.1.2 T433-1: Shopping list & Recipes App – Technical Requirements

Req. N.: APP443-1_TREQ01	Title: Recipe recommendation for select-ed products	Must
Rationale		
A system must be developed by which customers access a repository of predefined recipes and search using a selected product or ingredient of that product as search criteria. To accomplish this, a recipe model must be created that considers ingredients from recipes as recipe attributes and this recipe model must be implemented as a database structure. In addition, it must be designed and implemented some mechanisms, to be used by people with technical background, to populate the database of recipes and also to modify and delete recipes if needed.		

Req. N.: APP443-1_TREQ02	Title: Integration with the Product Infor-mation Service	Must
Rationale		
It is required a task to integrate technical developments in the Shopping list & recipe App with applications whose development is already advanced. Specifically, we need a proper integration with the Product Information Baseline App, for the request of product information when a recipe containing this product is selected. As in other TIC Trial applications, an integration task is needed with the FIspace platform. Specifically with the System&Data Integration service (from Task 250) to implement communication channels between FIspace and existing legacy systems in the supermarket and Security, Privacy and Trust system (from Task T270) that allow the Shopping list & recipe App to utilize authentication and authorization mechanisms to control the access to data.		

Req. N.: APP443-1_TREQ03	Title: Validation and testing	Must
Rationale		
A task is required for the validation of the development and integration activities. The validation will go through the launch of the system, initially in a restricted experimental environment, without end users, and finally, operated in a supermarket environment. The establishment of a test plan is also required. It must be created during the design of the application, and it will define the features that will be developed, the specific tests to be performed to verify the proper operation of each feature and finally, the metrics to determine if the results of the tests conclude that the implementation of the functionality is working properly.		

3.8.2   T443-2: Augmented Reality Product Info App

This Specific App will allow the retailer to push specific information (offers, alerts, birthday greetings...) to the consumer, and the consumer to access tailored product information at the supermarket in its mobile device by means of augmented reality.

3.8.2.1 T433-2: Augmented Reality Product Info App – Functional Requirements

ReqID	Title	Description
APP433-2_REQ01	User registration	Consumers could access the application in three different modes: • Anonymous • Registered with fidelity card • Registered without fidelity card
APP433-2_REQ02	Profile configuration	Users must configure their profile to set the information type they would like to receive. User profile should be common to other Apps such as the Product Information App. The possibility that a consumer has an empty profile should be covered.
APP433-2_REQ03	User presence at the supermarket	Consumers will be identified by a QR code when they enter the supermarket.
APP433-2_REQ06	Product pattern/ System training	So as to recognize products, product pattern should be stored. The pattern storage and training method should be easy for the retailer.
APP433-2_REQ07	Product recognition	Product should be recognized (based on its shape, on the product label…)
APP433-2_REQ08	Show information (Augmented reality)	Information tailored to user criteria should be shown in the mobile device screen superposed to the image of the products the user is scanning. Information shown should be structured in three layers: • **General info:** product description, brand, price... • **Profile target:** Depending on the user profile, different product information will be shown, for example, if the consumer is interested in low fat products, information about its fat, calories or saturates will be shown. The information must be shown in an attractive way (for example by means of graphs, colour codes…) • **Individual target:** Personal product info will be shown. So as to avoid showing too much information detail at the same time, the App should show the main info in one screen and allow the user to select part of it to get further detail.
APP433-2_REQ09	Connection with retailer ERP	Information to be pushed to the client will be gathered from retailer ERP.
APP433-2_REQ10	Connection with the FIspace Baseline Apps	This App should make use of the capabilities provided by the FIspace Baseline Apps, mainly those provided by the Product Information Service Baseline Apps.
APP433-2_REQ11	Product attributes	Product attributes will be those defined in the FIspace ecosystem

ReqID	Title	Description
APP433-2_REQ12	**Security**	All information exchanges should be secured (making use of the FIspace platform security capabilities)
APP433-2_REQ12	**Multi-device**	The App should be able to be executed in different devices (smartphone, tablet…)
APP433-2_REQ13 *Desirable*	Logo recognition	Product patterns should also recognize and prompt information associated to product logos

3.8.2.2 T433-2: Augmented Reality Product Info App – Technical Requirements

The Augmented Reality Product Info App has to fulfil the following technical requirements. These requirements are based on the ones defined in the previous section and they focus in the technical aspects of the behaviour and performance of the application

Req. N.: APP443-2_TREQ01	Title: Augmented push-based information system	Must
Rationale		

It is needed a mechanism that enables the information to be represented in an attractive and easy to access way.

Thus, it is required to integrate the Augmented Reality Product Info App with the Push information App.

Req. N.: APP443-2_TREQ02	Title: Product pattern storage and training	Must
Rationale		

The application must provide a mechanism to store new product patterns, which can be product shapes, logos, labels or barcodes/QR codes. This mechanism will enable the training process, by which the Augmented Reality Product Info application recognizes these patterns and assigns them to specific product IDs. As the supermarket deals with 500 different products in offer, the developed application must support this quantity of product patterns.

Req. N.: APP443-2_TREQ03	Title: Product recognition based on patterns	Must
Rationale		

The application must provide a scalable way to recognize products based on stored patterns. The Augmented Reality Product information must work even with 500 different stored patterns of supermarket products.

The recognition error must not represent an impediment to the realization of the shopping process.

Req. N.: APP443-2_TREQ04	Title: Augmented reality information representation	Must
Rationale		

Information tailored to user criteria should be shown in the mobile device screen superposed to the image of the products the user is scanning.

In addition to display information it is required a functionality by which the user interacts with this information so that touching it on the mobile screen enables information changes (for example, display more details about the selected information, while other information is reduced).

User actions will be recorded in a *registry* system, which will be accessible by the supermarket to observe user behaviour and detect errors in the use of the application.

Req. N.: APP443-2_TREQ05	Title: Logo recognition and information representation	Could
Rationale		
Product patterns should also recognize and prompt information associated to product logos. Logo information can also be useful to increase the product recognition rate.		

Req. N.: APP443-2_TREQ06	Title: Delay in product recognition	Should
Rationale		
The time range from the initiation of product recognition to the representation of the product information in the screen must to ensure the user's flow of thought is seamless. Users can sense a delay, and thus know their mobile device is generating the outcome, but they still feel in control of the overall experience and they are moving freely rather than waiting on the mobile screen. The application should be scalable enough so that this delay is respected even when the application deals with 500 different stored patterns.		

Req. N.: APP443-2_TREQ07	Title: Integration with the Product Information Service	Must
Rationale		
It is required a task to integrate technical developments in Augmented Reality Product Info with applications whose development is already advanced. Specifically, we need a proper integration with the Product Information Baseline App, for the request of tailored product information to be represented with augmented reality technologies. An integration task is needed with the FIspace platform. Specifically with the System&Data Integration service (from Task 250) to implement communication channels between FIspace and existing legacy systems in the supermarket and Security, Privacy and Trust system (from Task T270) that allow the Augment Reality Product Info App to utilize authentication and authorization mechanisms to control the access to data.		

Req. N.: APP443-2_TREQ08	Title: Validation and testing	Must

Rationale		

A task is required for the validation of the development and integration activities. The validation will go through the launch of the system, initially in a restricted experimental environment, without end users, and finally, operated in a supermarket environment.

The establishment of a test plan is also required. It must be created during the design of the application, and it will define the features that will be developed, the specific tests to be performed to verify the proper operation of each feature and finally, the metrics to determine if the results of the tests conclude that the implementation of the functionality is working properly.

3.8.3   T443-3: Push information App

This Specific App will allow the retailer to push specific information (offers, alerts, birthday greetings...) to the consumer, as well as alerts regarding product issues.

3.8.3.1 T 433-3: Push information App – Functional Requirements

This Specific App is defined considering the following requirements:

ReqID	Title	Description
APP443-3_REQ01	User registration	Consumers could access the application in three different modes: • Anonymous • Registered with fidelity card • Registered without fidelity card
APP443-3_REQ02	Profile configuration	Users must configure their profile to set the information type they would like to receive. User profile should be common to other Apps such as the Product Information App. The possibility that a consumer has an empty profile should be covered.
APP443-3_REQ03	User presence at the super-market	Consumers will be identified by a QR code when they enter the supermarket.
APP443-3_REQ04	Define information to push to the clients	The retailer must configure which information they want to push to the consumers. Information to push can be at three different levels: • **General info** (timetables, product information such as offers…) • **Profile target:** Depending on the user profile, different product information will be pushed (for example, if the consumer profile indicates he is allergic to wheat, offers on products without gluten will be pushed to him). This should be done by a consumer profile/product info matching module that based on this matching is able to recommend products that best suit consumer profile. • **Individual target**: Personal product info (such as vouchers) will be sent.
APP443-3_REQ05	Push info	Push information messages to the client once he is identified by the QR code when entering the supermarket. The information must be pushed in an attractive and easy to access way.

ReqID	Title	Description
APP443-3_REQ06	Alert notification	When a food alert arises, the app will push this alert to the consumers. Alert notification can be at two different levels: • **Global alert:** the app transmits an alert message of general interest from the competent authority. • **Targeted alert**: the App checks if there are users that have acquired the product, identifies affected users and obtains affected users' data, and, finally, notifies the users and gets confirmation back
APP443-3_REQ07	Connection with retailer ERP	Information to be pushed to the client will be gathered from retailer ERP.
APP443-3_REQ08	Connection with the FIspace Platform	This App should make use of the capabilities provided by the FIspace Platform, mainly regarding event-handling capabilities.
APP443-3_REQ09	Security	All information exchanges should be secured (making use of the FIspace platform security capabilities)
APP443-3_REQ10	Multi-device	The App should be able to be executed in different devices (smartphone, tablet…)

3.8.3.2 T443-3: Push information App - Technical Requirements

Req. N.: APP443-3_TREQ01	Title: Push-based information system	Must
Rationale		

It is needed a mechanism that enables the supermarket administrator to introduce information to be pushed in the three different levels explained in APP443-3_REQ04 (General info, Profile target, Individual target). The information must be pushed and represented in an attractive and easy to access way.

Provide a Web Service interface (SOAP or REST) that can be used by other applications such as the ERP for automatic information pushing depending on context information, user profile and whether the user is in the supermarket.

Req. N.: APP443-3_TREQ02	Title: Reliable alert notification	Must
Rationale		

If any food alert arises, the FIspace platform should communicate it to the retailer that will contact affected customers. The requirement of the push information App is to provide a reliable channel for alert notification to customers.

To do that, it will be needed an integration task with the FIspace platform. Specifically with Exception Handling function, for the provision of food alerts notifications to customers (exception handling and monitoring),

Req. N.: APP443-3_TREQ03	Title: Validation and testing	Must

Rationale
A task is required for the validation of the development and integration activities. The validation will go through the launch of the system, initially in a restricted experimental environment, without end users, and finally, operated in a supermarket environment. The establishment of a test plan is also required. It must be created during the design of the application, and it will define the features that will be developed, the specific tests to be performed to verify the proper operation of each feature and finally, the metrics to determine if the results of the tests conclude that the implementation of the functionality is working properly.

4   Integration Plan for new partners

So as to integrate new App developer partners in the consortium a number of tasks in the administrative, educational and technical field should be carried out. The integration plan will be structured in three phases:
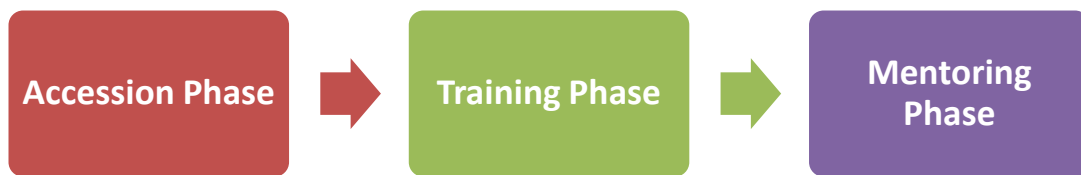

Figure 6.   Integration phases

1. **Accession Phase:** necessary administrative management will be made so as to include new partners in the project (contract amendment, consortium agreement…) and also include them in all communication tools and allow access to repositories. It lasts from communication to new beneficiary about its success in the open call to the time all administrative documents are signed

2. **Training Phase**: Administrative and technical "mentors" will be defined for this phase, which will be the reference point for new partners in relation to administrative and technical issues regarding FIspace. General and specific training will be given to instruct new partners on the FIspace platform, technologies, infrastructure and the relevant trials. It will last 4 weeks

3. **Mentoring Phase**: In this phase, till the end of the project, the new partners will receive on-demand technical support to carry out their activities in the project.