Deliverable D400.2

Progress report on trial experimentation and App development and initial plan for Phase 3 rollout

WP 400

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Abstract

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 work in the future. These 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.

The project will lay the foundation for realizing the vision and prepare for large-scale expansion, complying with the objectives and expected results of the Phase II use case projects. To achieve these outcomes the project will focus on the following four primary work areas, for which the main concepts and approach are outlined below:

1. **Implement the FIspace as an open and extensible Software-as-a-Service solution** along with an **initial set of cross-domain applications** for future B2B collaboration, **utilizing the Generic Enablers** provided by the FI PPP Core Platform
2. **Establish Experimentation Sites across Europe** where **pilot applications are tested in early trials** from the **Agri-Food and the Transport and Logistics** domains
3. **Provide a working Experimentation Environment** for conducting **early and large-scale trials** for Future Internet enabled B2B collaboration in several domains, and
4. **Prepare for industrial uptake and innovation enablement** by pro-active engagement of stakeholders and associations from relevant industry sectors and the IT industry.

This document is being submitted as specified in the FIspace Description of Work (DoW) as part of deliverable D400.2 - detailed experimentation plans and initial work plans, including App development. The document provides an overview of the experimentation plans of the eight trials proposed for the FIspace project and includes a detailed set of work plans for the work package. Included in the document is an overview of the domain/trial specific apps that are proposed for development in the project and that provide the unique functionality required by each trial to perform the business activities described in their experimentation plans.

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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)	

Abbreviations

App	Application
B2B	business to Business
BPM	Business Process Management
D	Deliverable
DLO	Dienst Landbouwkundig Onderzoek
DoW	Description of Work
e.g.	Exempli gratia = for example
EC	European Commission
EDI	Electronic Data Interchange
EPCIS	Electronic Code Information Service
ESB	Enterprise Service Bus
EU	European Union
FFV	Fruit Flowers Vegetables
FI PPP	Future Internet Public Private Partnership
FIA	Future Internet Assembly
FP7	Framework Programme 7
GA	Grant Agreement
GE	Generic Enabler
GLN	Global Location Number
GPS	Global Positioning System
GUI	Graphic User Interface
i.e.	id est = that is to say
ICT	Information and Communication Technology
IP	Intellectual Property
IPR	Intellectual Property Rights
ISO	International Standardization Organization
KPI	Key Performance Indicator
LDD	Large Digit Display
LSC	Logistics Service Consumer
LSP	Logistics Service Provider
M	Month
MIP	Meat Information Provenance
PC	Personal Computer
PInfS	Product Information Service Baseline App
QR-code	Quick response code
RFID	Radio Frequency Identification
RTD	Research and Technological Development
SDK	Software Developer Kid
SLA	Service Level Agreement
SME	Small and Medium Sized Enterprise
ST	Sub-Task
T	Task
TIC	Tailored Information for Consumers
TTS	Time Temperature Sum
WP	Work Package

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Disclaimer

1 Introduction

Insights gained in Phase 1 of the FI-PPP emphasize the need for novel ICT solutions that allow radical improvements for collaboration in business networks. Numerous sectors demand such solutions including the Agri-Food and Transport and Logistics industries, which are the focus of the FIspace project. This project leverages the outcomes of two complementary Phase 1 use case projects: FInest and SmartAgri-Food. The aim of the project is to pioneer fundamental changes in how collaborative business networks work in future.

Modern business is characterized by cross-organizational business networks where several actors need to interact in order to achieve common, as well as individual, business goals. When conducting business in such highly networked, often border-crossing, dynamic and competitive environments, it becomes crucial for the involved actors – which can include commercial enterprises of any size, public authorities, associated service providers (e.g., financial institutions or insurance companies), etc. – to collaborate in an efficient, effective, secure and trustworthy manner, i.e., to exchange information and communicate among each other in order to coordinate their business activities.

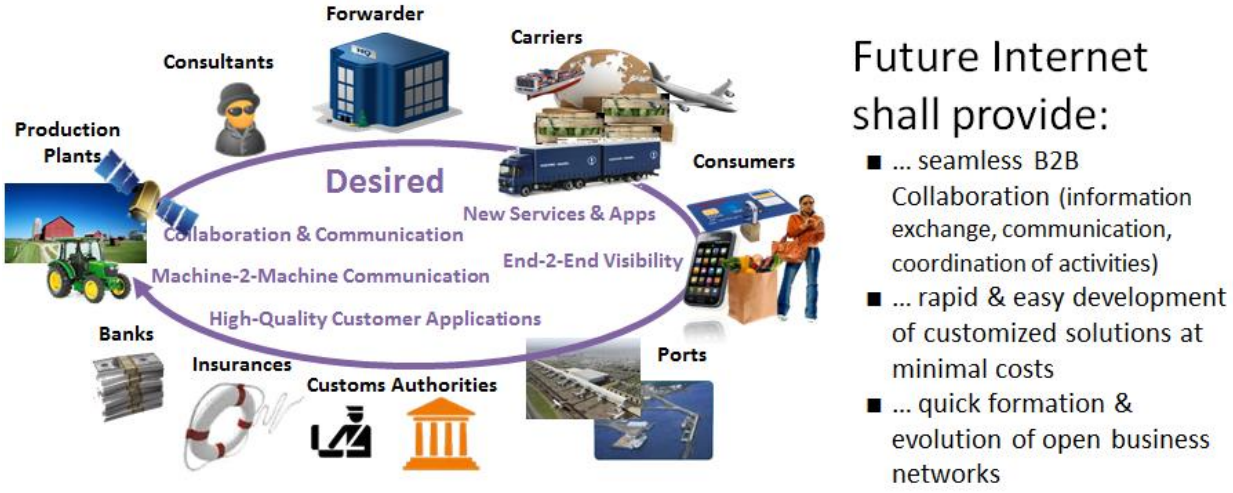

Figure 1: Desired Collaborative Business Network and the needs for the Future Internet

Current ICT solutions do not provide adequate support for collaborative business networks. The vast majority of existing and currently employed IT solutions focus on supporting the internal business activities of individual actors, while interaction with business partners is limited to manual efforts using e-mail, phone, and fax, or only partially supported through EDI. In addition, monitoring and managing of business processes still heavily relies on human involvement, leading to high latencies between the occurrence of a business event in the real-world and its observation by IT systems, and thus other stakeholders along the value chain. This results in the unsatisfying situation where there is only limited end-to-end visibility in collaborative business networks, with unacceptably high manual coordinating efforts required by each involved stakeholder leading to the establishment of mainly closed partner networks. Closed networks particularly disadvantage SMEs who generally do not have the financial or technical means for entering these networks and collaborating with larger organizations.

Novel ICT infrastructures that enable seamless B2B collaboration and facilitate the creation of dynamic and open business networks are needed – not to merely overcome today's technical deficiencies, but in order to pave the way towards truly collaborative business networks in the future. Such a future can be realized by exploiting the capabilities of Future Internet technology developed within the FI PPP programme. These technologies allow, for instance, the gathering of real-world data via smart sensors (Internet of Things), cost-efficient development of value-added applications by orchestrating existing ones (Internet of Services), and ubiquitous access via Cloud infrastructures.

1.1 Project structure and key activities

In order to achieve its goals, FIspace leverages and capitalizes on the outcomes of two successful Phase I use case projects – FInest and SmartAgriFood –, as well as the Generic Enablers available from the FI PPP Technology Foundation ("Core Platform") projects (FI-WARE and its successor).

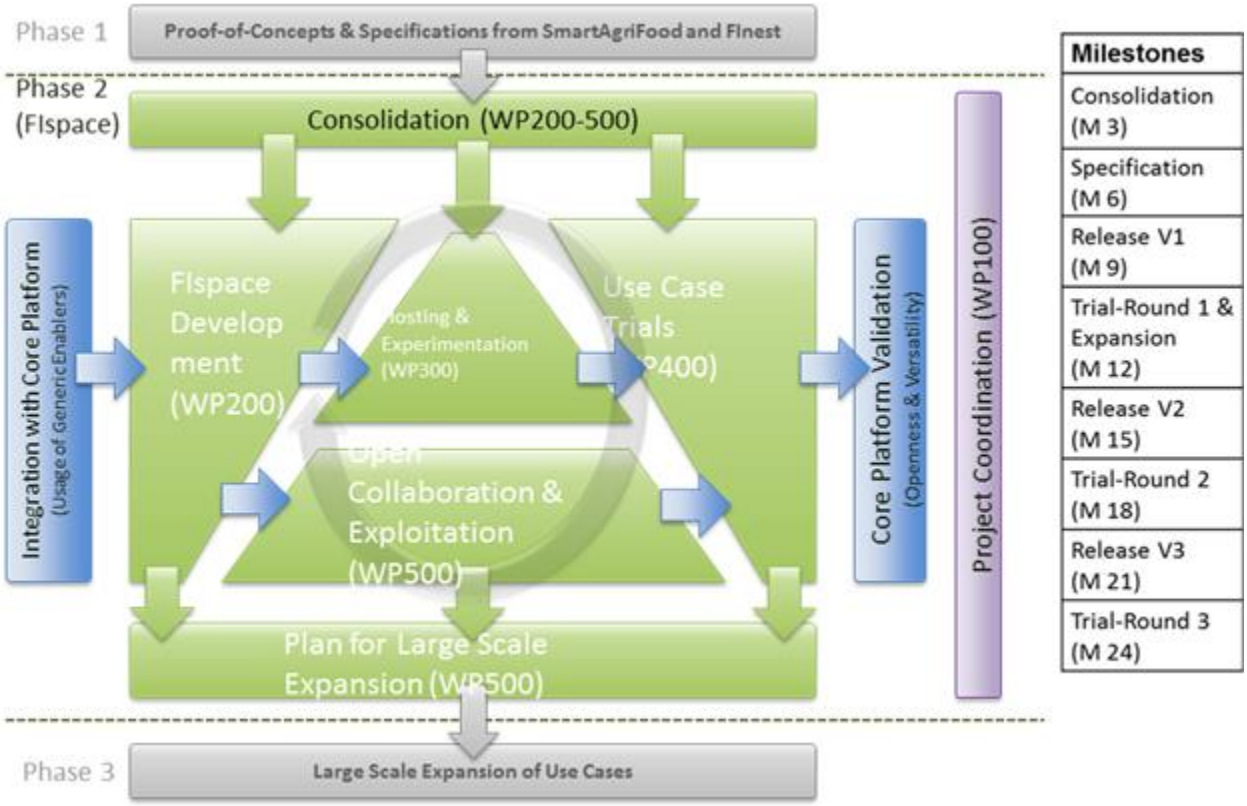

Figure 2: The work in FIspace follows three major work streams

Workstream 1: The major work stream in FIspace is devoted to **solution development, trial experimentation and use case expansion** (depicted from top to bottom in Figure 2). It is subdivided into:

- **FIspace Development (WP200)**, which addresses the iterative design, implementation and testing of the software components implementing the FIspace service, while incorporating feedback from users and developers, thereby ultimately enabling the App ecosystem;

- **FIspace Hosting & Experimentation (WP300)**, which is responsible for setting up compute infrastructures, deploying the FIspace software components (developed in WP200) and Apps (developed in WP400) including the deployment of the required Core Platform Generic Enablers, as well as for providing experimentation support and enablement to the use case trials (in WP400);

- **Use Case Trials (WP400)**, which define cross-domain use cases and specifies, sets up, and executes use case trials to demonstrate the FIspace capabilities and benefits in the real-world; this WP thus includes the development of Apps and the connection of trial-specific, local infrastructure (e.g., in-the-field systems and devices) to the FIspace software components (hosted by WP300). Two types of Apps will be developed: (1) general purpose **baseline Apps** (i.e., Apps required by stakeholders across several domains), (2) **domain Apps** needed for conducting specific use case trial experiments.

- **Open collaboration & Exploitation (WP500)**, which will foster early uptake of results and drive the creation of an eco-system around FIspace, including dissemination, exploitation and standardization; this WP will also coordinate and prepare guidelines and plans for large scale expansion of platform usage involving relevant stakeholder groups.

1.2 WP400

1.2.1 Use case trials and domain Apps (WP 400)

WP 400 focuses on leveraging and extending work performed in Phase I of the FI PPP program to setup trial sites for real world use cases and to exploit those sites for conducting initial use case experiments (with the support of WP 300) to determine and demonstrate whether the FIspace solution and the underlying Generic Enablers being utilized are capable of delivering benefits and utility in the real-world.

Based on the needs of the use case trials themselves, baseline and domain Apps will be developed (as part of WP 400) so that the trials can be performed and the ecosystem business model envisioned for the FIspace service tested. In addition, where needed, trial-specific, local infrastructure (such as in-the-field sensors and devices) will be set-up and linked to the FIspace components hosted by WP300.

Overall, WP 400 is decomposed into 3 primary types of tasks as depicted in Figure 3:

- **Design, setup, and execution of use case trials**: This includes defining cross-domain use cases and the set-up and execution of use case trials. Overall eight use case trials are proposed:
  - **Farming in the Cloud (Task 420)** addresses (1) the intelligent application of pesticides to improve crop protection and information sharing, and (2) the improvement of greenhouse operations through the use of IoT devices for monitoring and controlling environmental conditions.
  - **Intelligent Perishable Goods Logistics (Task 430)** looks at (1) the shipment of fish from Norway to continental Europe and the impact that effective planning and re-planning can have on the product, (2) the impact of supply chain deviations on fresh fruit and vegetables, (3) the improvement of the entire supply chain process of flowers to a retailer.
  - **Smart Distribution & Consumption (Task 440)** is concerned with (1) tracking and tracing of meat from the farm to the consumer, (2) the linked management of inbound materials and outbound finished goods optimized with respect to consumer demand, (3) providing consumers with information about the products that they have purchased.
- **Development of general purpose and domain specific applications (Task 450):** The requirements for these Apps are defined in Tasks 420–440. The Apps will demonstrate the extensibility and domain-specific benefits of FIspace during the use case trials.
- **WP Coordination**, which is overseen by **Task 410**.

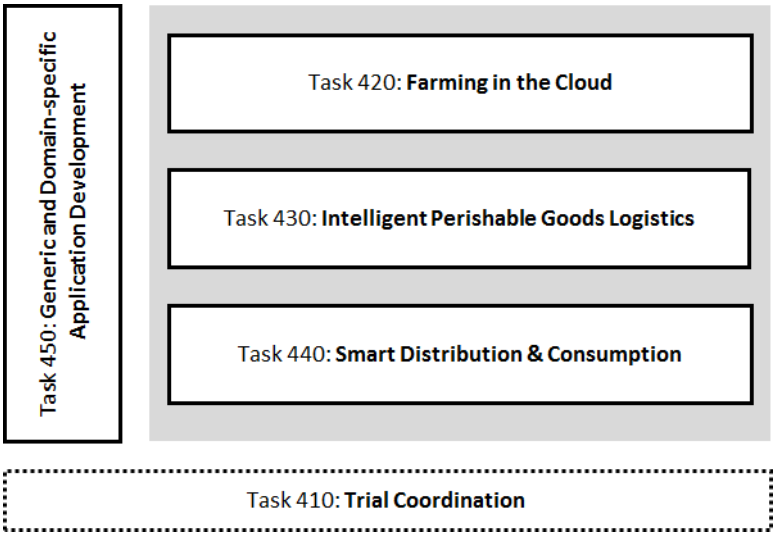

Figure 3: High-level structure of WP400 “Use case trials and domain Apps”

2 400.2 Progress report on Trial expermentation and App development and initial plan for Phase 3 rollout

This deliverable provides a progress report on the development of trial experiments and FIspace Apps as well as an overview of the plans currently being developed for Phase 3 rollout of the FIspace service for the agri-foods and transport and logistics domains. The document provides an overview of the experimentation plans of the eight trials proposed for the FIspace project and includes a detailed set of work plans for the work package. Included in the document is an overview of the domain/trial specific apps that are proposed for development in the project and that provide the unique functionality required by each trial to perform the business activities described in their experimentation plans.

In the sections that follow, each trial presents a progress report on its efforts to date to set-up the trial, develop experiments, perform community outreach and collaborate with other trials. In addition, preliminary plans for Phase 3 rollout of the FIspace service for each trial is discussed. It should be noted that these initial plans for Phase 3 activities will be revised as the project moves forward and results from the experiments become available.

Each trial progress report is concerned with the actual conduct of the defined experiments using the identified experimentation environments, domain specific applications, FIspace services and FI WARE infrastructure. Experimental outcomes, based on clearly defined protocols which are being developed, will be compared to expected outcomes. Results will be documented and feedback made based on achievement of business value, performance of FIspace and FI WARE services and the domain applications. The progress reports include (or will include in the future as experiments are carried out) details on the following:

- Conduct of defined experiments following the experimental protocols
- Documentation of experimental outcomes
- Feedback of experimental outcomes to interested domain partners, FIspace developers, domain application developers and FI WARE developers
- Accommodation for T520 to perform specific trial-based business modeling activities
- Progress monitoring and control of the experimentation and domain application development activities

To align with the Apps functionalities proposed in D400.6 and D400.10, involved partners have made an initial analysis of the Baseline Apps and their relationship to the trials. Alignment of the Baseline Apps with the trials is a work in progress with some trials more advanced in the analysis than others. All the trials will perform the deep inspection and analysis of the Baseline Apps necessary to ensure that these apps are properly developed during the next reporting period.

Achieving the aims of the FIspace project within the two year duration of the project requires close collaboration between the individual trial work groups and the other trials as well between the trials and the other work packages. To harmonize approaches and avoid duplication of effort, the trials will:

- Look for similar business processes within and between each trial
- Avoid parallel and unaligned approaches to App development
- Align on experimentation and testing scope
- Establish a collaborative network among the trials

Harmonizing the activities of WP400 shall ensure an efficient utilization of the provided funds and a high level of productivity for achieving the aims set out in the DoW.

This report also includes discussion of the identification of potential large scale trials, identification of potential additional trial sites and development of a large scale trial rollout plan for Phase 3 of the FI PPP. The initial work on the set-up of Phase 3 actions includes preliminary work on:

- Selection of specific trials that have business value for large scale rollout tests
- Development of rollout test plans for the rollout
- Identification and documentation of rollout site requirements
- Identification of potential rollout sites
- Documentation of the above in a plan for the conduct of large scale trials

2.1 Trial 421 - Crop Protection Information Sharing

2.1.1 Report on Trial Progress

2.1.1.1 Team

The Crop Protection Information Sharing Trial team is composed of the following partners:

- DLO-ASG - Trial lead, Scheduling application and soil moisture sensor system and Agricultural Activity Data Server
- DLO-PRI - Phytophthora advisory applications, including weather data
- Kverneland - Spraying, Real time dose adjustment, Logging and Agricultural Activity Data Server
- LimeTree - Field data, Task Formulation and Recipe Formulation.

2.1.1.2 Activities

This section of the progress report for Trial 421 describes the major activities in which the trial partners were involved for the past six months.

DLO-ASG and LimeTree participated in the kick-off meeting of the FIspace project.

All members of the team have bi-weekly meetings, alternating between face-to-face meetings and conference calls. Members are informed of developments in other work packages of the project and activities in which not all team members have participated.

The trial leader participated in the bi-weekly conference calls of the WP400 management team.

Initial trial meetings have concentrated on a global description of the entire trial. The trial is composed of processes that will be realized in the form of applications. An overall business process model has been developed that shows the required data exchange between applications. Responsibilities for the different applications have been agreed on. Sub-section 2.1.2 of this report describes in more detail the applications that are currently being examined as part of the trial.

A work plan, including the testing of the applications that will be developed in the next six month development cycle, has been developed.

The trial team identified three applications for the open call. These are:

1. Weather scenarios. This is an extension of an existing weather scenario application. The present application uses proprietary methods of data exchange. The open call application will use standardized interfaces and extend the period of prediction.
2. Bad weather warning. This application will provide weather related warnings to spraying operations ased on actual and forecasted weather.
3. What grows here. This application will show the types of crops being grown in the fields around the actual position of the user. Additional information on the fields may be added in the future.

DLO-ASG and LimeTree had extensive discussions with IBM on the use of the Business Collaboration Objects. The Business Process Descriptions of the trial played an important role in developing a mutual understanding of the applications that have to cooperate and interact for the trial.

The trial leader participated in the meeting on “What the FIspace platform should do”. This meeting gave a good insight into the capabilities and boundaris of the platform.

2.1.1.3 App Development

The Crop Protection Information Sharing Trial focused in the first six months of the project on the specification of seven applications, while six additional applications are to be developed in months 7-18 of the project.

The work on the different experiments to be conducted is composed of the following steps:

- Description of the business processes. This is done following the BPMN 2.0 specification.
- Inventory of data flows. The dataflows are iteratively specified. Initially a global description of the data is given, but when the required data is represented in the domain model the XML representation of this data is used as the specification.

- Modeling of the data in a domain reference model. The data used in the Crop Protection Information Sharing Trial belongs to the crop production domain. We use the domain reference model drmCrop, under development in the Netherlands, as the reference model and extend this model with the requirements from this trial.
- Description of the system behavior. For describing the behavior of the system, sequence and state diagrams are used. Sequence diagrams are used to show the behavior between different business processes (i.e., applications). The state diagrams are used to specify the state of individual objects.
- Specification of interfaces. The classes and attributes described in the domain reference model are transformed to an XSD model from which an XSD schema is generated. For each specific interface a selection of classes (and attributes) can be made.
- Test of the interfaces. The interfaces will be tested by implementing the applications as web services and web clients.

The realization of the work on the different Apps is shown in **Fehler! Verweisquelle konnte nicht gefunden werden.**.

Table 1: Progress on the development of different apps of the Crop Protection Information Sharing Trial(Status of August 30, 2013)

Activities / **Applications**	Business Process	Data flow	In reference domain model	System behavior	Interface description	Test
Combine weather data	+	+	+	-	-	
Whole Field Phytophthora Advise	+	+	+	+	+	±
Assemble Field data	-	+	+	-	±	
Recipe Formulation	-	+	+	-	±	
Task Formulation		+	+			
Measure Crop Reflectance	-	±	±	-	-	±[1)]
Measure soil moisture	+	+	+	-	-	

[1)]Only technically, no data interchange.

Combine weather data is, for the moment, being treated as part of the Whole Field Phytophthora Advice application since a custom protocol between the weather application and this application has been implemented. In the open call a version of the weather App will be developed that uses a standards based interface.

The Whole Field Phytophthora Advice application uses a wrapper to exchange information between the application and other applications using dedicated CSV fields.

Assemble Field Data has been implemented in a very simple form through the manual specification of fields and executed operations.

Task formulation converts a coding list to the ISO11783 task file format. This application is currently running. To formulate a task, a number of coding lists are specified. No interfaces are defined for them as it is assumed that these lists are available in the farm management information system that performs task formulation.

Measure Crop Reflectance. Crop reflectance measurements are executed during the late summer season. The data collection system being used is a proprietary system. Conversion to a standard data interchange is still to be specified. The interface requires special attention as a more efficient data transfer approach must be found than the use of XML files.

Measure Soil Moisture. The system to measure soil moisture has been described. The interface for this system also requires special attention as, like for measuring crop reflectance, a more efficient data trans-

fer approach must be specified then the use of XML files. Delivery of wireless sensors is delayed due to a shortage by the manufacturer.

2.1.2 Updated Workplan.

The different steps during App development are extended by “formulation of coding tables”. We experienced that available coding tables for agriculture are not focussed on more advanced applications like the Phytophthora advice. In months 7-12 we will start to finalize interface tests for the applications developed in the first six months and start testing on the FIspace platform with two of the applications, which also use the Business Collaboration Object.

Table 2: Planning of App development and employment. + indicates that this activity is ready, a numberrefers to the month in which it is planned to be ready.

Activities / Applications	Business Process	Data flow	In reference domain model	Coding tables	System behavior	Interface description	Interface Test	GE specification	FIspace platform with GE's	Platform Test
Combine weather data	+	+	+	12	6	12	15	15	18	21
Whole Field Phytophthora Advise	+	+	+	6	+	+	6	9	12	15
Assemble Field data	6	+	+	6	6	6	9	12	12	18
Recipe Formulation	6	+	+	6	6	6	9	12	15	18
Task Formulation	6	+	+	9	6	6	9	12	15	18
Measure Crop Reflectance	6	9	9	9	6	9	9	n.a.	n.a.	n.a.
Measure soil moisture	+	+	+	9	6	9	12	12	15	18
Canopy Specific Phytophthora Advice	9	9	9	9	9	9	12	12	15	18
Scheduling	9	9	9	12	12	15	18	18	18	21
Logging	9	9	9	12	12	15	18	18	18	21
Spraying	9	9	9	9	9	9	12	12	15	18
Real Time dose adjustment	15	15	15	15	15	15	18	18	18	21
Remote monitoring	9	9	9	9	9	9	12	12	15	18

n.a. = not applicable

2.2 Trial 422 - Greenhouse Management and Control

2.2.1 Report on Trial Progress

The main effort since the last Greenhouse Management and Control trial reporting has been focused on the trial specific apps that are to be developed in the context of the trial’s scenarios: their functional and technical requirements, as well as the relationship between them and the functionality that will be offered by the Baseline Applications.

In the D400.1 deliverable, an initial overview of the trial’s specific apps was presented. In the meanwhile, the scenarios have been refined. Moreover, as the Baseline Applications’ specifications are further analyzed, a refinement procedure has also taken place concerning their relationship to the trial.

In the context of the Greenhouse Management & Control trial, five scenarios will take place to demonstrate the FIspace platform functionality. Their updated description on the business layer, as well as high-level technology layers, are presented in the figures below.

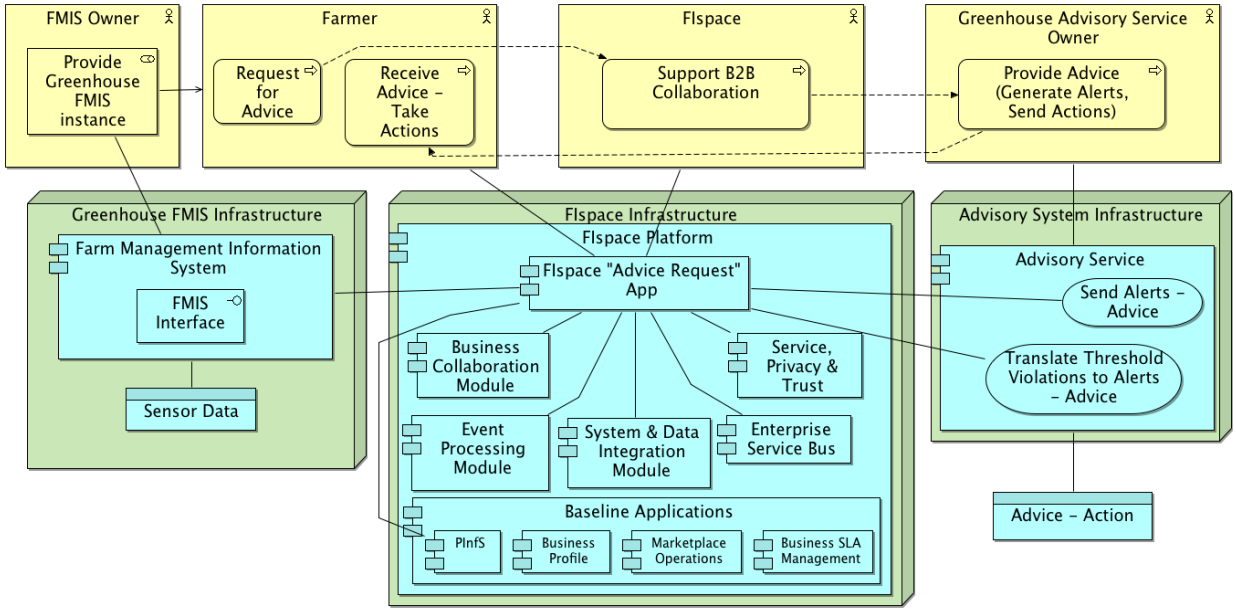

Figure 4: Advice Request

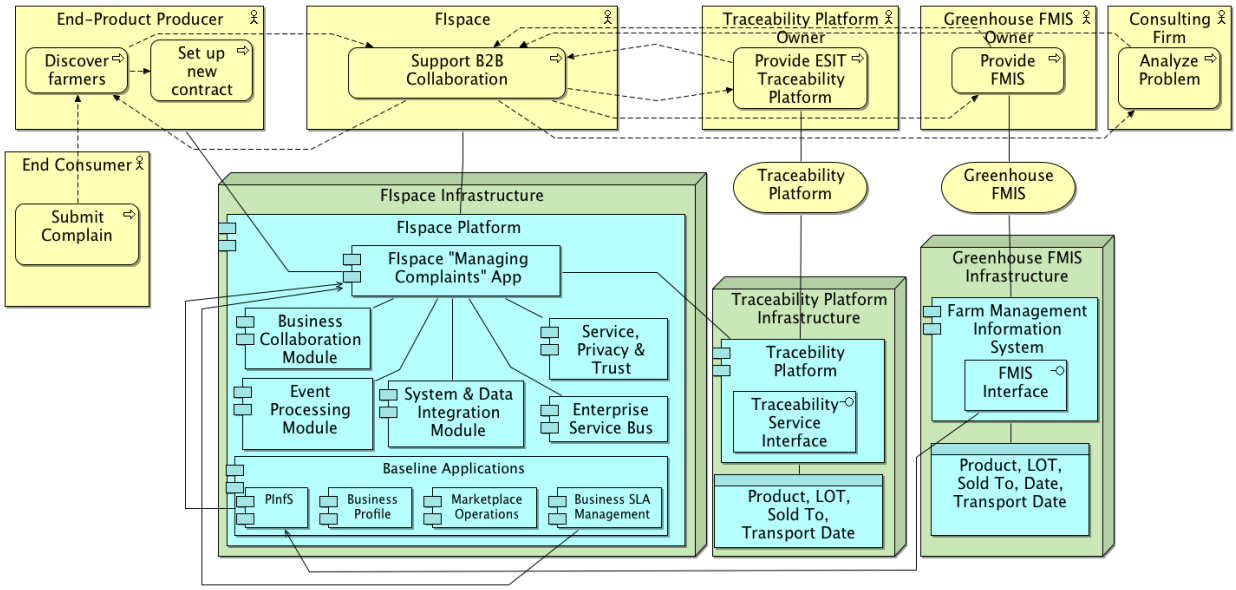

Figure 5: Managing Complaints

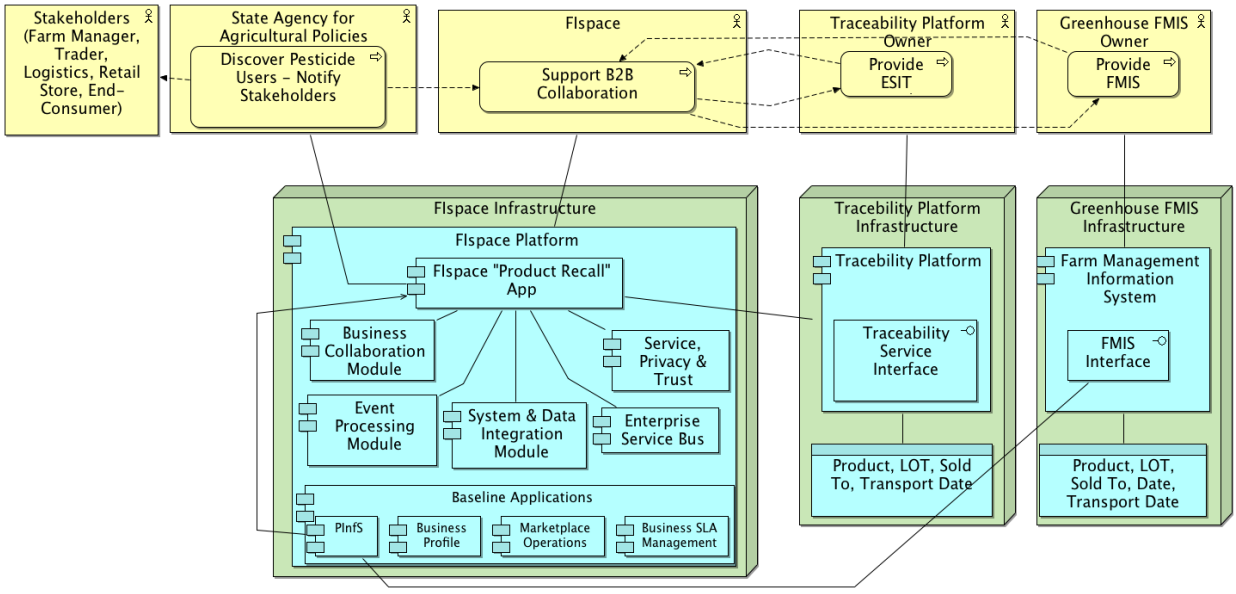

Figure 6: Product Recall

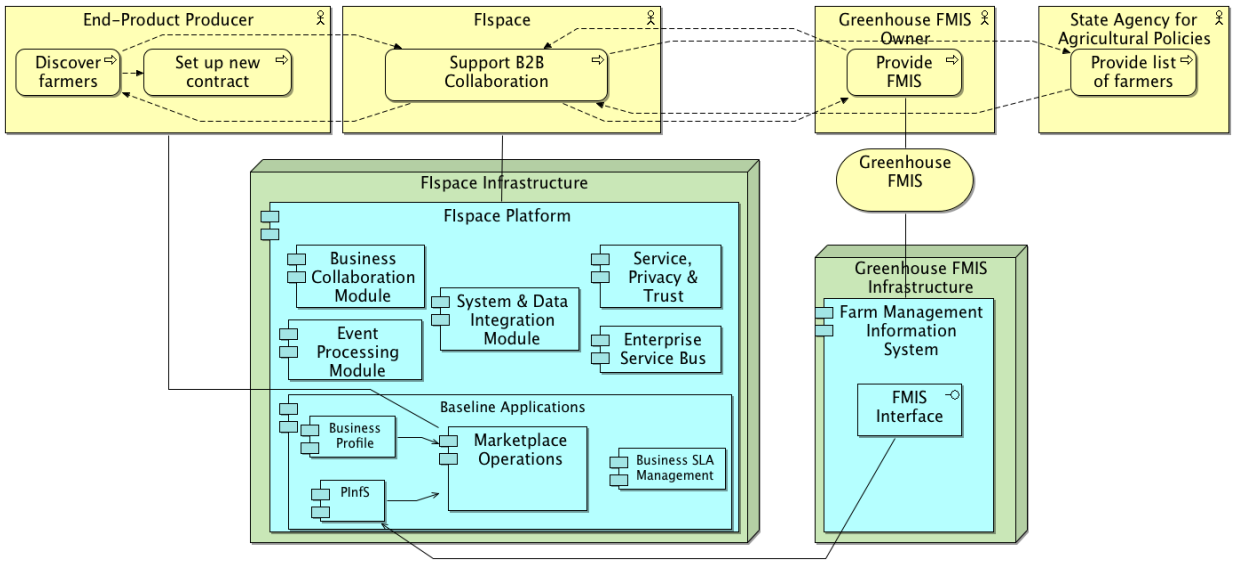

Figure 7: Search for Farmers

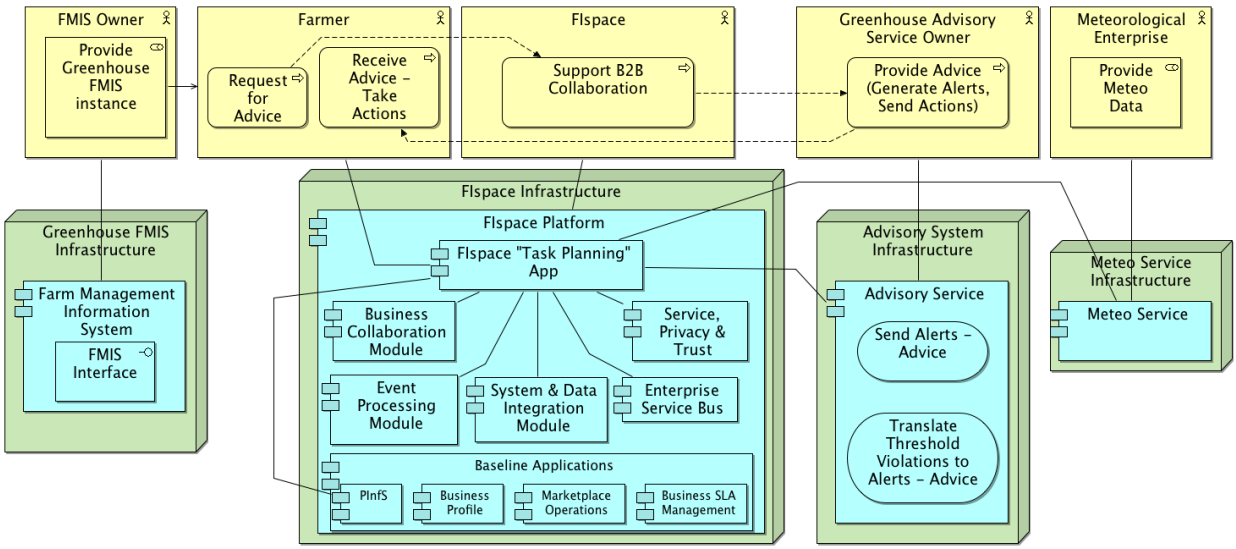

Figure 8: Task Planning

2.2.2 App development

2.2.2.1 Baseline apps

The development of the scenario-specific applications is tightly related to the Baseline Apps, which are to be developed and provided via the FIspace core services. The table below shows which of the five trial specific apps will use partial or full functionality of the Baseline Apps:

Table 3: Greenhouse Trial and Baseline Apps relationship

Baseline App	Scenario
Product Information Service (PInfS)	Advice Request, Search For Farmers, Managing Complaints, Product Recall, Task Planning
Business Profile	Search For Farmers
Marketplace Operations Apps	Search For Farmers
Real-time Business SLA Management	Managing Complaints

The Product Information Service, Business Profile and Real-time Business SLA Management Baseline Apps will provide common services to each use case scenario. The Marketplace Operations Baseline App will act as the main interface for the use case "Search for Farmers." This Baseline App provides all the required functionality for this action and no trial specific app is required.

2.2.2.2 Trial-specific apps

As derived from the above, in the context of the Greenhouse Management and Control trial's scenarios, four domain-specific and one generic Baseline App will be used for the experimentation.

Table 4: Greenhouse Trial app types per scenario

Scenario	App	Type
Advice Request	„Advice Request" app	Specific
Managing Complaints	„Managing Complaints" app	Specific
Product Recall	„Product Recall" app	Specific

Search for Farmers	„Marketplace Operations“ app	Baseline
Task Planning	„Task Planning“ app	Specific

App development for the first version of the specific applications will occur in months six through nine. The specifications of the identified trial specific apps are currently well along. In order to be able to test the basic functionality of the apps for the first phase of the experimentation process, the implementation of the interfaces between the various backend systems will be a primary objective during the next six months.

Mock-ups of the specific apps to be developed have already started being created and will be finalized, before proceeding with the development, in order to properly define and finalize all the functional requirements. An example of the Complaint Management app can be seen in the following figure:

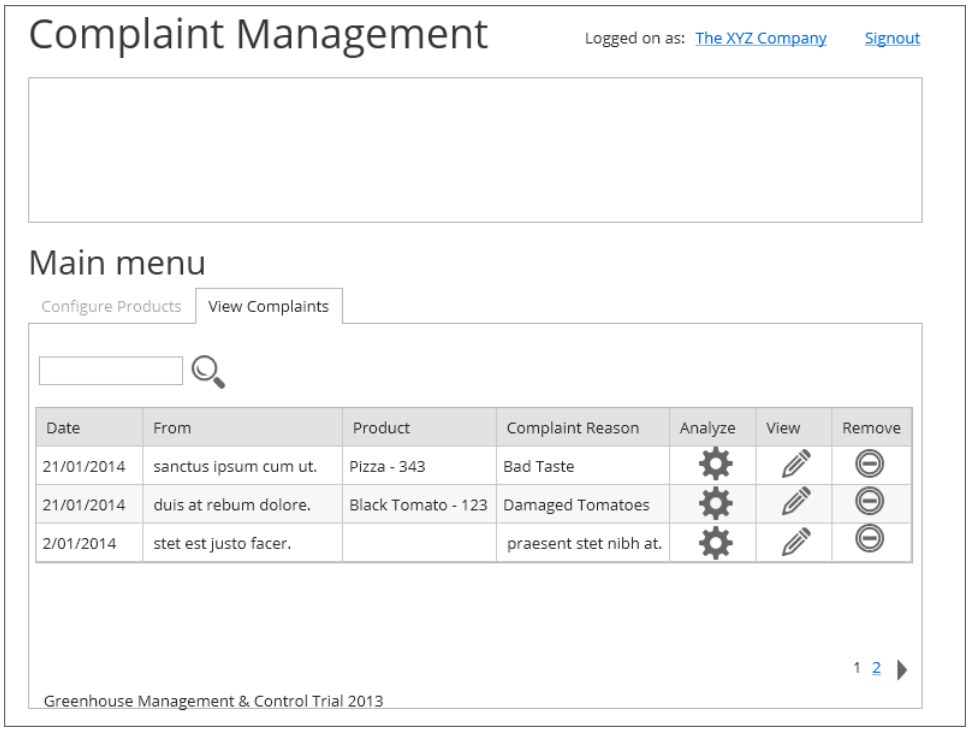

Figure 9. Complaint Management app main screen mock-up example

Development of the component architectures for each of the specific apps will be an essential step in the implementation phase of the trial. The user interfaces will be created once the architectures have been specified in order to properly define the exact functionality of each of the trial specific apps.

All the apps that will be developed and interact within FIspace will use the functionality of the Core Modules of the FIspace platform. Task 280 of WP200 will provide a SDK to App developers to ensure that any App that is developed for the FIspace store properly interacts with the FIspace platform services and can interact with other Apps or lower level systems (e.g., IoT sensors or legacy systems).

By month 10 the first release of the apps providing the basic functionality that will be required, will be ready to support selected scenarios of the Greenhouse Trial. For each one of the specific apps, the experimentation protocol will be followed in order to evaluate the app’s functionality and features. The results of the 1st phase of the experimentation will be aggregated and analyzed in order to further improve the various apps towards the 2nd release for the 2nd phase of the experimentation.

In the next section an updated work plan is presented that includes the app development phase.

2.2.3 Updated Workplan

In the figure below the overall work plan for the Greenhouse Trial is presented. Currently the project is on schedule and all milestones have been met. In addition, the relation between the trial and the four different Baseline Applications has been identified.

Figure 10: Overall Work Plan for Greenhouse Trial (M1 – M24)

A detailed work plan for the trial through month twelve is presented below showing all relevant milestones.

Table 5: Detailed Plan for M6 - M12

Month	Description
M6, September 2013	• The equipment to be installed in the Greenhouses will be gathered. • The number and type of sensors per Greenhouse is already defined. The preparation of the experimention sites will begin. • Any final details regarding the sites will be taken care of as well (broadband connection etc.). • The installation will begin after mid of September. • Some of the specific app interfaces will be already finished. The rest specific app interfaces will begin being implemented.
M7, October 2013	• The installation of the equipment will continue until end of October. • In the meanwhile, the first testing from the already set-up experimentation sites will start taking place. • The development of the specific apps will continue.
M8, November 2013	• Any last details of the equipment installation will be taken care of. • The communication testing between the implemented interfaces will continue. • The development of the specific apps will continue and start adopting any FIspace functionality provided until then • Depending on the progress of the FIspace platform and components (e.g. Event Processing Module), testing between the experimentation sites (legacy systems) and FIspace will start.
M9, December 2013	• Results from the first testing phase of the experimentation sites (data reception, interfaces etc.) • Continue integrating FIspace components' functionality (use SDK guidelines etc.)

Month	Description
	into the specific apps • Preparation for the experimentation for M10
M10, January 2014	• 1st release of specific apps will available with basic functionality • Experiment realisation will start for selected scenarios • First results analysis
M11, February 2014	• Continue experimentation for all scenarios • Continue integrating FIspace components' functionality towards release No2 of specific apps • Continue logging of results
M12, March 2014	• Finalizing experimentation phase 1 • Continue integrating FIspace components' functionality towards release No2 of specific apps • Finalization and gathering experimentation results for analysis

With regard to the large scale expansion of the Greenhouse Management and Control Trial, all the trial partners will contribute in demonstrating the trial's value to the wider Greenhouse community. Over the next several months of the project, in coordination with WP 500, a coordinated large scale plan will be developed and provided.

2.3 Trial 431 - Fish Distribution and (Re-) Planning

The Fish Distribution and (Re-)Planning trial is concerned with the planning of logistics and transport activity in the fish industry, a crucial process for ensuring performance across the whole supply chain. The main challenges addressed are low predictability of transport demand 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 (carrier, terminal). Furthermore, data quality at the planning phase is essential for enabling effective monitoring of transport execution.

The initial description of the trial can be found in FIspace deliverable D400.1.

2.3.1 Report on Trial Progress

The work on the trial has been focused on refining the storyline with the use of baseline and proposed trial-specific apps, outlining the challenges that the trial will look into, as well as discussing some performance indicators that can be used to measure improvements in the trial experiments.

2.3.1.1 Updated storyline

The storyline of the trial has been updated to include the intended use of the different FIspace apps.

Main actors

The main actors in the storyline are:

1. **NCL**: the **container ship operator** that provides feedering services from the Norwegian coast to Europe, including the voyage of focus in the scenario from Ålesund to Rotterdam (part of a regular route), served by the vessel Clarissa.
2. **APL**: **Overseas operator** that uses the FIspace platform for sending reservations to short sea carriers, confirm a specific booking to NCL for the Clarissa voyage (from Ålesund to Rotterdam), then cancel the shipment due to lack of export license.

3. **MSC**: **Overseas operator** that works on behalf of the fish exporter that registers a late need for transport, due to a recent deviation in own transport plan (requiring the cargo to leave Ålesund today instead of tomorrow).
4. **Tyrholm and Farstad** (T&F): **Forwarder** with minor roles in the trial, and works on behalf of the fish exporter to book a shipment. As the departure date approaches, FIspace detects a high probability of cancellation, based on information like cargo location and booking history. This detection of possible cancellation enables NCL to anticipate and open for more shipment bookings before it is too late.

Storyline

The storyline is concerned with setting up a normal fish transport from Norway to Brazil, where the trial looks specifically into the feedering from Ålesund on the Norwegian coast to the deep-sea port Rotterdam in the Netherlands.

A deviation occurs, due to the lack of an import license; this means that the cargo cannot be loaded onto the ship. In order to utilize the now empty transport space, the carrier trys to find demands for transport that can be used as a replacement for the cancellation.

The main steps for the trial are the same as reported in D400.1. The list below connects intended use of FIspace apps to the steps.

1. Fish exporters use the Fispace platform to publish demand for container shipping on marketplaces.
    - Fispace use: Use of **Logistics Planning App** (or T442's **Transport Demand Description App**) to describe the demand. The **Marketplace Operations App** is used for the publishing of the demand.
2. The carrier NCL answers the pending requests for shipping by sending offers to the fish exporters.
    - Fispace use: Use of **Marketplace Operations App** to market services and find demands. The **Logistics Planning App** should have functionality for getting answers to requests for transport and logistics services. The **Pricing Proposal App** may be used for generating offers based on known market situation.
3. APL receives offers from carriers, accept or reject offers, make normal or confirm reservations.
    - FIspace use: The **Marketplace Operations App** may be useful for generating contact between providers and clients. The **Logistics Planning App** should have functionality for transport and logistics service negotiation.
4. When the departure day approaches, the carrier requests a confirmation of reservations. The shipper confirms by prepaying the shipment.
5. The shippers respond to the request for confirmation of reservation sent by NCL.
6. Compute confirmation probability for pending confirmations. Compute cancellation probability for bookings
    - FIspace use: The **Booking Probability App** is used for these computations.
7. 6 hours before departure, because of problems with the Brazilian customs regarding the import license, APL needs to cancel the shipment.
8. NCL receive notifications of cancellations of bookings (binding reservations) and handles these cancellations by first offering a new departure time to the shipper, and secondly by finding replacement cargo for filling up the capacity now available.
    - FIspace use: The **Cargo Replacement App** is used to find matching cargo that can be loaded on short notice.
9. Find a best possible match for a cancelled reservation, with a number saying how well it fits (regarding from-port, to-port, amount, pickup and delivery dates.
    - FIspace use: The matching and fitting of cargo is part of the **Cargo Replacement App** functionality.
10. It is now 4 hours before departure, and NCL is now looking for replacement cargo for filling as much capacity as possible in the short time window remaining. The chart displays the capacities of a vessel between the single ports on the voyage and the capacity utilization rate for each part of the tour. The carrier finds the best possible matches (covering maximum capacity) and sends offers to the respective shipper(s).
    - FIspace use: This is similar to the matching and fitting of cargo triggered by a cancellation, and the **Cargo Replacement App** should be able to fulfil this functionality.

2.3.1.2 Challenges

The main challenges related to the trial are connected to the cancellation of the transport; in the trial storyline, this is exemplified with a cancellation caused by lacking licenses for import.

Cancellations are especially problematic when the information about cancellations reaches the transport provider at a late time, giving a short time window to find cargo that can be transported in stead of the cargo that was cancelled.

Some of these cancellation problems may be connected to the information flow in the fish supply chain. As an example, not knowing the exact amount of cargo will often result in reserving too much transport space just to be sure to get enough, the reservations are not always updated when the right cargo amounts are known. Manual information handling as well as the information going through several actors before reaching the transporter may result in a large delay from the point where the right information is available at the shipper's side to the actual cancellation is received at the transporter's side. Thus, systems that give better information availability for all the actors in the chain may give a large benefit.

Among the results from the FIspace platform and apps that may lessen the impact of the late cancellation problem is better information sharing between transport customers and providers, calculations of probabilities for cancellations, and quick access to marketplaces for finding transport demands for utilizing vessel capacity.

2.3.1.3 Measuring performance

In order to reason about the success of new technology, including the usages of FIspace, some measures or performance indicators have to be defined. For the fish trial, some measures that may be interesting to use are:

- Vessel utilization: This is an important measure for the transport industry. Better utilization (i.e. more cargo on each voyage), will usually result in more revenue for the transport provider and less environmental footprint for each cargo unit. For a simulated trial, this measure can be readily used, but for a real-life trial there will be many other factors affecting the vessel utilization, for instance seasonal variations in the fisheries, making it difficult to get a significant measure of the FIspace contribution.
- Cancellation "latency": The time between a customer decides to cancel a transport and the transport provider gets informed of the cancellation. The earlier the transport provider gets the cancellation notification, the higher probability that other cargo can be used as replacements.
- Replacement cargo success rate: The percentage of cancellations where replacement cargo is found.

It should be noted that this is an initial list of measures, and that the list may be extended and refined as the experiment is further designed.

2.3.2 App Development

The trial will be involved in app development in two ways. First, the trial will serve as a case for the use of some of the FIspace baseline apps, and we have requested requirements and features for these apps. Second, the trial has proposed three trial-specific apps. For these apps, the trial has a special responsibility in defining the apps' functionalities, and an initial set of requirements has been developed.

2.3.2.1 Baseline apps

The following baseline apps will be important to the fish trial:

- Logistics planning app: the trial will use the app for booking and cancellation of cargo, service description, and generation of transport service plans.
- Marketplace operations: the trial will actively use marketplaces to publish both the provider's services and the client's demands, as well as for finding matches between service and demand. Functionality in the marketplace operations app is assumed being used by both the logistics planning app and several of the trial-specific apps.

The trial has contributed with user stories on how these apps may be used by the trial, this is reported in 400.1. Some of the members of the trial team are also actively involved in the requirements study and design of the Logistics planning app.

2.3.2.2 Trial-specific apps

The fish trial has proposed 3 trial-specific apps that will be used during the trial experimentation. While these apps are defined for the execution of the trial, it is also believed that they will be useful in other settings, as the challenges they address are found in many different situations. The apps are described in more detail in FIspace deliverable D400.1. Initial lists of requirements for the apps have been developed, these are reported in FIspace deliverable D400.14

The apps are:

- The Booking probability app. This app is used to give probabilities that bookings will be completed or cancelled before the transport is started. For the challenges described in the trial, the possibility to predict late cancellations is assumed to be of great value, as the work on finding cargo replacements can be started at an earlier stage.
- The Find cargo replacement app. This app is used to search marketplaces for cargo that can be picked up by the transport provider at a late stage, something that may be very useful in face of the challenge of late cancellations. The app may also be useful for a generic increase in the utilization of the transport means, as the base functionality also may be used without being triggered by a cancellation.
- The Pricing proposal app. This app is used as a support tool for selling services in a variable price scheme. In the trial, it will be used to propose prices for transport services based on real-time and historical market information, and booking status/current utilization of the vessel.

All three apps have been proposed for the Open Call. This also means that one of the tasks related to the trial is to establish contact potential developers of the apps.

2.3.2.3 Trial-specific apps from other trials

While the fish trial will not be a direct part of the development of apps from other trials, some of the apps defined by other trials may be of use either directly by the trial, or in the wider scope of the trial setting (i.e. fish distribution, transport planning etc.).

For the fish trial, it may be useful to have input about the weather conditions for instance in the estimation of arrival of cargo in case the vessel is delayed. For this, the "Combine weather data" functionality described in Trial 421 "Crop Protection Information Sharing" may be interesting. However, it must be checked whether this app gives the weather information at an appropriate level of detail, compared to what is needed for container transportation, and compared to other existing weather apps.

Trial 432 "Fruit and Vegetables Quality Assurance" has described several domain specific apps that are not directly needed in the fish trial, but that would be very useful for sea transportation of fish in general. These include apps for "Product Quality Information", "Product Quality Feedback Information", "Transport Status Information", "Certification Status Information", and "Deviation Management and Exception Reporting". The same goes for the apps defined in trial 433 "Flowers and Plants Supply Chain Monitoring", especially the apps for "Logistics Tracking and Tracing" and "Conditions Monitoring".

The domain specific apps from Trial 442 "Import and Export of Consumer Goods" are more relevant for the fish trial, since they deal more directly with logistics planning. The "Transport Demand Description app" can be used for describing the demand, the "Shipment Status app" can be used for tracking of cargo and as input to the fish trial specific app for computing the probability that the cargo will be at the correct place in time, and lastly the "Manual Event and Deviation Reporting app" can be used by logistics service providers to give manual input on the status of the transport.

2.3.3 Updated Workplan

This section contains the updated work plan for months 7 (October 2013) to 24 (March 2015). The tasks that will be performed are:

Oct-Dec 2013: Experiment and App requirement Elicitation:

This task is concerned with identifying the detailed business and technical requirements (as necessary) for each application and domain-specific test application, obtain internal or open call resources to develop the applications and provision the applications so that defined experiments can be conducted. This task includes:

1. Evaluation of Phase 1 domain application designs

2. Identification of additional domain application requirements based on detailed experiment designs
3. Identification of appropriate resources to develop applications

Oct 2013-Mar 2015: Large Scale Rollout Preparation:

This task includes the identification of potential large scale trials, identification of potential trial sites and development of a large scale trial rollout plan. This includes:

1. Selection of specific trials that have business value for large scale rollout tests
2. Development of rollout test plans for the rollout
3. Identification and documentation of rollout site requirements
4. Identification of potential rollout sites
5. Documentation of the above in a plan for the conduct of large scale trials

This task will interact with T570 where the overall plans for large scale rollout of FIspace are developed.

Jan 2014-Mar 2015: Experiment Realization and Test:

This task is concerned with the actual conduct of the defined experiments using the identified experimentation environments, domain specific applications, FIspace services and FI WARE infrastructure. Experimental outcomes, based on clearly defined protocols, will be documented and compared to expected outcomes. Results will be documented and feedback made based on achievement of business value, performance of FIspace and FI WARE services and domain applications. This includes:

1. Conduction of defined experiment following the experimental protocol
2. Documentation of experimental outcomes
3. Feedback of experimental outcomes to interested domain partners, FIspace developers, domain application developers and FI WARE developers
4. Accommodation for T520 to perform specific trial-based business modelling activities.

2.3.3.1 Detailed plans, M7-M12

Note, these plans only covers months 7 to 12, several of the activities here will continue after M12.

Month	Task	Responsible
7-12	Ongoing development of trial • Use of applications in the trial • Refinement of experimentation test protocol • Gathering of data needed for experiment • Performance indicators suitable for measuring success factors	MRTK, NCL
7-9	Stakeholder meetings (Actors in fish transport)	NCL
7-9	Meetings with developers for Open Call trial-specific applications • Contact with potential developers • Communication of application ideas, intent, requirements • After development start: Follow-up, bringing applications into trial	MRTK
7-9	Ongoing evaluation and refinement of baseline and domain-specific app requirements.	MRTK
9 (end)	Assessment of baseline apps first release • Acceptance of release • Integration in trial • New requests for functionality	
10-12	Experiment realization • First phases of experiment realization • First tests	MRTK, NCL
10-12	Start development of large scale roll out plan for the fish trial	MRTK, NCL

Month	Task	Responsible
12	Deadline: D400.3 Progress report on trial experimentation and App development and updated plan for Phase 3 rollout	
12 (end)	Assessment of domain-specific apps first release • Acceptance of release • Integration in trial • New requests for functionality	

Table 6: WP431 Detailed Workplan M7-M12

2.4 Trial 432 - Fruit & Vegetable Quality Assurance

2.4.1 Report on Trial Experimentation

The trial 'Fresh Fruits and Vegetables' (FFV) builds on:

- the participation of its business partners and the communication among them as well as with project partners,
- the engagement of project partners in the design, organization, initiation, and communication of app developments and experimentation activities,
- the preparation of app development needs through open call activities.

2.4.1.1 Business partner communication

A crucial element in the trial is the identification of information to be exchanged between business partners. The identification and coordination of information from a provider and user perspective along the chain is not just an issue for system development but reaches into operational business requirements and business models for reaching system acceptance in the market.

Operational business requirements were identified through detailed analysis of present communication process organizations between enterprises along the chain. This also includes communication needs along the chain in case deviations in food safety and food quality requirements have been detected ('*exception reporting*').

Communication for improvements (=changes) in transparency along the chain and with consumers as a core feature of the trial raised the question of *appropriate* and sustainable distribution of costs, benefits, transparency needs and confidentiality needs along the chain. Business partners have agreed on a baseline approach where improvements in forward communication of information (from farms /trading to retail/consumers) are matched by some backward communication (from retail to trader/farms) which is scarcely available in present business activities. This is a first step towards a balanced consideration of interests. These baseline agreements are sufficient for app development and can stepwise be extended in line with experiences and development of needs.

2.4.1.2 Experimentation activities

With the identification of app development interests, the trial partners were moving towards prototype experimentations which were scheduled (see D400.1) as *paper-based prototypes*, *screen prototypes*, and *functional prototypes*. While the first two ones are primarily focused on actors involved, the following ones are primarily focused on the feasibility and efficiency of internal system characteristics. Present activities concentrate on actor involvement. Actor integration for all different trial apps suitable for experiments has been worked out in Report '*D400.1: Trial Fresh Fruits and Vegetables (2013)*'. An example dealing with the communication of information from production to retail is outlined in the following Figure 10.

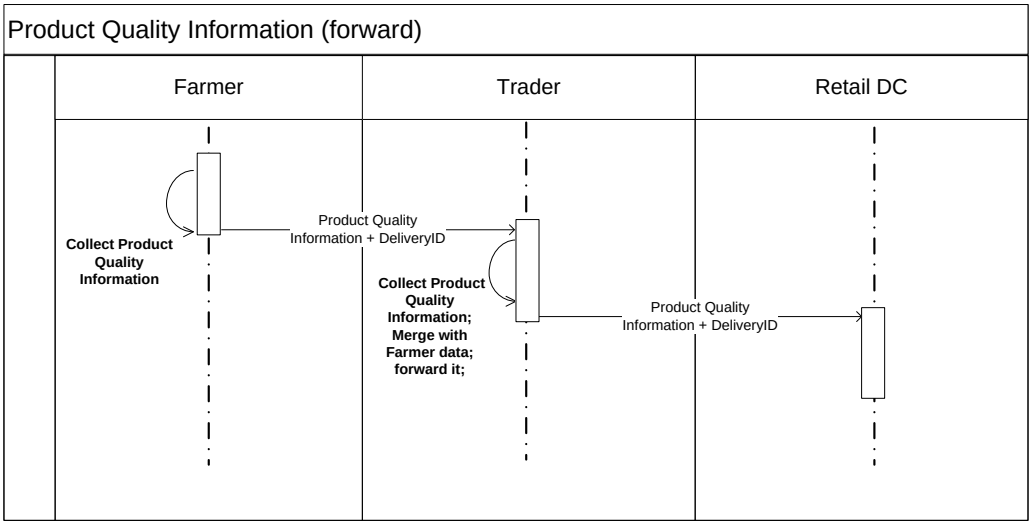

Figure 11: Actor involvement in forward communication for transparency

First paper-based 'mock-ups' of communication views were already outlined in stakeholder meetings in May this year. Presently 'mock-ups' of screen prototypes are being developed (example see figure 11). Mock-ups have been developed for all stages of the chain reaching from farmers to retail. They provide the basis for stakeholder evaluation and should, in addition, support communication with potential app development partners looked for in the upcoming open call. Stakeholder evaluation of screen prototypes is already going on with stakeholders engaged in crate management and will be finalized with all stakeholders by the end of the year. A specific evaluation meeting with all stakeholders present is envisaged for November this year.

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Actor involvement in forward communication for transparency

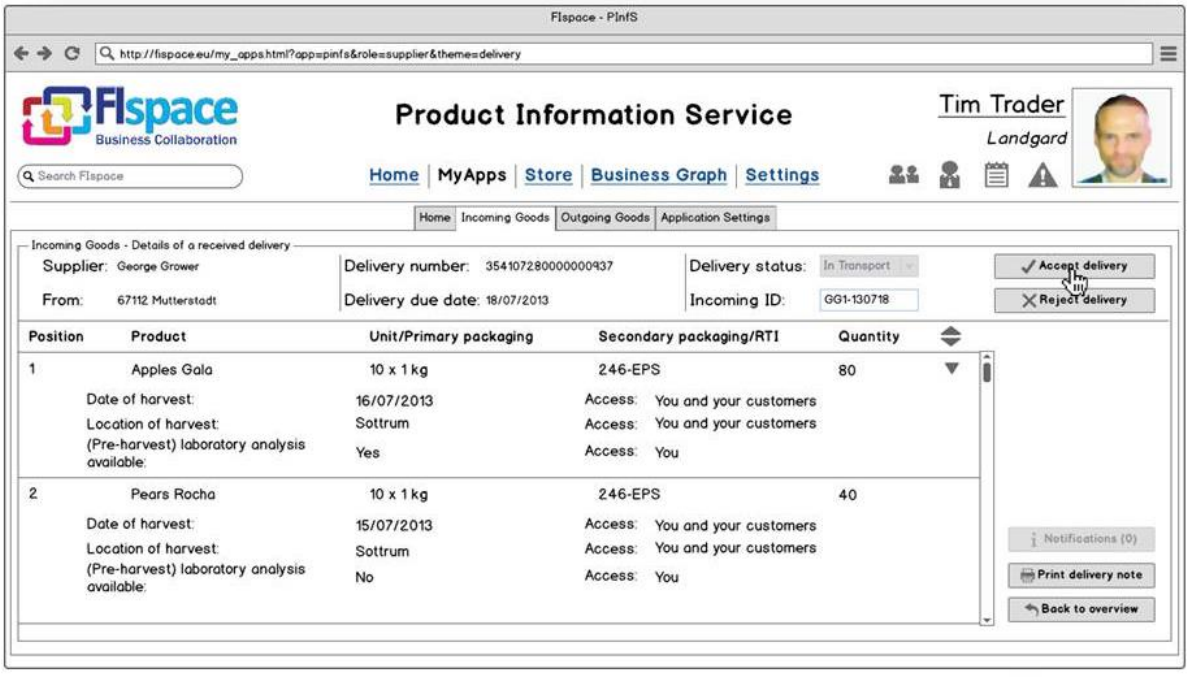

Figure 12: Example of mock-up for trader's product information delivery

2.4.2 App Development

App development is closely linked with experimentation plans and activities. All domain specific App development interests have been summarized in deliverable D400.1 together with an identification of development priorities. Development needs with highest priority are envisaged to be implemented as functional prototypes during the course of the project, either by project partners directly or by new partners looked for in the forthcoming open call. In summary, the following Apps will be dealt with in experimental settings during the course of the project (Table 7).

As has been outlined in deliverable D400.1, the trial will benefit from App developments in other trials that complement actors' needs. The closest cooperation is with the trial on 'Flowers and Plants' whose Apps related to the monitoring of quality and transportation deviations along the distribution channel will directly fit into the FFV trial while the Apps of the FFV trial will fit into the trial 'Flowers and Plants'. The linkage with the trials at farmers' and retailer' end (consumer communication) is envisaged at a later stage of the project as their linkage is only subject to providing interfaces at both ends.

Table 7: Priority apps selected for experimentation within the project

Apps for experimentation	Scope	Actor	Initial Priority	ID Experiment
Forward and backward communication				
Exchange of product and process information (forward)	The provision of information on products, processes, packaging, and production/trading sites linked to products and a physical transaction. Information flow from supplier (Pfalzmarkt, Landgard) to customer (EDEKA) and RTI service provider	Trader	1	1
Exchange of product and distribution information (backward)	The provision of feedback information on products, packaging, and distributional issues (location, time, etc) linked to products and a physical transaction. Information flow from customer (EDEKA) to supplier (Landgard, Pfalzmarkt) and RTI service provider	Retail	1	2
Mangement of RTIs (crates)				
Management of RTI Boxes	The provision of status information on movements of RTIs	RTI	2	3
Exception reporting				
Analytic Service Provider Integration, late information	Laboratory results may arrive late. If deviations or deficiencies are being detected by enterprise internal activities, an alert has to be sent to customers (retail) and in case of food safety deficiencies, to food safety authorities.	Trader	1	7

Close cooperation in the design of Apps with related view in the various chain related trials dealing with fish, flowers, fruits/vegetables, and meat has been initiated. The actors and Apps are different but the principle view (such as the communication of information) is similar which could facilitate the design of e.g. data models.

Groups with potential interest in the open call needs related to the FFV trial have been and are being contacted to assure awareness of the open call and to raise interest in participation. The present plan

envisages that two of the Apps are being developed by present project participants while two others should be developed by project participants selected through the open call.

For App development, the trial have identified

- *actor interaction* for the different App development needs (see above),
- *system functionalities* to be integrated in the different Apps (example see Figure 12).

Present activities concentrate on the specification of process flow diagrams and mock-ups of system-user interactions for Apps with priority 1. They are envisaged to be finalized by the end of the year, providing the basis for actual programming activities by project partners and incoming partners selected in the open call.

The trial has developed close relationships with the GS1 standardization working groups especially for fruits and vegetables but also for meat in which the major players in the market are present. They are being informed on a regular basis on the project's progress

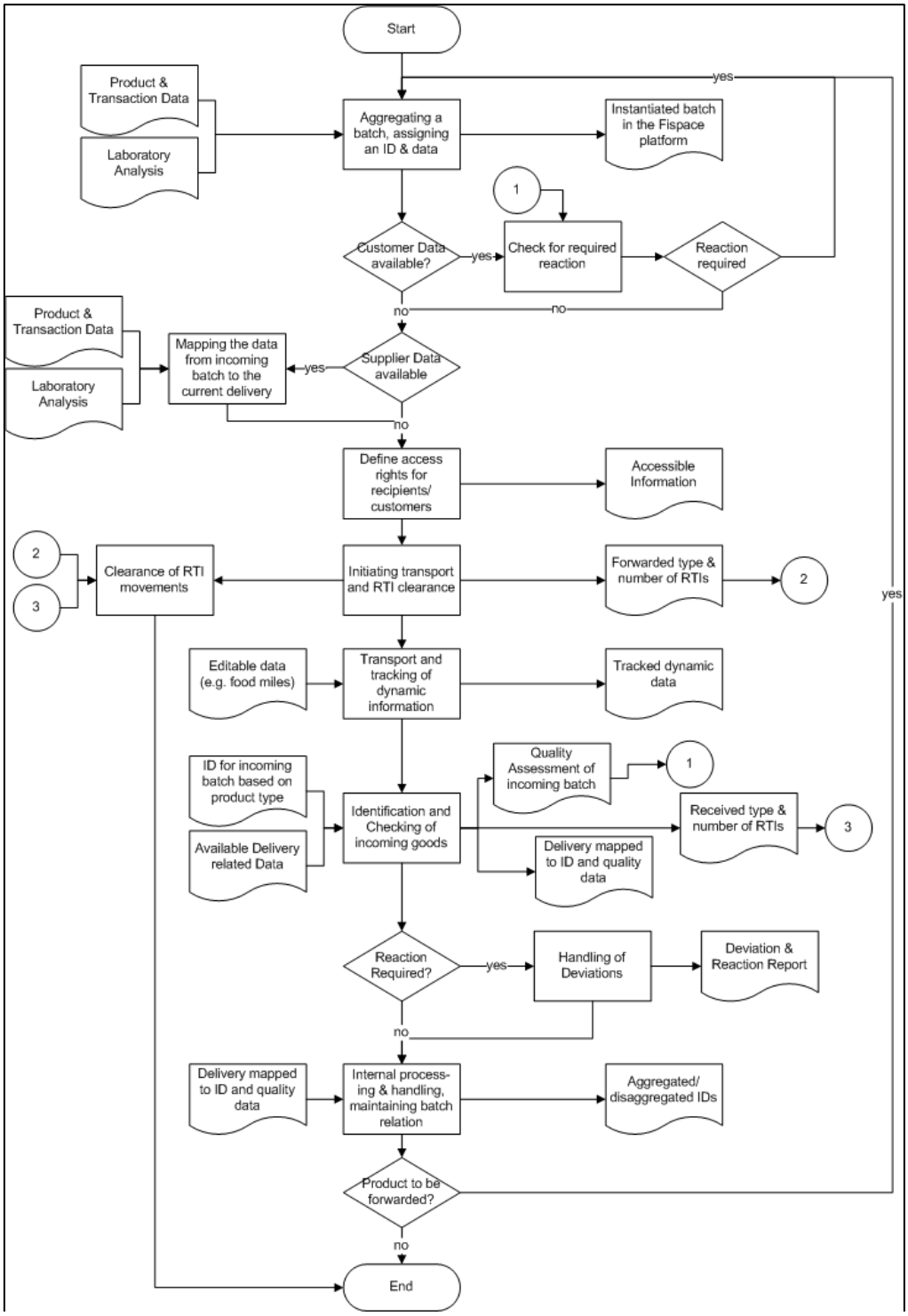

Figure 13: Overview on system functionalities

2.4.3 Updated Workplan

The work plan considers the:

- communication with actors
- the activities related to the development and experimentation of Apps, and
- the preparation for larger scale roll-out.

The communication with actors is partly based on communication as needed but is also based on a *routine communication scheme*:

1. The RTI service provider is a link between all actors in the chain. He is involved in a *bi-weekly information exchange*
2. The core chain actors comprised of trader, RTI service provider and retail are involved in a *3-monthly communication scheme*
3. All actors including certification provider, transportation service providers and others are scheduled to meet at least *every 6 month*. The next meeting is scheduled for November this year.

Table 8: Trial 432 Work Plan I

Month	**Task *(red: important FIspace deadline; yellow important internal trial deadline)***	**Responsible**
Periodically	Every 2 weeks telco with wp 400	CentMa
Periodically	Every 2 weeks internal exchange with RTI service provider	EPS
Periodically	Every 3 months exchange with core group	CentMa, EPS, ATB
Periodically	Every 6 months exchange with extended stakeholder group	CentMa, EPS, ATB
Irregular	Irregular update of stakeholder standardization groups on project progress	EPS, GS1
M6	Identification of open call Apps	CentMa, EPS, ATB
M8	First round of experiments with actors (screen-based) involving internal Apps	CentMa, EPS, ATB
M9	Mock-ups for all Apps ready for experimentation	CentMa, EPS, ATB
M10	Selection of open call results	CentMa, EPS, ATB
M15	Functional prototypes of all Apps ready for experimentation	EPS, ATB, open call partners
M16-M20	Experimentation with stakeholder actors	CentMa, EPS, ATB, open call partners
M21-M24	Preparation for large scale roll-out	CentMa, EPS

2.5 Trial 433 - Flowers and Plants Supply Chain Monitoring

2.5.1 Report on Trial Progress

As per the Description of Work, in the past 5 months we have conducted the following activities.

We have developed an experimentation plan, in which we defined the scope of the trial: the ornamental plants supply chain from production to retail. Furthermore, we have elaborated the specific experiments that will be conducted:

1. Item tracking and tracing
2. Conditions monitoring
3. Expert quality assessments
4. Product quality alerts
5. Quality decay prediction
6. Quality controlled planning

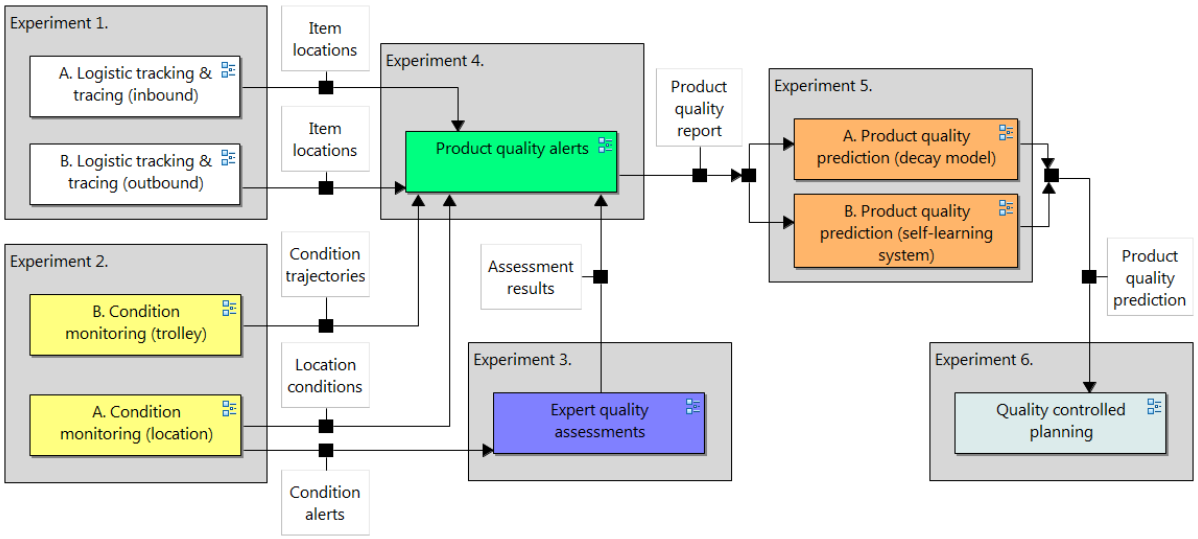

Figure 14: Summary of planned experiments

The experimentation plan is included in D400.1 and summarized in Figure 13. The experimentation plan is developed in close cooperation with stakeholders. We discussed our ideas with the ICT community in horticulture in the Netherlands on 28 May and with stakeholders in a meeting on 6 June. Besides, additional bilateral meetings with several stakeholders (trader, grower, logistic service provider) took place to elaborate the experiments in greater detail. For all experiments we have defined the intended results, a time schedule and a division of tasks for all partners as summarized in Figure 14. Additionally, communication with stakeholders will continually take place to get input for the expected results and results will be disseminated.

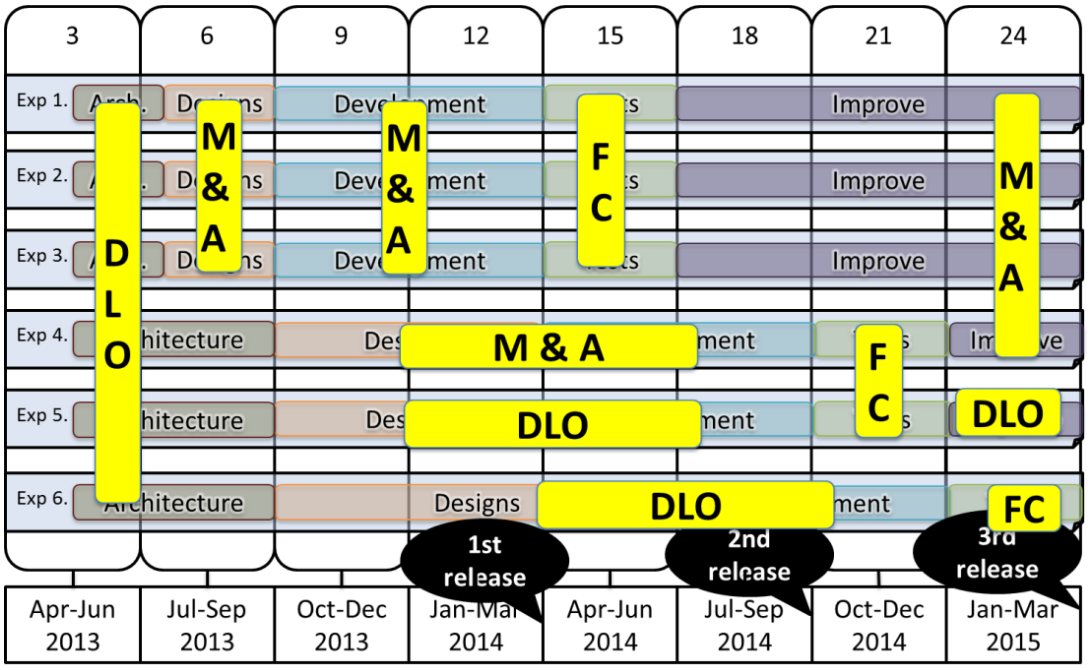

Figure 15: Time schedule and division of the main tasks

Afterwards, we started to execute the experimentation plan according to this schedule.

The focus has been mainly on the architecture and design of the first 3 experiments. We are currently working on the design of these experiments. Most of the time has been spent on experiment 1. The reason is that this experiment is rather extended in comparison with the other experiments and this experiment has the most interactions with WP 200. The architecture development of exp. 4, 5 and 6 is in an initial stage and needs to be accelerated.

Furthermore, we have provided input for the development of the baseline apps, we contributed to the open call by specifying requirements for two apps: a Flowers & Plants Botanic Info App and a Time Tem-

perature Sum Planning App, we provided input about communication and dissemination activities to WP 500 and started testing the Event Processing Component of the FIspace Platform.

2.5.2 App Development

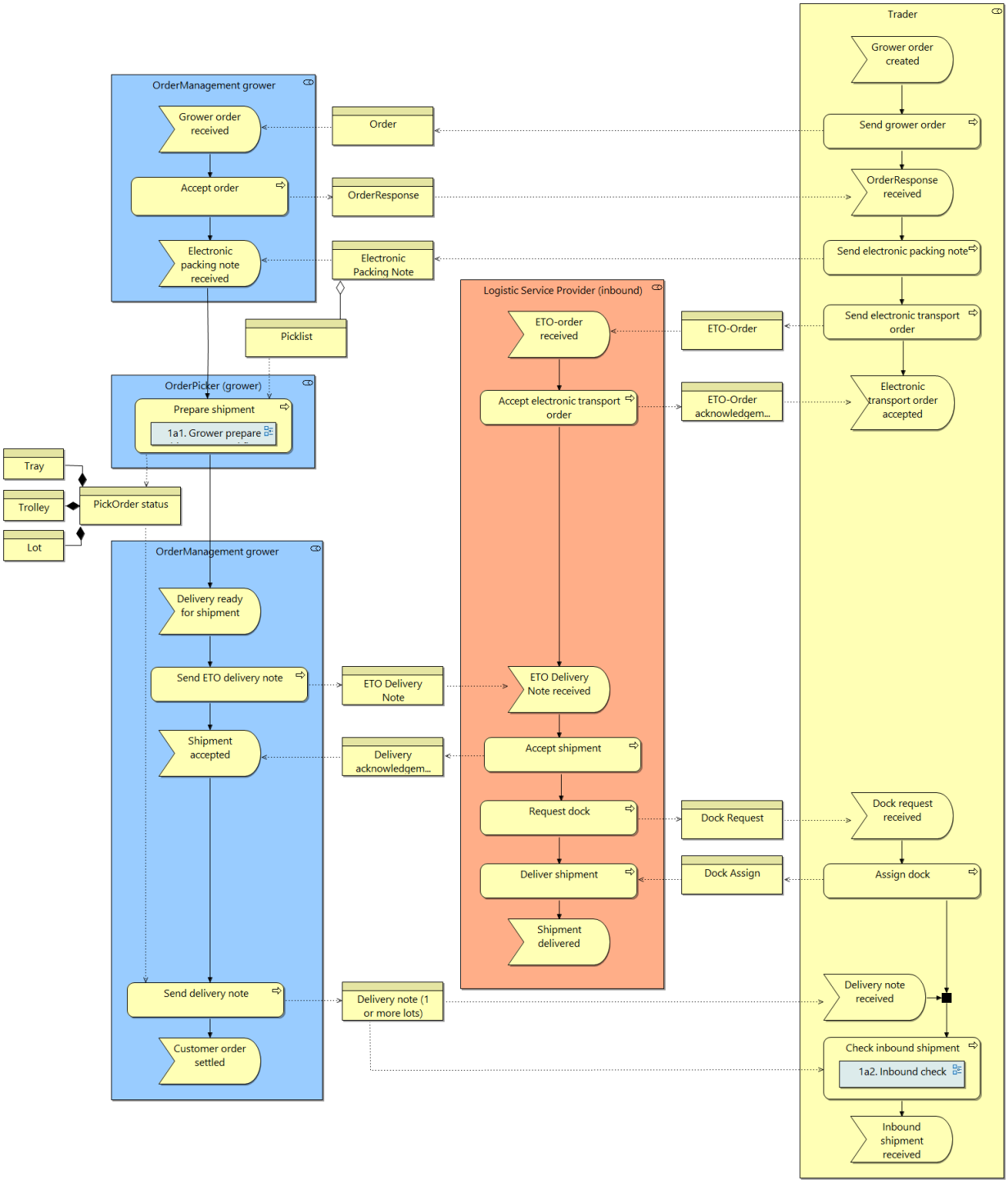

Figure 16: Example model experiment 1

In this stage we have developed the architecture of exp 1, 2 and 3 and are elaborating the technical design. An example of experiment 1 is presented in Figure 15. In this model the business-to-business interaction is presented with a high level overview of relevant triggers, business processes and business information objects. The processes 'Prepare shipment' and 'Check inbound shipment' are described in more detail since these represent activities that impact the flow of physical goods and the link of them to the b2b interactions.

2.5.3 Updated Work plan

In the coming six months, priority will be given to completing the technical design of exp. 1, 2 and 3, to reach agreement with WP 200 about the division of the responsibilities and to start the development of the apps. In Table 9, a summarized milestone plan is presented which will internally be specified in order to make smart appointments how to comply with the deadlines. Furthermore, we will pay attention to the extension of the stakeholders involved. Until now, only one chain (grower, exporter, logistic service provider) is directly involved, which might make the trial vulnerable and may limit the possibilities to develop apps which are generic applicable. However, because of the efforts made to present the trial to a much broader stakeholder community, we have access to other chains that can be involved.

Month	**Task** ***(red: important FIspace deadline; yellow important internal trial deadline)***	**Responsible**
Periodically	Every 2 weeks telco with wp 400	DLO
Periodically	Every 2 weeks internal trial meeting with all partners	DLO, M&A, Floricode, GS1
March 2014	D400.11 First release of app 1, 2 and 3	M&A
	Completion of technical design of app 4, 5 and 6	M&A (4), DLO (5, 6)
	D400.3 Progress report on trial experimentation and App development and updated plan for Phase 3 rollout	DLO
	MS4 Trial-Round 1 & Large Scale Expansion	Floricode
	D500.1.4 Report on community building activities, knowledge transfer, education and training activities and potential for innovation	Floricode

Table 9: Summarized milestone plan ST433

2.6 Trial 441 – Meat Information Provenance

2.6.1 Trial experimentation report

In D400.1 the MIP trial activities are described in detail and **Fehler! Verweisquelle konnte nicht gefunden werden.**6 summarizes these actions. There are two experiments: a simulation and a realistic experiment. The simulation experiment consists of a first implementation of the transparency system, which will be fed with a data capturing app by data in a laboratory setting. Subsequently, other apps can be used to test tracking & tracing of meat items throughout the whole meat supply chain. Based on the first experiment the meat transparency system should be corrected and improved. In the second, realistic experiment of the MIP trial the data are provided by the meat supply chain partners directly into an EPCIS repository. Subsequently, apps can be used to analyze different transparency issues.

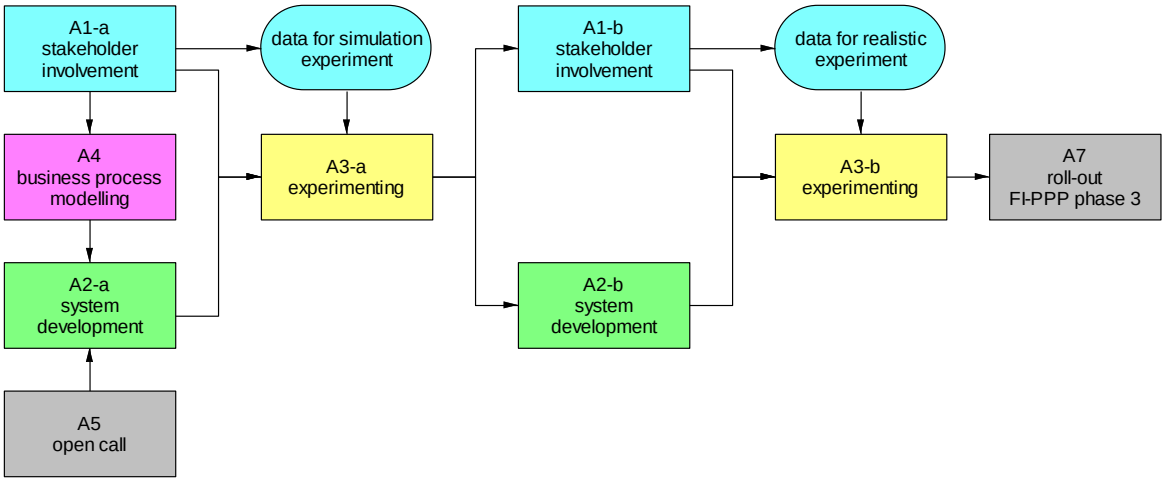

Figure 17: Overview of the actions with direct relation to experimenting in the MIP trial.

Main **action A0** (trial management, not depicted in Figure 16) consists mainly of ongoing sub actions, except for a detailed trial plan, which is published in D400.1.

Main **action A1** (stakeholder involvement) was planned to complete in 2013, but we experienced that the direct MIP trial stakeholders that do breeding, fattening, slaughtering, deboning, further processing, distributing, retailing, but also indirect stakeholders such as service providers, regulators, consumers and authorities, need to be convinced by very concrete solutions with realistic business cases, clear explanations of the functional architecture and easiness of implementation. In order to engage stakeholders in the trial, we follow now the AIDA model, i.e. (in this order) raise *awareness*, raise *interest*, convince stakeholders they *desire* our transparency system and take *action* to implement it. Despite our definition of a new transparency system, based on EPCIS, this is not convincing to our direct and indirect stakeholders. Therefore, the MIP trial started with raising awareness and interest, the first two steps of AIDA, and postponed the last two AIDA steps (desire and action) to the moment that the MIP trial has first results of the simulation experiment. Raising awareness and interest will be done by giving presentations on seminars, workshops and conferences for audiences in which at least a part of the stakeholders are represented. Furthermore direct interviews with stakeholders are planned to inform them about the MIP trial plans and to consult them on their wishes to such systems.

Main **action A2** (system development) is completely in time, but the MIP trial experienced the risk of having no MIP trial partner that will implement an EPCIS test bed. To avoid or mitigate such risk, the MIP trial has to find a FIspace partner willing and able to do this.

Main **action A3** (experimenting) is on schedule, as the experiments are planned to start in month 11.

Great achievements have been made in main **action A4** (business process modeling), as the MIP trial has developed a reference process model of meat supply chains that can be easily adapted for specific meat supply chains. The reference model of meat supply chain processes will be asked to be validated in collaboration with FIspace associated partner Westfleisch.

The requirements of the MIP trial for apps to be developed by new partners that enter FIspace through the *open call* (main **action A5**) are completely in time. First estimations show that there seem to be sufficient interesting companies that could potentially become partners in 2014. The MIP trial is trying to focus on the most promising ones in order to optimize the results of FIspace, i.e. FI-PPP Phase 2, and prepare eventually FI-PPP phase 3 initiatives.

In main **action A6** (dissemination and exploitation) there are no delays. Some of its sub actions coincide with those of A1 (stakeholder involvement).

For the last main **action A7** (roll-out in FI-PPP phase 3) the MIP trial developed ideas to smoothen hurdles between phase 2 and phase 3. The MIP trial has a strong determination to initiate and facilitate initiatives for proposals that roll-out results of FIspace for the meat sector in Phase 3.

The MIP trial has not started experimentation as both experiments are planned to start in month 11.

2.6.2 App development report

The MIP trial does not develop apps itself, but tries to find partners within the FIspace project to do so. Additionally, the responsible of the MIP trial relief further for app development on new partners that enter FIspace through the open call. The focus of the MIP trial concerning apps is identifying what functionality is needed for which stakeholder.

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 enables tracking (where does a specific meat item come from) and tracing (where are all related meat items), 5 apps are described in D400.14 and summarised here:

2.6.2.1 App for populating EPCIS repositories with meat transparency data

Food operators in the meat sector document meat product life cycles. To enable transparency from birth to consumption (i.e. birth, breeding, fattening, slaughtering, cutting, packing/unpacking, sending/receiving and selling) transparency data at the food operator should either be accessible online or passed to a third-party transparency provider that will make the data accessible online. The latter approach 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. Supply chain actors that have an own (either local or cloud-based) EPCIS repository do not need this app.

2.6.2.2 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.). 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 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.

2.6.2.3 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.

2.6.2.4 Aggregation of traceability information

Based on the functionalities developed in (2.6.2.2) and (2.6.2.3) 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”.

- place/ date of birth, date/ location of slaughtering of the processed animals
- list of all parties who had custody of a product
- list of distribution centres/ retail stores a product of concern has been shipped to

2.6.2.5 App for accessing transparency data by consumers (B2C)

This app is a "consumer" variant of the previous app. As a special case of (2.6.2.4), 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 will be able to provide 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.

2.6.3 Updated work plan

A comprehensive work plan of the MIP trial is presented in D400.1, Most of the actions in this work plan are as scheduled. Some have delays and others are postponed (see **Fehler! Verweisquelle konnte nicht gefunden werden.**). Here we will summarize the major changes according to the planning of the trial and the major achievements

Table 10: Workplan Meat Information on Provenance trial (T441) with status (open, in progress, ongoing, completed, failed) and how actions are compared to the planning in the Gantt chart of D400.1 (in time, delayed, postponed).

	Actions and sub-actions in MIP trial	status	planning
A0	**Trial management**		
A0-1	Trial experiment plan	completed	in time
A0-2	Internal communication	ongoing	in time
A0-3	External communication	ongoing	in time
A0-4	Trial meetings	ongoing	in time
A0-5	Trial reporting	ongoing	in time
A1	**Stakeholder involvement**		
A1-1	Planning stakeholder involvement	in progress	In time
A1-2	Stakeholder analysis (who) with matrix	in progress	delay
A1-3	Business cases for various stakeholders	in progress	delay
A1-4	Position paper	in progress	in time
A1-5	Stakeholder persuasion PowerPoint	in progress	delay
A1-6	Data collection	open	in time
A1-7	Questionnaire	failed	changed
A1-8	Interviews	open	delay
A1-9	Analysing interviews/questionnaire	open	in time
A1-10	Stakeholder meeting	failed	postponed
A2	**System development**		
A2-1	Requirements to EPCIS to WP200 and T450	in progress	in time
A2-2	Requirements to basic apps	completed	in time
A2-3	Requirements to other apps	completed	in time
A2-4	Architecture	draft	in time
A2-5	Select GE's that are interesting to be used	draft	in time
A2-6	Software implementation	open	in time
A2-7	Technical test	open	in time
A2-8	Software improvement	open	in time
A2-9	Software improvement test	open	in time
A3	**Experimenting**		
A3-1	Define KPI	in progress	delay
A3-2	Planning simulation	open	in time

A3-3	Doing simulation	open	in time
A3-4	Analyse simulation results	open	in time
A3-5	Prepare realistic experiment	open	in time
A3-6	Do realistic experiment in 1 supply chain	open	in time
A4	**Business process modelling**		
A4-1	Describing typical beef supply chain process	completed	in time
A4-2	Translate to EPCIS event types	in progress	in time
A4-3	First draft of BPM ArchiMate)	completed	in time
A4-4	Validate model with stakeholders	in progress	in time
A5	**Open call**		
A5-1	Describe technical and functional requirements	completed	in time
A5-2	Identify interest of solution providers	in progress	delay
A5-3	IPR issues	open	delay
A5-4	Help preparing proposal	open	in time
A5-5	Record progress	open	in time
A5-6	Test resulting software	open	in time
A6	**Dissemination and Exploitation**		
A6-1	Dissemination plan	completed	in time
A6-2	National discussion panel	in progress	delay
A6-3	Platform (part of FI-space)	open	delay
A6-4	Reflection	open	delay
A6-6	Exploitation plan	open	in time
A7	**Roll-out in FI-PPP phase 3**		
A7-1	Identify interested stakeholders	in progress	in time
A7-2	Help preparing proposal phase 3	open	in time

2.7 Trial 442 - Im - / Export of Consumer Goods

This trial is concerned with planning and execution of logistics activity in consumer goods sector ensuring effective planning of related activities resulting in improved coordination, loss minimization, efficient use of resources and high customer satisfaction level. One of the main challenges addressed in this trial is “shipment tracking challenge” which outlined the need for automated input through integration or electronic data extraction in order to avoid delays and human related problems during tracking of the execution of the shipment. Another challenge that was addressed is “transport order management” challenge which outlined the need for publishing the demand and services online to e-markets and a system that can automatically collect, merge and match the real-time service information with the published demand. The initial description of the trial can be found in FIspace deliverable D400.1.

2.7.1 Report on Trial Progress

The main focus was to refine and clarify the test scenarios, experiment requirements and test data requirements considering the proposed capabilities of the baseline apps. Work has been done to clarify the expectations from the domain specific applications.

Experiment Requirements:

- ✓ The experiment requires input from backend systems. Interactions with backend legacy systems are listed below:
- ✓

Table 11: App Requirements

No.	Scope	Required external Participants	Experimentation Type
1	Extraction of purchase order /sales information	Arcelik's backend - SAP	Simulation
2	Extraction of packing list information from legacy systems or manual input	Korean Steel (Material Supplier)	Simulation
3	Booking management	DAYS – Arcelik's TM system Forwarder/Carrier ICT Management	Simulation
4	Events extracted from legacy systems, external web sources or 3rd party IoT	Forwarder/Carrier ICT Management	Simulation
5	Access of transport status information	Forwarder/Carrier ICT Management	Simulation

✓ There has been an on-going work to update the test data in order to be able to use the baseline apps in the trial properly i.e. using standard templates provided by FIspace.

Table 12: App Requirements

Application	Test data	Content
Logistics Planning Services App, Market Place Operations App.	Service descriptions for the transport service	Schedules, Pricing etc.
Logistics Planning Services App, Market Place Operations App.	Demand examples	Similar demands, different demands
Logistics Planning Services App	Alternative route examples	Alternatives ways to go from A to B
Service contracts including SLAs	Contracts	Agreements with the provider
Shipment Status Monitoring, Event Management	Events	Real-life events and their sources

2.7.2 App Development:

Baseline apps:

- The trial team is actively involved in the requirements definition of Logistics Planning Services app in collaboration with Koc Sistem and Marintek. During FInest project, one of the main challenges that Arcelik outlined was "transport order management" which is highly related with the capabilities proposed by this app. Therefore the trial will use this app for the transport booking in its import scenario to a great extent.
- Marketplace Operations app and Real-time Business Management App are also planned to be used by the trial therefore it is planned to have more updates on the test data according to main specifications after the first release.

Domain specific apps:

The trial has requested 3 domain specific apps that are planned to be used during the trial experimentation. The story line related with this app is initially described in the deliverable of 400.1 and initial requirements have been determined and described in the deliverable of D400.14. In order to clarify and better develop the requirements for the domain specific apps introductory mock-ups are created for brainstorming and clarification purposes during the requirement definition.

The domain specific apps that listed below have been proposed for the Open Call:

- **Transport Demand App**
  - Improve collaboration between different stakeholders during the transport demand description process
  - Provides the users with visibility on the content of the shipping units to be able to combine real-time shipment status with in-transit stock movement
- **Shipment Status App**
  - Provide real-time visibility to the status of the shipment and notify parties according to their points of interests.
- **Manual Event and Deviation Reporting App**
  - Report shipment status and delay manually in case electronic data extraction from back-end systems is not possible

2.7.3 Updated Workplan

The common work plan for months 7 (October 2013) to 24 (March 2015) is listed below:

		O-13	N-13	D-13	J-14	F-14	M-14	A-14	M-14	J-14	J-14	A-14	S-14	O-14	N-14	D-14	J-15	F-15	M-15
Oct-Dec 2013	**Sub Task 412_Experiment and App requirement Elicitation:**																		
	Evaluation of Phase 1 domain application designs																		
	Identification of additional domain application requirements based on detailed experiment designs																		
	Identification of appropriate resources to develop applications																		
Jan 2014-Mar 2015	**Sub Task 413_Experiment realisation and test:**																		
	Conduction of defined experiment following the experimental protocol																		
	Documentation of experimental outcomes																		
	Feedback of experimental outcomes to interested domain partners, FIspace developers, domain application developers and FI WARE developers																		
	Accommodation for T520 to perform specific trial-based business modelling activities																		
Oct 2013-Mar 2015	**Sub Task 414_Large scale rollout preparation:**																		
	Selection of specific trials that have business value for large scale rollout tests																		
	Development of rollout test plans for the rollout																		
	Identification and documentation of rollout site requirements																		
	Identification of potential rollout sites																		
	Documentation of the above in a plan for the conduct of large scale trials																		

Figure 18: T442 Workplan

Detailed Workplan for M7-M12

M7- October 2013:

- The development of the specific apps will continue.
- Revision and finalization of the test data in line with the development of the baseline apps.
- Refinement of experimentation test protocol
- Gathering of data needed for experiment
- Evaluation and refinement of baseline and domain-specific app requirements.
- Telco with IBM to finalize the first version of business collaboration objects (ARC & KN & IBM)
- Meetings with developers for Open Call trial-specific applications

M8- November 2013:

- The development of the specific apps will continue and adopting any FIspace functionality provided
- Revision and finalization of the test data in line with the development of the baseline apps.

- Refinement of experimentation test protocol if necessary
- Gathering of data needed for experiment
- Evaluation and refinement of baseline and domain-specific app requirements.
- Continue working on business collaboration objects (ARC & KN)
- Meetings with developers for Open Call trial-specific applications

M9- December 2013 :

- Deadline: D400.7 Baseline applications 1st release
- Assessment of the first release of the baseline apps
- New requests for functionality

M10-M11 – January –February 2014:

- Baseline apps will available with basic functionality
- Experiment realisation will start for selected scenarios
- Results analysis

M12 – March 2014:

- Deadline: D400.11 Domain-specific test applications 1st release
- Deadline: D400.3 Progress report on trial experimentation and App development and updated plan for Phase 3 rollout
- Continue experimentation for all scenarios
- Results analysis

2.8 Trial T443 Tailored Information for Consumers

2.8.1 Trial experimentation report

In T443 since M4, the trial team has been working on several tasks for the refinement of the trial experimentation definition and App requirement elicitation. This is concerned with identifying the detailed business and technical requirements for each application and assign internal or open call resources to develop the applications.

So as to achieve these objectives the team has carried out the following activities:

1. **Trial team meetings**

   The trial team has hold regular meetings and is planning to hold different workshops with other stakeholders (such as end users and supply chain actors).

   In the second half of June a meeting was held in the experimentation site so as to review the requirements for the experimentation and the App requirements.

2. **Product Attributes definition**

   So as to define product attributes to be provided by the TIC trial, different contacts have been established with GS1 Spain (AECOC) and GS1 Germany (working in FIspace). Based on gathered information an analysis will be carried out (also taking into account input from WP500 and Phase I) so as to define attributes to be provided.

General attributes for all products:		Type of data (Text/Number)					
PREFERENCES	***ATTRIBUTES***		Dynamic/Static	***Category***	***Provided by***	***Source***	***Compulsory/voluntary***
	Batch number	N	D	Batch	Provider	EDI	Compulsory
	Price	N	D	REF	Retailer	ERP	Compulsory
	Price/unit	N	D	REF	Retailer	ERP	Compulsory
	Picture	image	S	REF	Retailer	bbdd	Voluntary
	Logistic information		D	PROV	Provider		Voluntary
Origin	Provider	T	Static	PROV	Provider		Compulsory
	Location	T	Dynamic	Batch	Provider		Compulsory
	Local product	T	Dynamic	Batch	Provider		Voluntary
Sustainability	Ecological crop	T	Static	REF	Provider		Compulsory
	Recycled packaging	T	Static	REF	Provider		
	CO2 footpring	N	Static	PROV	Provider		Voluntary
Origin Denomination	PDO	alfa N	Static	REF	Provider		Voluntary
	PGI	alfa N	Static	REF	Provider		Voluntary
Chemicals content	Pesticides	alfa N	Static	REF	Provider		Voluntary
	Additives	alfa N	Static	REF	Provider		Voluntary
	Preservative	alfa N	Static	REF	Provider		Voluntary
Quality Aspects	Quality certificate	alfa N	Static	REF	Provider		Voluntary
					Provider		Voluntary
Best before date	Best before date	N	Dynamic	Batch	Provider		Compulsory
Allergens content	Eggs	T	Static	REF	Provider		Voluntary
	Dry fruits	T	Static	REF	Provider		Voluntary
	Lactose	T	Static	REF	Provider		Voluntary
	Gluten	T	Static	REF	Provider		Voluntary
Transgenic	Transgenic	alfa N	Static	REF	Provider		Voluntary
Production date	Production date	N	D	Batch	Provider		Voluntary
Nutritional info	kcal	N	Static	FAM	Provider		Voluntary
	Fat	N	Static	FAM	Provider		Voluntary
	carbohydrates	N	Static	FAM	Provider		Voluntary
	sugar	N	Static	FAM	Provider		Voluntary
	proteins	N	Static	FAM	Provider		Voluntary
Specific attributes :							
PREFERENCES	***SHOWN ATTRIBUTES***						
Fruit and vegetables	Season		Dynamic	REF	Retailer		Voluntary

Figure 19: Product attributes defined in SmartAgriFood (Phase 1)

3. Experimentation protocol definition

The team has worked in the initial experimentation protocol refinement, analyzing for each step the required input, expected outcomes and involved actors.

Step	Description	Actor	Expected Outcomes	Required Inputs
Connect to FIspace platform: Consumers use the FIspace platform to download apps that will allow them to improve their shopping experience				
1	Connect to FIspace through the web site address provided by PlusFresc	Consumer	Enter to FIspace platform	Smartphone and link to the platform
2	Select one of the available apps from FIspace to be used by the consumer	Consumer	To have a list of available apps that can be used to improve the shopping experience by getting tailored information, creating a shopping list, getting knowledge about products with a traffic light code, and providing feedback and complaints about products	Display a list of apps Get instructions about how to use the apps A brief description of each app so the user can learn about it
Use of PRODUCT INFO app				
3	From FIspace click on "PRODUCT INFO app" button to download the app	Consumer	Download the PRODUCT INFO app to begin to use it for the shopping experience	To have PRODUCT INFO app operative at FIspace platform Store the PRODUCT INFO app at the Smartphone and create an icon at the Smartphone screen to login directly in the future
4	Log in to "PRODUCT INFO app"	Consumer	Enter "PRODUCT INFO" app to begin to use it	Access to main menu of PRODUCT INFO app

5	Select the language by "Please select language" and click on one of the flags representing the available languages.	Consumer	The app will work in one of the selected languages	The app should work in different country and region languages: English, Spanish, Catalan. Flag icons on the screen for all of the available languages.
6	Select one of the options to run the app: as an anonymous user or as a User Id by clicking one of the two buttons: "Anonymous user" or "User Id"	Consumer	User logs in to the application by the selected option and goes to the next window	Display two buttons to log in to PRODUCT INFO app: Anonymous user/User Id.

Figure 20: Example of experimentation protocol steps

4. Open Call Requirements Definition

The TIC trial has contributed to the technical specification of the open call. In this sense, the work has been centered in defining the detailed functional and technical requirements for the open call Apps. So as to achieve this objective, the following tasks have been accomplished:

• Detailed evaluation of Phase 1 domain application designs

• Identification of additional domain application requirements based on detailed experiment designs

• Identification of appropriate resources to develop applications

5. Educational material

In relationship with WP500, the trial team has developed a first set of educational material on trial overview, describing the trial itself and the trial´s obejectives.

2.8.2 App development report

The App development phase has officially started on M4, but this section also covers activities during the Apps functionality definition stage, which occurred from M1 to M3. There are different actions carried out in this preliminary stage, as the definition of four scenarios to be covered by the experiments. After this stage the technical requirements of each scenario have been defined, and the matching with the functionalities provided by the FIspace platform and baseline applications. Finally the definition of Domain Apps has been tacked, as well as the development plan.

2.8.2.1 Domain Apps Scenario Definition

The development of applications for the TIC trial covers the following scenarios:

- Scenario 1: Product tailored info/knowledge gathering: is initiated by a customer who wishes to obtain information related to a product tailored to his/her personal preferences stored in the user profile (allergies, favourite food, etc.).
- Scenario 2: Shopping list & recipes management: customers want to manage their shopping list and receive product recommendations according to recipes.
- Scenario 3: Augmented reality & push information: Information of products is displayed with augmented reality technologies by using capabilities of customer's mobile phones.
- Scenario 4: Alerts: The TIC trial supports food alert notification to users who bought certain products and can deliver notification globally, individually or to groups.

2.8.3 App technical requirements

Technical requirements for TIC apps have been analysed and classified into the following categories:

- Requirements describing the creation, publication, storage, management and execution of services. These requirements state that the TIC trial must include an infrastructure supporting different phases of the service lifecycle. These functionalities will be described later in this section.
- Requirements describing the communication infrastructure, the mobile nature of the provided services and the integration of legacy software and hardware systems. These requirements will be taken into account as some FIspace capabilities are designed to solve these problems.
- Requirements describing user notification of information, event generation, identification, processing, management and subsequent information visualization.

2.8.3.1 Requirement matching with FIspace and baseline functionalities

This report includes the analysis performed to determine which FIspace services and baseline applications will be used by the applications developed in the TIC trial.

We identify relations of this trial with the FIspace components that will be developed in these tasks:

- Task T240 FIspace Real-Time B2B Collaboration: TIC applications will use T240 functionalities to identify the stakeholder that is the owner of product information, in order to request the information directly to it
- Task T250 System & Data Integration: TIC applications will use the technical infrastructure of T250 to this technical infrastructure to implement the communication channels between the FIspace and existing legacy systems in the supermarket (e.g. in-house logistics solution, ERP system).
- Task T260 FIspace Operating Environment: TIC applications will use T260 service to interact to all FIspace modules, components and services through a cloud-based enterprise service bus (ESB)
- Task T270 Security, Privacy and Trust: TIC applications will use T260 authentication and authorisation mechanisms to control the access to data and decide about the trustworthiness of an information source from an ICT point of view

All of these services will be provided by the usage of the Product Information Baseline apps, which directly accesses to the functionalities offered by the FIspace platform.

2.8.4 Domain Apps Definition

The defined apps for the TIC trial are:

- **Product Info App**: This App allows end users to access tailored information through the mobile application where mode of use (anonymous, preferences) can be set and scan of different products located at supermarket premises can be achieved. It also allows the consumer to provide feedback on products.
- **Food Traffic Light App**: By means of this App, product data gathered from different actors can be transformed into knowledge based on a set of rules.
- **Shopping List Recipe 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.
- **Augmented Reality Offers 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.
- **Food Alerts App**: If any food alert arises, the FIspace platform should communicate it to the retailer that will contact affected customers (if they have used their fidelity card).

2.8.4.1 Domain Apps development plan

The development plan is divided into three releases, expected for months M12, M18 y M24.

The ***first release*** is expected to incorporate to FIspace the functionalities implemented in the TIC pilot of SmartAgriFood, updating and replacing ad-hoc functionality by functionalities provided by FI-WARE and the FIspace platform. These mechanisms will be integrated into a new application that will be called Product Info App, which uses the Product Information Service baseline app as a fundamental component to interact to the FIspace platform.

The ***second release*** will generate a new version of the Product Info App and will add the Traffic Light Food App, taking advantage of the rule management mechanisms offered by the latest version of the Product Information Service Baseline App, expressed in its Epic 2.

The ***third release*** will improve the applications already created and will deliver the applications Augmented Reality, Shopping List and Recipe and Safety Food Alerts. The implementation of these three applications is subject to the availability of external developers through the open call. In the event that applications are developed by a partner introduced in the FIspace project through the open call, TIC trial participants will perform at this third stage a task to aid the developers for a seamless integration of their applications with the FIspace platform and the applications previously implemented in the TIC trial.

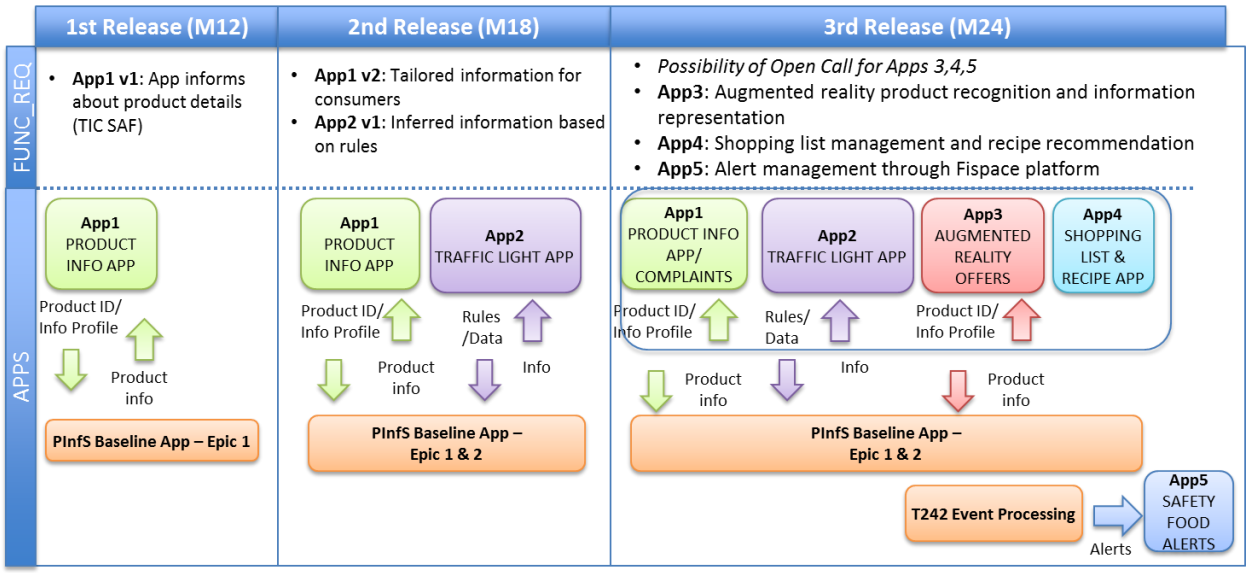

Figure 21: Summary of the applications to be developed in each of the iterations

2.8.5 Updated work plan (detailed till M12 / milestones till M24)

The trial work plan for the first release (M1-M12) is shown in the following figure:

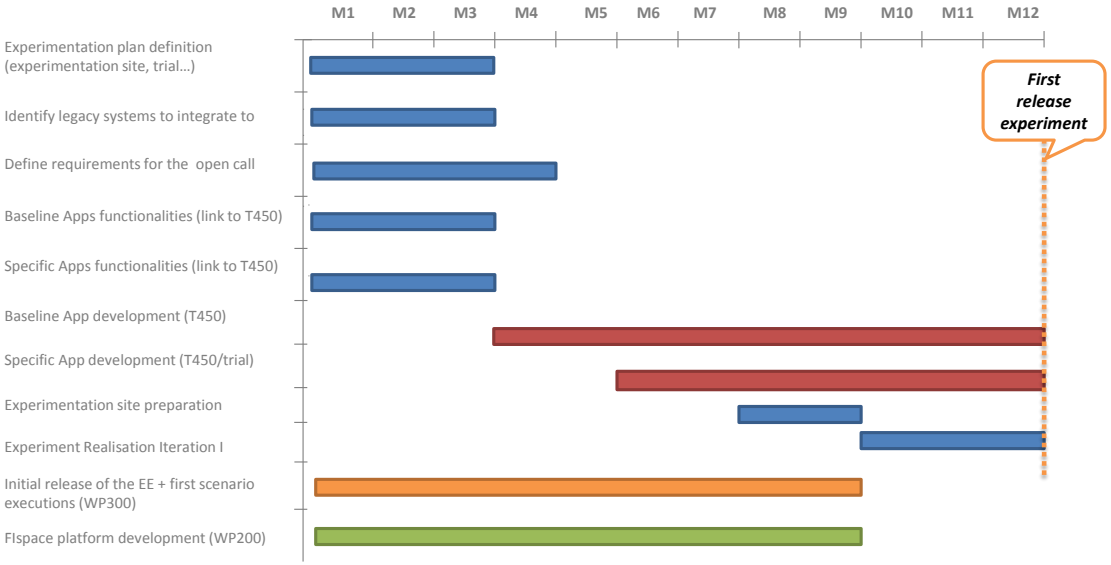

Figure 22: Detailed plnning is managed in bi-weekly sprints

3 Harmonization and Collaboration

Since FIspace contains eight trials from different domains focusing on experiments that will demonstrate how the FIspace can benefit the specific domain, it is important to ensure that trial activities are conducted in as harmonized a manner as is possible. Without such harmonization the true benefits of B2B collaboration envisioned through the use of the FIspace service will not be realized and redundant activities will occur that will dissipate funds with limited benefit for the overall project. In the sub-sections that follow several examples of how collaboration between the trials will benefit the overall project are described. These examples serve as a small window into the ongoing work of the trials to work with one another sharing ideas and concepts so that efforts can be leveraged across trials to the advange of the entire project.

3.1 Trial 421 and Trial 422

Trials 421, Crop Protection Information Sharing and 422, Greenhouse Management and Control both cover primary farm production, and they have common characteristics. Both trials attempt to integrate sensor data streams into the crop management process to ensure that yields are maximized. Because both of these trials deal with similar problems, but from differing perspectives, they are able to leverage certain common services while providing a broader demonstration of the capabilities of the FIspace service. Both trials will utilize the same refermence model (the Netherlands' drmCrop model), Farm Management Information System, and IoT services. In addition, both will utilize a cloud proxy service to ensure that local data can be continuously managed should an actual connection to the cloud not be available.

3.2 Supply Chain Management in FIspace

Most of the trials in the FIspace project have some sort of supply chain associated with them. This fact makes collaboration across these trials logical. Trials 431 (Fish Distribution), 432 (Fruit and Vegetables QA), 433 (Flower and Plant SCM), 441 (Meat Provenance), 442 (Consumer Product Export/Import), and 443 (Tailored Information for Consumers) all involve the need to track information through the supply chain. While the trials themselves focus on different aspects of information tracking, and thus exercise the FIspace service differently, they share common requirements for supply chain event management, visibility, tracking, monitoring and notification. These common needs provide the foundation for leveraging services across trials and for collaboration between trials to ensure that the common services are capable of addressing all of the various trials' needs. Additionally, there is the potential for "trial specific apps" to be shared across trials if they are developed with an eye towards configurability, a potential that the T431 team has identified when they performed a cross trial analysis of the currently specified "trial specific apps." As the project moves forward continued collaboration across trials will be an essential component of the efficient testing and development of the FIspace service.

3.3 Collaboration among the FIspace WP

The time line which has been set for the FIspace project is tight. WP400 is involved to some degree in all activties of FIspace. Trial tasks drive platform and app services. Trial experiments demonstrate to user communities what the FIspace service can do to benefit them. Trial experiments are carried out through the use of FIspace infrastructure services. Trials experiments define whether and how the FIspace project is deemed a success. Because WP400 activities are integral to the successful execution of the tasks of each of the other work packages, WP400 personnel have been integrated into the planning and execution actions of the other work packages.

Trial teams have attended FIspace educational sessions so as to align FIspace platform functionalities and trials requirements. Trial teams representatives have have also attended T240 and T250 meetings with the following objectives:

- ***T240 FIspace Real-time B2B Collaboration:*** to assist in defining the Business Collaboration Objects and the events that need to be monitored to ensure that these platform services are capable of handling the real world requirements of the trials;
- ***T250 System & Data Integration:*** to ensure that the data integration services developed for the platform are capable of integrating with domain specific back end systems, IoT devices, and other legacy applications.

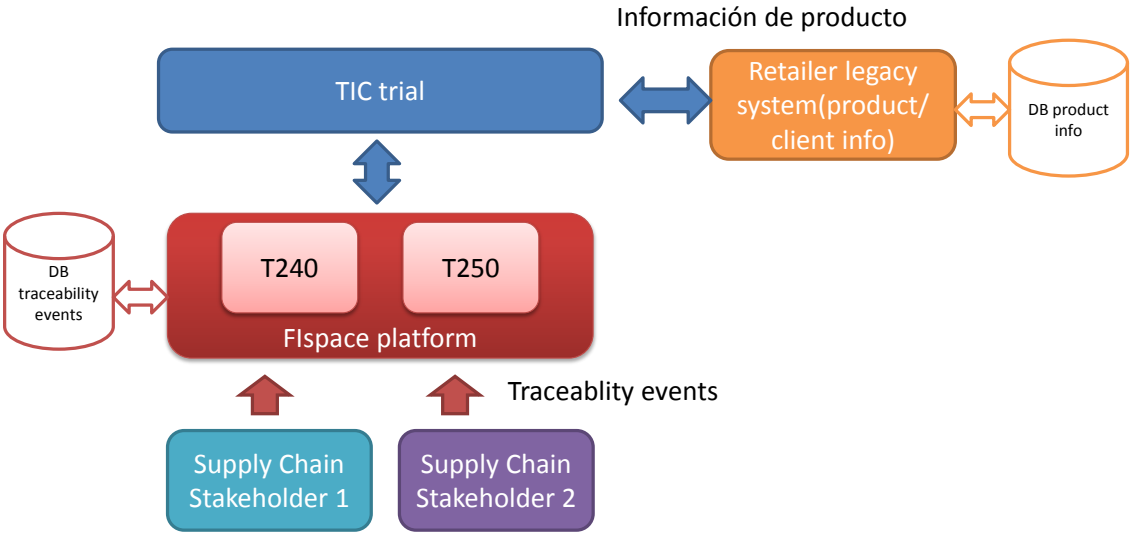

Figure 23: Trial interaction with T240 and T250 (example from T443)

Collaboration and Harmonization within FIspace is an ongoing topic that will be continually emphasized through the entire life of the project. Reports on the collaboration and cooperation efforts of the trial teams will be provided in the following M12, M18 and M24 deliverables.

4 Initial plan for large scale expansion of the use case trials in Phase 3

This task involves all leading partners from the different WPs. Its objective is to aggregate relevant results concerning the FIspace platform, the required and deployed infrastructure and the trials, as well as progress towards ecosystem building, business modeling, regulation, standardization and exploitation, in order to draft specific requirements, deployment options and recommendations for eventual FI-PPP Phase 3 projects and to draft detailed plans for the large scale expansion of platform usage facilitated by local and regional stakeholders including SMEs. This task will interact with T570 where the overall large scale rollout of FIspace is developed.

For this activity the FIspace community is pro-actively approaching relevant communities of stakeholders in order to engage larger user groups and external IT solution providers in taking up and contributing the large scale expansion results. WP500 of the FIspace project has worked closely with each of the trial teams to identify relevant domain organizations to engage in dissemination activities and is working closely with venture and software organizations to increase their awareness of the potentials for the FIspace servie. The specific actions being followed by the team are:

- Engaging players and associations from relevant industrial sectors and the IT industry
- Exploiting contacts to existing communities and stakeholders in the Agri-Food and the Transport & Logistics domains as well as Living Labs and IT partner networks
- Leveraging on the local ecosystems on the Experimentation Sites established in project by engaging the business partners and customers of the Early Trial owners (see above)
- Collaborating with the other FI-PPP Phase II and Phase III projects, in particular with the other phase II use cases and capacity building project,
- Conducting knowledge transfer and education activities, and
- Providing a thorough and detailed documentation of the FIspace project results available to the public to support easy exploitation and community building.

At this stage of the FIspace project, preliminary actions have begun to identify and engage the relevant parties for large scale rollout of the project's results (see D500.1.1 and D500.1.2). Reports on actions and results in this regards will be documented in the following M12, M18 and M24 deliverables.

5 Summary

This document is the first of the test and development progress reports. At this stage of the FIspace Project the testing of the developed application (App's) has not yet started as their first release are scheduled for, and expected after, month nine. In addition, as the FIspace platform itself has not been operationalized yet, trial experiments have not been conducted. However, the trials have been working to develop experimentation plans, identify application requirements, map information flows, engage external parties in community building and prepare for the initial release of the FIspace platform. The preparation for the experimentation exercise is ongoing and will be reported on in the following reports (M12, M18 and M24) where results will be documented according to the level of the software releases and available platform services.

The project ecosystem is beginning to develop and plans are being roughed out to begin the large scale expansion of the project envisioned in Phase 3. These plans include exploitation and dissemination activities being coordinated by WP500 as well as trial and domain specific community building aligned with WP500 plans.

Within the six month period since the FIspace project started, the WP400 team has achieved it set goals in defining the trials as well as their domain specific apps. The work of the trial teams is well planned and continues to track to the work plans developed for each trial. Future progress reports in months 12, 18 and 24 will hopefully continue to demonstrate the ongoing achievement of milestones as currently planned.


FIspace
Business Collaboration