

Deliverable D400.3

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

WP 400

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Abstract

As a use case project in Phase 2 of the FI PPP, Flspace 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. Flspace 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 Flspace 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 Flspace Description of Work (DoW) as part of deliverable D400.3 – progress report on trial experimentation and App development and updated work plan. The document provides an overview of the experimentation effort and results of the eight trials. It includes a detailed work plan for the work package containing the activities and milestones of the work package as well as for each trial.

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PP	Restricted to other programme participants (including the Commission Services)	
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Abbreviations

App	Application
B2B	Business to Business
BCO	Business Collaboration Object
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 App
QR-code	Quick response code
RFID	Radio Frequency Identification
RTD	Research and Technological Development
RTI	Returnable Transport Item
SDK	Software Developer Kit
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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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 Flspace project. This project leverages the outcomes of two complementary Phase 1 use case projects: Flnest 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.



Future Internet shall provide:

- ... seamless B2B Collaboration (information exchange, communication, coordination of activities)
- ... rapid & easy development of customized solutions at minimal costs
- ... quick formation & evolution of open business networks

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, Flspace leverages and capitalizes on the outcomes of two successful Phase I use case projects – Flnest and SmartAgriFood –, as well as the Generic Enablers available from the FI PPP Technology Foundation (“Core Platform”) projects (FI-WARE and its successor).

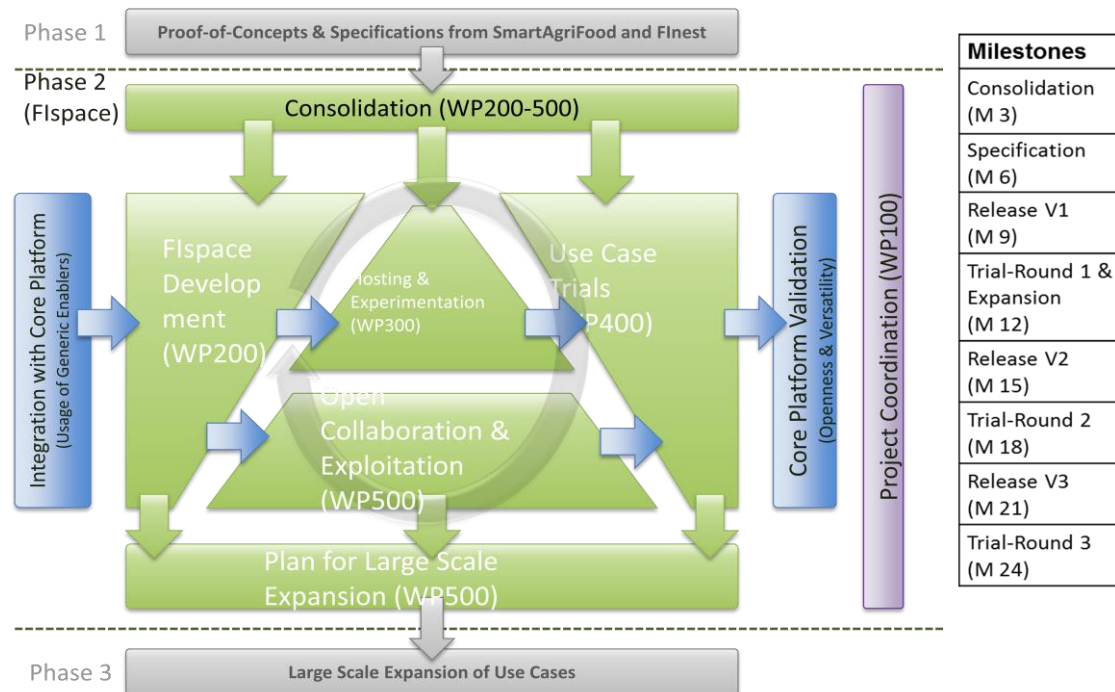


Figure 2: The work in Flspace follows three major work streams

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

- **Flspace Development (WP200),**
- **Flspace Hosting & Experimentation (WP300),**
- **Use Case Trials (WP400).**
- **Open collaboration & Exploitation (WP500),**

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 Flspace 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 Flspace 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 Flspace components hosted by WP300.

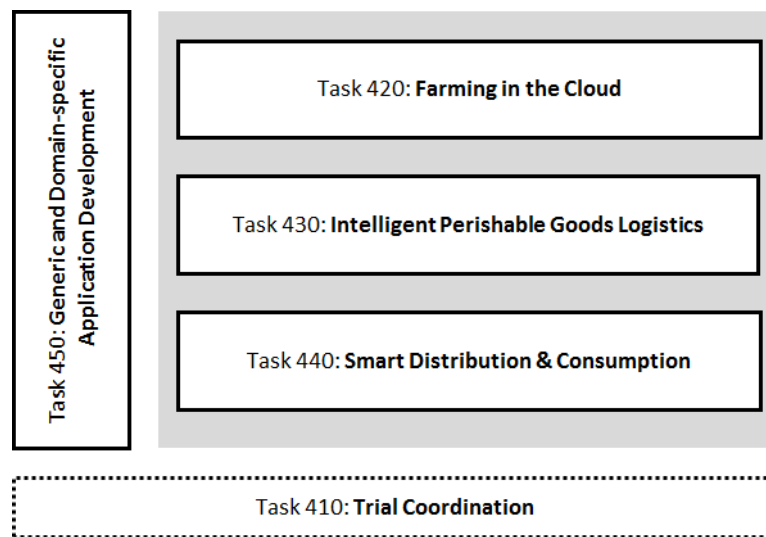


Figure 3: High-level structure of WP400 “Use case trials and domain Apps”

2 D400.3 Progress report on Trial experimentation and App development and initial plan for Phase 3 rollout

This deliverable provides a progress report on the development of trial experiments and Flspace Apps as well as an overview of the plans currently being developed for Phase 3 rollout of the Flspace 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 Flspace project and includes a detailed set of work plans for the work package.

Each trial progress report is concerned with the actual conduct of the defined experiments using the identified experimentation environments, domain specific applications, Flspace 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 Flspace 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:

- Progress monitoring and control of the experimentation and domain application development activities
- Definition of trial specific key performance indicators (KPI)
- Documentation of experimental outcomes with a balanced score card approach
- Feedback of experimental outcomes to interested domain partners, Flspace developers, domain application developers and FI WARE developers

To align with the Apps functionalities proposed in D400.6 and D400.10, involved partners have made an initial analysis of the Apps and their relationship to the trials. Alignment of the 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.

- 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

Activities and actions concerning the development and implementation of initial and domain apps, which is lead and monitored by Task 450 will be reported in D400.7 as well as in D400.11

A workplan for the WP400 activities has been established and is constantly updated through input from the trials. The workplan is a separate document.

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.

2.1 Trial 421 - Crop Protection Information Sharing

2.1.1 Trial Team

The Crop Protection Information Sharing Trial will be realised by:

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.

As a result of the open call, the team will be expanded by

BO-MO LTD	"Combine weather data", now called "Formulation of weather scenarios"
CIT Development S.L.	Bad weather alert.

2.1.2 Report on Trial Progress

Activities

The 421 trial team reduced the two weekly meeting to monthly meetings as the tasks within the trial become clear.

The Trial Leader participated actively in the two weekly telco meetings of the WP400 trials team. And participated in a dedicated meeting in Bonn.

The trial leader participated actively in activities around standardizing data interchange in Agriculture. On the national level in the Netherlands these are activities from AgroConnect to develop EDI-Teeltv4 and at the international level ISO/TC23/SC19 WG1 and WG5. The objective is to secure that results of this Crop Protection Information Sharing trial can be adopted in the crop production domain by means of 1) staying informed on activities and used technologies in other information sharing activities and 2) letting other parties adopt as much as possible findings of the Flspace project and the 421 trial.

The trial lead also participated in two workshops in the Netherlands, where the principles behind the Flspace programme are explained and discussed as possible technology for future developments in ICT architecture for agriculture.

Requirements for three apps in the open call were formulated, which resulted in two apps that will be developed by new partners.

The activities around App development are described hereafter.

A start was made to formulate the key performance indicators (KPI) of the trial which will be finished at the end of this reporting period. Also an initial text for the promotional leaflet of the trial is made.

2.1.3 App Development.

During the reporting period the different Apps of the Crop Protection Information Sharing trial and their mutual interaction are worked out in more detail, especially the interfaces between the different Apps.

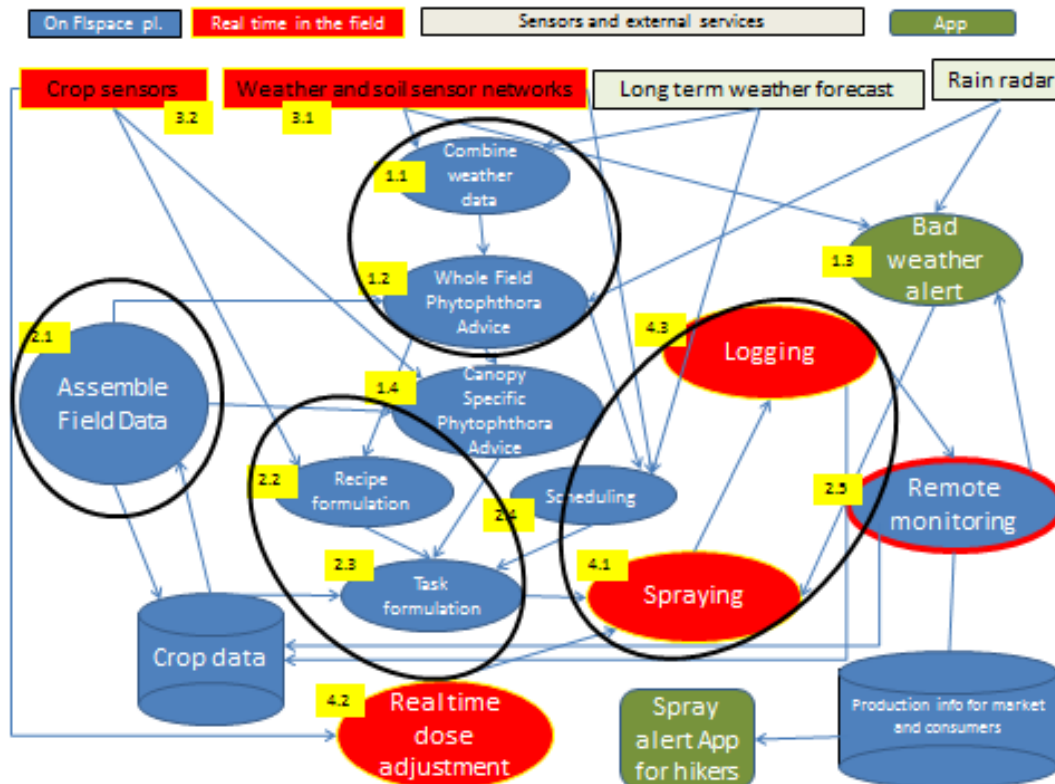


Figure 4: Apps foreseen in the original trial plan with the apps in test at the end of month twelve indicated by black circles..

Initially the Assemble Field Data, The Whole Field Phytophthora Advice (including an ad hoc version of Combine Weather Data), Task Formulation (including an ad hoc version of Recipe Formulation), Spraying and Logging are developed and used to realise data exchange for Phytophthora Control.

The interaction between the Apps and the “Business Collaboration Object” (BCO) are specified in a sequence diagram. During analyses of the cooperation between the BCO and the different Apps it became evident that we have to distinguish between events and data messages. Events are communicated to and from the BCO while data messages are exchanged between the data stores of the participating apps directly. There are seven event messages defined (*AdviceRequestEventMsg*, *NewWeatherPredictionEventMsg*, *NewAdviceEventMsg*, *NewTaskEventMsg*, *TaskRealizedEventMsg*, *OperationRealizedEventMsg* and *RelevantGrowthStageEventMsg*) and five data request and five data response messages. (*InitialCropFieldDataRequest/ResponseMsg*, *PhytophthoraAdviseRequest/ResponseMsg*, *TaskdataRequest/ResponseMsg*, *RealisedTaskDataRequest/ResponseMsg*, *UpdatedCropFieldDataRequest/ResponseMsg*)

As a BCO for the Crop Protection Information Sharing trial is not available, the event messages are for initial testing exchanged between the Apps directly. Event messages have as less data as possible, the only information is where the request comes from and eventually which object is concerned.

The data messages and also the minimal content of the event messages are based on the *drmCrop* reference (data) model. From this platform independent reference model an XML model is made by use of a transformation template. Subsequently xsd files are generated, which can be used to generate the API's for the Apps.

At the end of this reporting period the data interfaces between the different Apps are tested.

Five of the in total fourteen foreseen Apps are operational and being tested, including their interfaces. Two Apps, “Combine Weather Data” and “Bad Weather Alert” will be developed by new partners from the open call.

2.1.4 Balanced Scorecard & Key Performance Indicator

The T421 community is elaborating Key performance indicators. This has been finalized so far. It will be delivered soon.

A balanced scorecard is under construction and will be issued as soon as the KPI have been defined.

2.2 Trial 422 - Greenhouse Management and Control

2.2.1 Trial Team Members:

Trial Lead: NKUA

Participants OKEPE, INNOV

2.2.2 Report on Trial Progress

A detailed analysis based on the *Balance Scorecard* approach is presented for reporting the progress of the Greenhouse Management & Control trial in the following section. During the project M6-M12 period, there has been a significant progress regarding the development of the trial apps (domain-specific as well as generic ones), the design and the evaluation method of the Business KPIs of the trial's use cases (business and technical), as well as the first step towards experimentation on the actual Experimentation Environment of Flspace and benchmarking.

Table 1: Trial 422

Vision	Improve efficiency -> support Business to Business collaboration and efficient information exchange, improve planning of operations, handling of events, quality of products, satisfaction of customers
Stakeholders	Farmers/Greenhouse Managers, End-product Producers, Automated/Advisory Systems Enterprises (FMIS enterprises, Expert – Advisory System services enterprises, Agronomists, Traceability platform/services enterprises, Agriculture State Agencies, Meteorological service etc.)
Understanding	System acceptance requires a <i>win-win approach</i> throughout the chain
Perspectives for improvements	Processes <> Employees <> Stakeholder collaboration >> Finances

2.2.3 Major initiatives

Table 2: Major Initiatives

<p>1. Greenhouse Advice apps (Greenhouse Monitoring, Greenhouse Analyser, Task Planning etc.)</p> <p>1a. <u>Investment</u>: Automated/Advisory Systems Enterprises</p> <p>1b. <u>Utilization</u>: Farmer/Greenhouse Manager, FMIS companies, Agronomist</p> <p>Experimental Evaluation</p> <p>a) time required to identify & forward an event/alert, organize greenhouse task planning etc.</p> <p>b) time required to receive required actions from the expert system/task plan</p> <p>c) success rate (percentage of advice requests which were successfully addressed)</p>

2. Complaint Management app

2a. Investment: FMIS companies, Traceability platform/service owner

2b. Utilization: End-product Producers, Greenhouse Manager/Farmers

Experimental Evaluation

a) time required to submit a complaint and receive a successful analysis back

b) success rate of complaint analysis

c) quality of the analysis (satisfaction of the End-product Producer)

3. Marketplace Operations app/service

3a. Investment: End-product producers, State Agency for Agricultural policies

3b. Utilization: End-product producers, State Agency for Agricultural policies

Experimental Evaluation

a) time required to find a new service offer/demand

b) success rate of matchmaking mechanism (between offers – demands)

c) request – response time with external systems (e.g., State Agency DB)

c) quality of results (unsuccessful queries, search with same criteria etc.)

4. Product Recall app

4a. Investment: End-product producers, State Agency for Agricultural policies

4b. Utilization: End-product producers, State Agency for Agricultural policies

Experimental Evaluation

c) request – response time with external services (e.g., State Agency DB)

b) overall time required to identify the list with the related stakeholders in the business chain

b) success rate of product recall requests

2.2.4 Key performance Indicators

The purpose of the evaluation is to verify how much Flspace supports addressing the needs of the stakeholders in terms of Business-to-Business collaboration and integration. Does it really help? Do the Flspace capabilities provide the expected results? Do the daily work and the collaboration of the stakeholders have been improved? The target behind the evaluation is to translate the business goals into capability requirements, and assessing the solution's capabilities and how much they contribute to accomplish the business goals, by defining business KPIs that enable the measurement of the effectiveness of the capabilities.

The main idea illustrated in each scenario of the Greenhouse trial is to use cloud-based applications to support Business to Business collaboration and efficient information exchange in order to improve planning of operations, quality of products, satisfaction of customers, handling of events and especially emergency events. However, the expected performance improvement in terms of operational efficiency can vary depending on the type and extent of an event, the market's needs etc. In order to assess the real potential of Flspace one should evaluate the various test cases independently (3rd section). In order to select and assess the right KPIs for the evaluation, we need to specify which aspect of performance one needs to evaluate.

2.2.4.1 High-level Greenhouse trial stakeholders KPIs

1. Time required to accomplish each one of the business collaborations defined in the trial scenarios
2. Time required for the stakeholders to get used the platform usage and start taking advantage of it
3. Deployment costs
4. Maintenance costs
5. Update / Upgrade costs
6. Impact on the stakeholder's revenues due to
 - a. the automation of procedures
 - b. centralized support of the Greenhouse software inside the platform
 - c. better options for collaboration with a variety of stakeholders using the platform's features

2.2.4.2 High-level Greenhouse Trial KPIs from the Platform perspective

1. Platform usability
 - a. Time required to integrate external systems into Flspace (e.g. new FMIS) using adapters
 - b. Training time for the stakeholders
2. Response time (applied for each one of the test cases, e.g. time for alert to be triggered, time for advice to come back, time to find receive a complaint analysis for a product etc.)
3. Time to upgrade a Greenhouse trial Flspace app
4. Quality indicators:
 - a. Product life time
 - b. User acceptance – friendliness
 - c. Quality of notifications
 - i. True positives rate
 - ii. False positives rate
 - iii. True negatives rate
 - iv. False negatives rate
5. Number of Flspace apps created and uploaded in the Flspace Store
6. Number of different business entities created in the trial context
7. Number of stakeholders / SMEs participated
8. Number of different business entities (workflows/collaborations) created

2.2.5 Balanced Scorecard

The following tables demonstrate the objectives, the means of measuring, the target as well as the type of activity to be performed in order to reach a specific KPI from four different perspectives: the process, the customer, the learning, as well as the financial perspective. For each one of the stakeholder category, apart from the respective scorecard table, a flow chart is demonstrated which depicts the relationship between the objectives and the respective activities.

Table 3: Farmers/Greenhouse Managers Scorecard

Perspective	Objective	Measure	Target	Activity
Process Perspective	Reduction of time required for handling alerts/task planning	Time/alert-task plan-complaint analysis etc.	-50%	Greenhouse Advice apps utilization (process automisation)
Customer Perspective	Better guarantees in food safety (risk reduction at customers)	No. of complaints from end-product producers	-30%	Automised procedures' results by using the Greenhouse Advice apps
	Better services to customers, higher customer satisfaction	New customers/year	+10%	Automised procedures' results by using the Greenhouse Advice apps
Learning	Increased flexibility in	Freed time in	-10%	Greenhouse Advice

Perspective	employee engagements	process activity		apps utilization (process automatisisation)
Financial Perspective	Increase productivity	Product quantity/year	+10%	Optimized task planning
	Lower process costs (pesticides etc.)	€/process cycle	-10%	Optimized task planning/alert handling, fewer greenhouse employees

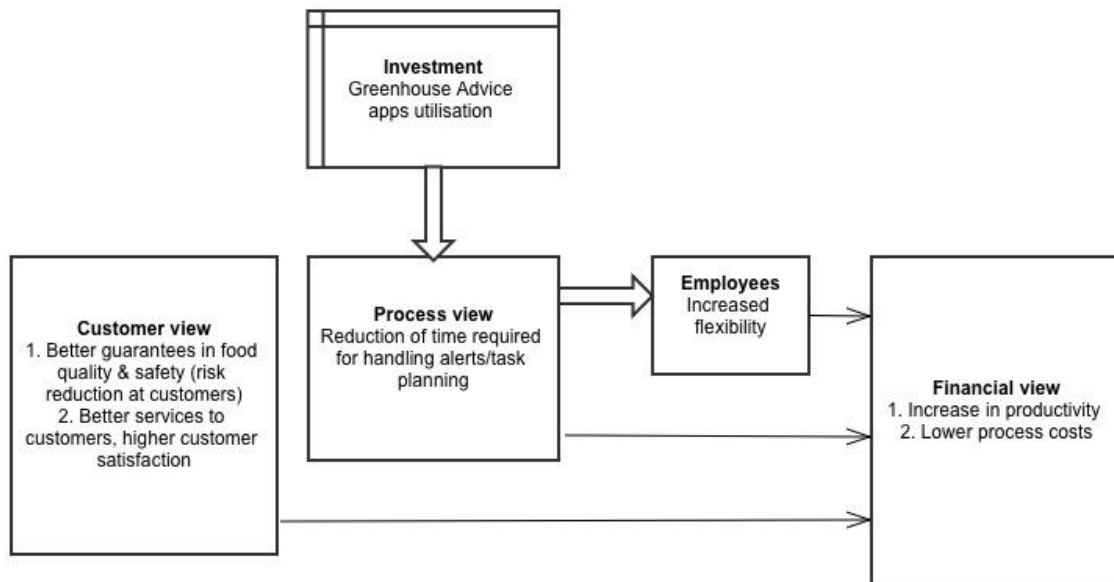


Figure 5: Relationship between objectives and activities

Table 4: End-product Producers Scorecard

Perspective	Objective	Measure	Target	Activity
Process Perspective	Reduction of time required to analyse a customer complaint	Time/complaint analysis	-50%	Complaint Management app investment & utilization
	Reduction of time required to receive the stakeholder list for recalling a product	Time/product recall stakeholder list	-50%	Product Recall app investment & utilization
	Reduction of time required to find new business players to collaborate with	New collaborations/year	+10%	Marketplace Operations app investment & utilization
Customer Perspective	Better services to customers, higher customer satisfaction	New customers/year	+10%	Automised complaint management & product recall procedures
Learning Perspective	Increased flexibility in employee engagements	Freed time in process activity	-20%	Complaint Management, Product Recall apps utilization (process automatisisation)
Financial Perspective	Lower process costs	€/process cycle	-20%	Time reduction & less personnel

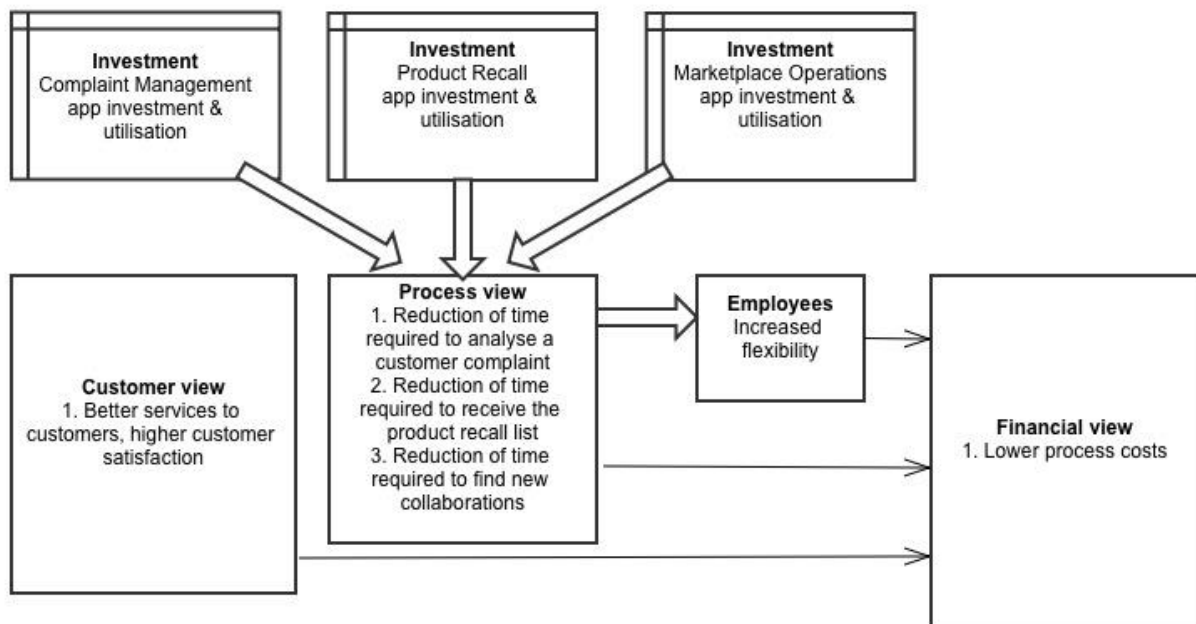


Figure 6: Relationship between objectives and activities

Table 5: Advisory/Expert Systems Enterprises Scorecard

Perspective	Objective	Measure	Target	Activity
Process Perspective	Reduction of time required to provide services to customers	Time/provided service (e.g.	-50%	Greenhouse Advice Apps investment & utilization
Customer Perspective	Higher quality and faster advisory/expert system/other services to customers (Greenhouse Managers etc.), higher customer satisfaction	New customers/year	+10%	Greenhouse Advice Apps investment & utilization
Learning Perspective	Increased flexibility in employee engagements	Freed time in process activity	-20%	Automation of provided services to stakeholders
Financial Perspective	Lower process costs	€/process cycle	-20%	Time reduction & less personnel
	Increase productivity	Provided services/time	+50%	Optimized & automated services via Greenhouse apps investment & utilization

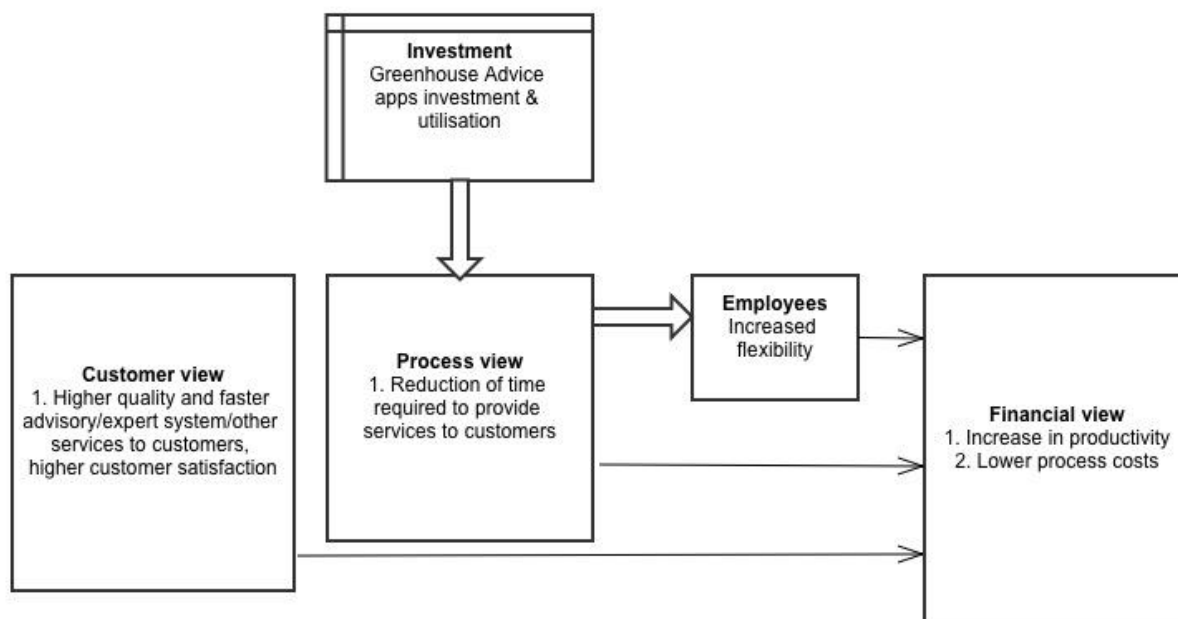


Figure 7: Relationship between objectives and activities

2.2.5.1 App Development

2.2.5.1.1 Overview

In the following section we present the latest status with regard to the Trial's App development status. In order to facilitate the trial experimentation and KPIs' assessment, trial-specific, as well broader-scope apps („initial“ apps-services) are developed. One of the Greenhouse trial's use cases, Advice Request, is the first use case to be deployed and demonstrate the platform's functionality. As a result, a strong collaboration between the trial team and the other work packages (WP200 – WP300) was required during the last months.

The apps which are presented, were designed in order to be deployable on the Flspace platform, available via the Wirecloud GE from FI-WARE, which offers the widget functionality to the platform. The following table shows the trial apps, categorized by the use case they are connected to. The Open Call apps have been added as well in the overall app table:

Table 6: Greenhouse Trial apps

Scenario	App	Type
Advice Request	Greenhouse Advice	trial-specific app
	Greenhouse Sensor Monitoring	trial-specific app
	Greenhouse Crop Monitoring	Open Call trial app
	Greenhouse Crop Analyser	Open Call trial app
Managing Complaints	Complaint Management	specific app
Search for new Farmers	Marketplace Operations	initial app/service
Product Recall	Product Recall	trial-specific app
Task Planning	Task Planning widget	trial-specific app
	Greenhouse Crop Analyser	Open Call trial app*

*Part of the Task Planning scenario's functionality will be implemented by the open call Greenhouse Crop Analyser app

2.2.5.1.2 Greenhouse Advice app

The Advice Request scenario is the first actual use case to be tested on the Flspace platform. The particular use case, as well as the functional requirements of the respective app, have already been described in detail in previous deliverables. Below, a description of the latest development regarding the Greenhouse Advice app is given.

The trial team's effort focused on the sensor information handling, the adapter development on the side of Flspace, the expert system functionality, as well as the messages' definition between the components, in relation to the required functionality of the scenario.

The whole use case is based on the Advice Business Entity, which was defined in collaboration with the team of T240, i.e., the B2B module developers. The business entity, on which the whole operation is based upon is presented below:

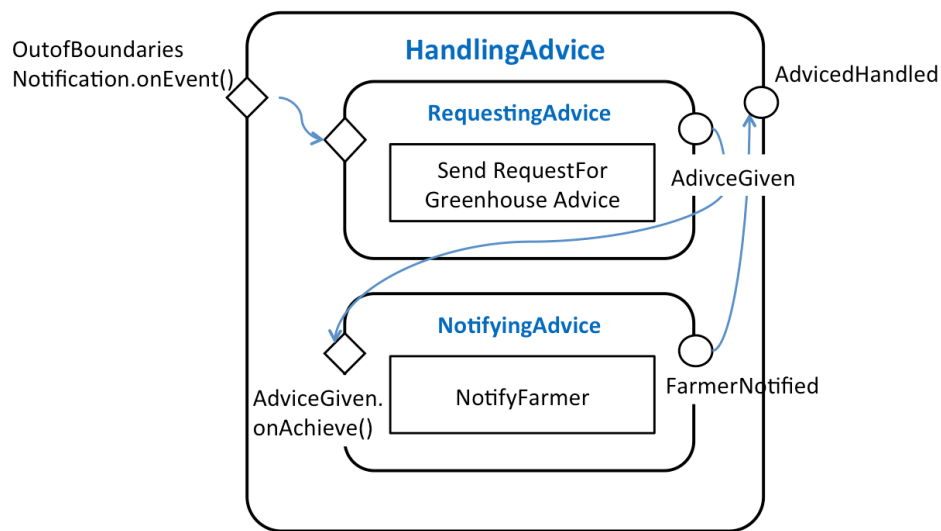


Figure 8: Advice Business Entity for Advice Request Greenhouse trial scenario

The scenario is currently working on the Flspace platform, with the collaboration of most of the platform core's components. The interaction between them, with regard to the specific scenario is shown in the following message sequence diagram:

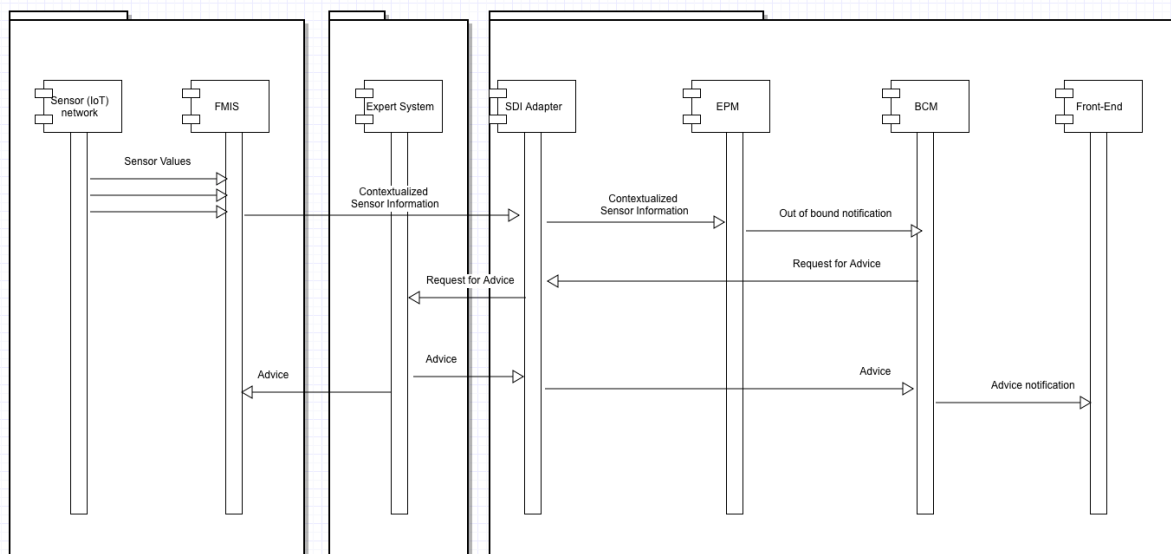


Figure 9: Current interaction of components for the current implementation on the Flspace platform of the Advice Request scenario

The Greenhouse Advice app is currently deployed on the Applications section of the Flspace platform (Wirecloud GE). The first working functionality is receiving the advice notification for the user and presenting this advice via the GUI, according to the above diagram. An example of a received advice, after a sensor value threshold violation has been identified in the B2B module, is demonstrated in the figure below:

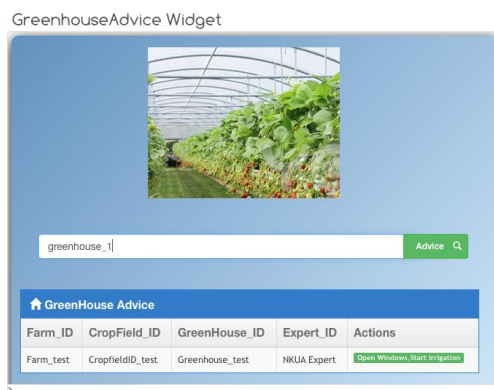


Figure 10: Advice notification in Greenhouse Advice app in Flspace platform

2.2.5.1.3 Greenhouse Sensor Monitoring app

The Greenhouse Sensor Monitoring widget is already deployed in Flspace applications on the cloud and available from the Wirecloud GE, as it can be seen from the screenshot below (a):

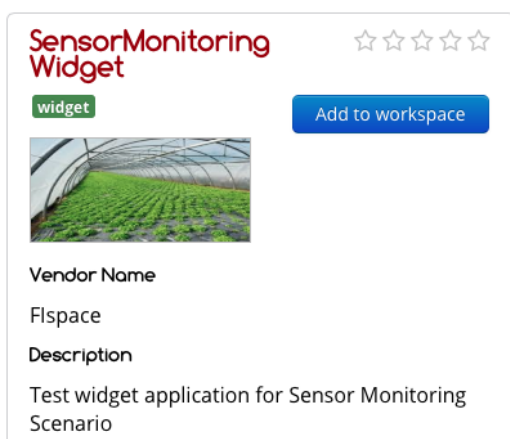


Figure 11: Greenhouse Sensor Monitoring widget available in Flspace applications

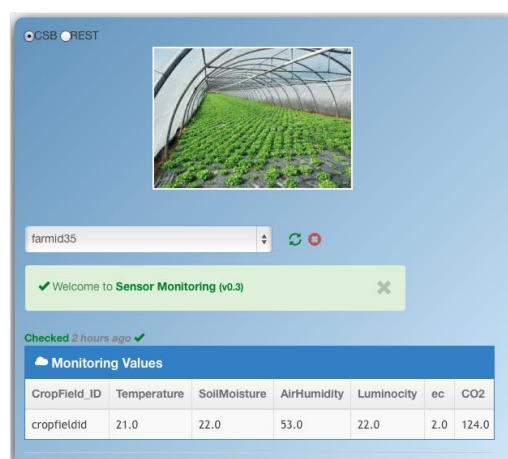


Figure 12: Greenhouse Sensor Monitoring widget 1st release functionality

By adding the widget on the Flspace app workspace, the user can browse for all his/her added Greenhouses/Farms the last sensor values, which were forwarded to the Flspace platform (Fig. b).

Via a dropdown menu, the user has the ability to select one of the available monitored Greenhouses, and in the Monitoring Values' table below, see the respective received values, which are at the same time monitored by the B2B module (as described in the Advice Request scenario earlier) for generating advice in cases of alert.

2.2.5.1.4 Complaint Management

The Complaint Management Flspace app will be used to demonstrate the business value of the platform in the Managing Complaints use case. Its aim is to provide the necessary functionality for producers and processed-food companies to manage the complaints they receive from their customers. In addition, apart from viewing and sorting the complaints received, also encompasses the process of analysing the complaint to pin-point any problems during the production, storage or transportation phase.

In a typical flow the user logs in and sees the list of complaints for his company. The user can select any complaint and ask to analyse it. The analysis request will trigger further requests from the information sources configured for the product (an FMIS or ESIT,-a Traceability Service-), which will in turn give information to the complaint analysis engine to generate a complaint analysis report which will be shown to the user.

The back end is written in Java EE 7. It provides a RESTful API via Jetty. CDI is used for injection, whereas JPA is using for accessing the MySQL persistent storage. The backend runs on the latest Glassfish version (Nightly build 4.0.1-b04-02-2014-m1)

The front end is written in HTML 5 and Javascript.

Authentication is done using the OAuth 2.0 framework. Since by the time of writing the details for authentication within FISpace were not available authentication is done using Google as the primary authentication provider.

The major classes taking part in the complaint management app are described in the following class diagram:

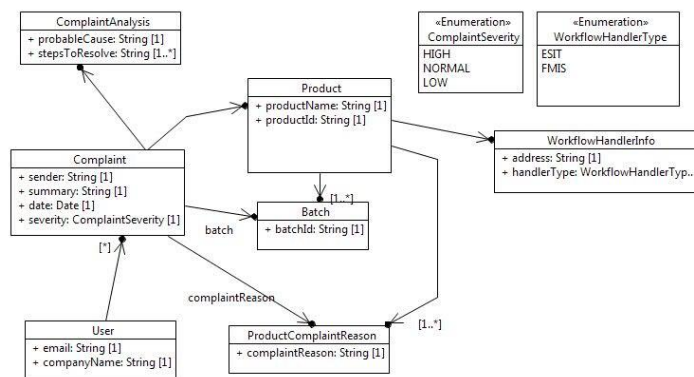


Figure 13: Complaint Management class diagram

The basic class `Complaint` refers to a particular `Product` and a particular `Batch`. It is related to an analysis report (`ComplaintAnalysis`). The specifics of each product's production may be handled by a specific workflow provider (`WorkflowHandlerInfo`) which has a specific address and type and provides the details for the conditions that were prevalent during a particular's batches production. Such a workflow traces the steps used to grow or create the particular product. At the moment two different types of workflow providers are considered: ESIT and FMIS (`WorkflowHandlerType`).

The process of a complaint analysis is demonstrated in the following sequence diagrams:

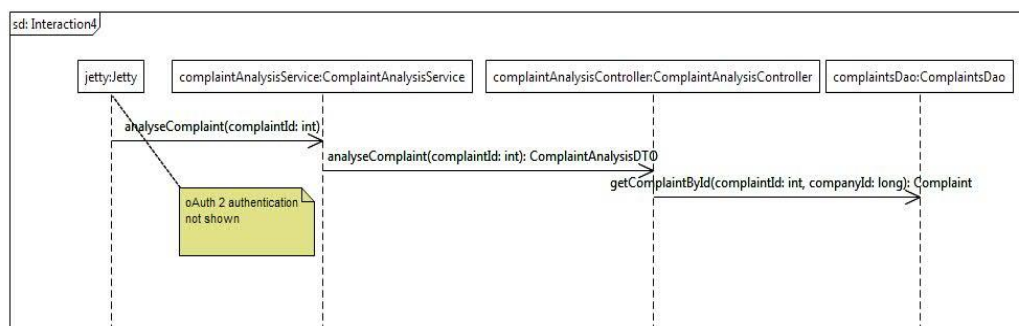


Figure 14: Starting sequence for Complaint Analysis

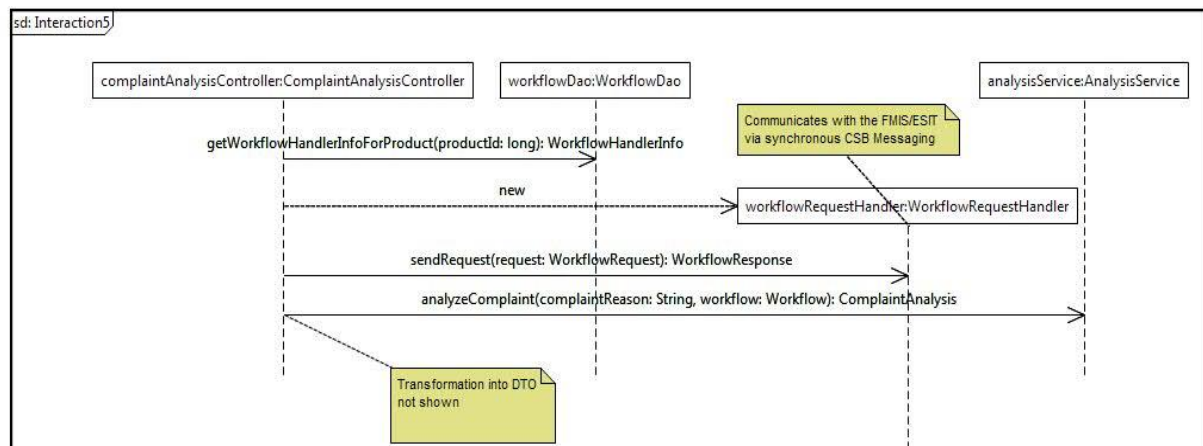


Figure 15: Finishing sequence for complaint analysis

Finally, the screenshots below give a first idea about the current functionality – implementation:

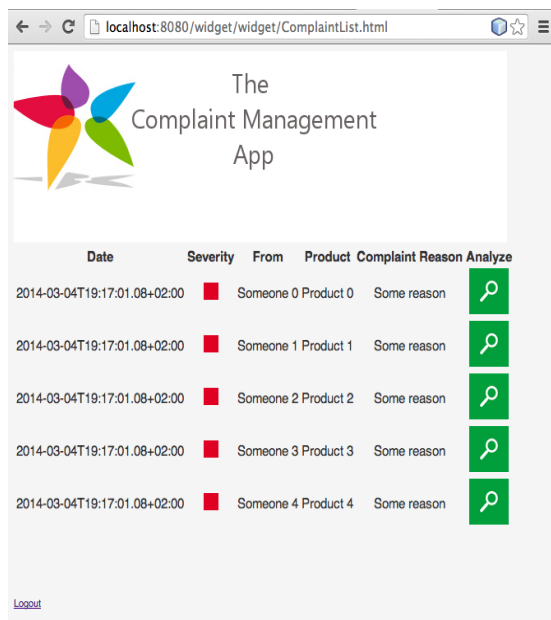


Figure 16: Viewing the existing complaints screen

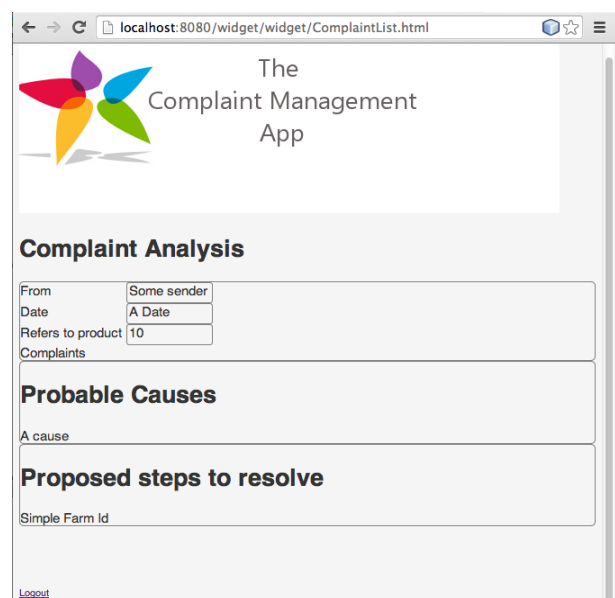


Figure 17: View of a complaint analysis report

2.2.5.1.5 Marketplace Operations app/service

The Marketplace Operations initial Flspace app/service (formely “baseline”) is used in the “Search for new Farmers” scenario. Currently, the app supports two domains, i.e., Logistics and Agriculture. Specifying the search criteria from the provided forms, the user can search for services of farmers with a certain geographical area, about a specific farm product, quantity etc.. The next release of the app will support connection to an external Database of Farmers in Greece, and provide advanced information regarding the particular use case.

The Marketplace Operations app is currently deployed in the Wirecloud GE workspace of Flspace (where all the apps are uploaded), but –depending on the WP200 team’s decisions- it may be provided a separate service within Flspace platform.

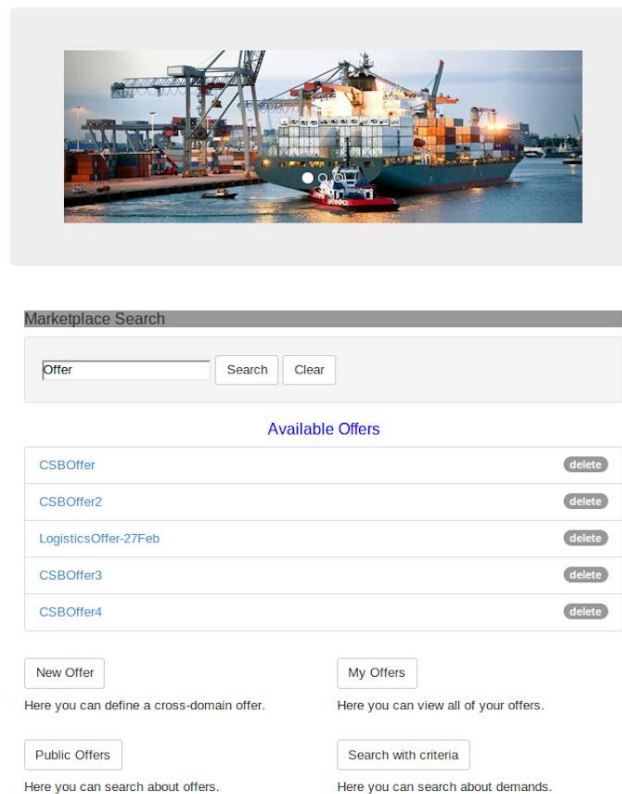


Figure 18: Marketplace Operations initial app main screen

2.2.5.2 Greenhouse Trial and Experimentation Environment (WP300)

The choice of the Advice Request scenario from the WP200, for demonstrating the first release of the platform core components' functionality, is in a tight relation with WP300 as well, and in particular with the Experimentation Environment (EE). The development of the EE focused on the first initial components for supporting the same use case. As a result, the Greenhouse trial team collaborated with the WP300 team in order to be able to evaluate the scenario using the EE.

Indicatively, the Backend Simulator EE component simulated the Sensor Network in the Greenhouse, which provides the sensor data to the platform. The same EE component also provides the Expert System's functionality of receiving the Greenhouse Alert and providing back to the platform the Advice and Actions to be taken. Moreover, in the KPI Manager EE component, some first basic KPIs have been specified (e.g. Execution time in ms, Step time in ms) and are evaluated and presented to the EE user during the experiment execution via the respective GUI. Analysing the details of the EE features further is out of scope of this document.

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

2.3.1 Trial Team

Lead: MARINTEK

Participants: NCL

The Fish Distribution Planning Trial is used to demonstrate the capabilities of the collaboration platform to support business processes during the **planning of transport**. The context of the Fish Trial is the export of fish from Norway to Brasil. Although the planned experimentation focuses exclusively on the Apps and Services supporting the interaction between the shipper (transport customers) and carrier (transport provider), the Flspace collaboration platform offers complementary capabilities which can support other processes along the fish export supply chain. These capabilities are the ones experimented in other trials (shipment tracking and shipment planning – Consumer goods Trial; and product information – FFV Trial). The figure below illustrates the **complete potential of Flspace** for the supply chain (the green box representing the experimentation part).

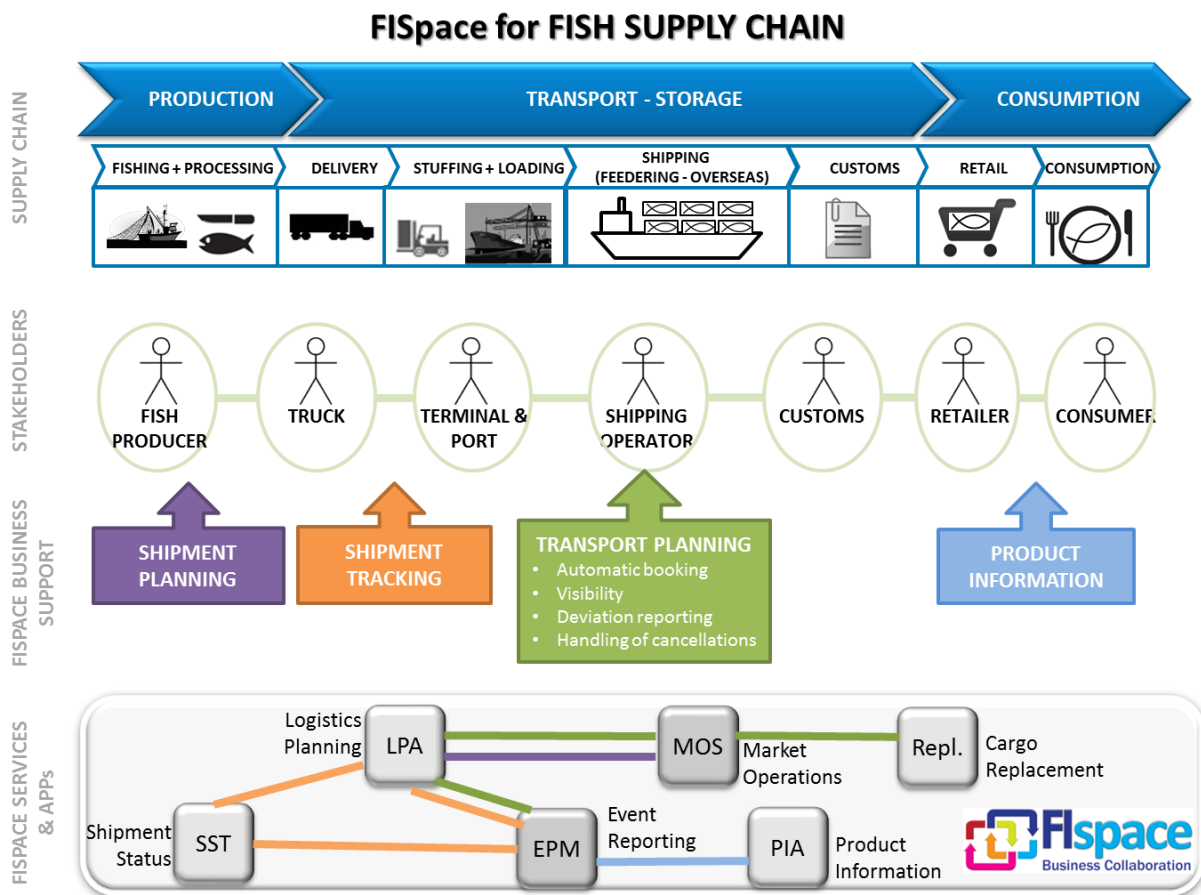


Figure 19: Flspace support for the fish supply chain

2.3.2 Test and Experimentation Report /App development report

2.3.2.1 Description of the test scenario.

The business interaction model for carriers and shippers based on the Flspace collaboration platform is illustrated below.

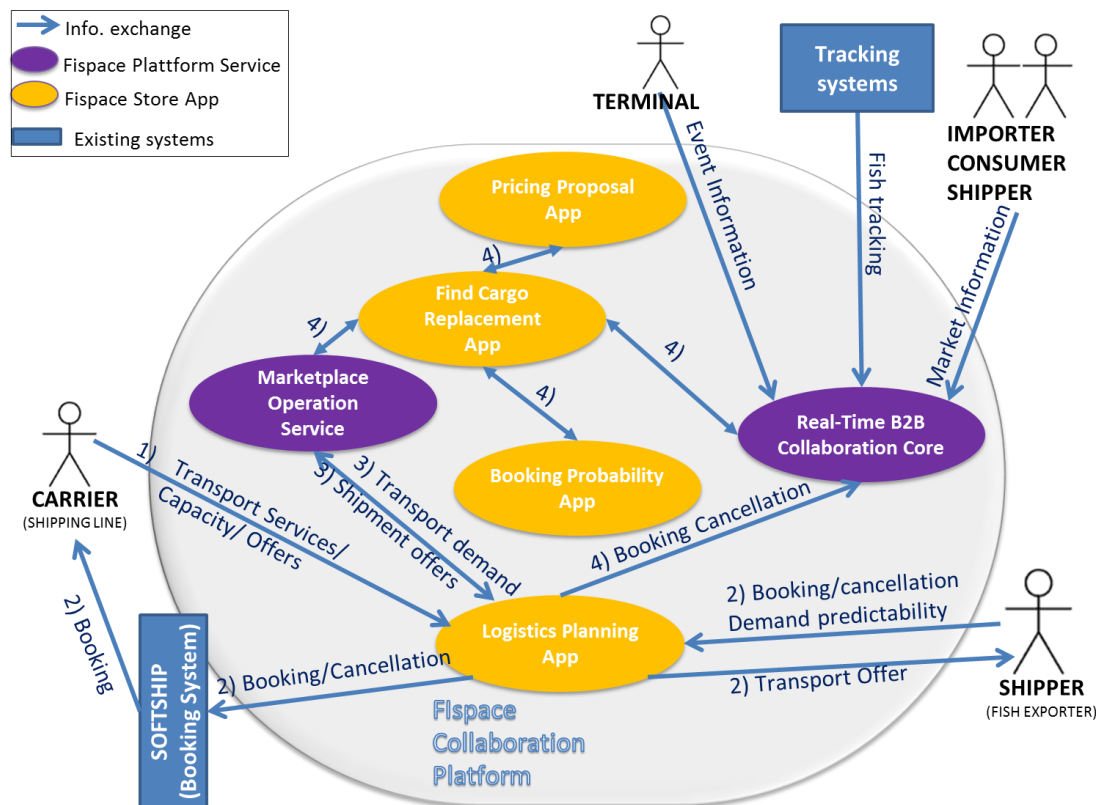


Figure 20: Fish Trial Usage of Flspace Platform

Figure 20 shows how the various apps and services in the Flspace interact to improve the B2B collaboration between Fish Trial stakeholders:

- 1) **Logistics Planning App for carriers:** Publishing transport services and sending offers to and negotiating with shippers.
- 2) **Logistics Planning App for shippers:** Setting up transport plans based on real-time information on transport services, benchmarking offers from spot market and existing contracts, and booking of transport.
- 3) **Marketplace Operation Services:** Match making between transport demands and offers, based on real time information and connected to other market places.
- 4) **Collaboration Support for carriers:** Event detection and reporting, booking probability (Booking Probability App) calculation to anticipate "unreliable" bookings, improved handling of late cancellations, and automatic search for replacement cargo (Cargo Replacement App).

Combined with pricing policies to encourage early booking and dissuade dummy booking and late cancellations, this solution is believed to have a strong positive impact on capacity utilization and operational efficiency. The main innovation brought about by the Flspace collaboration platform is the interoperability among its services and applications, which together can enable better supply-chain integration in terms of information distribution and accessibility. Expected benefits for carriers are improved transport planning and reduced number or consequences of cancellations, and for the shippers, access to more suitable transport offers, thus reducing the need for dummy bookings and improving the quality of the information flow between stakeholders.

2.3.3 Evaluation of Flspace Services and Initial Apps

This section summarizes the testing done in the Fish Trial in M7-M12 of the project. The tests have been conducted as an evaluation of Flspace Services and Initial Apps with respect to how they cover the requirements from the Fish Trial. The evaluation has been based on the following input:

- 1) **Description** of the Fish Trial as it is found in Deliverable D400.1 and through continuous **collaboration** with NCL, the main stakeholder of the Fish Trial, acting as a feeder container line.

- 2) **Data collected** from NCL on bookings, cancellations, and schedules.
- 3) **Requirements** from the Fish Trial to the Flspace Services and Initial Apps as described in Deliverable D400.1.
- 4) Description of the first version of **the Flspace Services and Initial Apps** as found in Deliverable D400.7.
- 5) **Demonstrations** held by the Flspace Service and Initial App developers.
- 6) **Tests** performed by the fish trial participants of the available Flspace Services and Initial Apps, during February and March 2014.

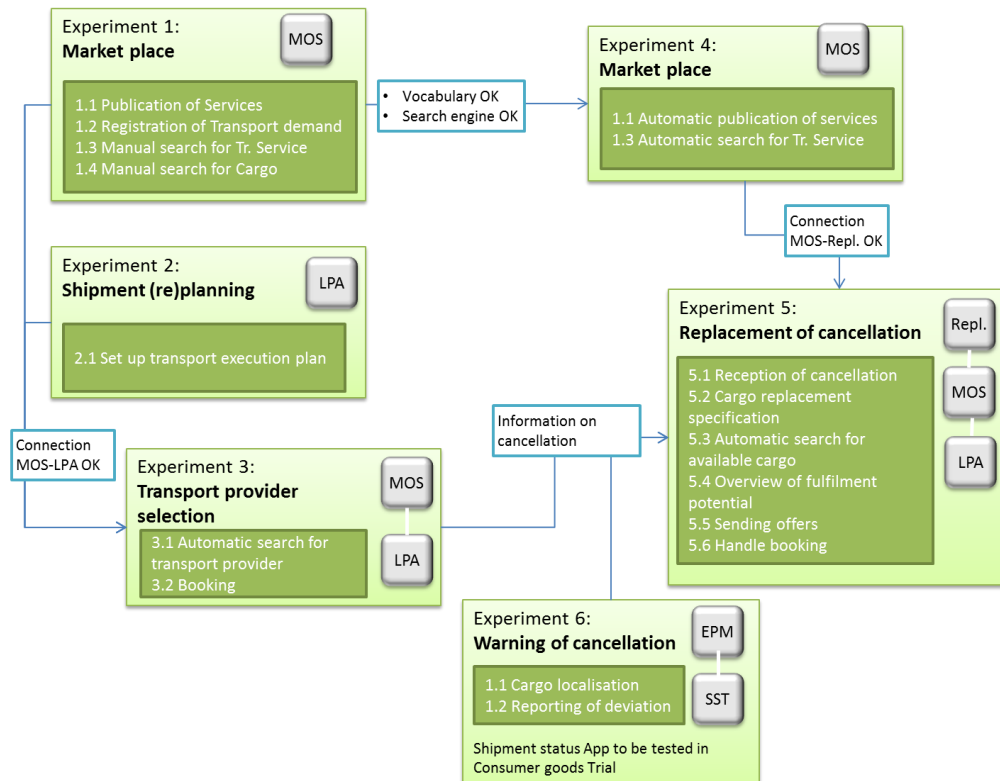


Figure 21: Fish Trial Experimentation Overview.

The figure above gives the overview of the Fish Trial Experimentation plan. In this deliverable, the results of Experiment 1 and 2 are described.

Marketplace Operations Service (MOS)

The Marketplace Operation Service (MOS) version deployed on the WireCloud¹ was tested during February 2014. The following is a list of what was tested:

1. Creation of a new service offer that is a feedering service between two locations (service with one leg).
2. View details of a specific offer.
3. Textual search for a service offer using the name of the offering as a keyword
4. View available service offers

For the next releases of the MOA, several functionalities will be needed by the Fish Trial, as

¹ <http://37.131.248.57:9092>

1. More details of the service offers (ETD, ETA, price)
2. Possibility to add services with more than one leg
3. Extended search functionality
4. Allow the LSC to publish demands on the Marketplace
5. Do matchmaking between service offers and transport demands

Logistics Planning App (LPA)

The LPA was demonstrated to the fish trial during February 2014, however, the LPA was not available for testing by the Fish Trial participants themselves. From what we saw from the demonstration, the initial functionality of the LPA is well suited for use by the Fish Trial. For the next versions of the LPA, several extensions to the current version will be needed:

1. Add the possibility to have several legs in one transport plan.
2. Interact with the booking systems through the CSB to have automatically bookings from the LPA.
3. Integration with the MOA to be able to book services published on the Marketplace, and to do matchmaking
4. Handle replanning triggers and allow replanning

B2B Collaboration Core Modules (T240)

Since none fish trial specific apps has been developed yet, the B2B Collaboration Core Modules including event monitoring have not been tested. However, the following is a list of revisited requirements from the fish trial regarding this module:

1. The B2B Collaboration Core Modules must be able handle new, updated, and cancelled transport plans from the LPA, that is, to send the booking requests to the booking system (Softship).
2. The B2B Collaboration Core Modules must be able to send a replanning trigger to the LPA to notify the planner about a need for replanning of booking. This can be done by the B2B Collaboration module by picking up events related to bookings in Softship, for instance saying that the booking state has changed from waiting list to OK.
3. The B2B Collaboration Core Modules should be able to notify the LPA when an import licence for a cargo in a booking is missing 24 hours before loading starts.
4. The B2B Collaboration Core Modules should be able to notify the LPA when the cargo has not been fetched at the shipper's place 12 hours before loading starts.
5. The B2B Collaboration Core Modules should be able to notify the LPA when the cargo is delayed to terminal.

2.3.4 System and Data Integration (T250)

Since none fish trial specific apps has been developed yet, the System and Data Integration modules have not been tested. However, functionality from these modules will be needed for several purposes, among them preparation for the integration between Flspace apps and Softship, by describing a mapping between the data model of the transport plan given by the LPA, and the Softship booking format (EDIFACT, IFTMIN).

Open Call Apps

The fish trial app "Find Cargo Replacement" App (CargoSwApp) will be implemented through the Open Call. The first prototype will be available at end of June 2014, while the second release will be available in Dec 2014.

The "Booking Probability" app will not be implemented through the Open Call. However, simulations can be done to show the relevant functionality. Another possibility is to define events related to the transport indicating the probability that a booking will be completed (for instance the position of the cargo or the existence of an import licence), and then to use this as input to the "Find Cargo Replacement" app.

2.3.5 Balanced Scorecard & Key Performance Indicator

KPIs for evaluating the Flspace capabilities and business value are presented below, using the Balanced Score Card framework, which is set up from the perspective of the carrier / feeder service operator NCL.

Figure 22 : Apps, KPI and Perspectives

Vision:	Better transport offer and services, as a result of higher capacity use, lower operational/planning costs, and more effective planning
Stakeholders:	Trial's core business relationship: (1) Feeder shipping operator NCL, (2) Cargo owner / Shipper (Fish exporter or forwarder)
Understanding:	Improve information availability => improved info exchange => Improved transparency => More visibility => better planning => better services

Perspectives for improvements:

<u>BSC perspective</u>	<u>Requirement for improvement</u>
Processes	Planning; booking performance
Employee	Operational efficiency
Customers	Value for transport users
Finances	Vessel capacity utilization; More sales

Flspace Serv + Apps	(1) Market Operation Service	(2) Real-time b2b collaboration core	(3) Logistics Planning App	(4) Cargo Replacement App
a. Investment			Shipper	Carrier
b. Utilization	Carrier + Shipper	Carrier + Shipper	Shipper	Carrier
KPIs for measuring Flspace capabilities	-Access to larger market -Easier identification of tr. Services -Efficient match-making demand/offer	-Access to real-time, up-to-date and correct information -Earlier warning of cancellations -efficient information exchange -Automatic notification	-Automatic booking of transport -Efficient benchmarking of services	Rapid identification of cargo available for transport
KPIs for measuring Flspace up-take	% of transport services found through marketplace App		Share of bookings realised by using <i>Booking App</i>	Share of cancellation replacement realised by using <i>Replacement App</i>

Two Trial Apps described previously have not been retained by the project for further development: **Probability App** and **Pricing App**. Their main utilization were intended for the carrier, for Anticipation of cancellations, and more adapted pricing. It is foreseen that the capability of anticipation of cancellation can be partially covered by combining information about cargo/shipment (from the shipment status app and the product information App, designed and demonstrated in other trials), and the functionalities of the Event handling service of Flspace.

Figure 23: Balanced Scorecard

BSC Perspective	Objective	Measure	Target	Activity
Processes (BOOKING PERFORMANCE)	Automatic Booking	Share of bookings not made by mail/phone/fax	99% of bookings	Use of LPA by shippers and connection to carrier's booking system (Softship)
	Booking reliability	Share of bookings and requests that resulted in actual transport	+50%	Access to MOS for shippers and use of ProbApp by carrier
	Replacement of booking cancellations	Share of booking cancellations replaced	75%	Use of Repl.App by carriers and connection to MOS
	Booking probability accuracy	Share of anticipated cancellation	+50%	use of ProbApp by carrier
	Pricing accuracy	margin /voyage	+30%	use of PricingApp by carrier
	Early warning of cancellation	Booking cancelled earlier than 48 hours before departure (instead of within 48h)	+25%	Prob.App to track potential cancellation; LPA to replan and send updates through B2B collaboration core
Employee (OPERATIONAL COSTS)	Planning costs	Manhours for handling bookings	-50%	Automatic booking through LPA
	Re-planning costs	Manhours for handling replacement of cancellations	-90%	Use of Repl.App by carriers and connection to MOS
Customers (VALUES FOR TRANSPORT USERS)	Last minute booking	Latest possible time for booking before departure		
	Transport planning efficiency (search)	Lead time and manual work to find a transport service	-30%	Use of LPA and MOS
	Transport planning efficiency (select)	Lead time and manual work to find best offer (stop searching)	-50%	Use of LPA and MOS
	Automatic booking	Share of bookings not made by mail/phone/fax	+90%	Use of LPA and MOS
	up-to-date information	Share of booking based on up-to-date information (immediate response)	+100%	Use of LPA and MOS
Financial (VESSEL UTILIZATION)	Transport capacity use	Average load factor	+50%	Use of MOS and Repl.App
	Replacement of late cancellations (vol.)	Share of late cancellations cancellation replaced (in nbr. of containers)	75%	Use of Repl.App by carriers and connection to MOS
	Rapidity to find replacement	Active time to find replacement after cancellation;	-90%	Use of Repl.App by carriers and connection to MOS

2.3.5.1 Relationships between Objectives and Activities

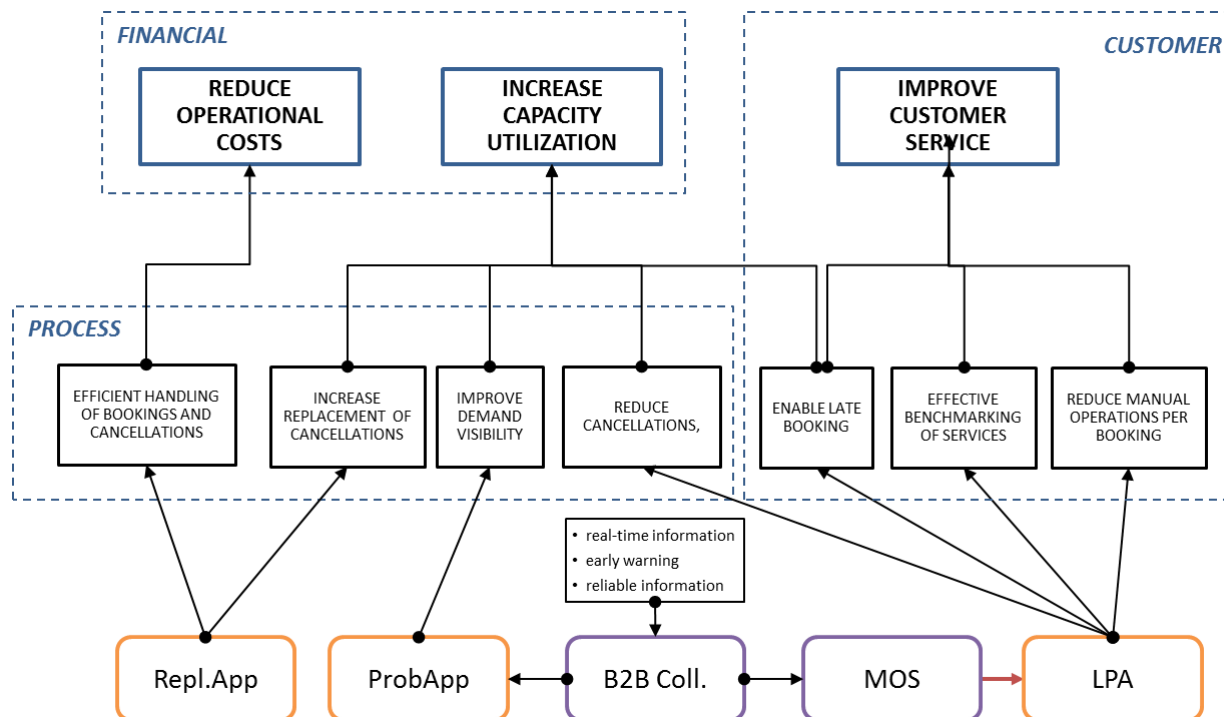


Figure 24: Relationships between objectives and activities

2.4 Trial 432 – Fresh Fruit and Vegetable Quality Assurance

2.4.1 Trial Team Members

Lead: CentMa

Participants: Europool, GS1 G,

2.4.2 Test and Experimentation Report

The trial has several test scenarios it needs to deal with. They refer to

- the fit of the Apps with the requirements of the stakeholders in the fruits- and vegetable chain
- the usability of the Apps,
- the appropriate functioning of the Apps under development,
- the interaction of Apps with the Flspace platform, and
- the benefit of Apps with regard to enterprises KPIs

The **fit of Apps with requirements** could build on various meetings with stakeholders in the chain where the business processes and chain interaction processes were presented and discussed. They involved general meetings with stakeholders of all stages of the chain present, starting as early as May 2013 (first meeting) until November 2013 (last meeting). These meetings were complemented by meetings with stakeholders of individual stages and especially with the trading group (associate partners Landgard and Pfalzmarkt) who picks up products from farms and trades them with retail, with the logistics group (associate partner Vendel), and the RTI (returnable trade items) management group (project partner EPS).

The meetings with stakeholders of individual stages are an ongoing process that does not only support the identification of suitable functionalities of Apps but also the separation of the generic core of Apps (generic for the fruits and vegetable sector) from individual requirements any individual stakeholder would like to have implemented. This separation identified development priorities and provides an outlook to phase 3 where specific needs might be served that complement the generic core of Apps developed in phase 2 of the project.

As a result from these discussions, 3 major Apps were defined and selected for development during this phase of the project. They involve:

- a) communication of product information along the chain (backward and forward) (**PIA**),
- b) risk management dealing with deficiencies in food safety and quality (**Riskman**), and
- c) management of RTIs along the chain (**Boxman**).

The first one was selected for realization by present project partners, the others by partners selected during the ongoing open call process. The further discussion refers therefore to the first App only.

At this stage of the project, tests around the **usability of Apps** were primarily focused on presentations and discussions of user interfaces. The tests followed a classical prototyping approach. Based on first paper based outlines (step 1) stakeholders were presented with screen based prototypes (step 2) and functionality prototypes (step3). The first functionality prototypes were presented and discussed during the general meeting in November 2013 followed by presentations and discussions with individual stakeholders, especially with the trading group in February 2013.

The appropriate **functioning of Apps** could be demonstrated with the stage 3 prototype jointly with tests on the usability of Apps. What is still open is a test on the **interaction of Apps** with the Flspace platform. These tests will be performed as soon as the platform is ready for dealing with Apps beyond their own test environment.

The final and most crucial tests concerns **improvements in stakeholders KPIs**. KPIs that concern improvements in information on quality issues as well as on transparency could be part of the test activity and are closely linked with tests on the fit of Apps with requirements. Tests related to costs and benefits could be based on arguments. Tests based on experiments with Apps need to be performed at later stages of developments or have to be postponed to real implementations in the sector.

2.4.3 Test results, challenges, recommendations and advises for the project team.

The basic tests outlined above (fit, usability, functioning) were performed through presentations with stakeholders. The general response was positive. This involved fit with stakeholders' requirements, usability, and functioning of prototypes. There were no proposals on how to improve or change. This result was due to intensive discussions among project partners who know the sector, know the software applications used in the sector and have been engaged in previous software development arrangements with stakeholders in the chain.

However, the tests served as a basis for extended discussions among stakeholders on

- a) potential adaptations to specific situations,
- b) priorities in further development, and
- c) the data content that should be considered.

Concerning the first issues, stakeholders considered the Apps the appropriate base (generic core) on which enterprise specific 'add-ons' could be developed. As one stakeholder expressed it, "...it is the base that allows to formulate specific requirements for phase 3 developments for smooth integration into the present specific (and not generic) business processes individual enterprises and chains might be dealing with....".

A few of such forward-looking discussions were held with the trading group which decided at board level to bet on Flspace developments as one of their strategic development goals.

A critical issue concerns the future of the Flspace platform. One needs to clarify at the earliest convenience that

- a) the platform developments will live up to expectations,
- b) the platform will live beyond project end, and
- c) the platform will be integrated into an acceptable and affordable organization and management scheme.

Stakeholders made it very clear, that the increased requirement of App development and testing on their investments in time and engagement could only be justified if the issues regarding the future of the Flspace platform are being resolved as fast as possible.

2.2.1. Key Performance Indicator

The identification of KPIs in the food and vegetable trial requires the consideration of the main stakeholders in the chain. They involve the RTI management group, the trading group, and retail. As has become common, the KPIs for the stakeholders are being determined through the Balanced Scorecard (BSC) approach. The scorecards for the three stakeholders are outlined in table 1-3. Relationships between objectives (KPIs) are characterized by arrows in the tables. As an example, the relationships between objectives in scorecard of table 1 are outlined in figure 1. A summary of the approach and the results relevant for experimental initiatives are as follows:

1. BSC-Vision: The major business objectives were identified as **competitiveness** based on improvements in efficiency and market related sustainability.

2. BSC-Perspectives for improvements: The overriding focus is on finances and on customers who assure market success based on efficient processes and the appropriate engagement of employees resulting in the following sequence of dependencies:

Processes <> employees <> customers (markets) >> finances

3. BSC-Focus: The focus of attention are investments in, and the utilization of, the Flspace Apps PIA, Riskman, and Boxman.

4. BSC-KPI results: The relevant KPIs associated with investments and utilizations in the Apps are identified in the scorecards of table 1-3. Figure 1 demonstrates as an example the relationships between objectives of the scorecard depicted in table 1. The KPIs that can be utilized in experimental activities are the following:

App BOXMAN

- 1. Investment in BOXMAN (Box Service Provider)
- 2. Utilization of BOXMAN (Box Service provider, Trader, Retail)

KPIs for experimental evaluation:

- a) Reduction in process time by Box Service Provider
- b) Reduction in process time by customers (trader, retail)
- c) Reduction in errors by customers (trader, retail)

App RISKMAN

- 1. Investment in RISKMAN (Trader, Retail)
- 2. Utilization of RISKMAN (Trader, Retail)

KPIs for experimental evaluation:

- a) Better early warning capability (Trader, Retail)

App PIA

1. Investment in PIA (Trader, Retail)

2. Utilization of PIA (Trader, Retail)

KPIs for experimental evaluation

a) Better information about products (Trader, Retail)

b) Better information about production status at farms (Trader, Retail)

2.4.4 Balanced Scorecards

Perspective	Objective	Measure	Target	Activity
> Process perspective (info collection)	Reduction in process time	Min./process cycle/customer	- 50%	Investment in BOXMAN (automization of process)
> Customer perspective	Reduction in process time by customers (offer)	Min./process cycle at customers	- 50%	Provision of BOXMAN to customers for facilitating data input (automization)
	Better customer relationships	New customers per year	+ 10%	Provision of BOXMAN to customers for improved process efficiency
	Reduction in input errors by customers (time saving)	Errors/cust./ process cycle	- 30%	Provision of BOXMAN to customer (automization)
> Learning perspective	Increased flexibility in employee engagements	Freed time in process activity	- 10%	Investment in BOXMAN for reduction in process engagement (automization)
> Financial perspective	Increase in customer returns	Turnover/year	+ 10%	Increase in customer acquisition
	Lower process costs	€/process cycle	- 10%	Reduction in time and personnel
	Lower costs for growth	Personnel for growth/year	- 10%	Less employees for process activities
Legend: Red cells in objectives indicate KPIs for experimentation; grey cells in activities indicate investments in Apps; arrows across rows indicate dependencies in objectives				

Figure 25: Scorecard RTI Service Provider

Perspective	Objective	Measure	Target	Activity
> Process perspective	Reduction in crate mgmt process time	Min./process cycle	- 50%	Utilizing BOXMAN provided by box service (automization)
	Better information about products	No of info items /delivery	+ 50%	Investment in Plnf-System
	Better information about production status at farms (better marketing opportunities)	No of status reports per customer	+100%	Investment in Plnf-System
	Better early warning capability or deficiencies in products	Time for informing customers	- 50%	Investment in RISKMAN
> Customer perspective	Better planning in customer service (early planning of deliveries)	Accuracy in projected delivery status (variability in weeks)	- 50%	Utilization of Plnf-System
	Better guarantees in food safety and guarantee (risk reduction at customers)	No. of complaints	- 50%	Utilization of Plnf-System
	Better customer relationships	Increase in customer returns	+ 10%	Utilization of Plnf-System and RISKMAN
> Learning perspective	Increased flexibility in employee engagements	Freed time in box mgmt. process activity	- 10%	Utilization of BOXMAN
> Financial perspective	Increase in customer returns	Turnover/year	+ 10%	Better relationships customer
	Lower process costs (box mgmt.)	€/process cycle	- 10%	Reduction in time and personnel
	Lower costs for growth	Personnel for growth/year	- 10%	Less personnel for process activities
Legend: Red cells in objectives indicate KPIs for experimentation; grey cells in activities indicate investments in Apps; arrows across rows indicate dependencies in objectives				

Figure 26. Scorecard Trader

Perspective	Objective	Measure	Target	Activity
> Process perspective	Reduction in crate mgmt process time	Min./process cycle	- 50%	Utilizing BOXMAN provided by box service (automization)
	Better information about products (risk reduction)	No of info items /delivery	+ 50%	Investment in Plnf-System
	Better information about production status at farms (better purchasing opportunities)	No of status reports per customer	+100%	Investment in Plnf-System
	Better early warning capability on deficiencies in products	Number of cases where deficient products reach consumers	- 50%	Investment in RISKMAN
> Customer perspective	Trust in food products	Number of cases where deficient products reach consumers	- 50%	Utilizing RISKMAN
	Better transparency	Increase in sales	+ 10%	Providing consumers with information they request
> Learning perspective	Increased flexibility in employee engagements	Freed time in box mgmt. process activity	- 10%	Utilization of BOXMAN
> Financial perspective	Increase in customer returns	Turnover/year	+ 10%	Better trust and transparency for consumers
	Lower process costs (box mgmt.)	€/process cycle	- 10%	Reduction in time and personnel
	Lower costs for growth	Personnel for growth/year	- 10%	Less personnel for process activities
Legend: Red cells in objectives indicate KPIs for experimentation; grey cells in activities indicate investments in Apps; arrows across rows indicate dependencies in objectives				

Figure 27: Scorecard Retail

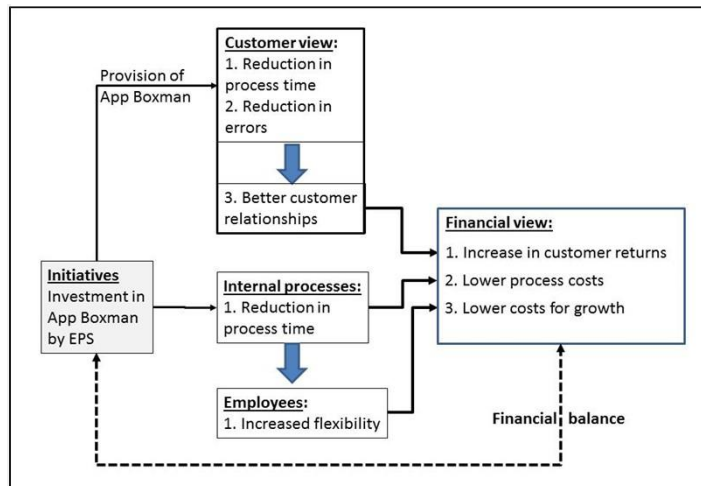


Figure 28: Relationships between objectives (KPIs) in scorecard of table 1 (RTI service provider).

2.5 T433 Flowers & Plants Supply Chain Monitoring

2.5.1 Trial Team

Lead: DLO

Participants: Florecom, GS1 G, M&A

2.5.2 Brief description about the test scenario.

During the last six months, the Flowers & Plants Trial was faced with bankruptcy of the main business partner in the project (Baas Plantenservice, a trader of pot plants). In the early fall of 2013, we got the message that Baas Plantenservice was faced with financial problems of their main customers. By consequence they had spent a lot of time to solve these problems and were not able to invest in Flspace F&P Trial. In the mean time, we got the message that a new start was likely. However shortly before Christmas, we got the message that all efforts to save Baas Plantenservice failed. Therefore we had search new business partners during the first months of 2014. In the meantime the app development has been postponed, since no sparring partner was left. At the beginning of April, a restart of the trial will be made with new business partners. Therefore the testscenario could not be developed.

2.5.3 Test results, challenges, recommendations and advises for the project team

No test results to be developed. The challenge is to get all project members and business partners on one line, to agree with an updated work plan and to finish within the deadlines. The project leader has been requested to postpone the deadline for our trial. No response has been received yet.

Balanced Scorecard Approach Flowers & Plants trial

Vision: Quality control + increased efficiency >> saving money

Stakeholders: Grower, logistic service provider, auction, trader, retail

Understanding: Increased quality control enhances customer satisfaction throughout the whole chain

Perspectives for improvements: **Processes** <> employees <> **customers (market)** >> **Finances**

2.5.4 Major Initiatives

Table 7: Major Activities

<p>1. APP ITT (Item Tracking and Tracing)</p> <p>1a. Investment in ITT (Grower, logistic service provider, auction, trader)</p> <p>1b. Utilization of ITT (Grower, logistic service provider, auction, trader)</p> <p>Experimental evaluation:</p> <p>a) Real time information about product location</p>
<p>2. APP CM (Conditions monitoring)</p> <p>2a. Investment in CM (Grower, logistic service provider, auction, trader, retailer)</p> <p>2b. Utilization of CM (Grower, logistic service provider, auction, trader, retailer)</p> <p>Experimental evaluation:</p> <p>a) Real time information about environmental conditions</p>
<p>3. APP EQA (Expert Quality Assessment)</p> <p>3a. Investment in CM (Grower, auction, trader, retailer)</p> <p>3b. Utilization of CM (auction, trader, retailer)</p> <p>Experimental evaluation:</p> <p>a) Periodically information about product quality</p>
<p>4. APP PQA (Product Quality Alerts)</p> <p>4a. Investment in PQA (auction, trader, retailer)</p> <p>4b. Utilization of PQA (auction, trader, retailer)</p> <p>Experimental evaluation:</p> <p>a) Reduced percentage of waste</p> <p>b) Reduced lead times</p> <p>c) Increased quality for end user</p>
<p>5. APP QDP (Quality Decay Prediction)</p> <p>4a. Investment in PQA (auction, trader, retailer)</p> <p>4b. Utilization of PQA (auction, trader, retailer)</p> <p>Experimental evaluation:</p> <p>a) Narrowing boundary values environmental conditions per product</p>

2.5.5 Balanced Scorecard & Keyperformance Indicators

Perspective	Objective	Measure	Target	Activity
Grower				
Process perspective	Waste reduction	% waste reduction	-50%	Investment in CM, ITT; adjusting environmental conditions
Customer perspective	Higher customer satisfaction	% satisfied customers	+10%	Continuous quality control by ITT, CM, EQA
Learning perspective	Narrowing boundaries environmental conditions	% waste reduction % satisfied customers In long term	-5% per year + 1% per year	Applying results of QDP, adjusting boundary values for environmental conditions
Financial perspective	Increased customer returns	% turnover	+5%	Investment in ITT, CM, EQA and QDP

Figure 29: Scorecard Grower

Perspective	Objective	Measure	Target	Activity
Logistic service provider				
Process perspective	Increased quality control during transport and storage	Offering facilities	50% of trucks and docks offered with realtime quality control	Investment in ITT and CM; adjusting environmental conditions
Customer perspective	Realtime adjustment of conditions	Possibility to adjust conditions	50% of trucks and docks offered with realtime quality control	Investment in ITT and CM; providing data to customer
Learning perspective	Narrowing boundaries environmental conditions	% waste reduction % satisfied customers In long term	-5% per year + 1% per year	Applying results of QDP, adjusting boundary values for environmental conditions
Financial perspective	Increased turnover	% turnover	+5%	Investment in ITT, CM

Figure 30: Scorecard Logistics Service Provider

Perspective	Objective	Measure	Target	Activity
Auction				
Process perspective	Increased quality control during transport and storage	Offering facilities	25% of docks offered with realtime quality control	Investment in ITT and CM; adjusting environmental conditions
Customer perspective	Higher customer satisfaction	% satisfied customers	+10%	Continuous quality control by ITT, CM, EQA
Learning perspective	Narrowing boundaries environmental conditions	% waste reduction % satisfied customers In long term	-5% per year + 1% per year	Applying results of QDP, adjusting boundary values for environmental conditions
Financial perspective	Increased membership of growers	% of production produced by members of the auction	+5%	Investment in ITT, CM; Continuous quality control by ITT, CM, EQA

Figure 31: Scorecard Auction

Perspective	Objective	Measure	Target	Activity
Trader				
Process perspective	Increased quality control during transport and storage	% waste reduction	-50%	Investment in CM, ITT; adjusting environmental conditions
Customer perspective	Higher customer satisfaction	% satisfied customers	+10%	Continuous quality control by ITT, CM, EQA
Learning perspective	Narrowing boundaries environmental conditions	% waste reduction % satisfied customers In long term	-5% per year + 1% per year	Applying results of QDP, adjusting boundary values for environmental conditions
Financial perspective	Increased turnover	% turnover	+5%	Investment in ITT, CM

Figure 32: Scorecard Auction

Perspective	Objective	Measure	Target	Activity
Retailer				
Process perspective	Increased quality control during transport and storage	% waste reduction Shorter lead times	-50% -25%	Investment in CM, ITT; adjusting environmental conditions
Customer perspective	Higher consumer satisfaction	% satisfied customers	+10%	Continuous quality control by ITT, CM, EQA
Learning perspective	Narrowing boundaries environmental conditions	% waste reduction % satisfied customers In long term	-5% per year + 1% per year	Applying results of QDP, adjusting boundary values for environmental conditions
Financial perspective	Increased turnover	% turnover	+5%	Investment in ITT, CM

Figure 33: Scorecard Retailer

2.5.6 Relationships between Objectives and Activities

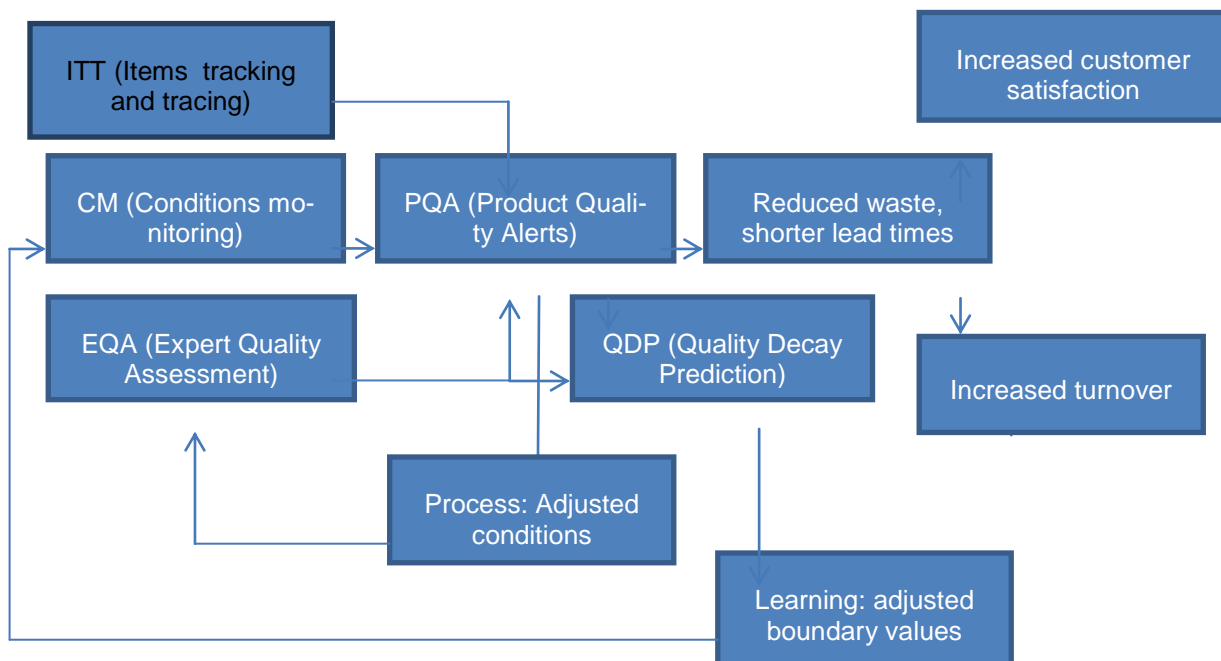


Figure 34: Relationships between Objectives and Activities

2.6 Trial 441 – Meat Information Provenance (MIP)

2.6.1 Trial Team

Lead: WU

Participants: GS1 G

2.6.2 App development

In the period M7-M12 of Flspace the MIP trial has spent substantial effort to developing apps that are needed to implement an EPCIS based transparency system. This system will form the test-bed for the MIP experiments on meat tracking and tracing with emphasis on beef. As the MIP trial has no resources for developing the MIP Transparency System by its partners, this trial depends on other trials and a new partner entering Flspace's MIP trial through the open call.

The MIP trial fine-tuned the requirements for the open call, raised awareness for it at several occasions including an infoday in Brussels and supported a large number of potential open call proposers in the preparation of their proposals. This resulted in a many proposals that aimed to develop apps for the MIP Transparency System. A single new open call partner for the MIP trial, the European EPC Competence Center (EECC) in Neuss, has been selected and the negotiations with this new partner proceed well. So we can expect that they can start working in Flspace's MIP trial on 1 April 2014.

Based on EECC's proposal for the development of three MIP trial apps the MIP subtask *system development* has been postponed slightly, which not hinders the MIP trial experiments substantially.

To implement the MIP Transparency System for testing and experimenting, the following has to be done:

1. Implementing one or more EPCIS implementations, which will be based on Frequenz's (<http://frequentz.com/traceability-server/>) Information Repository & Intelligence Server (IRIS), which is one of only a few EPCIS implementations that can handle the new EPCIS standard 1.1 (to be released spring 2014). The new open call partner, EECC, was involved in developing EPCIS 1.1 and uses the IRIS implementation already for several transparency systems.
2. The MIP Transparency System will develop several *apps to upload* dynamic (i.e. event oriented) data and master data on meat supply chain partners, products and processes:
 - a. The simplest app, referred to as Farm Capturing App, enables farmers to copy animal passport data (and more) as EPCIS events and master data on other aspects to an EPCIS repository;
 - b. Proper interfaces to upload EPCIS events directly from a meat processor's ERP system; this option is the best solution if a meat processor is able and willing to have its own EPCIS repository;
 - c. The last unfavorable option consist of adapting the PIA (Product Information App, to be developed by the Fresh Fruits & Vegetable trial); this is a weaker option, as the PIA does not enforce or encourage the use of all available standards.
3. *Query app*: the requirements for this app are described in deliverable D400.14. This app will be developed conform its requirements.
4. *Discovery app*: the requirements for this app are described in deliverable D400.14. This app will be developed conform its requirements.
5. *Aggregating app*: the requirements for this app are described in deliverable D400.14. This app will be developed conform its requirements.
6. To realize the *consumer app* Flspace's MIP trial will rely on the Tailored Information for Consumers (TIC) trial. This collaboration can build on previous experiences in FI-PPP phase 1 project SmartAgri-Food.

In this way a scalable MIP Transparency System will be realized in time to perform all planned experiments and more.

2.6.3 Brief description of test scenarios

The intended scenarios for experimenting in the MIP trial, as are described in D400.1, will be slightly changed, but also extended.

1. In the first set of experiments (also referred to as the simulation experiment, starting in July 2014 the first release of all apps will be tested for beef, probably without the Consumer App, developed by the

TIC trial. The emphasis will be on correct functioning of the apps and what has to be changed according to the test perceptions of (potential) end-users.

2. In the second set of tests (also referred to as realistic experiments) the whole integrated MIP Transparency System will be tested for beef. This includes but is not restricted to (1) tracing of the beef history for consumers by using the MIP Transparency System and the TIC Consumer App, (2) tracking and tracing of the whole supply chain for beef supply chain partners (bi-directional with simple and more complex queries concerning data for which they have authorization to see) and (3) simulating meat alerts for beef and associated functionalities and how authorities/regulators can use it.
3. A recent opportunity appeared from contacts with interested parties that are affiliated with authorities/regulators (e.g. UN/CEFACT, see 1.2). Collaborating with them enables to perform tests of the MIP Transparency System for other types of meat, i.e. pork in the Netherlands and poultry (chicken, duck and goose) in France. This can be seen as a final validation of the MIP Transparency System.

2.6.4 Test results, challenges, recommendations and advises for the project team

According to the MIP trial planning, no experiments have been performed so far.

2.6.5 Balanced Scocard & Key Performance Indicators

As the MIP Transparency System aims to serve three classes of end-users (consumers, supply chain partners and authorities/regulators) the KPIs are also specified from these three perspectives. The category supply chain partners is further decomposed into farmers, meat processors and retailers, as these have largely different perspectives too. The KPIs are summarized below:

perspective	objective	measure	target	activity
all	real-time information on meat items	fast, ubiquitous and real-time access to all events along meat supply chains	realised in experiments	realisation of the MIP Transparency System
authorities	surgical response to meat crises	fast access to locations of suspected meat items	within one hour	Discovery App in combination with the MIP Transparency System
authorities	one single point to get access to the information	prepared data at discovery service server	always available (but in practice it will be updated once or twice a day)	Discovery App in combination with the MIP Transparency System
authorities	completeness of meat related data for proper analysis	checks on completeness of these data	realised in experiments	running experiments with the MIP Transparency System
farmer	integrate farmers to the chain of information	affordable infrastructure and know-how	cheaper than € 1.000	Farm Capturing App in combination with the MIP Transparency System
farmer	provide data very easily to the transparency system	usable web-form to provide data, according existing rules	100% content from cow pass (EC1760/2000)	Farm Capturing App in combination with the MIP Transparency System
farmer	direct communication with consumers	consumer interview	yes, if this can help me to get better food	Farm Capturing App in combination with the MIP Transparency System and the Consumer App; farmer should provide email address and/or social media URL
meat processors	not high investment, but based on existing systems (ERP)	affordable infrastructure and know-how	cheaper than € 5.000	Enabling meat processor's ERP system to upload data to an EPCIS repository
meat processors	more than one step back and one step forward information	testing potential steps forward and backward in SC	3 companies in total in half an hour	Query App in combination with the MIP Transparency System
meat processors	direct communication with consumers	consumer interview	yes, if this can help me to get better food	Capturing data with ERP or otherwise in combination with MIP Transparency System and the Consumer App; meat processor should provide email address and/or social media URL

perspective	objective	measure	target	activity
retailer	batch based origin of a specific piece of meat can be shown to consumers	consumers' attitude on acceptance and turnover plus for retailers	degree of acceptance by clients and turnover raise few percent for the retailer	Convincing retailers on business case and implementing the MIP Transparency System
consumer	most relevant information on the piece of meat	display of dynamic and static information on a piece of meat	minimum set of provenance plus 3 user required information items	Consumer App in combination with the MIP Transparency System
consumer	tailored information on the piece of meat	user interview	good or better	Consumer App in combination with the MIP Transparency System
consumer	ease of use, e.g. smartphone, WWW	user interview	good or better	Consumer App in combination with the MIP Transparency System
consumer	promptness of information on the piece of meat	time of output	5 sec and realised in experiments	Consumer App in combination with the MIP Transparency System

Figure 35: KPI Meat Information Provenance Trial

2.7 442 - Import and Export of Consumer Goods

2.7.1 Trial Team

Lead: Arcelik

Participants: K+N

2.7.2 Report on Trial Progress

Trial has focused on the “export of consumer goods scenario” in the past months. Table given below summarizes the relationship between scenario steps and related Apps/ Flspace services.

Figure 36: Scenario Steps

Scenario Steps	Requirements (400.1)	Flspace	Status
1) Define transport services: Routes, Schedules, Tariffs, Contracts	<ul style="list-style-type: none"> Customized user interfaces based on points of interests ensuring secure information sharing through user access rights and privileges Support description of transport demand and services 	MOS, LPA, BizS-LAM	Initial applications 1 st release
2) Define transport demand: Information about the products that are in that specific transport unit	<ul style="list-style-type: none"> Support marketplace operations (e.g., publish offers and demands, search for services) enabling integration with external marketplaces Support contract lifecycle management operations 	Transport Demand App	Open Call
3) Issue transport order: Transport order is issued by matching the demand with available services; having real time overview of alternatives	<ul style="list-style-type: none"> Automatic matching of transport demand with available services that can satisfy the requirements of the demand Adding additional services and monitoring requests to transport execution plan Selecting and building of transport chain plans based on the transport demand and online available services, using the latest available information for service descriptions and information from existing contracts Settle a contract with a new partner Provide real-time feedback during the planning of the transport demand if the service offer is not in line with the SLA agreement in the contract Booking request transfer and receiving confirmation/rejection 	LPA	Initial applications 1 st release

Scenario Steps	Requirements (400.1)	FIspace	Status
4)Monitor the execution of the shipment: Real-time status information of all shipments from one source, possible to see which products are inside the shipping unit	<ul style="list-style-type: none"> Automatic retrieval of events from IoT or back-end tracking systems Enabling definition of deviation rules and points of interest for monitoring purposes Fast and seamless information exchange about the actual status of the shipment from one channel Automated notifications of deviations from transport execution plan that occur or about to occur Automated notifications of the events that the user is subscribed 	Shipment Status App, Event Processing (B2B).	Open Call
5)Report events/deviations – manually where necessary		Manual Deviation and Event Reporting App	Open Call

2.7.3 Assessment of the 1st release of the Initial Apps & FIspace services

The trial focused on the evaluation of the initial apps and FIspace services that are of interest, namely Market Place Operations Service (MOS), Logistics Planning App (LPA), Business Service Level Agreement App (BizSLAM) and Event Processing features on February and March 2014. The main inputs and activities performed during the last six months for evaluation are listed as below:

- Data collection for the test scenario and continuous checks about the applicability of the data to the initial apps.
- Event Processing: Several telcos with IBM and technical team members to finalize the GSM model and sequence diagram of export scenario.
- Telcos about alignment and evaluation of common requirements with the Fish use case and potentials for collaboration.
- Requirements of the trial as described in D400.1 and requirements about the relationship between the initial apps and apps that will be developed by the partners of the open call as described in D400.14.
- Description of the first version FIspace services and initial apps as found in Deliverable D400.7.
- Summary of current features of the FIspace services and initial apps in technical meeting in Bohn
- Telco with KOC & Demonstration of LPA on 24.02.2014.
- Telco with UOA & Demonstration of MOS on 27.02.2014.

The following is a list of comments to the implemented features of relevant FIspace services and apps in 1st release:

Figure 37: Feature to be implemented

Initial Apps 1 st Release		Comments/ New functionalities		
	Requirements	Functionalities	Vocabulary	Link between other Apps, FIspace services / Backend Systems
LPA	Description of transport demand	<ul style="list-style-type: none"> *Functionalities for entering, updating, viewing and deleting transport demands are currently available. *It is currently possible to define a demand that consists of one transport leg and utilizing 	Vocabulary should be extended for transport and logistics domain, especially for shipments	Connections to backend systems or other external sources to upload transport demand are currently partially available. Full

		only one mode of transport; however it should be extended to several legs with multi-model transport capabilities.	with more than one leg (e.g. multi-model transport, door-to door services).	integration is planned to be implemented in the next release (M15).
LPA	<p>*Automatic matching of transport demand with available services that can satisfy the requirements of the demand using the latest available service descriptions in the market place and information from existing contracts ;</p> <p>*List transport services fulfilling a transport demand together with detailed information about the service and its price.</p>	<p>*Currently LPA is able to match the service offers available in MOS with defined demands. It is also possible to define services directly in LPA and see the match for simulation purposes.</p> <p>*Match making through BizSLAM is currently not available since the integration has not been implemented in the 1st release.</p> <p>* Service information listed as an alternative should include more detailed information about the routes, timing of events in the service and detailed info on pricing structure.</p>	Vocabulary should be extended for transport and logistics domain, especially for shipments with more than one leg (e.g. multi-model transport, door-to door services).	<p>*LPA assumes price will be calculated either in MOS and/or BizSLAM. The relationship between these apps on cost (price) calculation should be clarified.</p> <p>*Full integration of LPA with the MOS and the BizSLAM App is planned to be implemented in the next release (M15).</p>
LPA	Start planning and re-planning	Re-planning functionality is currently not available in the 1 st release.	-	LPA should receive re-planning triggers from an external source for re-planning. This feature will be implemented in the next release (M15).
LPA	Adding additional services and monitoring requests to transport execution plan	<p>*Currently additional services such as customs clearance etc. are out of scope.</p> <p>*Monitoring requests will be defined in event processing module or in external apps such as Shipment Status app.</p>	-	-
LPA	Settle a contract with a new partner	LPA should trigger the settlement of a new contract in case it does not exist. However this feature has not been implemented in the 1 st release.	-	Full integration with the BizSLAM App is planned to be implemented in the next release (M15).
LPA	Booking request transfer to LSPs backend and receiving confirmation/rejection	Booking through integration with backend systems is currently not handled by the LPA and is not planned in the next releases. However LPA can handle internal messaging about transport order if the users own LPA accounts. There	-	Full integration with the MOS is planned to be implemented in the next release (M15).

		should be an outgoing message about the booking/transport order to external systems such as MOS to reach all relevant parties.		
LPA	Send booking/transport execution plan to execution (B2B Collaboration in WP240)	This functionality is essential for shipment tracking scenario of this trial. Therefore detailed information about the plan should be passed to B2B collaboration module and monitoring of the execution process will be done based on this plan. The LPA must also notify the B2B Collaboration about updated or cancelled transport plans/bookings. Those functionalities have not been implemented in the 1 st release.	-	Planned to be implemented in the next release (M15).
Event Processing / BCM	Fetch the transport execution plan from the LPA, and to follow up on the execution	Currently the functionality “to follow up on the execution of the plan and notifying the user if the execution is not in line with the plan” is being discussed with technical team.	-	GSM model and sequence diagrams are prepared and the interactions between LPA and FIspace components are being discussed currently.
MOS	Creation of a new service description	<p>*Service definition can be done by entering information to the system manually in the 1st release.</p> <p>* The validity of the offer is available but the timing and details (routes etc.) of the actual services should also be added.</p> <p>*Currently it is possible to define a service that consists of one transport leg and utilizing only one mode of transport; however it should be extended to several legs with multi-model transport capabilities. It should be possible to define a service offer including detailed information about the routes, timing of events and info on pricing structure.</p> <p>*Pricing/tariff structure of the offers is missing in the 1st release.</p>	Vocabulary should be extended for transport and logistics domain, especially for shipments with more than one leg (e.g. multi-model transport, door-to door services).	<p>* It should be possible to get and/or update service information automatically from external sources to ensure real-time information flow.</p> <p>*LPA assumes price will be calculated either in MOS and/or BizSLAM. The relationship between these apps on cost (price) calculation should be clarified.</p>
MO	View available ser-	The FIspace front end for view-	-	-

S	vice descriptions	ing all was tested.		
MOS	View details of a specific offer	Service information should include more detailed information about the routes, timing of events and more detailed info on pricing structure.	Vocabulary on transport and logistics domain should be extended to provide more detailed information about the services.	-
MOS	Search for a service	Searching by entering a text is available. Search with criteria function should also be implemented.	Vocabulary should be extended to define relevant criteria for different transport modes.	Planned to be implemented in the next release in M12.
MOS	Auto-matchmaking support 1 st version	-	-	Plans to be implemented in the next release on M16.
BizSLAM	Create a new Service Level Agreement	More information about the services and SLAs should be able to be defined (such as prices, targets for SLAs etc.)	Extension of transport & logistics vocabulary is recommended and is planned in the next release (M10).	*LPA assumes price will be calculated either in MOS and/or BizSLAM. The relationship between these apps on cost (price) calculation should be clarified.
BizSLAM	Update a new Service Level Agreement		Extension of transport & logistics vocabulary is planned in the next release (M10).	

2.7.4 Key Performance Indicators

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 Flspace deliverable D400.1.

The transport chain planning and optimization with effective and proactive deviation management is necessary to ensure on-time delivery in full and high product availability at the destination which in the end leads to high customer satisfaction level and profitability.

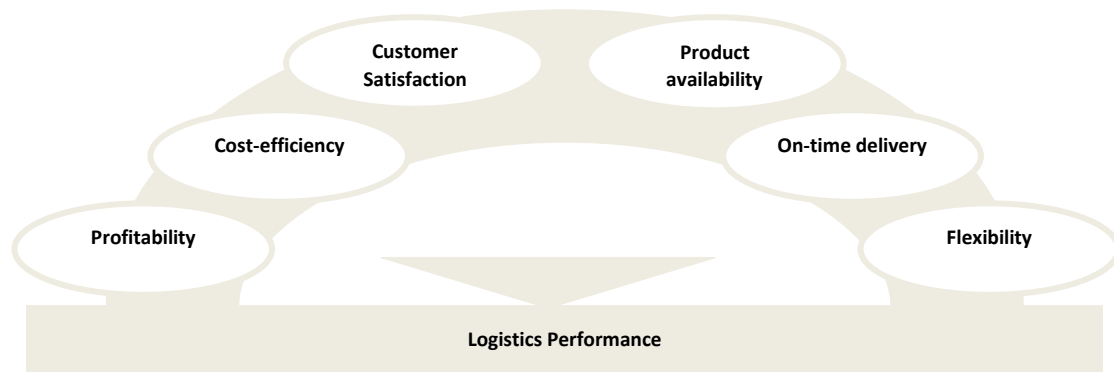


Figure 38: KPI Logistics Performance

The trial will explore the benefits of future internet applications that can improve collaboration with real-time information sharing through one channel and increased level of interaction between involved parties.

In order to analyze the performance of the test execution, the business user would require relevant KPIs in order to understand:

- How much the technology improves the efficiency of the processes?
- What will be the impact on customer satisfaction level?
- How much saving of operational costs can be realized due to improvements?

Lower operational costs:	Efficient process management:	Higher customer satisfaction:
<ul style="list-style-type: none"> • Less manual intervention for booking and monitoring • Better market overview (up-to-date info on service alternatives, automatic cost estimation) • Cost savings due to improved efficiency and responsiveness 	<ul style="list-style-type: none"> • Increased visibility on processes (responsibilities, bottlenecks) • Automatic and on-time detection of deviations • Improved responsiveness • Flexibility with respect to the partners involved in the chain (just-in-time partnering) 	<ul style="list-style-type: none"> • Better alignment due to transparency • Improved collaboration due to up-to-date info from one source

2.7.5 Scorecard

Vision: *Efficiency*

Stakeholders: *Consumer Goods Manufacturer, Material Suppliers/ Customers (Subsidiary/Retailer)*

Understanding: *Improved Collaboration & Follow up in transport demand description*

Perspectives for improvements:

Processes <> Employees <> Customers (Market) >> Finances

Major initiatives

Initiatives	<i>Transport demand app</i>	
a. Investment		<i>Consumer Goods Manufacturer</i>
b. Utilization		<i>Consumer Goods Manufacturer, Logistics Service Provider</i>

Experimental evaluation

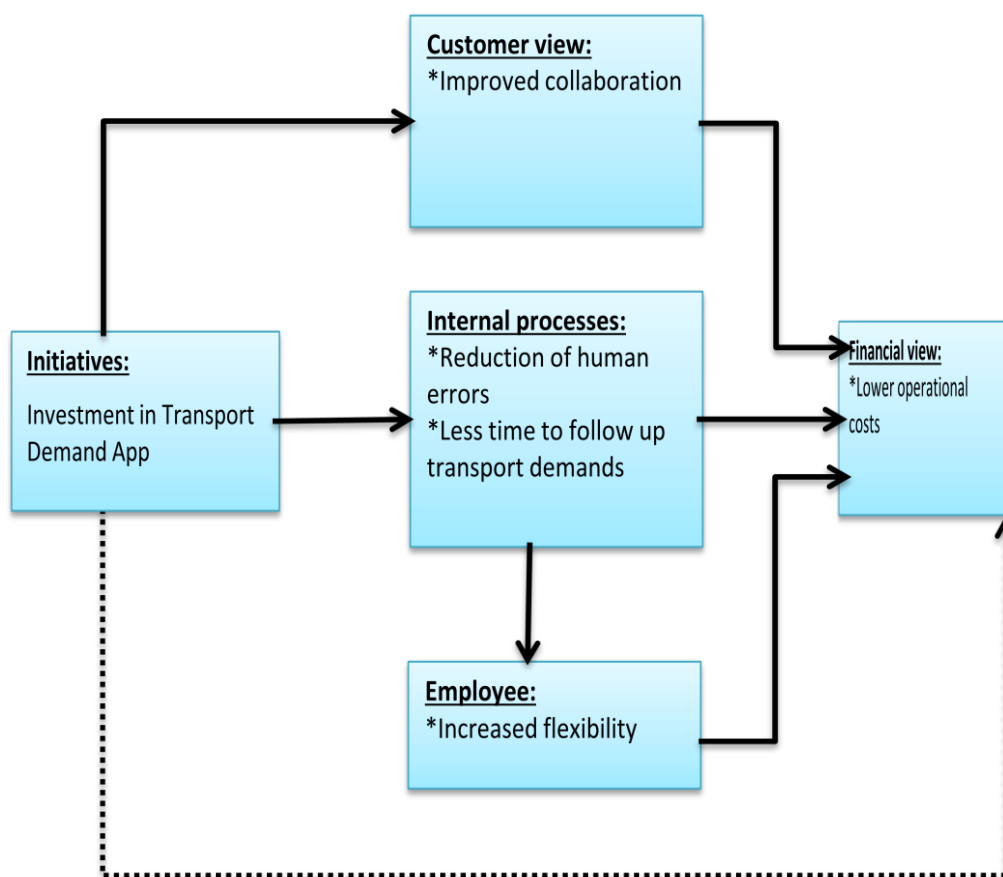
KPI *Lower Operational Costs*
Improved process efficiency

Figure 39: Scorecard Trial 442

	Perspective	Objective	Measure	Target	Activity
Process Perspective	Consumer Goods Manufacturer	Reduction in human errors in demand description process	Number of errors per year	-75%	Utilization of transport demand app
	Consumer Goods Manufacturer	Less time to follow up transport demands	Avg.time spent for transport demand processing & follow ups (per shipment)	-50%	Utilization of transport demand app
	Material Suppliers/ Customers (Subsidiary/Retailer)	Reduction in human errors in demand description process	Number of errors per year	-75%	Utilization of transport demand app
	Material Suppliers/ Customers (Subsidiary/Retailer)	Less time to follow up transport demands	Avg.time spent for transport demand processing & follow ups (per shipment)	-50%	Utilization of transport demand app
Customer Perspective	Consumer Goods Manufacturer	Improved collaboration due to higher transparency	No of complains/waiting info requests	-50%	Utilization of transport demand app
	Material Suppliers/ Customers (Subsidiary/Retailer)	Improved collaboration due to higher transparency	No of complains/waiting info requests	-50%	Utilization of transport demand app
Learning Perspective	Consumer Goods Manufacturer	Increased flexibility	Freed time in process activity (mins per process)	-50%	Reduction in process time
	Material Suppliers/ Customers (Subsidiary/Retailer)	Increased flexibility	Freed time in process activity (mins per process)	-50%	Reduction in process time

Financial Perspective	Consumer Goods Manufacturer	Lower operational costs	Manhours spent for transport demand management	-50%	Reduction in time and personnel
	Material Suppliers/ Customers (Subsidiary/Retailer)	Lower operational costs	Manhours spent for transport demand management	-50%	Reduction in time and personnel

Relationships between objectives and activities



2.8 Trial 443 – Tailored Information for Consumers (TIC)

2.8.1 Trial Team

Lead: ATOS

Participants: UPM, Plus Fresc

2.8.2 Report on Trial Progress

Since the last reporting the trial team has been working on several tasks for the refinement of functional and technical requirements of Product Info; as well as the development of the app and its interaction with the Initial Apps, in this case the Product Information Tailored Information for Consumers – PlnApp TIC. The team has been also working on tasks for dissemination of the trial and Flspace project.

To achieve these objectives the following activities had been carried out:

1. Trial team meetings

The team has hold regular meetings in order to prepare the workshop with consumers, and to refine the functional and technical requirements of the Product Info. These meetings also served to keep informed team members not involved on app development about the Product Info status.

2. Product attributes definition

Communication with other partners has been established; GS1, ATB among others in order to define the product attributes to be provided and to define a suitable data model that can fit any product and can be used by any app that need it.

3. Workshop

At the end of January PlusFresc celebrated their first workshop with consumers in the context of the TIC trial. The workshop took place in the Sunka Room, one of the facilities of Plusfresc in Lleida.

There was a wide and relevant representation from PlusFresc side, including the Managing Director and representatives of the Board of Directors, Sales Department and Customer Service.

More than 20 consumers attended the workshop. They followed the session with active participation and contributed with profitable comments. There was a lot of interest in the Flspace project and in the Product Info, and they are willing to test it.

2.8.3 App Development

The defined apps for the TIC trial are:

- **Product Info:** This app allows end users to access tailored information from products located in the supermarket. The products can be scanned or search manually by entering its EAN code. It also allows the user 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. This app to be done through Open Call.
- **Augmented Reality Product Info App:** This Specific App will allow the consumer to access tailored product information at the supermarket in its mobile device by means of augmented reality. This app to be done through Open Call.
- **Push Info App:** This Specific App will allow the retailer to push specific information (offers, alerts, birthday greetings...) to the consumer. This app to be done through Open Call.

As stated on the development plan which is divided into three releases, expected for months M12, M18 and M24, the first release brings the Product Info which incorporates to Flspace the functionalities implemented in the TIC pilot of SmartAgriFood.

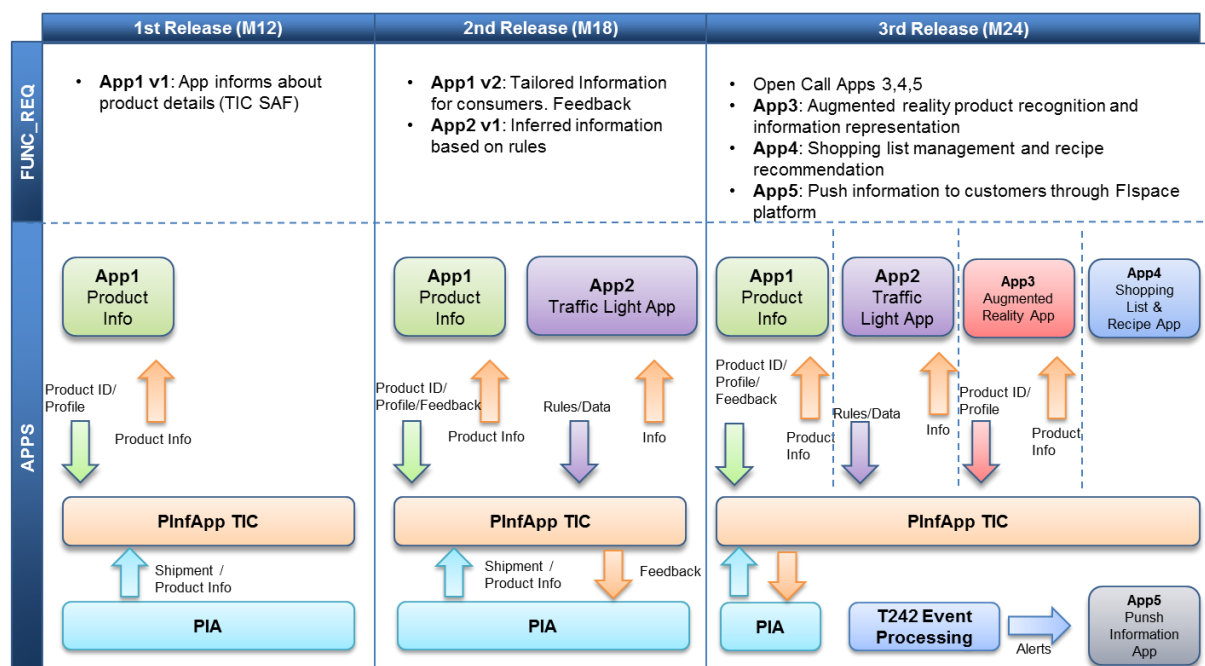


Figure 40: TIC - Summary of developed apps on each release.

On this first release the Product Info allows users to search product info from products on a supermarket by entering the EAN code of the product. The product info it's obtained directly from the initial app PlnfApp TIC which gathers this product info directly from the food chain through another initial app, the PIA (Product Information App – Food Chain View), as it can be seen on the next figure.

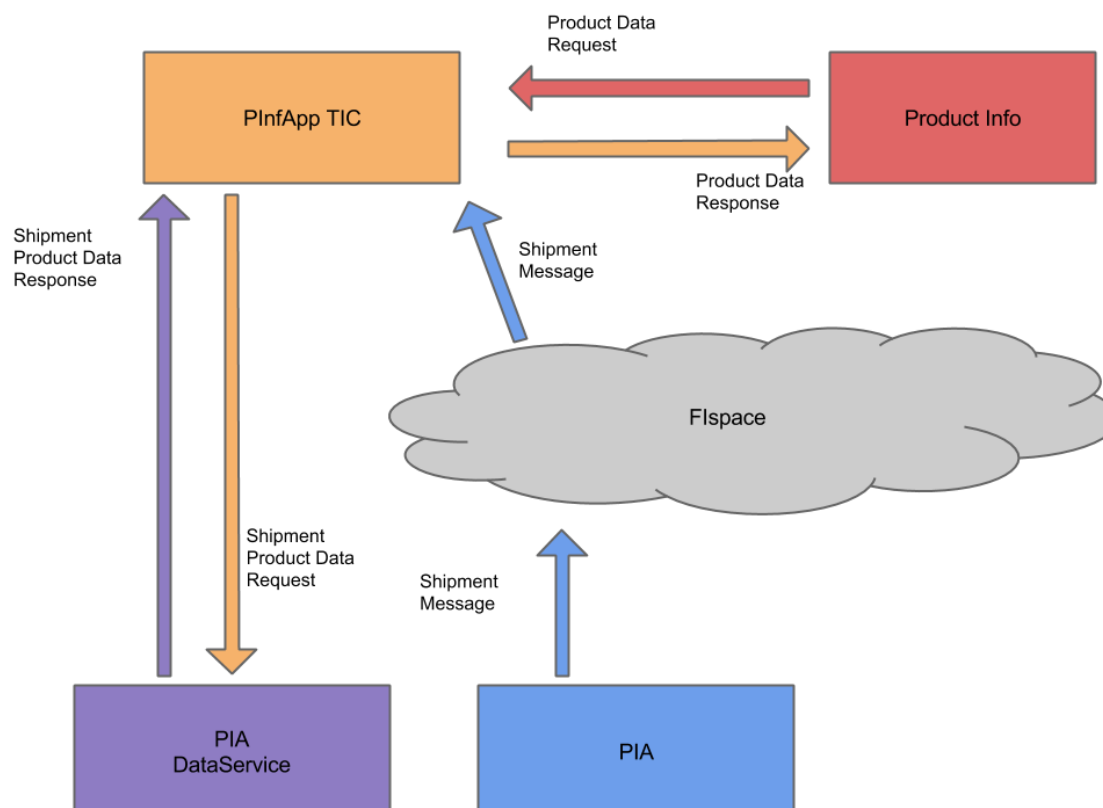


Figure 41: TIC - Apps connections and data exchange.

On following steps the Product Info will be improved by adding the Tailored Info feature and the possibility to provide feedback on the products. The feedback provided by the consumers is expected to be submitted to PlnfApp – TIC and when normalized can be submitted to provider's PIA.

2.8.4 Balanced Scorecard & Key Performance Indicators

For the KPI a Balance Score approach is used.

Vision: Improve shopping experience.

Stakeholders: Providers, retailers and consumers.

Understanding: Improve food information to consumers to increase food trust.

Perspectives for improvements:

Farmers, Manufacturers and Providers >> Traders >> Retailers >> Consumers

Five major initiatives:

1. Product Info

1a. Investment: Flspace platform, providers and retailers.

1b. Utilization: Retailer and Consumers.

2. Food Traffic Light App

2a. Investment: Flspace platform, providers and retailers.

2b. Utilization: Retailer and Consumers.

3. Augmented Reality App

3a. Investment: Flspace platform, providers and retailers.

3b. Utilization: Retailer and Consumers.

4. Shopping List & Recipes App

4a. Investment: Retailers and Consumers.

4b. Utilization: Retailer and Consumers.

5. Push Information App

5a. Investment: Retailers.

5b. Utilization: Retailer and Consumers.

perspective	Objective	Measure	Target	Activity
Product Info				
Process perspective	Increase available product information for consumers	N of products with information from app/Total N of products *100	+50%	Investment in Pln-fApp - TIC
	Provide new information channels to increase efficiency of product requests	N of info requests from app/N of total info requests	+25%	Investment in Product Info
Customers perspective	Better trust in food products through feedback from consumers	N of product feedback petitions/Total N of products *100	+5%	Utilization of Product Info
	Successful rate of feedback petitions	N of successful feedback petitions/Total N of petitions *100	+75%	Utilization of Product Info
	Better trust in food products through consumers petitions of product info	N of product info petitions/N of product requests * 100	+25%	Utilization of Product Info
	Improve consumers shopping experience through the use of apps	Number of app downloads /Number of total costumers	+20%	Investment in Product Info
	Better trust in food products through number of attributes selected for each product	N of attributes selected by product/ Total N of attributes by product *100	+25%	Investment in Product Info
Learning Perspective	Inclusion of new food products in the shopping list	Number of new food products purchased / Number of total food product	+10%	Investment in Product Info
Financial Perspective	Increase in new costumers	Turnover / Year	+5%	Better trust and transparency for consumers
	Increase of consumers with fidelity card	Number of customers with fidelity card / Total number of costumers	+10%	Increase of sales
	Increase of marginal purchase per consumer	Average purchase ticket	+5%	Increase of sales
	Cost reduction through lower personnel costs (personnel spend less time providing info to consumers)	Personnel for growth / Year	-5%	Reduction in time and personnel. Reduction in internal costs.

Figure 42: Scorecard Product Info

Perspective	Objective	Measure	Target	Activity
Food Traffic Light App				
Process perspective	Increase available product information for consumers	N of products with information from app/Total N of products * 100	+50%	Investment in PInfApp - TIC
	Provide new information channels to increase efficiency of product requests	N of info requests from app / N of total info requests	+25%	Investment in Food Traffic Light App
Customers perspective	Better trust in food products through consumers petitions of product info	N of product info petitions / N of product requests * 100	+25%	Utilization of in Food Traffic Light App
	Improve consumers shopping experience through the use of apps	Number of app downloads /Number of total costumers	+20%	Investment in in Food Traffic Light App
Learning Perspective	Inclusion of new food products in the shopping list	Number of new food products purchased / Number of total food product	+10%	Utilization of in Food Traffic Light App
Financial Perspective	Increase in new costumers	Turnover / Year	+5%	Better trust and transparency for consumers
	Increase of consumers with fidelity card	Number of customers with fidelity card / Total number of costumers	+10%	Increase of sales
	Increase of marginal purchase per consumer	Average purchase ticket	+5%	Increase of sales
	Cost reduction through lower personnel costs (personnel spend less time providing info to consumers)	Personnel for growth / Year	-5%	Reduction in time and personnel. Reduction in internal costs.

Figure 43: Scorecard Food Traffic Light App

Perspective	Objective	Measure	Target	Activity
Augmented Reality App				
Process perspective	Increase available product information for consumers	N of products with information from app/Total N of products *100	+50%	Investment in Pln-fApp - TIC
	Provide new information channels to increase efficiency of product requests	N of info requests from app/N of total info requests	+25%	Investment in Augmented Reality App
Customers perspective	Better trust in food products through consumers petitions of product info	N of product info petitions/N of product requests * 100	+25%	Utilization of Augmented Reality App
	Improve consumers shopping experience through the use of apps	Number of app downloads /Number of total costumers	+20%	Investment in Augmented Reality App
	Better trust in food products through number of attributes selected for each product	N of attributes selected by product/ Total N of attributes by product *100	+25%	Investment in Augmented Reality App
	Improve consumers shopping experience through augmented reality	Number of reality app downloads /Number of total costumers	+10%	Investment in Augmented Reality App
Learning Perspective	Inclusion of new food products in the shopping list	Number of new food products purchased / Number of total food product	+10%	Utilization of in Augmented Reality App
Financial Perspective	Increase in new costumers	Turnover / Year	+5%	Better trust and transparency for consumers
	Increase of consumers with fidelity card	Number of customers with fidelity card / Total number of costumers	+10%	Increase of sales
	Increase of marginal purchase per consumer	Average purchase ticket	+5%	Increase of sales
	Cost reduction through lower personnel costs (personnel spend less time providing info to consumers)	Personnel for growth / Year	-5%	Reduction in time and personnel. Reduction in internal costs.

Figure 44: Scorecard Augmented Reality App

Perspective	Objective	Measure	Target	Activity
Shopping List & Recipes App				
Process perspective	Increase available product information for consumers	N of products with information from app/Total N of products *100	+50%	Investment in Pln-fApp - TIC
Customers perspective	Improve consumers shopping experience through the use of apps	Number of app downloads /Number of total costumers	+20%	Investment in Shopping List & Recipes App
Learning Perspective	Increase of consumers food knowledge through number of recipes downloads	Number of Shopping list & Recipe app downloads / Number of app downloads * 100	+10%	Utilization of Shopping List & Recipes App
	Inclusion of new food products in the shopping list	Number of new food products purchased / Number of total food product	+10%	Utilization of Shopping List & Recipes App
Financial Perspective	Increase in new costumers	Turnover / Year	+5%	Better trust and transparency for consumers
	Increase of consumers with fidelity card	Number of costumers with fidelity card / Total number of costumers	+10%	Increase of sales
	Increase of marginal purchase per consumer	Average purchase ticket	+5%	Increase of sales

Figure 45: Scorecard Shopping List & Recipes App

Perspective	Objective	Measure	Target	Activity
Push Information App				
Process perspective	Better early warnings to consumers	N of warnings sent to consumers	+25%	Investment in FIspace platform
	Improve retailer communication to consumers	N of push info communications from retailer	+25%	Utilization of Push Information App
Customers perspective	Improve consumers shopping experience through the use of apps	Number of app downloads / Number of total costumers	+20%	Investment in Push Information App
Learning Perspective	Inclusion of new food products in the shopping list	Number of new food products purchased / Number of total food product	+10%	Utilization of Push Information App
Financial Perspective	Increase in new costumers	Turnover / Year	+5%	Better trust and transparency for consumers
	Increase of consumers with fidelity card	Number of customers with fidelity card / Total number of costumers	+10%	Increase of sales
	Increase of marginal purchase per consumer	Average purchase ticket	+5%	Increase of sales
	Lower process costs with Push Information App	Used offers vouchers from apps / Total used offers vouchers (app+paper)	-20%	Reduction in time and personnel
	Increase of sales through push info offers vouchers	Offers sales € / Total sales €	+2%	Increase of sales of specific products (offer products)
	Cost reduction through reduction use of paper	€ used in offers brochures and vouchers	-10%	Reduction in internal costs

Figure 46: Scorecard Push Information App

Relationships between objectives and activities

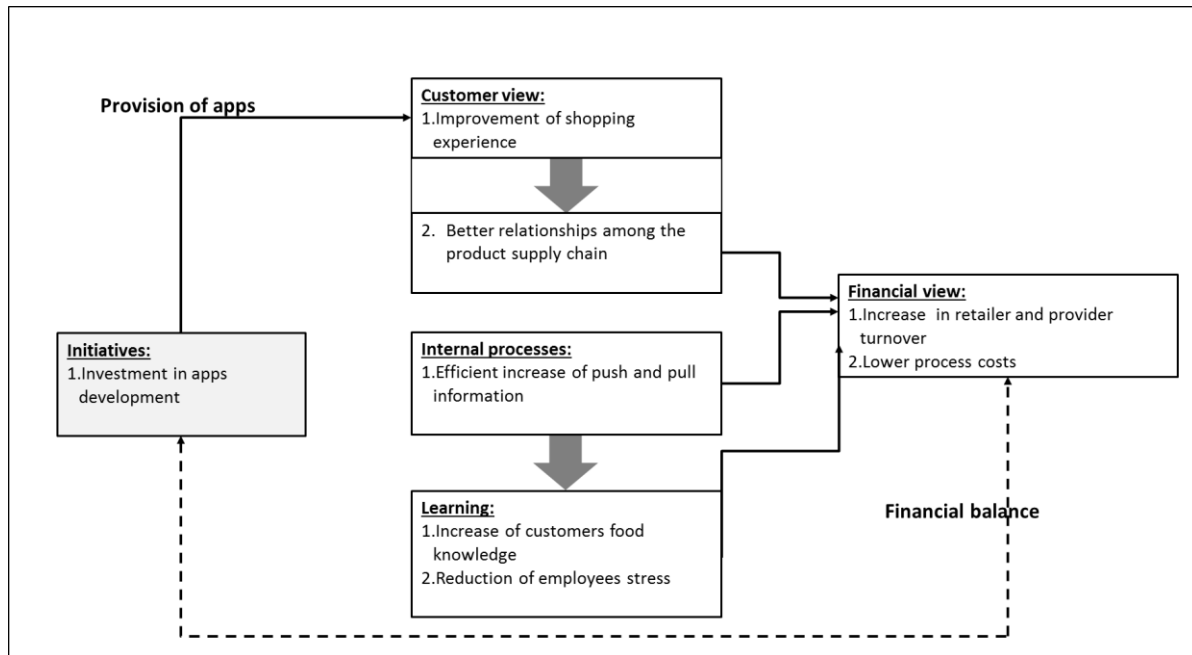


Figure 47: Relationship between objectives and activities.

3 Update on collaboration and harmonization and large scale expansion activities of the use case trials in Phase 3

3.1 Update on collaboration and harmonization

Most of the work during the M7-M12 period has been focused on the development of the Apps, including their specification, description of concept in use, preparation of tests, tests and preparation for evaluation (KPIs).

The intensive communication between among the trials as well as with other work packages enables to collaboration in the cross trial/domain utilization of Apps and harmonization approaches in regards of the development of Flspace.

Following examples for these extensive activities which have been performed of Trial 431:

- Collaboration for App tests: MARINTEK and Arcelik have organized common demonstration online sessions for WP450-developers of the LPA (Koc), MOS (NTUA) and the Event Monitoring & Management module (IBM). This enabled looking at the functionalities of the Apps from the perspective of the carrier (fish trial) and shipper (Consumer goods trial), and provide common feedback to the developers.
- Harmonization of evaluation method and KPIs: MARINTEK, CentMat and KN have exchanged about how to evaluate the business value of using Flspace, and presented their methods for identifying KPIs, providing a template to the rest of the trials.
- Harmonization of GSM model design: MARINTEK and IBM have collaborated for updating the fish trial's GSM model (WP300)
- Interaction with WP300 about the Experimentation Environment and provision of necessary data and information to test the Fish trial in the EE.

The activities of Trial 441 state the significant amount of cross trail interaction as well:

- The MIP trial cooperates with the Fresh Fruits & Vegetable trial on developing the PIA (Product Information App);
- The MIP trial initiated the development of a common and shared data model with the Fresh Fruits & Vegetable trial, the Flowers & Plant trial, the Tailored Information for Consumers trial and several others.
- The MIP trial works together with the Tailored Information for Consumers trial on a Consumer App, to be developed by the TIC trial.

Next to this collaboration, the MIP trial discusses other collaboration opportunities, e.g. the Ebbits project (<http://www.ebbits-project.eu/news.php>), UN/CEFACT (United Nations Centre for Trade Facilitation and Electronic Business), and its project to realize transparency for pork and poultry. Furthermore interest is shown from GS1 Netherlands and GS1 Global Office (US).

These activities will be the prove the envisioned Flspace platform as a real generic multidomain collaboration platform.

Further activities will be documented and reported in the following M18 and M24 reports.

3.2 Update on large scale expansion

The basis for large scale expansion is the availability of the chain encompassing Apps. They describe the difference to solutions already on the market and focus on pressing issues in the sector. In continuation of ongoing initiatives, trial participants are engaged in working groups of business stakeholders of the sector organized.

Furthermore, trial participants engage in business stakeholder meetings with presentations such as at the 'KTBL-Tage' and others. These initiatives are complemented by presentations at IT oriented meetings. Of special relevance are IT meetings with food sector focus such as the German Association for IT in Agriculture and Food (GIL) where a whole workshop was dedicated to Flspace developments.

In order to engage potential users and other stakeholders, the following activities, as examples of single trials, are planned around the Trial 431:

- **Brochure** describing the Flspace and the Fish Trial: Apps, business interaction model and expected benefits (M13)
- **Seminar for Norwegian maritime community** to raise awareness around the possibilities offered by cloud technologies (M17)
- **Stakeholder meeting with NCL's business partners** to demonstrate Flspace collaboration platform with demo from the fish trial and get feedback from potential users (M15-17)
- **I-ESA workshop** on interoperability (France): paper and workshop participation to exchange experience among distinct FI PPP projects. MARINTEK to present the Fish Trial (M12)
- **ICTTE conference** (Portugal): conference paper "Future Internet Perspectives on an Operational Transport Planning ICT Tool" (M13)
- **SmartAgrimatics conference** (France): paper and organization of a workshop on perishable goods logistics (M15)
- **MTEC conference** (Norway): conference paper "Future Internet Based Services for Improved Transport Planning and Capacity Utilization" due M15 (conference M19)
- **Open Call Partner Follow-up:** training, and collaboration for App development

Trial 443 has disseminated the Flspace's Collaboration Platform with highlighting the supply chain and logistics planning, real-time tracing and tracking and manual deviation handling aspects of the solutions to the potential users, ICT community and the Civil Society in general at below events:

- FI-PPP Use-case projects info day in Brussels in October
- FI-PPP Exhibition Stand at ICT Event 2013 in Vilnius in November
- At Arcelik stand in the second R&D Centers Summit in Istanbul Convention Centre in November where Arcelik was the main sponsor of the event
- At Arcelik stand in TIM (Turkish Exporters Assembly) Innovation Week in Istanbul in November where Arcelik was the main sponsor of the event
- At FI-PPP exhibition area in FIA Week 2014 in Athens in March

The Consumer Goods Trial has also informed Koc Holding group of companies (potential end-users), Zer A.S. (Koc Holding's central purchasing company), LODER (Logistics Association) and UND (International Transporters Association) about the Flspace project in the period and after the 1st release of the trial specific apps, a workshop will take place at these potential users' premises emphasizing on the apps' functionalities.

Presentations at international scientific meetings with food sector focus such as the International Forum on System Dynamics and Innovation in Food Networks (February 2014) where a whole session was dedicated to Flspace developments raise awareness in the scientific community and provide the base for scientific business support towards new levels of transparency that could be reached with Flspace technology. This support is crucial for matching technology with new process organizations that might evolve in logistics and communication along the chain.

The further expansion will be supported by the phase 3 project Finish which is explicitly focusing on perishable foods.

4 Summary

This document is the first progress report of the test and development. At this stage of the Flspace Project the testing of the developed application (App's) has not yet started since their first release are scheduled for month nine is slightly delayed. In addition, as the Flspace platform itself has not been operationalized yet.

Trial experiments have just started on the experimentation environment and the results will be reported in the M18 progress report.

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 Flspace platform. The preparation for the experimentation exercise is ongoing and will be reported on in the following reports (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 first 12 month period since the Flspace project started, the WP400 team has achieved its set goals in defining the trials as well as their domain specific apps. The work of the trial teams is planned and continues to track to the work plans developed for each trial. Future progress reports in months 18 and 24 will continue to demonstrate the ongoing achievement of milestones as currently planned.

