Deliverable D 500.1

Requirements on Core Platform for all use cases supported in SmartAgriFood

WP 500

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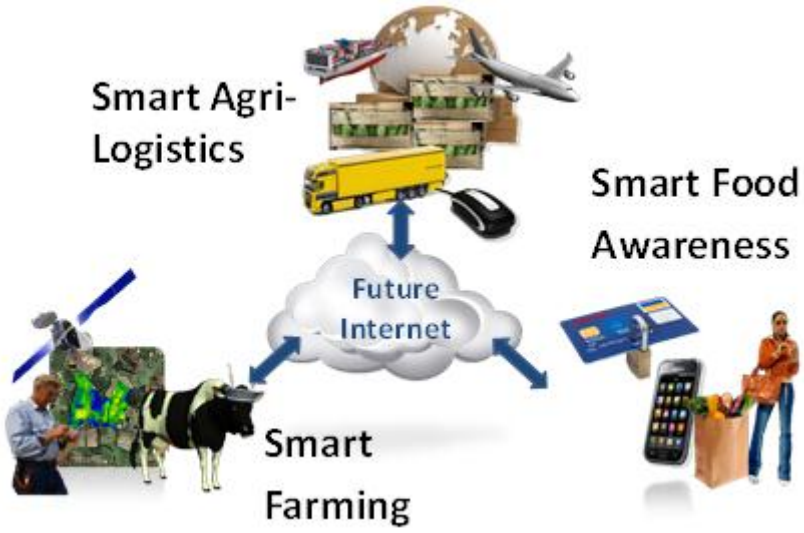
The SmartAgriFood Project

The SmartAgriFood project is funded in the scope of the Future Internet Public Private Partnership Programme (FI-PPP), as part of the 7th Framework Programme of the European Commission. The key objective is to elaborate requirements that shall be fulfilled by a "Future Internet" to drastically improve the production and delivery of safe & healthy food.

Project Summary

SmartAgriFood aims to boost application & use of Future Internet ICTs in agri-food sector by:

- Identifying and describing technical, functional and non-functional Future Internet specifications for experimentation in smart agri-food production as a whole system and in particular for smart farming, smart agri-logistics & smart food awareness,
- Identifying and developing smart agri-food-specific capabilities and conceptual prototypes, demonstrating critical technological solutions including the feasibility to further develop them in large scale experimentation and validation,
- Identifying and describing existing experimentation structures and start user community building, resulting in an implementation plan for the next phase in the framework of the FI PPP programme.



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Dissemination Level

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

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Document Summary

The SmartAgriFood project addresses the food and agribusiness as a use case for Future Internet. The sector provides important and demanding use cases for Future Internet design addressing the physical layer all the way up to the service layer. The SAF project focuses on three sub systems of the sector - smart farming, smart agri-logistics, and smart food awareness. Smart Farming focusses on the integrated use of (Future Internet ICT) technologies for improvement of productivity, quality, sustainability, traceability and transparency. Sensor networks and actuators are of particular importance. Smart Logistics aims at improving the quality, effciency and effectiveness of logistic operations for agrifood products resulting in better products for consumers with information with integrity about the origin, quality, whereabouts and proces history of these products. These improvements are to be realised by the design and implementation of new logistic chain processes that are managed and controlled using integrated Future Internet ICT technologies. Aspects of particular importance encompass sensors, actuators, real time virtualisation, connectivity and logistics intelligence. Finally Smart Food awareness aims at better informing stakeholders of the agrifood supply chain networks, in particular consumers. This sub system focusses on transparency of data and knowledge representation in order to be able to provide information with integrity that can be trusted.

Concurrently, the FI-WARE project has been initiated to build the Core Platform of the Future Internet. Key goals of the FI-WARE project are the identification and specification of GEs, together with the development and demonstration of reference implementations of identified GEs. Any implementation of a GE comprises a set of components and will offer capabilities and functionalities which can be flexibly customized, used and combined for many different Usage Areas, enabling the development of advanced and innovative Internet applications and services.

Regarding SAF as one of the use case project, WP500 (Requests/Feedback for Core Platform and Feasibility Demo) takes all coordination and collaboration issues into account.This deliverable addresses the harmonization of functional requirements from three sub-domains towards Core Platform considering the GEs which are already defined in FI-WARE. The intention of this document is to specify the set of requirements which are submitted to Core Platform as first phase of collaboration between Core Platform and SAF.

This document will be further elaborated along with other on-going project activities, discussed and refined in collaboration with all involved partners.

Abbreviations

BPM	Business Process Model
CDI	Connected Device Interfaces
CP	Core Platform
D	Deliverable
DSL	Digital Subscriber line
EFMIS	Enhanced Farm Management Information System
EPC	Electronic Product Code
EPCIS	EPC Information Services
ERP	Enterprise Resource Planning
FI	Future Internet
FMIS	Farm Management Information System
FI-PPP	Future Internet Public Private Partnership
GE	Generic Enabler
GlobalGAP	Global Good Agricultural Practices
IaaS	Infrastructure as a Service
ICT	Information and Communication Technology
IoS	Internet of Service
IoT	Internet of Things
ISO	International Organization for Standardization
IT	Information Technology
MMS	Multimedia Messaging Serv.
NetIC	Network Information and Control
LL	Living Lab
OHSAS	Occupational Health and Safety Management
OWL	Ontology Web Language
PA	Precision Agriculture
PaaS	Platform as a Service
QoE	Quality of Experience
QoS	Quality of Service
OS	Operating System
RDF	Resource Description Framework
RFID	Radio Frequency Identification
S3C	Service, Capability, Connectivity and Control
SaaS	Software as a Service
SAF	Smart Agri-Food
SCEM	Supply Chain Event Management
SME	Small and Medium Enterprise
SMS	Short Messaging Service
SOA	Service Oriented Architecture
SQL	Structure Query Language
WiFi	Synonymous for WLAN, Wireless LAN
WP	Work Package
Xaas	X-As A Service. Overall for Iaas, Paas, SaaS
XML	Extensible Mark – Up Lang

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1 Introduction

This chapter describes the context of the document and introduces the main topics addressed in the document.

1.1 Context

Different Use Case projects will cooperate with the FI-WARE project to define a platform based on Generic Enablers which are distinguished from Domain-specific Common Enablers.

The identified requirements from the eight Use Case projects-including SAF- provide part of the requirements, which FI-WARE has to fulfil. Elicitation and elaboration of requirements requires continuous interaction between the FI-WARE project and Use Case projects. As a result of this plan, a requirements backlog has been distributed to all Use Case projects to transfer their functional requirements.

The purpose of this deliverable is to harmonize Core Platform relevant functional requirements from all sub-domains (smart farming, smart agri-logistics, smart food awareness) and transfer them to FI-WARE project in the form of backlogs.

In this deliverable we firstly describe the relation between SAF and Core Platform, and therafter the timeline and iteration of process and methodology.

In Chapter 3 we discuss the produced use cases that cover a number of different scenarios from the sub-domains. We have described the sub use cases (Smart farming, smart logistics and smart food awareness) in terms of business processes with information needs for management, execution, monitoring and control on rather different levels of abstraction. The harmonized functional requirements have been linked to pre-defined GEs in FI-WARE project.

Description of the fields specified in Backlog template can be found in Appendix A. Detailed description of use cases from sub-domains can be found in Appendix B.

In Chapter 4 & 5 we discussed results of the work and had conclusion for further steps. In the documents we have brought forward, ideas about the ICT architecture (in view of Future Internet) with all its type of components that we envision to bring about the required information systems (IS) for supporting the business processes identified. For these BPM's, architectures and requirements we can 'conjecture' about the FI-ware chapters and CP GE's to be addressed.

Several iterations with SAF and FI-WARE will take place in order to consolidate a first backlog of FI-WARE requirements.

1.2 Relationship with other tasks and work packages

In T510, the domain specific functional requirements which are elicited in Task 210, Task 310 and 410, are harmonized to address GEs in FI-WARE High Level Description document.

Analysis and handling of Core Platform requests in this document will serve as the basis for:

- Compilation of Required Generic Enablers in task 520,
- Architectural Requirements in task 530.

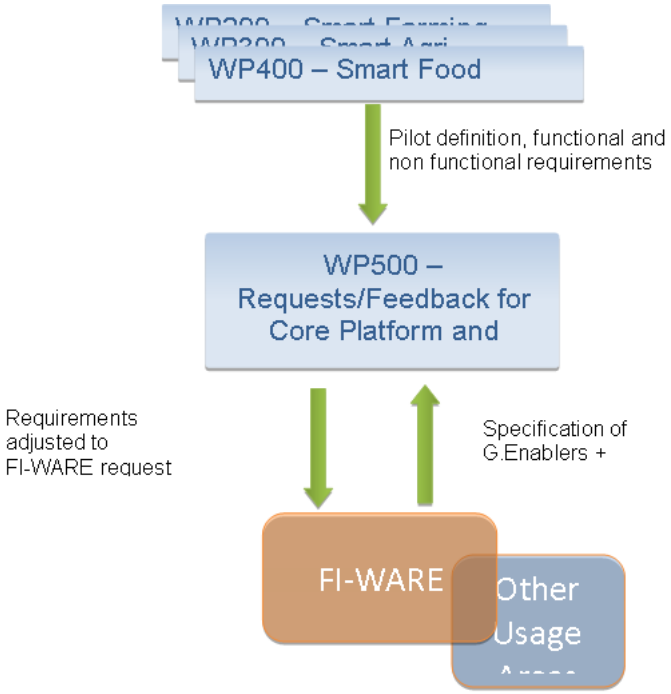

Figure 1 Relation with other WPs in SAF

2 SAF towards FI Core Platform

2.1 Relation between UC projects and FI Core Platform

The FI-WARE project will design, develop and implement the network and service Core Platform as key part of the FI-PPP program. The FI-WARE project will closely cooperate across different industry sectors with all Use Case projects being part of the FI-PPP program. The platform aims to meet the demands of key market stakeholders across many different sectors, strengthen the innovation-enabling capabilities in Europe and overall ensure the long-term success of European companies in a highly dynamic market environment. FI-WARE will be open, based on Generic Enablers which offer reusable and commonly shared functions serving a multiplicity of Usage Areas across various sectors.

Specifically, FI Core Platform to be provided by the FI-WARE project is based on GEs linked to the following main architectural chapters:

- **Applications / Services Ecosystem Delivery**– the infrastructure to create, publish, manage and consume FI services across their life cycle, addressing all technical and business aspects.
- **Cloud Hosting** – the fundamental layer which provides the computation, storage and network resources, upon which services are provisioned and managed.
- **Data/Context Management Services** – the facilities for effective accessing, processing, and analyzing massive streams of data, and semantically classifying them into valuable knowledge.
- **IoT Enablement** – the bridge whereby FI services interface and leverage the ubiquity of heterogeneous, resource-constrained devices in the Internet of Things.
- **Interface to the Network and Devices** – open interfaces to networks and devices, providing the connectivity needs of services delivered across the platform.
- **Security** – the mechanisms which ensure that the delivery and usage of services is trustworthy and meets security and privacy requirements.

Elicitation of requirements requires continuous interaction between the FI-WARE project and Use Case projects. As a result of this interaction, a FI-WARE requirements backlog will continuously be updated. To a large degree, the functionalities of the Generic Enablers will be driven by requirements from Use Case projects in the context of the PPP. Therefore, FI-WARE will closely collaborate with Use Case projects.

Different Use Case projects cooperate with the FI-WARE project to define a platform based on Generic Enablers which are distinguished from Domain-specific Common Enablers.

Products implementing FI-WARE GEs can be picked and plugged together with complementary products in order to build FI-WARE Instances, operated by so called FI-WARE Instance Providers. Complementary products allow FI-WARE Instance Providers to differentiate their offerings and implement their desired business models. Since FI-WARE doesn't impose usage off all assets by businesses, FI-WARE GEs are further classified into core FI-WARE GEs and optional FI-WARE GEs. Core FI-WARE GEs are required to be deployed in every FI-WARE Instance.

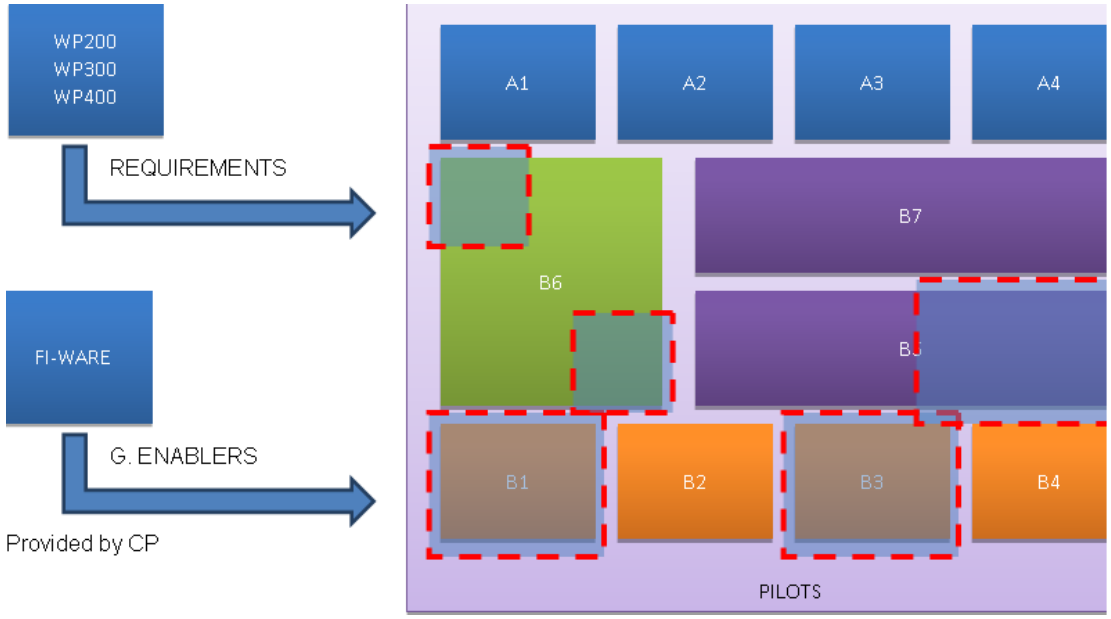

Figure 2 SAF & FI-WARE relation over pilot systems

2.2 Generic Enablers in FI Core Platform

Key goals of the FI-WARE project are the identification and specification of GEs, together with the development and demonstration of reference implementations of identified GEs.

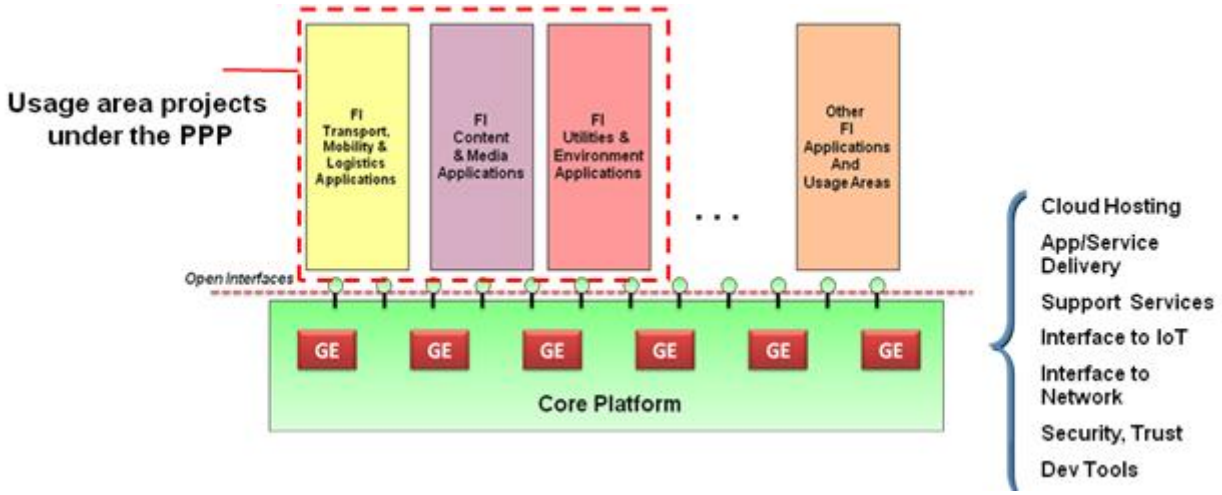

Figure 3 Generic Enablers in Core Platform

The FI Core Platform comprises a set of technological "Generic Enablers" which are considered general purpose and common future "usage areas". A FI-WARE Generic Enabler (GE) is a functional building block of FI-WARE in order to serve for serve in several scopes such as Cloud and IOT. Any implementation of a Generic Enabler (GE) is made up of a set of components which together supports a concrete set of Functions and provides a concrete set of APIs and interoperable interfaces that are in compliance with open specifications published for that GE. Therefore, Core Platform will provide open interfaces for development of Application.

For each stakeholder domain SAF has a number of requirements to the Core Platform regarding GEs specified in FI-WARE HLD. One of the purposes of WP500 is to identify the set of ena-

blers already served by Core Platform in order to use instead of domain specific functional blocks.

2.3 Schedule of coordination between SAF and FI-WARE

A request for requirements of Core Platform, already published to Use Case projects-comprising SAF Project too- in month 3. The request template of Core Platform is defined in the form of a backlog with necessary fields in order to address GEs. Also at this point, an initial High-level description of FI-WARE functional chapters has been shared with SAF and other use case projects in order to use a reference guideline in requirements elicitation.

In month 6-recent phase-, we will deliver our initial set of requirements towards core platform. From now until month 8, several iterations with SAF and FI-WARE will take place in order to consolidate a first backlog of FI-WARE requirements.

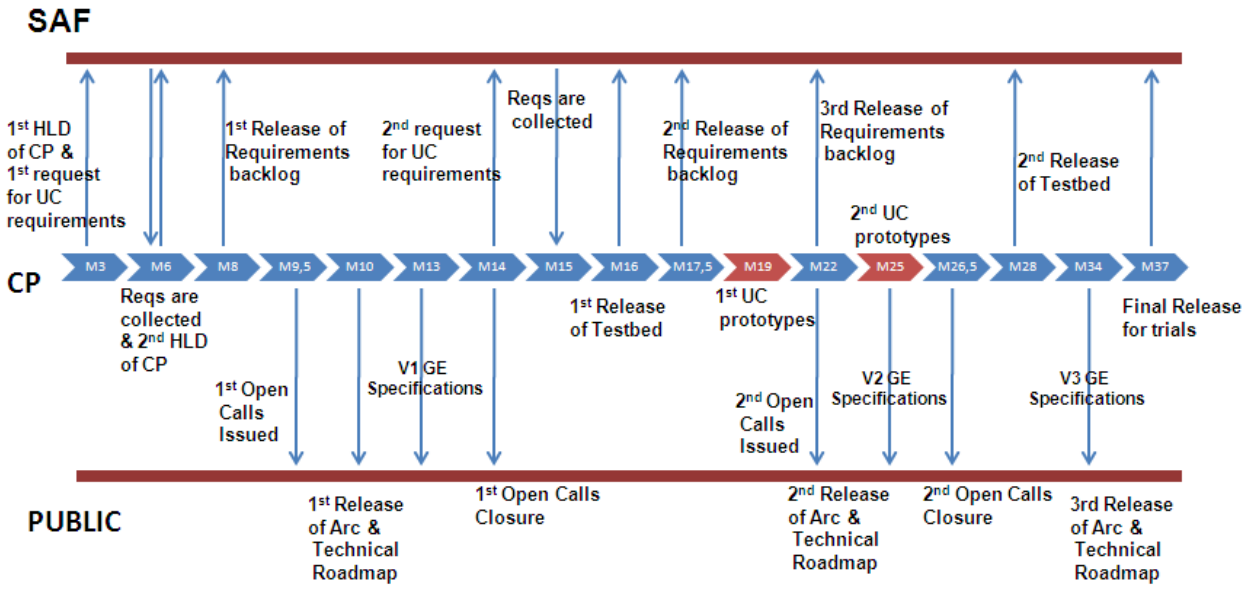

Figure 4 Schedule of FI-WARE & SAF iteration

2.4 Methodology used for harmonization of requirements

A set of different use cases addressing future internet needs have been produced by the project partners in each sub-domain. The goal was to describe a number of specific use cases to demonstrate new technologies or service concepts that address Future Internet capabilities in Core Platform.

In order to facilitate the identification of requirements which sufficiently map to Generic Enablers for all sub-domains, HLD document and backlog of FI-WARE has been distributed to ICT partners in sub-domain WPs. HLD document comprises a list of GEs and their high level definition in a set of chapters such as IOT, Service Delivery Framework and Cloud etc.

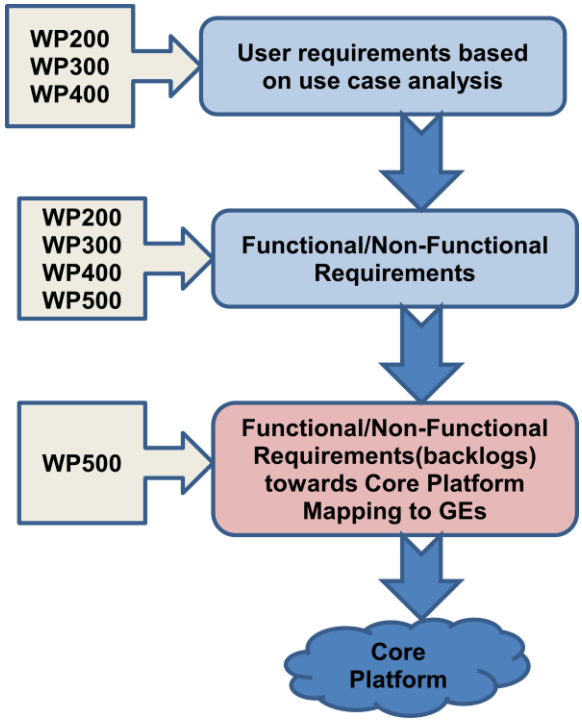

Figure 5 Methodology for requirements harmonization

Our approach consists of the steps defined in the following list:

- Sub-domains in SAF created a number of themes & scenarios addressing and describing Future Internet needs for smart-farming, smart-food awareness and smart-logistics.
- A number of functional and non functional requirements (FNR) with respect to Future Internet have been defined after the use case analysis, which were derived from described scenario/theme action steps. In the documents we have brought forward ideas about the ICT architecture (in view of Future Internet) with all its components that we envision to bring about the required information systems (IS) for supporting the business processes identified.
  In order to guide the elicitation of requirements, a set of principles and restrictions for SAF has been set as being relevant to Core Platform. Combined with the use cases, they form a framework for eliciting requirements for GEs.
- Based on the analysis of the use cases, the functional requirements were grouped into functional blocks. The grouping is made based on the logical association of the different functional requirements that address Generic Enablers (GE) that are provided by the Future Internet Core Platform. In the analysis, homogenization and abstraction of the requirements over our BPMs, taking into account HLD and chapters of FI-WARE, we arrive at a new set of FNR's with their use in the different BPM's and with connections to FI-WARE chapters and our ideas about GEs and domain specific GEs.
- The grouped functional requirements were further transformed into the backlog template format which was provided by Core Platform to be fulfilled by SAF.
- All backlog data have been uploaded to Core Platform via FI-WARE Wiki page and each backlog entry specifies one requirement for specific Generic Enabler(s) in Core Platform.
- In order to track and monitor the progress of entries by use case projects, FI-WARE team announced to use FI-WARE Forge web tool - a ticketing system for all coordination issues. A single account for each use case project was provided by the FI-WARE team to upload entries to the Forge tool.

2.4.1 Principles and restrictions

The following general principles and restrictions, defined in the context of the Core Platform project should be taken into consideration in order to optimize requirement exchange between Use Case Projects and FI-WARE.

2.4.1.1 Questions to address during elicitation of requirement

Here are some questions to elicit the requirements:

- Which user needs should be addressed by Core Platform? Plus, developers and service providers can be one of the users too.
- Which attributes are critical to satisfy the needs selected, and therefore for the success of the core platform development?

2.4.1.2 Fundamentals of Backlog

Backlog is a quick way of handling user requirements without having to deal with large formal requirement documents and tedious tasks related to maintaining them. The intention is to be able to respond faster and with less overhead to rapidly changing requirements.

There are three types of backlog templates provided by Core Platform for requirements fulfilment in wiki page:

Feature

```
{{Feature
|Name=
|Goal=
|Description=
|Version=
|Source=
|Source contact=
|Stakeholder=
|Scope=
|Theme=
|Status=
|Priority=MST
|Relative priority=
|Chapter=
|Enabler=
|Rationale=
|Owner=
|Owner contact=
|Complexity=
}}
```

Epic

```
{{Epic
|Name=
|Goal=
|Description=
|Version=
|Source=
|Source contact=
|Stakeholder=
|Scope=
|Theme=
|Status=
|Priority=MST
|Relative priority=
|Chapter=
|Enabler=
|Rationale=
|Owner=
|Owner contact=
|Complexity=
}}
```

User story

```
{{User story
|Name=
|Goal=
|Description=
|Version=
|Source=
|Source contact=
|Stakeholder=
|Scope=
|Theme=
|Status=
|Priority=MST
|Relative priority=
|Chapter=
|Enabler=
|Rationale=
|Owner=
|Owner contact=
|Complexity=
}}
```

Figure 6 Feature/Epic/User Story text templates for FI-WARE

The following principles are defined by Core Platform:

- User Stories comply with "INVEST" properties which mean they should be "Independent, Negotiable, Valuable, Estimatable, Small and Testable". User Stories have to be something "Small", as to be affordable in one Sprint.
- Sprints should be of a maximum of two months in FI-WARE, unitary tests included.
- In general, anything beyond a single sprint should be considered as EPIC.
- A User Story should be detailed enough - "I understand what I want precise enough to define a test for it" ("Testable" property).
- User stories should be "Estimatable", that is containing enough information enabling a developer to make a rough resource estimation for design, develop, and test (within one Sprint).

- There is no need to cover all details nor to have everything finalized. There should be details that may be worked out while developing.

2.4.2 Refinement of requirements

This initial list of requirements will be discussed among the partners for further progress and refinement. The following questions will be addressed:

- Are the requirements well defined in order to address specific needs on Core Platform? Discuss the most controversial requirements; are they applicable Core Platform features?
- Can requirements be enriched on the basis of the Core Platform needs in terms of Generic enablers?
- How to transfer requirements for Data Gathering module, Notifier module, Decision module, Data Analyzer Module, Statistical Analyzer Module?
- Can we elicit more requirements towards Data/Context Management?

3 Functional Requirements towards FI Core Platform

In this section we specify the functional requirements as harmonization of three sub-domains' outputs addressing Core Platform needs. Based on the previous analysis of the use cases, we linked the functional requirements into Generic Enablers. The addressing is made based on the logical association of the different functional requirements that address Generic Enablers (GE) that are provided by the Future Internet Core Platform.

Requirements towards Core Platform are harmonized in excel file, comprising the fields of back-log template, can be seen at Appendix B.

3.1 Requirements elicited from Smart-Farming sub-domain

Table 1 Requirements elicited from Smart-Farming sub-domain

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
Gathering multi-media information for further analysis should be possible	The collection of multimedia data (photos, videos) could be used in order to analyze specific patterns and produce important results.	Multimedia Analysis GE
Self-configuration mechanisms should take place	"Zero - configuration" techniques are proposed for people who are not familiar to ICT; in this way, every stakeholder can use every component of the involved system effortessly.	Resource Management GE (IoT)
Mechanisms should be developed for managing and controlling all up – coming services and applications	The cooperation of different services must be managed by a proper mechanism which will ensure the smooth operation of the overall system.	Service, Capability, Connectivity and Control GE (S3C)
Cooperation between different services should be possible	Cooperation of different services should be feasible so as to provide to any stakeholder high quality of service.	Service, Capability, Connectivity and Control GE (S3C)
Geo – located users activity data and mobility profiles should be available	Geo - spatial data should be gathered; those can be used in different areas, by different services and for different aims e.g. food - awareness subsystem needs to know the exact origin of a product	Mobility Analysis GE
Seamless transition between different devices should be performed	The handover from one device to another one, should be seamless; without losing any packet.	Multi-channel/Multi-device Access System GE

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
Defined level of control and management of the network should be available	The cooperation of different services must be managed by a proper mechanism which will ensure the smooth operation of the overall system.	Network Information and Control GE (NetIC)
Stakeholders should be given with the opportunity to give feedback for any stakeholders as well as the overall system.	Opinion mining procedures will help end - users gradually trust the recommendations and suggestions that are given to them. For example, if a stakeholder is not satisfied by a certain service, he could inform the respective help desk office which it in turn takes into consideration this complaint. After that, the provided service could be updated so as to cover users' needs.	Opinion Mining GE
Proper notifications should be sent to neighbouring stakeholders for any emergencies or alterations.	Collaborative mechanisms should take into consideration any publications and forward them to the involved stakeholders.	Social Network Analysis GE
Different stakeholders' profiles should be loaded for different services	Depending on which service wants to access stakeholder's profile, proper information should be loaded. The visibility of proper information and the encapsulation of internal processes must be defined every time, for every stakeholder and every service.	Social Network Analysis GE
Periodically updates of different profile should be possible depending on different types of feeds.	Different profiles should be updated with recent information so as all the external services that use those data, or stakeholders who want to be informed about a profile, are sure that the data they receive are correct and true.	Behavioural and Web Profiling GE
Finding other players and link to them should be available	Different communities will be reinforced since there will be developed a dynamic network that can easily link all stakeholders.	Social Network Analysis GE
Devices linked to the system announce their capabilities	Knowing the unique capabilities of a device, we will be able to manage the notifications and the profiles more efficiently e.g., if the mobile phone cannot support HD videos, we could send a simple text.	Connected Device Interfaces GE (CDI)

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
Adaptability of content on different devices should be possible	The information that will be presented a stakeholder, has to be adapted according to the devices that it will be displayed e.g.. its is not preferable to send HD data to a device with limited capabilities.	Connected Device Interfaces GE (CDI)
Local system has to take control when internet connection fails	Future Internet systems must work properly regardless the internet connection; this means that the local system should be implemented so as to efficently take the overall control when the "cloud" one is not accessible. Smooth handover between different networks enables data integrity and trustworthiness among different players.	Cloud proxy
Multimedia analysis should be present.	To provide with the opportunity to facilitate the system with more accurate information (HD data) for each stakeholder.	Multimedia Analysis GE
Real – time recommendations should be sent according to stakeholder's behaviour	The system should be clever enough to identify the different interest of stakeholders and gradually provide them with personalized recommendations and advertisements.	Real – time Recommendation GE

3.2 Requirements elicited from Smart-Logistics sub-domain

Table 2 Requirements elicited from Smart-Logistics sub-domain

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
Advanced sensor capabilities, e.g. ripeness, temperature, humidity should be in place	Advanced sensor capabilities should be in place. These sensors must be able to sense ripeness, temperature, humidity and other quality parameters. These sensor devices must have interfaces to connect them to some kind of local data collection service that can derive the environment conditions of the produce.	IOT & Connected Device Interfaces GE (CDI)
It should be possible to access advanced sensor data on-line via the internet	It should be possible to access advanced sensor data on-line via the internet. More specifically, the data collection service as introduced in the previous requirement 11 must be accessible anywhere, anytime to give access to the sensored data about the environment and the produce.	IOT & Connected Device Interfaces GE (CDI)

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
It should be possible to communicate quality alerts about products in transit on-line via the internet	The local data collection services that monitor the environment conditions and quality level of the produce should be able to communicate quality alerts about produce on-line via the internet when certain thresholds are exceeded, e.g. temperature too high. An alert signal must be given towards responsible stakeholders in order to take action upon it.	IOT & Connected Device Interfaces GE (CDI)
Agri-logistics security systems should allow for trusted human interventions	The system shall enable the user/ object to authenticate and/or authorise each other (i.e. in a client server, as well as p2p environment) based on decentralised certificate scheme.	Identity Management GE
Logistic objects should allow for decentralised generation of trusted relationships	Logistic objects should allow for decentralised generation of trusted relationships	Internet of Things GE
Readable RFID chips from pallets	RFID chips from pallets must be read at warehouse, truck and retail store in order to know information of the pallet and delivery conditions of the products on it.Thus, a component is needed to read information contained on the RFID chip and a data reader in the warehouse and in the retail store. Such readers should be connected to other components that comprise the information system around the logistics process	Internet of Things GE
The user interfaces of mobile logistic devices should be OS or platform-independent	The user interfaces of mobile logistic devices should be OS or platform-independent. In that way, these interfaces are portable and can be easily adapted towards other platforms and devices.	Multi-channel/Multi-device Access System GE
Provision to consumers of up-to-date certification information via websites and mobile devices	Consumers want to have up-to-date information via websites and mobile devices about the certification status of the various organisations in the agrifood chain. Thereby, consumers can check whether the product they are buying has been delivered via a chain that is certified around quality information. Thus, the information in the "certification database" must be accessible via multiple channels and devices.	Multi-channel/Multi-device Access System GE
Supply chain monitoring systems must support different communication media/ devices	The events and their corresponding actions must be monitored via various different communication media and devices, such as mobile apps/devices, fixed back-office apps/systems and internet-based apps/services.	Network Information and Control GE (NetIC)

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
Local routing of messages must be possible.	Local routing of messages must be possible. For various reasons of network efficiency and real-time behavior, certain messages should be routed as locally as possible.	Network Information and Control GE (NetIC)
Asynchronous communication of exception event/messages must be possible.	Asynchronous communication of exception event/messages must be possible. It is not always the case that an internet connection is available. In that case, an asynchronous message has to be delivered somewhere that can be picked up once the receiver is connected again.	Service composition engine GE
It should be possible to smoothly connect the logistic information systems of different actors ('pick, plug and play')	Different legacy systems are often offering semantically similar but technical incompatible interfaces. Nevertheless, they need to im- and export information from/ to a product related digital/virtual object. There shall be a module to also map those different technical interfaces to the object, executed by a user, familiar with the semantics.	Service, Capability, Connectivity, and Control GE (S3C)
Allow functionality without an internet connection	In rural areas it is not possible to be always connected to the internet/cloud. To allow devices to work under such conditions it should be possible to migrate services from the cloud on the device.	Service, Capability, Connectivity, and Control GE (S3C)
Compensate loss of connectivity in rural areas	To allow work in rural areas, the system should compensate disconnects from the internet on mobile devices by allowing asynchronous communication (i.e. sending data without waiting for an immediantly response).	Service, Capability, Connectivity, and Control GE (S3C)
Create/Join/Leave P2P Networks	To map real-life communication inside a supply-chain it should be possible to easily create, join and leave P2P networks. This includes centralized, hybrid and pure P2P networks. Additionally problems like routing of messages through the chain, not requiring a central authority that tracks the latest IP should be addressed, while taking care for routing, prioritisation, message handling and storage.	Service, Capability, Connectivity, and Control GE (S3C)
Safety risk information has to be communicated very rapidly to the involved stakeholders	In conjunction with requirement 39, it must be possible to communicate any safety risk information based on detected problems very rapidly to stakeholders such as the European Rapid Alert System for Food and Feed (RASFF). Thus, the same notification GE component that is responsible for notifying the product owner can also notify the ERASFF and other stakeholders involved.	Service, Capability, Connectivity, and Control GE (S3C)

3.3 Requirements elicited from Smart-Food Awareness sub-domain

Table 3 Requirements elicited from Smart-Food Awareness sub-domain

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
Service and service components manager	The service infrastructure has to support the storage and management of service components, service templates and executable services	Service, Capability, Connectivity and Control GE (S3C)
Service creation	The prosumer requires a suitable environment for creating services and service components	Composition Editors GE
Service Execution	Service Execution should be supported locally combining user terminal and environment in order to provide a fully adapted service execution	Composition Execution GE
Configuration and context adaptation	Service modules and the service itself should be able to adapt and configure to the user and context	Configuration and Communication
Sensor and actuator GE	Self-configuration mechanisms should take place	IoT GE
Transparent Device usage	Service created by prosumers will interact with devices so transparent and standard mechanism for communicating and interacting with them should be provided	Connected Device Interfaces GE (CDI)
Processing of heterogeneous event provided by sources of different nature	Event generation, gathering, identification, processing and management	Complex Event Processing GE
Domain model for structured information	Common processing capabilites to heterogeneous metadata linked to different types of "objects" in the retalier domain, inlcuding those that come from the other stakeholders of the supply chain, the consumers, etc	Meta data preprocessing GE
Integrate unstructured information in system's data model	Processing of unstructured information	Unstructured data analysis GE
Obtain Geographical positioning of the user	Application of localization algorithms to calculate a device's positioning based on Wifi, AGPS, RTLS systems. Etc	Localization platform GE

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
Obtain easy access to the information stored in heterogeneous databases	Abtraction layer for the retrieval of information from different databases	Query-access GE
Unified acces to diferrent sources of information	Retrieval and delivery of information to/from different sources	Publish/Subscribe Broker GE
Sematic description of the domain	Sematic description of the domain's components that defines the objects attrivbutes and how they interact with the rest of the domain.	Semantic Annotation GE
Development of semantic based sacalable systems	Development of semantic based sacalable systems	Semantic Application Support GE
Process the information of the instant positions of the user into an activity and/or movements profile	Process the information of the instant positions of the user into an activity and/or movements profile	Mobility Analysis GE
Statistical analysis of the user behaviour and preferences and generation of tailored information	Statistical analysis of the user behaviour and preferences and generation of tailored information	Real-time recommendations GE
Infer behavioural patterns based on user activity	Given the information provided by the user profil, its past actions and its current action this module will infer behavioural patters of the users.	Behavioural and Web profiling GE
Availability of a repository of commonly structured services	A (most probably) distributed repository of all the services that operate in the system, including thier capabilites' description and availabilty	USDL Repository GE
Management of service repository platform; discovery of services	Tool for the administration of the service repository used for maintenance and deployment of the services that exists in the system.	USDL Registry GE
Users can compose thier own services following the prosumer ap-	Current trends in the ICT paradigm are dealing with the concept of prosumer, in where the classical end user changes its hard consuming role to a new one in which himself can create new services that perfectly fit his requirements. These services are created using a "user	Composition Editors GE

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
proach.	friendly" application where the user can combine different logical components to create a personalizaed service or application.	
Abstraction layer for the visualization of applications in mobile devices	The abstractions layer comprises the mechanisms to provide adapted visualization to all the end-user services with independency of the mobile device used.	Multi-channel/Multi-device Access System GE
Establishment and management of the communications of the system with sensors and devices with independency on the communication protocols	Abstraction layer that will provide technologies developers with an common API to communicate with different devices that use different communication protocols and interfaces	IoT Communications GE
Service and device description repository. Management and storage of the repository	Repository where the capabilites, characteristics and proporties of IoT enabled devices and services are identified, described and published	IoT Resources Management GE
Collection, filtering and distribution of data generated by sensors	System component that will gather all the raw data incoming fromn the sensors, filter it in a way that all the not usable information is deleted, combine it into usable information, and deliver it to the next component in the information flow chain.	IoT Data handling GE
Establish mechanisms to automatically trigger actions involving IoT components	Unified model for the description of domain specific rules for a more autonomous management and operation of IoT resources.	IoT Process Automation GE
Standard API to connect with user devices of different nature	Framework for development activities that provides a standard way of interact with mobile devices and get information about their status, performance, capabilities and availability	Connected Device Interfacing (CDI) GE
Identify possible cyber attacks that may affect sensitive information (users' personal information mostly)	Component for the gathering, analysis and reporting of information related to the cyber security of the Information System. Intelligent anomaly detection based on the correlation on events and the modelization of the domain to protect is done.	Securitymonitoring GE

Title What is the requirement?	Description & Rationale What does it mean, why & when is it needed? You can define here if it requires more clarification or example.	Name Of Generic Enabler
Obtain reliable identification and authorisation of the user to the system's services.	Externalization of the identification and authorization processing and data storage and communicating with those identification services through open protocols . Application for the end users to manage their privacy policies	Identity Management GE
Offer the user a tool to understand how their privacy is being managed by the ICTs and to correctly express their preferences.	Language that provides the non expert user with a translation, in understandable terms,of the privacy policies of the services he recevies/ wants to receive. It also applies the other way around. This tool will translate user preferences expressed in common languaje to technical languaje that security experts can understand.	PrimeLife Policy Language (PPL) Engine GE

4 Results

This section presents the results of requirements specification so far. These requirements are going to be refined and enriched in the next version of this deliverable.

Table 4 Results after harmonization

Sub-Domain	Total use cases	Total Requirements	Requirements towards Core Platform **
Smart Farming	29	64	16
Smart Agri-Logistics	7	46	16
Smart Food Awareness	15	31	29

** There are number of requirements from three sub-domains addressing Data Gathering, Data Analyzing, Statistical Analyzer, Configuration & Communication, Execution module and Notifier. Since there is no specific Generic Enabler in FI-WARE HLD to address these requirements, we created one EPIC for each these for further clarification.

5 Conclusions

This version of the deliverable provides the first requirements elicitation towards Core Platform. The proposed list of requirements needs to be refined, completed and validated in the light of the three sub-domains. The refinement process will continue during next 2 months in an iterative way between Core Platform and SAF project.

6 Appendix A Backlog template

In this section the fields of backlog template is described in details. We used the same format for use cases and functional requirements.

Id	Used to identify the backlog entry We are still waiting on agreed format, e.g.: <category>.<scope>.<id-number> (EPIC.UC.16) where: <category>::= "Theme" | "EPIC" | "use story" | "feature" <scope>::= "UC" | "FIWARE" | "OTHER" | …
Name	Descriptive name of the entry
Goal	Short phrase describing the goal for this entry
Version	Version associated to the entry. Helpful to monitor progress and follow-up modifications
Source	Project or organization who identified the use case / feature
Source Contact	Contact point in Source project or organization (was "Author")
Stakeholder	List of projects or organizations interested in coverage of the use case / feature (the source is considered to be a stakeholder)
Scope	Projects to which the entry applies. Could be: "Platform Generic" = It relates to a functional or non-functional feature required at platform level and general purpose "Platform Common" = It relates to a functional or non-functional feature required at platform level but whose applicability is restricted to applications in a few number of domains (Usage Areas) "Application" = It relates to a user story related to some functional o non-functional feature required at application level "Global" = It relates to some functional or non-functional feature required both at platform (generic or common) and application level "Not Yet Determined" = when decision still has not taken place
Status	Should be "Pending" (still not revised), "Planned" (is in the roadmap), "Under execution" (being developed in current sprint), "Done" (has been already developed) or "Deprecated" in which case the Description field should explain why and

	the list of Ids of entries replacing it when applicable.
MoSCoW priority	MUST - Features that absolutely have to be done are categorized as Must. If any of these features are not done, the project will be considered a failure. SHOULD - Features that are important to the success of the project, but are not absolute musts (they have a workaround or will not cause the project to fail) are categorized as Should. COULD - Features that are nice to have but are not core features are categorized as Could. WONT - Features that are not going to be implemented this time are marked as Won't.
Relative priority	Priority number relative to the same MoSCoW priority We may use maybe a number of 2 digits, with the first one linked to the MoSCoW priority and the second to the relative priority. That would allow ordering entries just based on this number. Thus, we may have: Priority 35 = "Should" with priority 5 among those labeled as "Should"
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Apps" - "IoT" - "I2ND" - "Security"
Enabler	Only applicable to Platform features. It identifies the Enabler to which this entry (feature) in the backlog applies.
Category	Would be "Theme", "EPIC" or "user story"/"feature" (depending on how we want to name fine-grained items in the backlog)
Description	Description of the feature. FINEST proposed the following information but this will not be mandatory: - Actors - Preconditions - Triggers - Main success scenario ("How to demo") - Extensions - Alternative paths

	- Postconditions - Notes
Actors	Entities that are involved in entry use case / feature description Users are not necessarely End Users. Particularly, users typically are the applications, the application developer or application providers in entries linked to Platform enablers
Primary Actor	Primary entity involved in entry use case / feature description
Rationale	Rationale of why the feature is needed
Owner	Name of project taking care of it
Owner Contact	Name of person in Owner project taking care of it
Complexity	Label or number describing how complex supporting the use case / feature will be. E.g.: - XXL: Costs quite a lot - XL: Costs a lot - L: Has a significant cost - M: Medium cost - S: Doesn't take that much - XS: It's almost trivial
Creation Date	Date of creation
Last modified	Last date at which it was modified (any field)

7 Appendix B Use Cases gathered from sub-domains

In this section a set of different use cases from three sub-domains are presented that were used in the previous section to derive the main functional and non-functional requirements for the Core Platform.

7.1 Use cases from Smart-Farming sub-domain

Id	Theme.UC.SAF.WP200.1
Name	Yield measurement system
Goal	To ensure appropriate data for the organisation and distribution. To collect information of variation in yield from the all points of the area. To prepare yield map. To prepare a database system about collected information.
Version	V1.0
Source	CBHU
Source Contact	a.sebok@campdenkht.com k.viola@campdenkht.com
Stakeholder	Project = 'SmartAgriFood' Organization= CBHU
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Apps" - "IoT" - "I2ND" - "Security"
Enabler	...

Description	The operation of the existing yield measurement systems requires some development. The information and results are often unpunctual and unreliable, so organization of production is more difficult. The collected data of yield and variation in yield provide base information about the fertility and the biological activity of the soil, the cultivation technique and the efficiency of previous fertilizer practice. The assessment of crop development and forecast yield can be used for, for planning of the production, for sales forecast, for scheduling harvesting, for irrigation network and for nutrients management. Yield estimation means the collection quantity and quality information about crops, fruits and vegetables before harvesting. Information about: • the expected yield, • the development of crops, fruits and vegetables • the damages of crops • Etc. There is a large database about the information, which is available for all participants. The information is collected by different technologies. - Actors All members in the precision agriculture End Users, Customers, database, data collector service - Primary Actors All members in the precision agriculture - Preconditions • Technical and technological expertise • Procurement of the required equipments • A farmer has to permit his FMIS or other FMISs access his raw data. • Storage and transport capacity may be planned in advance - Triggers • A farmer asks for the state of his crops. • A farmer wants to know the estimated crop according to the existing state of his farm - Main success scenario ("How to demo") • The farmers can collect information (different data, analyzed or not data, sensed data, multimedia data, etc.) about: the expected yield, the development of crops, fruits and vegetables, the damages of crops, etc.

	A decision entity, which may use information to cross the quality of the specific crop, recognizes whether it is ready for harvest. • They can send the collected information to the database. • This information is usable for planning of the production, for sales forecast, for scheduling harvesting, for irrigation network and for nutrients management. • Monitoring
Actors	All members in the precision agriculture. End Users – Customers Database Data collector service • Yield measurers • Data collector • Sensors • Mobile devices • GPS • On-board devices • Remote sensing
Primary Actor	Actors are all members in the precision agriculture who use the developed system and database.
Rationale	Farmer: reliable quantity information before harvesting, efficient organization of production, logistics, import and export, etc. cost reduction End Users – Customers: Reliable and available information for the members of food chain
Owner	SmartAgriFood
Owner Contact	András Sebők: a.sebok@campdenkht.com Katalin Viola: k.viola@campdenkht.com
Complexity	- XXL: Costs quite a lot
Creation Date	22/07/2011
Last modified	30/09/2011

Id	Theme.UC.SAF.WP200.2
Name	Extraneous and foreign bodies identification
Goal	To ensure appropriate data for machines and farmers about foreign bodies.

Version	V1.0
Source	CBHU
Source Contact	a.sebok@campdenkht.com k.viola@campdenkht.com
Stakeholder	Project = 'SmartAgriFood' Organization= CBHU
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD - Features that are important to the success of the project, but are not absolute musts (they have a workaround or will not cause the project to fail) are categorized as Should.
Chapter	Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Apps" - "IoT" - "I2ND"
Enabler	...
Description	Several foreign bodies can occur and can cause hazards during the processes of arable crop and vegetables production and processing. Foreign material can be: glass, bottle, splint, flinders, plastic, metal, stone, etc. The presence of foreign bodies affects adversely the food safety and the quality of products therefore it is necessary to identify and eliminate the foreign bodies before the food processing. Foreign bodies can cause injuries for customers, consumers and customers' complaints. Reliable removal of foreign bodies coming with raw materials is not always possible during the food processing. It is better to prevent foreign body contamination from raw materials. When agricultural machines (tractors, harvesting machines, etc.) are working on the field camera systems connected to foreign body identification systems can identify the foreign bodies and their location and provide a map to guide their removal. Identification can be realized with new technologies on the machines, on the fields and around the fields.

	Identification can be very exact and the information can be collected in a large database of pictures, images, data and characteristics about identified foreign bodies. - Actors All members in the precision agriculture End Users, Customers Identification system Database - Primary Actors All members in the precision agriculture - Preconditions • Appropriate technologies and database system. • Camera system is connected to foreign body identification systems • - Triggers • System identifies foreign bodies inside a crop - Main success scenario ("How to demo") When agricultural machines (tractors, harvesting machines, etc.) are working on the field, cameras which are connected to the foreign body identification systems, can identify the foreign bodies and their location so as provide a map to guide their removal. • System identifies their location inside this crop • Provision of a map to guide their removal • Upload this information to foreign bodies' data-base
Actors	All members in the precision agriculture. End Users – Customers Identification system • Remote sensing (air, space, equipments) • Sensors for identification of foreign bodies • Camera, shape, colour recognising system • GPS Database • Register of foreign bodies (database of pictures, images, etc.)
Primary Actor	Actors are all members in the precision agriculture who use the developed system and database.

Rationale	Farmers: Rapid and exact identification, avoid of food safety incidents and customer, consumer complaints, compensation costs and negative effects. End Users – Customers: Increase of food safety and quality IT: Increase of cost effectiveness (non-manual separation, remote control of fields)
Owner	SmartAgriFood
Owner Contact	András Sebők: a.sebok@campdenkht.com Katalin Viola: k.viola@campdenkht.com
Complexity	- XXL: Costs quite a lot
Creation Date	22/07/2011
Last modified	30/09/2011

Id	Theme.UC.SAF.WP200.3
Name	System for milk quota
Goal	To distribute the national quota with the assistance of monitoring and recording the milk quantity in order to help every member operate his production volumes. The aim is to develop a system for the correct data flow and to ensure expedited data transfer.
Version	V1.0
Source	CBHU
Source Contact	a.sebok@campdenkht.com k.viola@campdenkht.com
Stakeholder	Project = 'SmartAgriFood' Organization= CBHU
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD

Chapter	Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Apps" - "IoT" - "Security"
Enabler	...
Description	The milk market in the EU is regulated by a quota system. Every member state has a national production quota which is distributed to the farmers. Whenever a member state exceeds its quota, it has to pay a penalty (called 'super levy') to the EU. This national penalty is in turn financed by penalties imposed on farmers who have exceeded their individual quotas. - Actors • National agencies and contracted organisation responsible for registration, regulation, administration, monitoring of performance and production volumes for milk quota • Policy makers: legislation • Dairy production holdings - Preconditions • Recording of the members and the livestock units • Specification of the yearly milk quota by EU • Determination of the allocated quota of members • Application of the EU legislation - Triggers • The establishment of Common Agricultural Policy. Start of milk production. • A farmer shares his milk production - Main success scenario ("How to demo") • The system records the certain quantity. • The milk quota system, through intelligent modules, calculates the total milk production and further action. • If a farmer wants so, a planning is provided to him for next days in order to know how much milk to produce

Actors	• National agencies and contracted organisation responsible for registration, regulation, administration, monitoring of performance and production volumes for milk quota • Policy makers: legislation • Dairy production holdings
Primary Actor	Dairy production holdings
Rationale	Farmers: correct information flow, improvement of data flow, information about the maximum amount that he can produce potential profit. Each Nation: reduction of possible pentalties
Owner	SmartAgriFood
Owner Contact	András Sebők: a.sebok@campdenkht.com Katalin Viola: k.viola@campdenkht.com
Complexity	- XXL: Costs quite a lot
Creation Date	22/07/2011
Last modified	30/09/2011

Id	Theme.UC.SAF.WP200.4
Name	Collaborative Spraying
Goal	Definition of information flows and interfaces for vehicle to vehicle communication.
Version	V1.0
Source	MTT/JD-WP200
Source Contact	Frederick.Teye@MTT.FI Liis.Pesonen@MTT.FI HuetherNicole@JohnDeere.com schrankclaudia@johndeere.com
Stakeholder	Project = ‘SmartAgriFood’ Organization= MTT/JD
Scope	Global
Status	PENDING

MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "IoT" - "I2ND" - "Security"
Enabler	"Cloud": all "Data/Context": Big data processing, events, metadata and query-access. "IoT": all; communication between componets of sprayer and physical sensors. "I2ND": all; CDI, Cloud Edge, Netc and S3C.
Description	Several machines are coordinated within a fleet to work together on the same task. - Preconditions ✓ Field and task data are available: field specific information like field location and its farming history. ✓ Task planning , generation and modification possible ✓ Wireless connectivity between the vehicles and between the vehicles and the backend management systems ✓ Interoperability between vehicles / systems from different brands ✓ 100% cellular phone network coverage ✓ Low network latencies ✓ High network bandwidths - Triggers ✓ A sprayer has lost ability to complete the task so that a second sprayer has to overtake this task. - Main success scenario ("How to demo") ✓ A worker of a contracting company is spraying a customer's field driving a tractor and a sprayer, named number 1. After he has worked the half of the area the sprayer system informs him that the tank will be empty in 15 minutes, and 1/3 of the area will remain unsprayed. The sprayer shares the information with the other sprayers nearby, alarming them about the situation. The system assists in matching the spraying unit in trouble with the one

	capable to help (e.g. the one who is soon finishing its task with the same chemicals in the near by field of another customer).Now the driver in the assisting sprayer number 2 is aware of the situation and navigates to the field of sprayer number 1. Sprayer number 1 shares the information about sprayer settings, needed external services and their quality (wind, temperature, air humidity, growth and soil moisture, positioning correction accuracy), and task plan, as well as the unsprayed area of the task (with field ID) to sprayer number 2. ✓ Sprayer number 2 makes request about available relevant services in the target field and connects to the suitable ones. The sprayer number 1 sends information about remaining unsprayed area frequently after every 2 minutes to the sprayer number 2. Sprayer number 2 arrives into the field and starts spraying work while sprayer number 1 is still spraying. ✓ After 15 minutes the sprayer number 1 has run out of chemicals and stopped spraying. It shares the last update of accomplished work with sprayer number 2 and with the contractors MIS (CMIS) as also with the FMIS of the customers, if agreed so (Customer farmer is monitoring the proceeding of the work) as a document of executed work. ✓ The sprayer number 2 continues working and finalizes the task. ✓ Before leaving the field, the driver of sprayer number 2 sends a confirmation message to the contractor manager of the finalised task, as well as document of executed work (field ID, used chemicals, amounts, fuel consumption etc.) to CMIS and FMIS where the information is merged to the sprayer number 1´s document information. - Extensions ✓ None - Alternative paths ✓ None - Postconditions ✓ The task is completed of the sprayer 2 - Notes
Actors	Actors ✓ Farmer: Owner of the field. Assigns spraying orders to the contractor ✓ Contractor: Owner of the vehicles and coordinator of the tasks. ✓ Driver 1: Operates the sprayer 1, starts the spraying process and is asking for support ✓ Driver 2: Operates the sprayer 2 and supports sprayer 1 in order to fulfil the spraying task ✓ CMIS owner: Is owned by the contractor and manages the contractor’s vehicles and tasks

	✓ FMIS owner: Is owned by the farmer and manages the farmer's fields and tasks
Primary Actor	✓ Driver/ Owner / Operator: Owner of the field. Assigns spraying orders to the contractor. The contractor is the owner of the vehicles and coordinator of the tasks.
Rationale	For the farmer: The tasks are executed more efficiently, lower costs For the contractor: tasks are executed faster and more efficiently, reaction to dynamic changes in process parameters, lower costs
Owner	SmartAgriFood
Owner Contact	markus.dillinger@huawei.com
Complexity	- XL: Costs a lot
Creation Date	11/08/2011
Last modified	12/10/2011

Id	Theme.UC.SAF.WP200.5
Name	Plant disease forecast for spraying
Goal	✓ To provide a forecast and warning on the onset of plant disease. Also provide recommendation on disease spraying agent and ways of executing spraying task.
Version	V1.0
Source	MTT
Source Contact	Frederick.Teye@MTT.FI Liis.Pesonen@MTT.FI
Stakeholder	Project = 'SmartAgriFood' Organization= MTT
Scope	Global
Status	PENDING
MoSCoW priority	SHOULD

Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "IoT" - "I2ND" - "Security"
Enabler	"Cloud": all "Data/Context": Big data processing, complex events processing, metadata processing and query-access. "IoT": all; communication between componets of sprayer and physical sensors. "I2ND": all; CDI, Cloud Edge, Netc and S3C.
Description	Plant disease spraying is an important task in crop production. This scenario provides a step by step in depth into the utilization of plant disease forecast services for plant disease warning and recommendations for performing spraying. It also considers the tools and infrastructure needed for achieving this scenario. The scenario also shows the need and importance of fluent and reliable information flow between several actors, services and information sources for performing a spraying operation under demanding environmental conditions. - Preconditions ✓ Field and task data are available: field specific information like field location and its farming history are available for disease forecast and formulation of spraying task. ✓ Weather station network and weather information and history data are available ✓ Meteorological data supply, available from weather station network, forecasts and interpolated weather data availability. ✓ Task planning , generation and modification possible ✓ Disease model and service infrastructure. ✓ FMIS system or supply of field and work information. ✓ Data and service interfaces are needed. Interoperability between services and systems is needed. - Triggers ✓ Disease forecast is triggered after planting or seeding is completed. - Main success scenario ("How to demo") ✓ After the completion of seeding or planting: ○ The Plant Disease Forecast Service (PDFS) starts to col-

	lect to collect cumulated weather information such as air temperature, air humidity and rainfall from available weather services. ○ Weather information is available as interpolated data from national meteorological weather service and or local weather station network data. ○ Disease risk calculation: implemented information model and input information from different sources, information model. ✓ The plant disease forecast service receives farmers' site-specific cropping information from Farm Management Information System (FMIS); variety, soil type, previous season's plant amongst others. ✓ Based on a disease forecast model, criteria for disease onset can be predicted. This prediction service is an available service for farmers. ✓ When the criteria for disease risk prediction from the PDFS are reached, a warning is sent to the farmer's mobile phone telling him to go and verify the situation on his/her fields. ✓ In addition, the farmer can log in to the PDFS which incorporates information from his FMIS and agricultural advisory services; to provide detailed information about the disease forecast warning. ✓ The farmer carries out the field inspection and updates the PDFS with his/her observations. ✓ Field observations: events, notes, images or videos, remote sensing data. ✓ Based on the updated information, the PDFS gives recommendations for the spraying task. ✓ The farmer can carry out the spraying operation or make request for a contractor to carry out the spraying task. ✓ Using the FMIS, the farmer or contractor prepares a detail spraying task with schedule for the spraying operation. ✓ The spraying task is now ready for execution. ✓ Task plan: task name, field ID, sprayer ID, worker ID, chemical(s), amount of chemical per site (zones), documentation instructions, etc. ✓ After spraying is executed, the documentation of the spraying operation is updated to the PDFS for performing future predictions. - Extensions ✓ None - Alternative paths ✓ None - Postconditions ✓ The spraying operation has been completed. - Notes

Actors	Actors ✓ Farmer: end user, process owner, utilises services ✓ Weather service: provides tailored input data ✓ Sensor networks: provides raw data ✓ Disease service: provides knowledge and alarms ✓ Tractor, sprayer: work set ✓ Task controller: communicates with external services and controls the task in the work set. ✓ Cell phone: communicates with external services. ✓ FMIS: server and database, profession specific assisting functionalities. ✓ Farm advisory service: agricultural knowledge provider, possible provider of farmers' service hub. ✓ ISP: Internet Service Provider ✓ Farm/field: action site, provides functional and technical environment/infrastructure
Primary Actor	✓ Driver/ Owner / Operator: Owner of the field. Assigns spraying orders to the contractor. The contractor is the owner of the vehicles and coordinator of the tasks.
Rationale	The most important parts for this scenario are forming the warning and decision support system in the cloud. This includes the needed services and their intercommunication for forming of required service network. The service network will then be benefited by the all the stakeholders. For: ✓ Farmer: improved time, profit, farming is compliant with standards ✓ Weather service/Sensor networks/Disease service: more paying customers ✓ Tractor, sprayer (machine manufacturer): improved product efficiency, improved functionalities in the products. ✓ Farm/field: efficient and safe working and production environment ✓ Enhances interoperability between services and machines by using open interfaces.
Owner	SmartAgriFood
Owner Contact	markus.dillinger@huawei.com
Complexity	- XL: Costs a lot
Creation Date	11/08/2011
Last modified	12/10/2011

Id	Theme.UC.SAF.WP200.6
Name	Preparation and setup for plant disease spraying

Goal	✓ To prepare a Variable Rate Application (VRA) equipped sprayer for a Precision Agriculture (PA) spraying operation. The scenario shows the need and importance of fluent and reliable information flow between several actors, services and information sources whilst taking into account environmental consequences of an in-correct spraying operation.
Version	V1.0
Source	MTT/JD
Source Contact	Frederick.Teye@MTT.FI Liis.Pesonen@MTT.FI HuetherNicole@JohnDeere.com schrankclaudia@johndeere.com
Stakehold-er	Project = 'SmartAgriFood' Organization= MTT/JD
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "IoT" - "I2ND" - "Security"
Enabler	"Cloud": all "Data/Context": Big data processing, complex events processing, metadata processing and query-access. "IoT": all; communication between componets of sprayer and physical sensors. "I2ND": all; CDI, Cloud Edge, Netc and S3C.
Description	Before a plant disease spraying operation, the farmer has to prepare and set his machine up for the operation. This scenario describes the procedure in the setup process. - Preconditions ✓ Field and task data are available: field specific information like field location and its farming history are available for disease

	forecast and formulation of spraying task. ✓ Weather information and history data are available ✓ Disease model available ✓ Task generation and modification possible ✓ Task execution possible ✓ Accurate GPS information is available. ✓ FMIS system or supply of field and work information. Private SME provider's Farm management software for farmer. ✓ Machinery and controllers needed for task execution and documentation: at least simulations available. ISOBUS preferred and thus if real machinery needed for trials, cooperation with other project partners wanted. ✓ SOA service infrastructure and services are needed. Development of data and service interfaces are needed. Interoperability between services and systems is needed. - Triggers ✓ Seeding done or Plant Disease Forecast Service gives and alarm for spraying. - Main success scenario ("How to demo") ✓ After the farmer receives information for the Plant Disease Forecast Service: ✓ The farmer or contractor prepares the spraying plan according to background information received from farmer's Farm Management Information System (FMIS). ✓ The task plan accumulates the following information: o FMIS information: field location, area, target crop and disease, farming history in the field, water source for tank filling, earlier used fungicides, farming strategy rules to obey (government and private standards). o Regulation database: allowed chemicals and their amounts, chemical prise,, o Stock information: available chemicals in storage, available workers and work sets, navigation to the field. o The farmer/contractor generates plans and schedules for spraying, and uploads the generated task files to the FMIS server. Task plan contain information as: task name, field ID, sprayer ID, worker ID, chemical(s), amount of chemical per site (zones), documentation instructions, etc. ✓ The farmer/contractor prepares also other tasks for other clients to be executed within the same day and schedules the fleet. ✓ Using GPS and weather station network technology, the contractor manager can view the weather situation in the target fields from his/her office monitor, and the worker within the tractor-sprayer from Task Controller (TC) or mobile phone as he/she prepares the spraying agents mixing for sprayer tank filling according to the directions in the task file. o Weather check in the target field: wind speed and direc-

	tion, humidity in air and growth for instructions for spraying task; nozzles, tank mixing ✓ The worker navigates to the target field. On the field, the worker rechecks the task from sprayer TC via mobile Internet and starts work. An ISOBUS automation system, equipped with GPS, controls the spraying. ✓ The contractor manager can monitor the fleet as tasks proceed from the office screen or from one of the spraying units (TC or mobile phone) he/she is working with. He makes updates the task list and schedules of the fleet if necessary. ✓ The execution of the spraying operation is logged and the document data are uploaded to the disease forecast server for prediction of future events, as well as to farmer's FMIS and contractor's CMIS. ✓ Documentation per site and time of sprayed chemicals, consumed fuels, used working hours, observations by driver/work set. - Postconditions ✓ Spraying operation is completed by farmer or contractor issues spraying invoice. - Notes
Actors	Actors ✓ Farmer: end user, process owner, utilises services ✓ Weather service: provides tailored input data ✓ Sensor networks: provides raw data ✓ Disease service: Provides knowledge and alarms ✓ Tractor, sprayer: work set ✓ Task controller: communicates with external services and controls the task in the work set ✓ Cell phone: communicates with external services ✓ Contractor: end user, process executer, utilises services ✓ FMIS, CMIS: server and database, profession specific assisting functionalities ✓ Farm advisory service: agricultural knowledge provider, possible provider of farmers service hub ✓ ISP: Internet Service Provider ✓ Farm/field: action site, provides functional and technical environment/infrastructure.
Primary Actor	✓ Farmer/ Driver/ Owner / Operator: end user, process owner, utilises services.
Rationale	The most important parts for this scenario are possibilities to perform the spraying setup and scenario also on the cloud. There is the need for mirrored services on the physical sprayer (proxy?) to enable setup even with-out connectivity between the mobile work set and the cloud. This scenario has several benefits. For: ✓ Farmer: improved profit, efficient use of time, farming is compliant

	with standards. ✓ Weather service, sensor networks and disease service: more paying customers. ✓ Tractor, sprayer (machine manufacturer): improved product efficiency, improved functionalities in the products. ✓ Task controller: improved functionalities in the products. ✓ Contractor: improved profit, farming is compliant with standards. ✓ FMIS, CMIS: improved product efficiency ✓ Farm advisory service: enlarged service product portfolio ✓ ISP: test bed for new technologies, enlarged service and product portfolio ✓ Farm/field: efficient and safe working and production environment
Owner	SmartAgriFood
Owner Contact	markus.dillinger@huawei.com
Complexity	- XL: Costs a lot
Creation Date	11/08/2011
Last modified	12/10/2011

Id	Theme.UC.SAF.WP200.7
Name	Dealing with bad weather during spraying
Goal	✓ To bring real-time and forecasted local weather information on-board the tractor. ✓ To help in deciding how to perform spraying operation as a result of weather conditions ✓ To help decide whether to stop spraying and when to stop spraying as a result of weather conditional changes. ✓ - To provide information about spraying process and other spraying fleet for informed decision making.
Version	V1.0
Source	MTT/JD
Source Contact	Frederick.Teye@MTT.FI Liis.Pesonen@MTT.FI HuetherNicole@JohnDeere.com schrankclaudia@johndeere.com
Stakeholder	Project = 'SmartAgriFood' Organization= MTT/JD
Scope	GLOBAL

Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "IoT" - "I2ND" - "Security"
Enabler	"Cloud": all "Data/Context": Big data processing, complex events processing, metadata processing and query-access. "IoT": all; communication between sprayer and physical weather sensor network. "I2ND": all; CDI, Cloud Edge, Netc and S3C.
Description	In spraying chemicals are applied to plants for protection or improving their conditions. During bad weather such as severe temperatures, high humidity, high winds or onset of rainfall, chemicals could be wrongly dispersed, washed away, or affect the plants themselves. The operator of the tractor, the tractor and the sprayer, utilizes sensor information and internet services for weather situational awareness and control and decision-making during the spraying operation to prevent any disasters. - Preconditions ✓ Field and spraying task data is available. ✓ The sprayer has capabilities of Variable Rate Application (VRA). ✓ Sprayer machine status information is available. ✓ Weather information, forecasted and history data are obtainable. ✓ Spraying task recording and modification possible. ✓ Decision support service modules. ✓ Reliable wireless network between sprayer and weather service providers. ✓ Prioritization of weather, data and information transfer between machine and internet. ✓ Decision support service infrastructure over internet for performing decision in case of bad weather. ✓ Infrastructure to connect to Farm Management Information System (FMIS) for spraying task update on-the-fly with changes in weather conditions. ✓ Weather, sensor network and service infrastructure.

	✓ Geographical positioning system and correction services. - Triggers ✓ Machine operator is alarmed when current and forecasted weather conditions exceed predetermined maximum or minimum limits. - Main success scenario ("How to demo") ✓ The task is planned for the spraying operation including the following information: ○ FMIS information: field location and area, target crop and disease, chemical resources, location water source for tank filling, task operation date. ○ Regulation database information: allowed chemicals and their amounts, chemical prices. ○ Weather service information: Estimated best day for spraying. ✓ On the planned spraying date, the weather is again checked for the target field: wind speed and direction, humidity in air and plant canopy, and rainfall information. ✓ DePENDING on the chemicals and weather conditions, the tank mixing and spraying nozzle size, pressure and amount are adjusted. ✓ In the field during the spraying operation, the weather situation is continually monitored in real-time and the VRA performed according to the task requirements. ✓ Modification of task on-line is done when spraying; this task is based on to the present/changing weather parameters and forecasts, spatial rules. ✓ Based on several inputs from weather sensors, cost predictions and environmental effect estimation a decision support system provides the tractor operation with steps to take in case of bad weather situations such as severe temperatures, high humidity, high winds or onset of rainfall. ✓ With this decision support information, the operator then decides whether continue spraying adjusting the sprayer, or to stop spraying and when to stop spraying as a result of weather conditional changes. ✓ Documentation of the spraying work is the transferred to the FMIS server on the cloud for performing further spraying tasks. - Extensions ✓ None - Alternative paths ✓ None - Postconditions ✓ Spraying task is achieved or performed.

	- Notes
Actors	Actors ✓ Farmer: end user, process owner, utilises services. ✓ Weather service provider: provides tailored input data. ✓ Decision service provider/ farm advisory service: combines all available information including weather, spraying task and cost consequences to advice the operator on what actions to take e.g. postpone spraying etc. ✓ Sensor networks: provides raw weather data. ✓ Machinery: Tractor and sprayer work set for performing the spraying. ✓ FMIS: server and database, profession specific assisting functionalities.
Primary Actor	✓ Farmer/ Driver/ Owner / Operator: end user, process owner, utilises services.
Rationale	The most important parts for this scenario are possibilities to obtain updated weather data information from the cloud and also monitor nearby fleet that are spraying. There is the need for mirrored services on the physical sprayer (proxy?) to enable local decision making when there is no connectivity between the mobile work set and the cloud. With weather information to the sprayer, this scenario has several benefits. ✓ Economical benefits in amount of spraying agents used. ✓ Environmental benefits of avoiding risks of spraying agent washout by rain. ✓ Time optimization in spraying.
Owner	SmartAgriFood
Owner Contact	markus.dillinger@huawei.com
Complexity	- XL: Costs a lot
Creation Date	11/08/2011
Last modified	12/10/2011

Id	Theme.UC.SAF.WP200.8
Name	Cooperative harvesting
Goal	• Handle issues with unreliable networks / limited network coverage (rural areas) through virtual servers in the cloud • Prognostic tools/model for extrapolation (on vehicles and in the cloud)

	• High dynamics in system configuration (machines can join and leave the system at every time) • Interoperability between machines and other participants from different brands • Soft real-time requirements • Medium message frequency (a few seconds)
Version	V1.0
Source	JD-WP200
Source Contact	HuetherNicole@JohnDeere.com schrankclaudia@johndeere.com FloerchingerThomas@JohnDeere.com
Stakeholder	Project = 'SmartAgriFood' Organization= JD
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "I2ND" - "Security"
Enabler	(Data Collector, Data Analyzer, Desicion Module, Notifier) "Data/Context": Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE "Cloud": all "IoT": all; communication between sprayer and physical weather sensor network. "I2ND": all; CDI, Cloud Edge, Netc and S3C.
Description	- Actors • Biogas plant • Tractor drivers • SPFH drivers

	• Farmer • Contractor - Primary Actors drivers - Preconditions ✓ Wireless network connections between the vehicles ✓ Secure data transfer ✓ Low cost wireless network connections ✓ Low latencies and high bandwidths - Triggers ✓ Harvest starts - Main success scenario ("How to demo") Defect on SPFH • Trailers are reassigned to another harvesting chain Defect on a trailer • Reorganisation of trailer assignments Silo is full Trailers are reassigned to another silo - Extensions - Alternative paths - Postconditions Harvest ends - Notes
Actors	✓ Biogas plant ✓ Tractor drivers ✓ SPFH drivers ✓ Farmer ✓ Contractor
Primary Actor	✓ Farmer/ Driver/ Owner / Operator: end user, process owner.
Rationale	✓ Cost reduction due to reduced machine down hours ✓ Optimized resource usage ✓ Reduction of complexity and improved decision making for manager of harvesting chains ✓ Higher efficiency, lower carbon footprint
Owner	SmartAgriFood

Owner Contact	markus.dillinger@huawei.com
Complexity	- XXL: Costs quite a lot
Creation Date	13/07/2011
Last modified	12/10/2011

Id	EPIC.UC.SAF.WP200.9
Name	Online Firmware Update
Goal	• High requirements on security • High data volumes • High requirements on billing and permission
Version	V1.0
Source	JD-WP200
Source Contact	HuetherNicole@JohnDeere.com schrankclaudia@johndeere.com FloerchingerThomas@JohnDeere.com
Stakeholder	Project = 'SmartAgriFood' Organization= JD
Scope	Platform Common
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "I2ND"

	- "Security"
Enabler	(Data Collector, Configuration and Communication Module, Notifier) "Data/Context": Publish/Subscribe Broker GE, Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE "I2ND": CDI GE Cloud Edge GE NetIC GE S3C GE
Description	- Actors • Firmware update system • Tractor owner/driver - Primary Actors Firmware update system - Preconditions Legal requirements regarding safety and security have to be considered - Triggers Automatic firmware update functionality is activated and tractor is running - Main success scenario ("How to demo") • Tractor periodically checks for firmware updates by connecting to the update server • If a new firmware version is available the tractor asks the tractor owner/driver for permission to download and install New firmware is installed after it is downloaded completely and the tractor is turned off - Extensions - Alternative paths - Postconditions Tractor is turned off or automatic firmware update functionality is deactivated - Notes

Actors	• Firmware update system • Tractor owner/driver
Primary Actor	• Firmware update system
Rationale	• More reliability of the machines due to faster firmware updates • Reduced costs for firmware updates
Owner	SmartAgriFood
Owner Contact	markus.dillinger@huawei.com
Complexity	- XL: Costs a lot
Creation Date	11/10/2011
Last modified	12/10/2011

Id	EPIC.UC.SAF.WP200.10
Name	Analysis Of Logged Data For Process Optimization
Goal	- To identify information flows and interfaces for communication of large data sets from machines the vehicles to data management systems in the cloud - To identify security related requirements for a shared database in the cloud (data ownership, access control to the data, authentication of the data, trustworthiness of the data)
Version	V1.0
Source	JD-WP200
Source Contact	HuetherNicole@JohnDeere.com schrankclaudia@johndeere.com FloerchingerThomas@JohnDeere.com
Stakeholder	Project = 'SmartAgriFood' Organization= JD
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD

Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	- "Data/Context": Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE, Query-access GE, Semantic Annotation enabler GE
Description	During operation a data logging application on the tractor collects relevant machine data like tractor settings, fuel consumption, implement settings, implement state and data about the current task and about the environment. This data is transferred to a data mining application in the cloud that processes this data in order to find optimal settings and conditions for a given machine and task. The result of this analysis is stored in a database for later retrieval by interested farmers. - Actors - Farmer - Provider of the data mining applications - Data mining application - Data logging application and sensors on the vehicle - Primary Actors ✓ Data mining application - Preconditions ✓ The system has to be accepted and used by many users in order to get the required critical amount of data ✓ There is a mean to communicate the recorded data to the data mining application ✓ Legal requirements for privacy has to be fulfilled ✓ Low costs for network communication of large data sets - Triggers ✓ The farmer queries the data base for optimal machine settings for a given machine and task - Main success scenario ("How to demo") ✓ The farmer queries the database for optimal machine settings for his machine to perform a specific task ✓ The database returns a set of proposed machine settings and conditions from that the farmer can choose one that best matches his needs ✓ The farmers performs the task while applying the chosen ma-

	chine settings and recording of relevant data ✓ After finishing the task the recorded data is transferred to the data mining engine that processes the data and updates it's database - Extensions - Alternative paths - Postconditions ✓ The data mining application has processed the recorded data and updated its data base - Notes
Actors	✓ Farmer: owner of the vehicles, provides recorded data to the data mining system, queries the database of the data mining application for optimal machine settings for a given machine and task ✓ Provider of the data mining applications: Provides the data mining application and database of optimized machine settings ✓ Data mining application: processes the recorded machine data in order to determine optimal machine settings, stores the result of the data mining process in a database that can be queried by farmers ✓ Data logging application and sensors on the vehicle: record relevant machine data during operation
Primary Actor	✓ Data mining application: processes the recorded machine data in order to determine optimal machine settings, stores the result of the data mining process in a database that can be queried by farmers
Rationale	✓ Farmer: potential cost savings by performing the tasks with optimal machine settings, More optimal operating of the machines by unskilled persons ✓ Reduced resource consumption ✓ Reduced carbon footprint
Owner	SmartAgriFood
Owner Contact	markus.dillinger@huawei.com
Complexity	- XL: Costs a lot
Creation Date	14/07/2011
Last modified	12/10/2011

Id	Theme.UC.SAF.WP200.11

Name	Remote Machine Control
Goal	✓ To identify requirements on communication for remote machine control regarding reliability, security and latency. ✓ To identify safety relevant requirements
Version	V1.0
Source	JD-WP200
Source Contact	HuetherNicole@JohnDeere.com schrankclaudia@johndeere.com FloerchingerThomas@JohnDeere.com
Stakeholder	Project = 'SmartAgriFood' Organization= JD
Scope	GLOBAL
Status	PENDING
MoSCoW priority	WONT
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	- "Cloud": all - "Data/Context": Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE, Query-access GE, Semantic Annotation enabler GE
Description	- Actors ✓ Driver of the SPFH ✓ SPFH ✓ Driver of the tractor ✓ Tractor ✓ Trailer - Primary Actors ✓ SPFH - Preconditions

	✓ Legal requirements for safety has to be fulfilled ✓ Low costs for network communication ✓ Remote machine control is accepted by the participants - Triggers ✓ Tractor with trailer reaches the SPFH - Main success scenario ("How to demo") ✓ The driver of the tractor with an empty trailer steers the tractor close to the SPFH ✓ The SPFH detects the tractor and sees that it is ready for loading ✓ The SPFH as well as the tractor authenticate each other and check whether they have the required permission for remote control ✓ Either the driver of the SPFH or the SPFH itself selects the trailer for being filled next ✓ The driver of the tractor is asked for permission for velocity and steering control by the SPFH ✓ The driver gives the permission for remote control ✓ After that the SPFH loads a description of the tractor and it's trailer to get information about their geometry and other characteristics ✓ Based on that information the SPFH permanently sends steering and velocity commands in order to put the trailer in the best position for filling ✓ After a while the SPFH detects that the trailer is loaded completely and selects the next trailer that is already in right position behind the SPFH ✓ The tractor, whose trailer has been filled completely, is steered in front of the SPFH to make room for the next tractor and trailer ✓ The driver of the tractor that has been filled takes control over it's tractor and drives the tractor away from the SPFH to the street - Extensions - Alternative paths - Postconditions ✓ Trailer is loaded and tractor driver takes control over the vehicle - Notes
Actors	✓ Driver of the SPFH: Drives the SPFH, selects the trailer to be loaded next ✓ SPFH: Automatically controls the velocity and steering of the tractor that pulls the trailer that is being loaded, optionally selects the trailer to be loaded next ✓ Driver of the tractor: Drives the tractor to the SPFH for loading and drives the tractor away from the SPFH after being loaded, gives the permissions for remote velocity and steering control of

	it's tractor ✓ Tractor: Pulls the trailer, is controlled remotely by the SPFH during loading of its trailer ✓ Trailer: is loaded by the SPFH
Primary Actor	✓ SPFH: Automatically controls the velocity and steering of the tractor that pulls the trailer that is being loaded, optionally selects the trailer to be loaded next
Rationale	✓ Optimized corn harvesting due to faster loading and less losses of corn ✓ Reduced carbon footprint in corn harvesting ✓ Time safeness and fast reaction of trailer load capacity ✓ Optimized coordination of the corn harvest and efficiency of the machines ✓ Operator relief
Owner	SmartAgriFood
Owner Contact	markus.dillinger@huawei.com
Complexity	- L: Has a significant cost
Creation Date	11/10/2011
Last modified	12/10/20011

Id	Theme.UC.SAF.WP200.12
Name	Remote machine diagnostic
Goal	✓ Eliminates the first trip for diagnostics and trips to the field to only program controllers ✓ Reading diagnostic/error messages and remote diagnostics ✓ Controller programming and remote system issue solving
Version	V1.0
Source	JD-WP200
Source Contact	HuetherNicole@JohnDeere.com schrankclaudia@johndeere.com FloerchingerThomas@JohnDeere.com
Stakeholder	Project = 'SmartAgriFood' Organization= JD
Scope	GLOBAL
Status	PENDING

MoSCoW priority	COULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	- "Cloud": all - "Data/Context": Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE, Query-access GE, Semantic Annotation enabler GE
Description	During harvest a combine driver recognizes that the combine is not working properly. To avoid severe consequences he stops running the combine. He calls the dealer to find a solution to check the status of the combine and to proceed with harvesting as soon as possible. Via remote machine diagnostic and wireless connection the dealer, after getting permission from the operator, connects to the machine for diagnostics and trouble shooting. - Preconditions ✓ Machine error notification - Triggers ✓ Machine error notification - Main success scenario ("How to demo") ✓ Call of the driver/operator/owner of the machine ✓ Dealer technician connects to the enabled machine via network to remotely access diagnostic trouble code information and record diagnostic data as well as to remotely program controllers ✓ Operator/driver/owner gives permission for this connection ✓ The system communicates in a batch and forward communication where requests are sent to the machine, are processed onboard and then returned to the dealer technician. ✓ In case of remote programming payloads are sent directly to the machine - Extensions - Alternative paths

	- Postconditions ✓ Remote programming is finished and dealer technician has end the remote machine connection - Notes
Actors	✓ Driver/ Owner / Operator: He has access to the machine that is to be diagnosed whether it works properly.
Primary Actor	✓ Driver/ Owner / Operator: He has access to the machine that is to be diagnosed whether it works properly.
Rationale	✓ Time safeness because of eliminating first diagnose trip ✓ Cost reduction
Owner	SmartAgriFood
Owner Contact	markus.dillinger@huawei.com
Complexity	- L: Has a significant cost
Creation Date	14/07/2011
Last modified	12/10/2011

Id	Theme.UC.SAF.WP200.13
Name	Greenhouse management – normal operation – local data storage – system data storage
Goal	To define information flows and interfaces among a number of involved entities inside a farm. To identify possible areas where automation and information management is needed to be specified
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= NKUA, OPEKEPE
Scope	GLOBAL
Status	PENDING

MoSCoW priority	MUST
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	(Data Collector, Data Analyzer, Decision Module, Notifier, Execution Module) "Cloud": all "Data/Context": Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Metadata Pre-processing GE (Data Analyzer, Decision Module)
Description	- Actors ✓ Farmer ✓ Sensors ✓ Sensor network aggregator ✓ Data collector service ✓ ISP or Mobile Operator ✓ Spray contractor ✓ Agriculturist ✓ Database with additional data related to diseases, solutions etc - Primary Actors Farmer - Preconditions - Different types of sensors, regardless their manufactures are connected to the network and work properly. - The sensors of a farm define one or more sensor networks. - All data that come from different sensor networks are gathered and aggregated by a sensor network aggregator. - There is a means to communicate data to the farmer (e.g., wired or wireless communication link with the Internet). - The farmer has defined during the installation of the system or at a later time, the thresholds for

	receiving notifications and alarms for his cultivations - The system is configured by the farmer about the amount and the type of notifications that a farmer wants to receive. - Accounting procedures should apportion specific fees among FMISs and their services. - Modules have to control all FMISs as well as services that are located in and over the cloud for producing the best results. - Triggers An event happens in a greenhouse that violates a threshold; e.g., temperature is well above a certain limit - Main success scenario ("How to demo") An alarm which concerns of a problem inside the farm i.e. high temperature is recorded; internet connection works properly. 1. The farmer's FMIS accesses farmer's raw data and process them. If the problem is simple and can be handled autonomously by the locally installed system of sensors & actuators, which is installed is the farm, it is resolved (e.g., open the windows, start the ventilation system). The actions are reported to the farmer via a possible way i.e. sms, e-mail, mms etc. 2. If the problem is more complex and automation cannot be used, recommendations could be given. The decision process can be a simple one, based on the data that only arrive from one type of sensors or a more complex one by combining data from different types of sensors (e.g., if the temperature is high for the specific crop and the humidity is also high the famer needs to spray his plants with a certain pesticide in order to prevent diseases). The decision module can communicate with external entities or services (e.g., database with possible diseases, governmental agencies, meteorological stations, etc). Actions that are followed are: a. The respective notification entity undertakes the task to notify the farmer to take a certain action. b. The farmer can use his FMIS or other FMISs in order to discover and call another player (e.g., his spray contractor or an agriculturist) who could help him. c. The farmer calls the spray contractor or the agriculturist who may login with his account to where data are collected and be informed about the current and past conditions. d. The field is sprayed and the event is recorded. 3. If none of the registered services that provide suggestions about a specific alarm can give a corresponding recommendation, the farmer is informed only about the disorder values. - Extensions

	Different FMISs can also cooperate in order to reach to correct decisions. Farmer's raw data are transferred to the respective FMIS each time, a different FMIS other than the one he is registered in, manages to find a solution. - Alternative paths If internet connection fails, the local system undertakes to provide with the proper solution for the alarm. The local decision processes have limited functionalities. If it is impossible to handle the situation, farmer is notified about the abnormal values and a restore point is created. When internet connection re-establishes, the existing state of a farm is communicated in and over the cloud. - Postconditions All data values do not violate pre-set threshold - Notes
Actors	- Farmer: end user, wants his fields to be monitored, probably wants to be advised about his crops - Sensors: appliances that measure environmental quantities and provide raw digital data to network sensor aggregator - Sensor network aggregator: pre-processes (summarize) data, integrates sensors from different manufacturers, integrates data from different sensor networks, communication link with the internet - Data collector service: provides storage of raw and processed data, allows threshold/alarm settings, allows appropriate visibility to external users of these data (e.g., full visibility for farmer and e-agronomist, partial visibility to a consumer etc) - ISP or Mobile Operator - Spray contractor: Specialized man who sprays fields when needed - Agriculturist: Specialized man who can suggest the farmers what to do when there is problem inside a farm, he can also provide with the respective thresholds for the crops. - Database with additional data related to diseases, solutions etc
Primary Actor	Farmer: end user, wants his fields to be monitored, probably wants to be advised about his crops
Rationale	Farmer: automate existing procedures, faster response to problems, improvement of products, potential increase of profits, elimination of crop disasters Sensors: integration among different sensors, improvement of overall performance Data collector service: improved methods to store data based on contents, enrichment of data for a specific farmer

Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XXL: Costs quite a lot
Creation Date	23/9/2011
Last modified	11/10/2001

Id	EPIC.UC.SAF.WP200.14
Name	Faulty operation of sensors inside a farm
Goal	Detect and isolate faulty sensors
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= NKUA
Scope	Platform Common
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "IoT" - "Security"

Enabler	(Data Collector, Data Analyzer, Notifier, Execution Module) "IoT" : IoT Communications GEs (Front – end GE, Connectivity Management GE, Content Control GE, Naming GE) IoT Recourse Management GEs (Discovery and Resolution of Things GE, Services and Resources Interaction GE) IoT Data Handling GEs IoT Process Automation GEs
Description	- Actors ✓ Farmer ✓ Sensors ✓ Data collector service ✓ Fault detector module ✓ ISP or Mobile Operator - Primary Actors Fault detector module - Preconditions Different types of sensors have been connected to a sensor network and automatically establish working configurations. - The local computer of the farm can monitor all the sensors of the farm. - A software module analyzes all the data that come from the network sensor aggregator. - Triggers A sensor has been traced that is do not working properly - Main success scenario ("How to demo") A. A software module analyzes the data received by all sensors. B. If a sensor is detected to send faulty data, its values are no longer taken into account C. The farmer is notified to replace the faulty sensor D. The order for new sensors can be automatically placed to a seller of sensors or he can browse for neighbouring sellers from a suggestion list that could be loaded from a corresponding service. E. The newly installed sensor is automatically connected to the farmer's network and configured so as to send its data to the entity that collects data from all sensors. - Extensions If possible, the sensor is switched off automatically

	- Alternative paths none - Postconditions All the values that are sent by all sensors are correct
Actors	- Farmer: end user, wants to monitor his crops that he has cultivated in his fields or his animals in the dairy farm, - Sensors: appliances that measure environmental and other quantities related to the animals' health and plant cultivation process and provide raw digital data to network sensor aggregator. - Data collector service: provides storage of raw and processed data, allows threshold/alarm settings, allows appropriate visibility to external users of these data (e.g., full visibility for farmer and e-agronomist, partial visibility to a consumer etc) - Fault detector module: implements the proper algorithm to detect the faulty sensors - ISP or Mobile Operator
Primary Actor	Fault detector module: implements the proper algorithm to detect the faulty sensors
Rationale	Farmer: faster response to problems, improvement of products, potential increase of profits, elimination of crop disasters, better monitoring of animals' health Sensors: integration among different sensors, improvement of overall performance
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XL: Costs a lot
Creation Date	23/9/2011
Last modified	11/10/2001

Id	Theme.UC.SAF.WP200.15

Name	Agricultural related news coming from the outside world
Goal	Farmers could learn agricultural news from the outside world. This will help them protect their existing seeds, find new ways to produce qualitative products and broaden their mind in order to cultivate innovative products in the future.
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= NKUA
Scope	GLOBAL
Status	PENDING
MoSCoW priority	COULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Apps"
Enabler	(Data Collector, Data Analyzer, Decision Module, Notifier, Configuration and Communication Module) GEs of the Business Framework (USDL Repository, USDL Registry, Marketplace and Store, Business Element and Models Provisioning System, Revenue Settlement and Sharing System, SLA Management) GEs for Composition and Mashup
Description	- Actors ✓ Subscriber ✓ Publisher - Primary Actors Both subscribers and publishers have primary role in this scenario.

	- Preconditions - Different services i.e. policies' and information service, meteorological stations, etc give permission to access their data or want to provide the system with data - Stakeholders have to be registered at least in one EFMIS in order to get newsletters. - Triggers A stakeholder has published new information and has to inform all his subscribers. - Main success scenario ("How to demo") A. The system (i.e., the smart farming system or his FMIS) is informed by external services (registered or not) about relevant news or according to farmers behaviour and personal interests a new service may interest him. B. The farmer is notified for the news. C. The decision module may change some specific rule (e.g., based on a new governmental policy) in order to optimize its outcomes. - Postconditions When the farmer is notified and the decision module is appropriately reconfigured based on the new received data - Notes
Actors	- Subscriber: end user (i.e, farmer), wants to be informed about news that come from different services - Publisher: Service that updates its data, it is designed to inform its subscribers about a new event
Primary Actor	See above
Rationale	Farmer: better enlightenment about a number of events that will influence his tasks
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- M: Medium cost
Creation Date	23/9/2011
Last modi-	11/10/2001

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Id	THEME.UC.SAF.WP200.16
Name	Providing a farmers' information to different external entities/players
Goal	Providing farmer's infrmation to external services will lead to a transparent agricultural system.It will also help the farmers advertise their products effortlessly.
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= NKUA
Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Apps" - "Security"
Enabler	(Data Collector, Data Analyzer, Decision Module, Notifier) "Cloud" all "Data/Context"

	Publish / Subscribe Broker GE, Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE "Apps" GEs of the Business Framework (USDL Repository, USDL Registry, Marketplace and Store, Business Element and Models Provisioning System, Revenue Settlement and Sharing System, SLA Management) GEs for Composition and Mashup
Description	- Actors ✓ Farmer ✓ Data collector service ✓ Profile maker module ✓ Internet Users - Primary Actors Profile maker module - Preconditions Farmer's related data are securely accessed over the Internet - Triggers A new event takes place in the farm - Main success scenario ("How to demo") When an event takes place and is recorded in the data collector, the appropriate information profiles are updated. The data collected by the data collector and the raw data collector may include sensors' data, real and non-real time video, (high definition) pictures, actions taken (e.g., spraying, fertilization) etc DePENDING on who wants to have access in these data, an appropriate profile is created or updated. - Postconditions The appropriate profile is updated - Notes
Actors	- Farmer: end user, have full responsibility of the visibility of their profile, customize his profile depending on his needs - Data collector service: provides storage of raw and processed data - Profile maker module: Aggregates data from data collector databases and present them in a meaningful way for different users. - Internet Users: Users that want to browse the available profiles.
Primary Actor	- Farmer: end user, have full responsibility of the visibility of their profile, customize his profile depending on his needs

Rationale	Farmer: advertise himself and his product effortlessly Internet – User: knowledge of the origin of the products, trust of the product they may buy, transparency
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropou: lampropoi@di.uoa.gr
Complexity	- M: Medium cost
Creation Date	23/9/2011
Last modified	11/10/2001

Id	EPIC.UC.SAF.WP200.17
Name	Subscription to an electronic advisory service over the Internet
Goal	Advisory services will enable flexibility depending on the demands of individual farmers.
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= NKUA, OPEKEPE
Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST

Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Apps" - "Security"
Enabler	(Data Collector, Data Analyzer, Decision Module, Notifier) "Cloud" all "Data/Context" Publish / Subscribe Broker GE, Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE "Apps" GEs of the Business Framework (USDL Repository, USDL Registry, Marketplace and Store, Business Element and Models Provisioning System, Revenue Settlement and Sharing System, SLA Management) GEs for Composition and Mashup
Description	- Actors ✓ Farmer ✓ Decision Module - Primary Actors Decision Module - Preconditions - All data produced for a crop or any animal categories are stored in a place that is accessible over the Internet by other electronic services. - Specialized decision modules can have access to this data and place thresholds and alarms for the special needs of cultivation or animal farming. - There is a means to communicate with other entities to reach a decision e.g., governmental agencies, geo-spatial services, meteorological stations, etc. - Triggers A farmer is subscribed to an electronic advisory service (e-agriculturist, e-veterinarian) and receives sophisticated sug-

	gestions for his crop or animals. - Main success scenario ("How to demo") A. When the farmer subscribes to such services named as e-agriculturists or e-veterinarians, which are provided by his FMIS or other FMISs, he gives access to his crops' or animals' collected data. These data may include sensors' data, real and non-real time video, (high definition) pictures, actions taken (e.g., spraying, fertilization), etc B. Additionally, each e-agriculturist or e-veterinarian can set up some thresholds and alarms to be notified when they are violated (e.g., higher than normal temperature) C. When an e-agriculturist or e-veterinarian is notified for an event, it can check additional data (e.g., humidity) and decide for a specific counter-action. D. The farmer is notified to take an action (e.g., find a spray contractor, or a fertilizer contractor). In this task the e-agriculturist can also suggest specific contractors based on price, their location and availability, reviews from other farmers etc E. The task undertaken by the spray contractor and the farmer are stored in the data collector to be used in the future by the e-agriculturist. - Extensions The e-agriculturist or e-veterinarian, in order to decide for a specific counter – action, it may also communicate with other services that are located in and over the cloud and have announced their capabilities. For example, e-agriculturist could use a suitable service to combine the predefined standards for bio products with a relative alarm in order to come up with a proper recommendation. The e-agriculturist or the e-veterinarian may also have access to data from other farms in the area (this information is not communicated to the specific farmer) that will assist him to reach a correct decision. - Alternative paths none - Postconditions When the counter action (e.g., spraying) is completed - Notes
Actors	- Farmer: end user, provide feedback to the whole system, possibly fills questionnaires, rates specific methods of farming and evaluates the recommendations given from information/advisory service - Decision Module: Enrichment of the information that the decision module can handle
Primary	Decision module

Actor	
Rationale	Farmer: improvement of products, confirmation and help for cultivating new crops, potential increase of profits Decision module: Dynamically improvement of the service provided Data collector service: improved methods to store data based on contents, enrichment of data for a specific farmer, authoritative opinion about a farmer's profile
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XXL: Costs a lot
Creation Date	23/9/2011
Last modified	11/10/2001

Id	Theme.UC.SAF.WP200.18
Name	Different farmers exchange data
Goal	The goal is to use the knowledge gathered by surrounding farmers (e.g., their environmental status, their actions and results, their opinions, etc) in order to achieve better results.
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= interested partners
Scope	GLOBAL
Status	PENDING
MoSCoW priority	WONT

Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	Social Network Analysis GE Mobility Analysis GE Opinion Mining GE Web behavior analysis for profiling GE
Description	- Actors ✓ Farmer ✓ Data collector service ✓ Inter-farmer communication mechanism - Primary Actors Inter-farmer communication mechanism - Preconditions - All the farmers are registered to at least one EFMIS. - There is communication between the platform and the data collector service. - Triggers A new event is taking place in farmer A that is important for neighbouring farmers (e.g., a disease in the plants) - Main success scenario ("How to demo") A. The event is stored in the data collector of farmer A B. Neighbouring farmers' are notified for the specific emergencies. Those notifications may be accompanied with possible suggestions for specialized personnel who may help e.g. spray contractors, agriculturists etc. C. Data collector is updated for every further action. D. Neighboring farmer's counter-actions are also sent back to the initial farmer and other neighbours. Each farmer could share his opinion about the predictions, the suggestions that have been given as well as the specialized personnel that have been proposed by different FMISs. - Post conditions

	When an event is properly handled and completed - Notes
Actors	- Farmer: end user, provide feedback to other farmers - Data collector service: provides storage of raw and processed data - Inter-farmer communication mechanism
Primary Actor	Inter-farmer communication mechanism
Rationale	Farmer: A farmer can have real – time feedback from neighbours and achieve faster and more accurate responses
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XXL: Costs quite a lot
Creation Date	23/9/2011
Last modified	11/10/2001

Id	Theme.UC.SAF.WP200.19
Name	Statistics management
Goal	Through statistical analysis farmers can have full vision inside and outside the farm
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= NKUA
Scope	GLOBAL
Status	PENDING

MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	(Data Collector, Data Analyzer, Decision Module, Statistical Module) "Data/Context" Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE
Description	- Actors ✓ Farmer ✓ Statistical Module ✓ Decision Module - Primary Actors Statistical Module - Preconditions - Different kind of services i.e. state's policy and information service, meteorological service; etc can provide their information to the data collector service. - Data have to be aggregated in order to facilitate easy management. - Triggers - A farmer wants to have statistical analysis for external information, e.g. percentage of precipitation during a specific period. - A farmer wants to have statistical analysis for internal information, e.g. percentage of faulty sensors. - Main success scenario ("How to demo") ✓ Outside the farm A. The farmer subscribes to an Internet service that provides statistical data e.g. for the percentage of precipitation. B. After posting his request message to the server that ac-

	commodates this service, a statistical module processes his requests and undertakes to fetch specific information and store it in the data collector database of the farmer. After the processing, the system decision module can analyze these data in order to produce a proper recommendation (e.g., if for the last two years the percentage of rainfall is high, it should be recommended not to cultivate a crop that needs high temperature in order to grow.) C. All outputs are aggregated and transform into inputs that can be used by the smart farming service in order to present the result in a meaningful way to the farmer. D. The farmer can close the statistical UI or he can asks further information about weather; if he wants to learn more things we have a do loop from A to D until the farmer decides to stop browsing info about weather. ✓ Inside the farm A. The farmer logins the local system and asks statistical analysis about the percentage of faulty sensors. After posting his request message, the local statistical module processes his requests and undertakes to fetch specific information from the local database. After the processing, the local device module can take those data and analyze them in order to produce a proper recommendation i.e. if many sensors that come from a certain manufacture have broken down, it can come up with the conclusion that it is better not to re – purchase them. B. All outputs are aggregated and transform into inputs that can be used by local UI in order to present the result in a meaningful way to the farmer. C. The farmer can close the statistical UI or he can asks further information about weather; if he wants to learn more things we have a do loop A to D since the farmer decides to stop browsing info about weather. - Extensions Regardless if the statistical analysis refers to internal or external data, data mining procedures will be made periodically in order to be provided from the system more enhanced, accurate, personalized recommendations through time. - Postconditions The appropriate information is received, processed and stored. - Notes
Actors	- Farmer: end user, gets predictions and recommendations that enables him to increase his productivity, potential increase of profits - Statistical Module: executes statistical and self – optimization functions - Decision Module: produce recommendations

Primary Actor	Statistical Module: executes statistical and self – optimization functions
Rationale	Farmer: gain the insight from statistical processing of data
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropou: lampropoi@di.uoa.gr
Complexity	- XL: Costs a lot
Creation Date	23/9/2011
Last modified	11/10/2001

Id	EPIC.UC.SAF.WP200.20
Name	This scenario describes the capability of the system to leverage multimedia transfer (photos, videos HD).
Goal	To provide with the opportunity to facilitate the system with more accurate information (HD data) for each stakeholder.
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= interested partners
Scope	Platform Generic
Status	PENDING
MoSCoW priority	WONT

Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	(Data Collector, Data Analyzer, Decision Module) Multimedia Analysis GE Big Data Analysis GE
Description	- Actors ✓ Farmer ✓ Specialized agriculturists/veterinarians ✓ Multimedia Analyzer - Primary Actors Multimedia Analyzer - Preconditions - The check of the data can be done locally, either manually or with the assistance of the local data analyzer module or by transferring the information in the cloud, where an agriculturist/veterinarian manually or possibly with the system data analyzer module undertakes the analysis. - If the farmer or an agriculturist/veterinarian wishes they can have real time access to the cameras. - Triggers A farmer installs digital camera(s) in the farm that take high definition pictures or videos from the plants or animals that are monitored. - Main success scenario ("How to demo") A. The cameras are configured to send periodically data B. These multimedia data are either stored locally or remotely C. They are processed by an appropriate analyzer to identify possible issues (e.g., a disease). This may require to cross the received multimedia data with samples of healthy plants D. The result of the analysis is fed as input to the decision module. - Post conditions This process describes a loop. No appropriate end action is identified - Notes
Actors	- Farmer: end user, wants to know whether his plants or animals are being infected by a disease - Specialized agriculturists/veterinarians: end user, insert data into

	the disease database – service, provide with proper suggestions - Multimedia Analyzer: Module that analyzes HD data
Primary Actor	Multimedia Analyzer
Rationale	Farmer: informed if his plants or animals are infected by specific diseases through sophisticated methods, given certain recommendations for what to do, elimination of crop disasters and protection of animals' health, increase of potential profit
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XXL: Costs quite a lot
Creation Date	23/9/2011
Last modified	11/10/2001

Id	EPIC.UC.SAF.WP200.21
Name	Notifications are sent to more than one available end-terminals
Goal	To facilitate Future Internet with the merge of data that has to be exported to different devices using Internet. Also, to define the needed FI functionalities to support seamlessly multiple connections through different operators.
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= NKUA
Scope	Platform Generic

Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "I2ND" - "Security"
Enabler	(Data Collector Notifier, Communication and Configuration Module) Multi-channel/Multi-device Access System GE CDI GE NetIC GE S3C GE
Description	- Actors ✓ Farmer ✓ ISP or Mobile Operator - Primary Actors Farmer - Preconditions - A farmer has a subscription to more than one ISPs or cellular operators, possesses and uses more than one end terminals (e.g., smart mobile phone, pda, desktop, laptop etc) - A farmer must declare the priority of his devices he wants to be informed and the intermediate period in order to send the same notification to the next device - Triggers Data (urgent or non-urgent) have to be sent to a farmer that may be on the move. - Main success scenario ("How to demo") Regardless the service (local or system) that undertakes to send the message, the steps that will be followed are defined: A. The notifier checks the available identities of the farmer, their priorities and possibly the fixed time period of each device in a certain location.

	B. It sends a notification to the top priority device customizing the data according to the where it has to send the message. (e.g., it is meaningless to send high definition pictures that cannot be presented). C. The farmer (in this example) is on the move and receives some data to his smart mobile phone from his mobile operator A. He requests additional data while he is heading back to his farm where his desktop is operating. D. After his entrance in to his desktop, all the received data by his smart phone, as well as newly arrived data, are handed over to his desktop. Since his desktop has a DSL line with ISP B, this requires some routing decisions to be taken in the FI. The farmer wants to notify his agriculturist as well as a spray contractor. When they accept this communication data, will flow to and between all three parties. - Post conditions When the farmer terminates the reception of data - Notes
Actors	- Farmer: end user, receives notification about alarms and news, sets priorities and "stationary" periods - ISP or Mobile Operator
Primary Actor	Farmer: end user, receives notification about alarms and news, sets priorities and "stationary" periods
Rationale	Farmer: informed if his plants or animals are infected by specific diseases through sophisticated methods, given certain recommendations for what to do, elimination of crop disasters and protection of animals' health, increase of potential profit
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropou: lampropoi@di.uoa.gr
Complexity	- XXL: Costs quite a lot
Creation Date	23/9/2011
Last modified	11/10/2001

Id	EPIC.UC.SAF.WP200.22
Name	Decision making is provided by the local system
Goal	To facilitate any farm with appropriate services regardless the internet

	connection and the available devices
Version	V1.0
Source	NKUA – WP200
Source Contact	agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= NKUA
Scope	Platform Generic
Status	PENDING
MoSCoW priority	MUST
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Data/Context" - "Apps" - "IoT" - "Security"
Enabler	(Data Collector, Data Analyzer, Notifier, Configuration and Communication Module) CDI GE NetIC GE S3C GE
Description	- Actors ✓ Farmer ✓ ISP or Mobile Operator - Primary Actors Farmer - Preconditions - A farmer has authorized the system to transfer raw and processed data to /from the local system to/from the cloud. - The local system asks from the system that is located in the cloud to download a summarized package which has to process in order to get a clear view about the state of a farm.

	- Triggers Internet connection fails or the network link capacity is limited. - Main success scenario ("How to demo") A. The local system draws the information that has been extracted by the latest restore point. B. All the local functionalities have to be set into a local mode and adjust their results based on local configurations and capabilities (devices inside the farm and outside, CPUs, cache memory, RAM, ROM, etc). Although, the respective cloud proxy that will be located in the home network will provide with acceptable storage and computing capabilities. C. A suitable mechanism should check periodically the internet connection and decides whether it is preferable to switch again from the local system to the one which is located in and over the cloud. When the internet connection is stable again, a restore point is created for the local system and another one for the system located in and over the cloud in order to have seamless transition. - Extensions none - Alternative paths none - Postconditions When the restore points are processed and the management of a farm can be organized efficiently by services that are located in and over the cloud - Notes
Actors	- Farmer: end user, responsible for resetting his devices when necessary - ISP or Mobile Operator
Primary Actor	Farmer: end user, responsible for resetting his devices when necessary
Rationale	Farmer: He is informed about an alarm or a news that he is interested of in an acceptable time period, elimination of crop disaster, increase of reliance of the installed system, immediate response of the system
Owner	SmartAgriFood
Owner Contact	Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropou: lampropoi@di.uoa.gr

Complexity	- XXL: Costs quite a lot
Creation Date	23/9/2011
Last modi-fied	11/10/2001

Id	Theme.UC.SAF.WP200.23
Name	**Farm Management – Small Scale Barcode/RFID system -Traceability system**
Goal	To have a more transparent system and to help the farmers identify their products without investing a lot of money
Version	V1.0
Source	OPEKEPE
Source Contact	zoi.politopoulou@opekepe.gr eleni.antoniou@opekepe.gr agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= OPEKEPE
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD
Chapter	"Cloud", "Data/Context", "IoT", "Security"
Enabler	Execution Module, Configuration and Communication, Data Access Policy GE, Data Handling GE (Data Collector, Data Analyzer), Data Pooling GE, Local Storage GE
Description	- Actors ✓ Farmer: end user, have full responsibility of the visibility of their profile, inserts the proper data to the system that have to be print-

	ed, customize his profile depending on his needs ✓ Data collector service: provides storage of raw and processed data ✓ Profile maker module: Aggregates data that key in the database and present them in a meaningful way for users. ✓ Barcode label module : Creates and prints the barcode label depending on the data that the farmers enter ✓ Internet Users: Users that want to browse the product information though the available barcode label on the product. ✓ Internet Users: Users that want to complain about the product that they have bought - Primary Actors ✓ Farmer - Preconditions ✓ Farmer's related data are securely accessed over the Internet ✓ The farmer has a barcode printer ✓ The printer is configured by the farmer and is ready to print. - Triggers ✓ The farmer wants to print a barcode label ✓ The farmer wants to scan an already printed label - Main success scenario ("How to demo") ✓ A vegetable or a product has been gathered and a barcode label is needed to be printed. ✓ The farmer enters the appropriate data to the interface of the service and a label is printed for the specific product. ✓ The barcode number with the related data is stored in the database for future use from the farm and the customers as well. - Extensions To be printed more data exept the basic one (the name of the company-farm, the region that is setup, the name of the product, the date of the production etc) - Alternative paths If internet connection fails, the farmer should right manually the labels with his old system with the limited functionalities. If it is impossible to handle the situation locally, farmer is printed locally the labels and when internet connection re-establishes, the existing state of a farm's barcode numbers is communicated in and over the cloud.

	- Postconditions ✓ All data values do not violate pre-set threshold ✓ Customization of user interface ✓ Customization of the barcode label ✓ Customization of the RFID ✓ Identify the printer type ✓ Certify the data integrity and the security of the assessed data through the internet - Notes
Actors	- Farmer: end user, have full responsibility of the visibility of their profile, inserts the proper data to the system that have to be printed, customize his profile depending on his needs - Data collector service: provides storage of raw and processed data - Profile maker module: Aggregates data that key in the database and present them in a meaningful way for users. - Barcode label module : Creates and prints the barcode label depending on the data that the farmers enter - Internet Users: Users that want to browse the product information though the available barcode label on the product. - Internet Users: Users that want to complain about the product that they have bought
Primary Actor	- Farmer: wants to print a appropriate label for his product - End user: wants to trace back the product that he consumes
Rationale	- Farmer: Have a transparent production of his products - Internet User: knowledge of the origin of the products, trust of the product they may buy, transparency, declare their complains online
Owner	SmartAgriFood
Owner Contact	Zoi Politopoulou: zoi.politopoulou@opekepe.gr Eleni Antoniou: eleni.antoniou@opekepe.gr Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XL: Costs a lot
Creation Date	29/09/2011
Last modified	29/09/2011

Id	Theme.UC.SAF.WP200.24
Name	**Production of a cultivation plan for new farmers**
Goal	Help new farmers find information about cultivation practices, equipment etc.
Version	V1.0
Source	OPEKEPE
Source Contact	zoi.politopoulou@opekepe.gr eleni.antoniou@opekepe.gr agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= OPEKEPE, NKUA
Scope	GLOBAL
Status	PENDING
MoSCoW priority	COULD
Chapter	- "Cloud", "Data/Context", "Apps", "IoT","Security"
Enabler	"Cloud": all, Data Access Policy GE, Data Handling GE (Data Collector, Data Analyzer), Data Pooling GE, Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE - "Apps": GEs for Composition and Mashup, Query-access , Semantic Annotation enabler
Description	- Actors ✓ Farmer ✓ New farmer ✓ Data collector service ✓ E-agriculturist ✓ Decision module ✓ Aggregator module - Primary Actors New farmer: The farmer is informed about the products

	he is interested in and gets useful advice - Preconditions - Data are available for most of the regions - The advisory service contains information for most of the products cultivated - All available FMIS provide data in a specific format and can be fetched and displayed to the system - External players provide accurate data and update their information in a regular basis - New farmers should subscribe to get information - Triggers A new farmer subscribes to the system and he is interested in finding a cultivation plan. An example of steps are: A. A young farmer subscribes to the system B. The farmer provides data about the location of operation, infrastructure available, the properties of the parcel, etc. a. If he just wants to be informed about news etc the action ends here. b. If he is interested in producing a cultivation plan: i. He provides answers to some questions ii. A dynamic set of questions is generated from the previous answers iii. The data collector module presents infrastructure installed by different farmers and gives some information iv. The e-agriculturist service provides good practices for the cultivation of the product of interest v. The system produces a cultivation plan vi. The farmer can check if it profitable for him to grow the specific product i.e. costs, risks, diseases etc vii. The farmer can produce new cultivation plans if he changes the criteria - Extensions Compare two different plans and suggest the best one - Post conditions A new cultivation plan is produced
Actors	- New farmer: Subscribes to the system and provides information to specific questions - Farmers already exist in the system: Provide data for their crops, problems are dealing with, economic data concerning their investment - E-agriculturist: Provide information to the electronic advisory service

	- Information module: Handles data per geographic area, region, product, producer, type of equipment (humidity, temperature, cheap, expensive etc) - Decision module: produce qualitative recommendations - Aggregator module: fetches data available in different FMIS systems. Data concern crops, available infrastructure, data collected by sensors etc
Primary Actor	-New farmer: Subscribes to the system and provides information to specific questions
Rationale	New farmer: The farmer is informed about the products he is interested in and gets useful advice
Owner	SmartAgriFood
Owner Contact	Zoi Politopoulou: zoi.politopoulou@opekepe.gr Eleni Antoniou: eleni.antoniou@opekepe.gr Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XL: Costs a lot
Creation Date	29/9/2011
Last modified	29/9/2001

Id	Theme.UC.SAF.WP200.25
Name	**Advanced search engine**
Goal	Help farmers and visitors find information easily and present the information in a user friendly way.
Version	V1.0
Source	OPEKEPE
Source Contact	zoi.politopoulou@opekepe.gr eleni.antoniou@opekepe.gr agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = ‘SmartAgriFood’

	Organization= OPEKEPE,NKUA
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" -"Data/Context" - "Apps" - "Security"
Enabler	"Cloud": all "Data/Context": Publish / Subscribe Broker GE, Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE, Query-access GE, Semantic Annotation enabler GE
Description	The farmer or any visitor can search the material uploaded in the system using multiple criteria. Data come from various sources: sensor data, data provided by the e-agriculturists and e-vets, data collected from other FMIS - Actors ✓ Subscribers ✓ Publishers ✓ Farmer or visitor: performs a web search ✓ Web content creator: uploads content enriched with semantics ✓ Other FMIS content manager: the content is compliant with a standard and can be easily integrated in the system. FMIS could also allow access to a specific view of the data stored in their system- - Primary Actors Both subscribers and publishers have primary role in this scenario. - Preconditions ✓ All involved actors (e.g. farmers, project users etc) upload content

	✓ - The enrichment of the content in small-scale pilot system with semantics ✓ All available FMIS agree to provide a mechanism (e.g. data is compliant to a specific standard) for searching their content - Triggers A farmer or visitor uses the search engine - Main success scenario ("How to demo") D. A farmer uses the search engine to find something of interest E. He selects the criteria to perform the web search - Postconditions The farmer or visitor gets the search engine result - Notes
Actors	- Farmer or visitor: performs a web search - Web content creator: uploads content enriched with semantics - Other FMIS content manager: the content is compliant with a standard and can be easily integrated in the system. FMIS could also allow access to a specific view of the data stored in their system
Primary Actor	- Farmer or visitor: performs a web search
Rationale	The visitor or the farmer gets information in a quick and easy way
Owner	SmartAgriFood
Owner Contact	Zoi Politopoulou: zoi.politopoulou@opekepe.gr Eleni Antoniou: eleni.antoniou@opekepe.gr Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XL: Costs a lot
Creation Date	29/9/2011
Last modified	29/9/2001

Id	Theme.UC.SAF.WP200.27

Name	**Providing a farmers' information to certification authorities - players**
Goal	To have a more transparent system and to help the authorities access their data without losing a lot of time to search to different FMIS
Version	V1.0
Source	OPEKEPE
Source Contact	zoi.politopoulou@opekepe.gr eleni.antoniou@opekepe.gr agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= OPEKEPE
Scope	Global
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Apps" - "Security"
Enabler	"Cloud" all "Data/Context" Publish / Subscribe Broker GE, Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE "Apps" Query-access GE, Semantic Annotation enabler GE
Description	Farmer's related information is gathered in a specific point either locally or over the cloud from different FMIS. All information is derived from the

	transactions that are done between the sensor network, possibly a sensor network aggregator, the data collector service, a decision module and additional electronic advice services (e.g., e-agriculturist) that are located in the Internet to the available FMIS. These data can be formatted automatically in an appropriate format for presentation that will be useful by other involved entities such as certification authorities, government authorities, payment authorities etc. For example, the certification authorities will have access to the summarized info e.g., data that certify a product based on specific standards and make a first approach for their future audit. Also they will be able to prepare more efficient questionnaires for their audit. The payment authorities will access the data from far and will make a kind of a “spot control” to the farmers before the subsidies. - Actors ✓ Farmer ✓ Data collector service ✓ Profile maker module ✓ Internet Users - Primary Actors Profile maker module - Preconditions Farmer’s related data are securely accessed over the Internet to one or more FMIS Farmers have given their permission to be accessed their data by the certification authorities - players - Triggers An external player / authority needs to access farmer’s specific data - Main success scenario ("How to demo") - The data collected by the data collector from the different FMIS may include sensor’s data, real and non-real time video, (high definition) pictures, actions taken (e.g., spraying, fertilization) and are stored in a local database or in the cloud etc - Depending on who wants to have access in these data an appropriate profile is created or updated - Extensions none - Alternative paths none

	- Postconditions The appropriate profile is updated and the external player / authority access the data that need - Notes
Actors	- Farmer: end user, have full responsibility of the visibility of their profile, customize his profile depending on his needs - Data collector service: provides storage of raw and processed data - Profile maker module: Aggregates data from data collector database and present them in a meaningful way for users. - Internet Users: Users that want to browse the available profiles.
Primary Actor	- Farmer: end user, have full responsibility of the visibility of their profile, customize his profile depending on his needs
Rationale	- Farmer: has a transparent production - Internet – User: knowledge of the origin of the products, trust of the product they may buy, transparency, access data without losing time - Certification Authorities – Players: access to the data with easy and quick way
Owner	SmartAgriFood
Owner Contact	Zoi Politopoulou: zoi.politopoulou@opekepe.gr Eleni Antoniou: eleni.antoniou@opekepe.gr Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XL: Costs a lot
Creation Date	29/9/2011
Last modified	29/9/2001

Id	Theme.UC.SAF.WP200.26
Name	**Access to common infrastructure**
Goal	Help farmers reduce cost of own an infrastructure
Version	V1.0

Source	OPEKEPE
Source Contact	zoi.politopoulou@opekepe.gr eleni.antoniou@opekepe.gr agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= OPEKEPE
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	- "Data/Context": Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE, Query-access GE, Semantic Annotation enabler GE, Data Access Policy GE, Data Handling GE (Data Collector, Data Analyzer), Data Pooling GE, Local Storage GE
Description	Description of the feature: A producer, the owner of a small farm can't invest a big amount of money to buy automatic and new sensors for his cultivation. The most crucial information for him is the knowledge of weather conditions for the specific area. He enters the system (if he enters for the first time he should create a user profile) and performs a search for pro-ducers that are active nearby. The search functionality displays information both avail-able in the specific system and also in other FMIS. He checks the infrastructure available. He communicates with the farmers who own the specific infrastructure. - Actors ✓ Common infrastructure ✓ Data collector service ✓ Fault detector module ✓ ISP or Mobile Operator

	✓ Farmers already exist in the system: Provide data for their infrastructure ✓ Search module: produce qualitative results ✓ Other FMIS systems (both farmers and content managers): Provide access and share their content with our system - Primary Actors ✓ Common infrastructure - Preconditions ✓ New farmers should subscribe to get information ✓ Farmers already members of the system should provide information for their infrastructure (e.g. manufacturer, cost, accuracy in measurements) ✓ Farmers registered in other FMIS systems agree to share information with our system ✓ Other FMIS systems provide access to their content or they share it in a particular format - Triggers A farmer is interested in finding and using available infrastructure nearby - Main success scenario ("How to demo") A. A new farmer subscribes in the system B. He is interested in finding the infrastructure available near his cultivation a. He states the kind of infrastructure b. He provides information about the location of his business c. Accordingly, is provided a localized search in the system or other FMIS systems Consequently, he selects the radius of interest and therefore reduces the previously displayed results - Postconditions The farmer gets information about the available infrastructure
Actors	- New farmer: Subscribes to the system and searches with multiple criteria - Farmers already exist in the system: Provide data for their infrastructure - Search module: produce qualitative results - Other FMIS systems (both farmers and content managers): Provide access and share their content with our system

Primary Actor	Common infrastructure
Rationale	Farmer: faster response to problems, the farmer reduces costs by using already available infrastructure
Owner	SmartAgriFood
Owner Contact	Zoi Politopoulou: zoi.politopoulou@opekepe.gr Eleni Antoniou: eleni.antoniou@opekepe.gr Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XL: Costs a lot
Creation Date	29/9/2011
Last modified	29/9/2001

Id	Theme.UC.SAF.WP200.28
Name	**Information service for farmers interested in selling/buying animals**
Goal	Help farmers to identify other farmers that are interested in selling/buying animals or are interested in fertilization of their animals
Version	V1.0
Source	OPEKEPE
Source Contact	zoi.politopoulou@opekepe.gr eleni.antoniou@opekepe.gr agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= interested partners
Scope	GLOBAL
Status	PENDING
MoSCoW priority	COULD

Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - “Apps” - "Security"
Enabler	"Cloud": all "Data/Context": Publish / Subscribe Broker GE, Social Network GE, Query-access GE , Localization Platform, Data Access Policy GE, Data Handling GE (Data Collector, Data Analyzer), Data Pooling GE, Local Storage GE
Description	The owner of a dairy farm has a number of animals. He is interested in buying some animals but he wants to check that they are healthy, are well taken care of and if it is possible to have access to milk quota data. He is also interested in fertilization some of his animals with others from another farm - Actors ✓ Farmer interesting in buying or selling ✓ Search module ✓ Data management module ✓ Presentation module ✓ Aggregator module ✓ - Primary Actors Search module - Preconditions - Search engine capability with multiple criteria both in our system and other FMIS systems (functionality described in UC26) - Farmers have created a profile (functionality described in UC16) - Farmers (registered in our system and other FMIS systems) are providing access to their dairy farm data - Farmers upload information manually if not available automatically - Triggers E. A new farmer subscribes in the system

	F. He is interested in finding other farmers nearby (owners of dairy farms) c. He states the number of animals and the kind he is interested in d. He provides information about the location of his business e. Accordingly, is provided a localized search He gets information about the farmer; he has access to the data collected by sensors and various measurements concerning animals' health. He evaluates the results and makes conclusions - Extensions none - Alternative paths none - Postconditions The farmer stops searching when he comes to a result - Notes
Actors	- Farmer interesting in selling his animals subscribes to the system and states his interest - Farmer interesting in buying animals subscribes to the system, searches with multiple criteria to find other farmers - Search module: produce results - Data management module: Harmonises data collected from sensors - Presentation module: Presents data in a user friendly way - Aggregator module: fetches data from other FMIS system
Primary Actor	Search module
Rationale	The farmer has access to "real" data and can achieve better prices
Owner	SmartAgriFood
Owner Contact	Zoi Politopoulou: zoi.politopoulou@opekepe.gr Eleni Antoniou: eleni.antoniou@opekepe.gr Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XXL: Costs quite a lot

Creation Date	30/9/2011
Last modified	30/9/2011

Id	Theme.UC.SAF.WP200.29
Name	**Qualitative products of dairy farms**
Goal	Help customers and intermediate suppliers to identify farmers with qualitative products.
Version	V1.0
Source	OPEKEPE
Source Contact	zoi.politopoulou@opekepe.gr eleni.antoniou@opekepe.gr agk@di.uoa.gr lampropoi@di.uoa.gr
Stakeholder	Project = 'SmartAgriFood' Organization= OPEKEPE
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Security"
Enabler	Big Data Processing GE, Pre-processing of meta-data during/after gathering GE, Query-access GE, Semantic Annotation enabler GE, Localization Platform, Data Access Policy GE, Data Handling GE (Data Collector, Data Analyzer), Data Pooling GE, Local Storage GE

Description	Farmers use a variety of sensors that improve the management and collection of data of their dairy farms. Some of the data collected by sensors are: • Precise daily milk production • Full information for the milk's components such as fat, protein, lactose, number of Somatic Cells as well as indications that alarms the values of the above factors Customers buying milk products in the stores or intermediate suppliers are interested in finding out where these products come from. We suppose that farmers have already subscribed in the system (user profile) and they have given permission to access data collected by sensors used in their farms. We also suppose that they use the barcode/traceability system (described in the Theme.UC.SAF.WP200.23 use case) to enrich data collected from sensors. - Actors ✓ Farmer ✓ Consumers ✓ Supplier - Primary Actors Farmer - Preconditions ✓ Farmers have subscribed in the system ✓ Farmers use the barcode/traceability system available in the system to enrich data collected ✓ Different types of sensors installed ✓ If the farmer has not many sensors installed he uploads data in the system manually ✓ Data collector service - Triggers A user of the system is interested in finding data about a dairy farm product - Main success scenario ("How to demo") Step No. 1

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A. The farmer creates a user profile and subscribes to the system
B. The farmer gives access to data collected from his sensors
C. The farmer enriches data to be used in the traceability system

Step No. 2

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Scenario A.

A. The consumer bought some products from a store.
B. A barcode is printed in the product
C. He enters the system and searches the number of the barcode
D. Search results are presented in the screen

Scenario B.

A. The consumer is searching for qualitative products coming from dairy farms
B. He performs a web search using some criteria
C. He evaluates the results presented

Scenario C.

A. A supplier is looking for new farmers to cooperate so he enters the system
B. He performs a web search using criteria such as farmers that are located nearby
C. He checks the data collected from sensors and evaluates the re-ports produced
D. He communicates with farmers

- Extensions

none

- Alternative paths

none

- Postconditions

✓ Farmer has uploaded data in the system (if not all provided by sensors)
✓ Consumer or any other found the information they were interested in

	- Notes
Actors	- Farmer: inserts the proper data to the system, customizes his profile depending on his needs - Consumers: browses the product information through the available barcode label on a product - Supplier: uses the search engine to check farmers that meet his needs
Primary Actor	Farmer
Rationale	- Farmer/Producer: Achieves better prices - Intermediate supplier: Identifies farmers that have qualitative products - Consumer: food-aware since the beginning of milk's lifecycle, certified products
Owner	SmartAgriFood
Owner Contact	Zoi Politopoulou: zoi.politopoulou@opekepe.gr Eleni Antoniou: eleni.antoniou@opekepe.gr Alex Kaloxylos: agk@di.uoa.gr Ioanna Lampropoulou: lampropoi@di.uoa.gr
Complexity	- XXL: Costs quite a lot
Creation Date	30/9/2011
Last modified	30/9/2001

7.2 Use cases from Smart-Logistics sub-domain

Id	Theme.UC.SAF.WP300.01
Name	Intelligent Supply Chain Event Management (SCEM) systems for the future food supply chain
Goal	Responsiveness: critical supply chain incidents are handled much more efficient • Agility: enables companies and supply chains to react timely and adequately to supply chain events (deviations, disruptions, etc.) • Costs: contributes to reduce costs particularly in two ways: by enhanced logistics quality (i.e., fewer extra tours, contract penalties, loss in sales, etc.) as well as by reduced labor costs • Assets: enhances employee efficiency, strengthens customer relations, increases current market value etc. • Sustainability: (just indirectly through more efficient use of resources)
Version	V1.0
Source	GS1 Germany
Source Contact	Ralph Troeger | troeger@gs1-germany.de
Stakeholder	project = ‘SmartAgriFood’ organization = ‘GS1 Germany’
Scope	GLOBAL
Status	PENDING
MoSCoW priority	SHOULD - Features that are important to the success of the project, but are not absolute musts (they have a workaround or will not cause the project to fail) are categorized as Should.
Chapter	Values match chapters in FI-WARE, namely: - "Cloud" - "Data/Context" - "Apps" - "IoT" - "I2ND" - "Security"

Enabler	“App/ Services”: “Internet of Things”: "Cloud": all "Data/Context": Publish / Subscribe Broker GE, Complex Event Processing GE, Big Data Analysis GE, Unstructured data analysis GE, Meta-data Pre-processing GE
Description	- Actors ▪ Mobile/ thin clients ▪ Auto-ID reader devices (barcode, RFID) ▪ Middleware ▪ EPCIS capturing/ querying application/ repository ▪ Legacy Systems ▪ Data Warehouse ▪ Databases (event profiles, etc.) ▪ SCEM system ▪ Cloud services (news, weather, traffic, monitoring, notification, simulation, controlling, measuring, data mining, etc.) ▪ End users - Primary Actors ▪ Grower ▪ Forwarder ▪ Logistics service provider ▪ Packer/ Repacker ▪ Distributor/ Trader ▪ Retail stores ▪ Service providers - Preconditions ▪ **Unique identifiers** (such as Serial Shipping Container Code, Serialised Global Trade Item Number, Global Returnable Asset Identifier, etc.) allocated to all relevant objects in the food supply chain (cradles, pallets, business locations, ...) ▪ **Network connectivity** of all supply chain partners ▪ **High interoperability** (accomplished, for instance, by standards, service-oriented architectures, etc.) ▪ **Human interaction “**as much as necessary and as little as possible” (i.e., avoiding information overload, automation of routine jobs, etc.) Nevertheless, operators shall retain decision making authority. - Triggers ▪ Precondition: target processes, event types (for instance, “delay in

production") and corresponding event patterns (i.e., tolerance thresholds – "Shipping Date + 1 day delay", e.g.) specified
- Continuous analysis of data stream (for instance, from T&T services, EPCIS repositories, information services (weather and traffic data, etc.), and various other intra- and inter-company information systems), i.e. target/actual comparison concerning – ideally – object identity, place, quality, time, quantity, and costs as they correspond to the 6 "R's" of Logistics (reference: business objects (i. e., production/ transfer/ customer order; schedules) stored in ERP systems

- Main success scenario ("How to demo")

***Monitor*:** The SCEM system continuously and automatically (i.e., without any human interaction) analyses incoming data for critical incidents in the supply chain. As an example, we presume that a food supply chain's business is jeopardized by 3 so-called events:

(a) a broadening fruit disease in the vicinity of a grower,
(b) a loss of a truck load of fruits on its way to the distributor,
(c) a delay in shipping at the packer.

In order to detect those kinds of events, appropriate data sources are required feeding the SCEM system with status information. Likewise, for target/actual comparison, target data (ideally, object identity, place, quality, time, quantity, and costs as they correspond to the 6 "R's" of Logistics) is obtained – for instance, through a customer order that contains the agreed articles, destination, delivery time and quantity. Sophisticated SCEM systems should also have the capability to determine the severity level of events, thus being able to prioritize them.

Notify: As soon as such a critical incident has been identified, the process owner is to be determined. For alerting the person in charge, all communication media (e-mail, SMS, etc.) in use shall be supported. In our case, the addressees of the notifications concerning the above-mentioned events could be:

(a) the grower
(b) the packer
(c) the food service operator or trader

A SCEM solution should also provide an escalation mechanism in order to ensure a company can react even if the persons in charge are unavailable (due to sick leave, business trip, holiday, etc.).

***Simulate**:* The simulation feature of a SCEM system shall be capable of determining the probable impact of an event on subsequent processes (for instance, an indication about the extent to which due dates (customer delivery date, e. g.) are at risk). In our case, the system could display the following information related to the above events:

(a) "The fruit disease occurred in region 'xyz' will reach our acreage in approximately 10 days. If nothing is undertaken, the harvest could then be destroyed."
(b) "The delivery failure jeopardizes the fulfillment of the purchase or-

der '123', which is due to the 20th August 2012."
(c) "The delay in departure at packer 'ABC' probably leads to an exceedance of the agreed delivery date by 8 days. Thus, our promotion campaign planned for the 50th calendar week could not take place."

(Please note that these explanations are greatly simplified. An operational SCEM solution will provide much more than a message in plain text, i.e. context information, interactive features, graphical visualization, etc.!)

Moreover, the simulation function shall provide decision support for the process owners, i.e. appropriate action alternatives in order to diminish the negative consequences of an event. The system could query the information systems of supply chain partners in real time, thus gaining authoritative data. That could look like this:

(a) "Our Acreage needs to be treated with pesticide 'xxx111' or 'yyy222' immediately in order to prevent infestation."
(b) "The grower can deliver another truck on 29th July 2012 at the earliest. Alternatively, the same crop could be procured from company 'A1' (app. arriving on 22nd July 2012), or 'B2' (app. arriving on 24th July 2012)."
(c) "The shipping could be accelerated by changing the mode of transportation from 'truck' to 'express truck' (by 2 days) or from 'truck' to 'air-truck' (by 4 days), respectively."

Control: A SCEM solution shall also support the operator in executing the action alternative he or she has selected, i.e. automatically triggering the necessary business processes, thus diminishing the manual effort to the greatest possible extend. In the end, the system shall provide the operator with all relevant decision parameters along with the options available (rather similar to a travel portal). The process owner then just has to select one of the suggestions. That would ease decision making in supply chain management dramatically, imagining that operators get prepared information such like this:

(a) "Pesticides 'xxx111' or 'yyy222' are both on stock at retailer 'DEFG'. For treating the entire acreage, 1.500 litres are required. If you select one of the following options, the purchase order will be accepted automatically.

Option	Costs (€)	...
[1] xxx111	3.000	
[2] yyy222	3.200	

(b) "For procuring 2.000 kg of mangos there are two alternatives. Please select one of the following options. If you choose [2] or [3], the original purchase order will be cancelled as well as the new purchase order confirmed automatically."

	<table><tr><th>Option</th><th>Delivery date</th><th>Costs (€)</th><th>. .</th></tr><tr><td>[1] Original grower</td><td>2012-07-29</td><td>200</td><td></td></tr><tr><td>[2] A1</td><td>2012-07-22</td><td>250</td><td></td></tr><tr><td>[3] B2</td><td>2012-07-24</td><td>210</td><td></td></tr></table> (c) “For transporting the shipment from the packer ‘ABC’ to distributor ‘DEF’ there are two alternatives. Please select one of the following options. If you choose [2] or [3], the original transport order will be cancelled, the new transport order confirmed, and packer ‘ABC’ notified about the change of plans automatically.” <table><tr><th>Option</th><th>Delivery date</th><th>Costs (€)</th><th>.</th></tr><tr><td>[1] Truck</td><td>2012-12-10</td><td>100</td><td></td></tr><tr><td>[2] Express truck</td><td>2012-12-08</td><td>200</td><td></td></tr><tr><td>[3] Air-truck</td><td>2012-12-06</td><td>1.000</td><td></td></tr></table> ***Measure***: The SCEM system continuously transfers and stores event data. Thus, it can provide companies with regular (or ad hoc) reports containing key figures such as supply chain partner performance ratings (number of event types, e. g.), fill rates (in terms of production, transfer, and customer orders, e. g.) as well as trends and patterns (regarding place, frequency and probability of critical incidents) in order to get indications for the optimization of supply chain performance in the middle and long term. - Extensions: n/a - Alternative paths ▪ Manual accomplishment of processes (i.e., monitor, notify, simulate, control, and measure) ▪ Utilization of static/ historic data - Postconditions Negative effects of critical supply chain incidents are dimished/ prevented (i.e.; processes/ plans rescheduled; parters informed; etc.) - Notes: n/a
Actors	▪ Mobile/ thin clients ▪ Auto-ID reader devices (barcode, RFID) ▪ Middleware

	▪ EPCIS capturing/ querying application/ repository ▪ Legacy Systems ▪ Data Warehouse ▪ Databases (event profiles, etc.) ▪ SCEM system ▪ Cloud services (news, weather, traffic, monitoring, notification, simulation, controlling, measuring, data mining, etc.) ▪ End users
Primary Actor	▪ Process owners of grower, forwarder, packer/ repacker, distributor/ trader, retail store, logistics service provider ▪ Service providers
Rationale	The following general benefits through SCEM apply to all supply chain participants: - Enhanced logistics quality - Reduces logistics costs - Enhanced employee efficiency - Decision support for process owners
Owner	SmartAgriFood
Owner Contact	Sjaak Wolfert | sjaak.wolfert@wur.nl
Complexity	- L: Has a significant cost
Creation Date	2011-10-05
Last modified	2011-10-10

Id	Theme.UC.SAF.WP300.03
Name	Real-time and Trusted Information regarding Product Specifications and Compliance
Goal	• Transparency: all information regarding the fulfilling of specifications and the compliance of special requirements will be available (without pulling) in real time • Agility: enables companies and meat supply chains to react timely and adequately to supply chain events (deviations, disruptions, etc.) • Costs: the system will reduce costs caused by crisis situations which usually have to be paid by public and prevent costs in case of en-

	trance. Furthermore the selling price of a product itself related to the costs of its production compared with the selling price of a similar product will become comparably • Assets: strengthens customer relations and customer confidence. • Sustainability: all required/needed information are available on demand an do not need to be enquired periodically by different actors. It becomes more transparent for the retailer and consumer, which products are being manufactured under the aspect of sustainability (may justify a higher price)
Version	V1.0
Source	(GS1 Germany)
Source Contact	Angela Schillings-Schmitz (GS1 Germany)
Stakeholder	project = ‘SmartAgriFood’ organization = ‘GS1’
Status	PENDING
Scope	GLOBAL
MoSCoW priority	MUST
Chapter	The Platform Generic features to be addressed in the scenario will match: - "Cloud" - "Data/Context" - "Apps"
Enabler	Not applicable
Description	The feature can be described as follows: - Actors: see section on actors - Primary Actors: see section on primary actors - Preconditions: each involved actor collects and maintains the information necessary in his/her own IT-system. This information has to be made accessible to others in the chain and for the feature to be used as event generator. - Main success scenario ("How to demo"): each organization in the chain can get access to their needed information through the entire chain about history, track-

	ing/tracing and quality conditions of products, valid certificates of products. By doing this, the organizations up to the consumer (1) can monitor the status of products, (2) can be notified about exceptions for which corrective actions have been taken and (3) can make measurements for the long term based on history that is stored. - Extensions: none for the moment - Alternative paths: none - Post conditions: the functionalities described in the main success scenario are realized. Integration and open Interfaces towards farming sector and retail/consumer sector - Notes: additional to the developed platform there need to be smart solutions as well on both ends of the meat supply chain to ensure participation/usability of/for small companies as farmers or craft producers (e.g. web interface) and to make all information accessible for retailers/end users in a smart way (e.g. mobile devices).
Actors	The scenario affects the overall food chain from farm to fork: • Farmers that are generating the basic information with respect to the produce • Laboratories that are generating the information that is baseline to identify an exception • Traders that are selling batches of the produce to the chain • Transport providers that are carrying the produce from A to B. From technology point of view, they could play an active role, providing ICT related hardware, but they could also behave passively only carrying the produce and some related equipment. • Distribution centers receiving and forwarding dispatched batches to their customers. They need to specifically track the mix of produce from incoming to outgoing goods. • Retailer as key interface to the consumer. Urgently requiring the information to stop the sales of produce concerned. • The Consumer could also be considered as one of the future users. Being informed about any exception with respect to the goods stored at home. • A service provider like EuroPool System would be an additional user, as they are providing with their returnable packaging/ box a key asset that is vital for making the scenario work.
Primary Actor	Actually all actors are evenly important. We could imagine that the farmers, the Slaughterhouses and the processors are the main actors in this scenario.
Rationale	The following general benefits through SCEM apply to all supply chain participants: - Reducing costs of nonconformity - Reducing prevention costs

	- Improvement of consumer Confidence - Sustaining of customer – supplier connections
Owner	SmartAgriFood
Owner Contact	GS1 Germany (Angela Schillings-Schmitz)
Complexity	- XL: Costs a lot
Creation Date	5-10-2011
Last modified	09-10-2011

Id	Theme.UC.SAF.WP300.04
Name	Legal compliance and quality control
Goal	• **Reliability**: - ensure the reliability of the website/software and IS used. - ensure the legal compliance of the product - ensure the retailer specifications compliance (e.g. the right quantity, the right quality) - ensure the compatibility of the Tracking and Tracing Systems • **Responsiveness**: - Quick response to a problem/risk detected by the transmission of the information via the IS. (e.g. no more than XX hours) • **Agility**: **With this system,** - The response could be quicker and could be re-order the product if quality/quantity problem would be detected and perform corrective actions more efficiently. If safety risk, the information is rapidly transmitted to the RASFF. - The response can be a more efficient and sure withdrawal of the product if safety risk and perform corrective actions (traceability compatible systems ensured and transport routes optimized). - The response can be selecting other transporter/packer/wholesaler if any problem/risk is detected. (certifications web) - The response could be to recalculate the route of the transporter if natural disasters, road accident or to save energy, time or to optimize

	the load of the shipment. • **Costs**: - Transport costs could be reduced by ensuring the optimization of the shipments. - Costs associated to quality defaults in products would be reduced by ensuring efficient information transmission system. Costs associated to product withdrawal/food crises would be decreased by ensuring efficient information transmission system and traceability compatibility between all supply chain participants. • **Assets**: - by choosing companies certified by an Energy Management System Standard (BS EN 16001) who efficiently manage their assets, the Asset Management Efficiency would be considered. - By recalculating the route by energy saving criteria, the Asset Management Efficiency would be considered. • **Sustainability:** - by transmitting to the consumer the information of the certifications obtained by the companies involved in the supply chain and the requirements used to certify (maximum temperature/humidity, hygiene conditions, quality conditions, packaging/warehousing/transporting integrity conditions….), the brand image is enhanced. - by choosing companies certified by an Occupational Health and Safety Standard (OHSAS) or a Social Accountability Standard (SA 8000), the good working conditions aspects are ensured. - By choosing companies certified by Energy Management Systems Standard (BS EN 16001) and by the optimization of the transport the energy efficiency is ensured. - By choosing companies certified by an Environmental Management System Standard (ISO 14001) taking care of the environment is ensured.
Version	V1.0
Source	SGS
Source Contact	Yann Cassing / Elena Mansilla (SGS).

Stakeholder	project = ‘SmartAgriFood’ organization = ‘SGS
Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST
Chapter	The Platform Generic features to be addressed in FI-WARE will match: - "Cloud" - "Data/Context" - "Security" -“I2ND”
Enabler	Data/Context Management: - Data Collector - Complex Event Processing (for real-time responses for changing conditions, e.g. accidents, optimization) - Localization Platform (retrieve mobile end-user positions, e.g, from the tracks) Security: - Security Monitoring - Identity Management (e.g., authentication) I2ND: -Connected Devices Interfacing (CDI) - Network Information and Control (NetIC) - Network Information and Control (NetIC) - Service, Capability, Connectivity, and Control (S3C)
Description	- Actors: producer (or product owner); transporter; packager; wholesaler/trader; retailer; certification body; consumer; Information System (IS) provider - Primary Actors: producer (or product owner); IS provider; certification body - Preconditions: Information of legislation, retailer’ specifications, available certified companies by relevant standards, most appropriate route (depending on various criteria) must be available in the IS (or web-

	site/software in some cases) to all the stakeholder of the food chain - Triggers - Main success scenario ("How to demo"): the information needed by each company is accessible in the IS (or website/software in some cases) to ensure legal compliance and quality control (and other aspects) and any problem/risk detected and the decision making about it is transmitted via the IS. Furthermore, the certification body carries out audits to ensure the reliability and the security of the information transmitted. Finally, all information about the standards involved (and the details of the requirements used to certify) in the food supply chain processes are available to the consumer. - Alternative paths: none - Post conditions: the functionalities described in the main success scenario are realized.
Actors	The scenario affects the overall food chain from farm to fork: • Farmers that are generating the basic information with respect to the produce • Laboratories that are generating the information that is baseline to identify an exception • Traders that are selling batches of the produce to the chain • Transport providers that are carrying the produce from A to B. From technology point of view, they could play an active role, providing ICT related hardware, but they could also behave passively only carrying the produce and some related equipment. • Distribution centers receiving and forwarding dispatched batches to their customers. They need to specifically track the mix of produce from incoming to outgoing goods. • Retailer as key interface to the consumer. Urgently requiring the information to stop the sales of produce concerned. • The Consumer could also be considered as one of the future users. Being informed about any exception with respect to the goods stored at home. • A service provider like EuroPool System would be an additional user, as they are providing with their returnable packaging/ box a key asset that is vital for making the scenario work.
Primary Actor	
Rationale	The following general benefits through SCEM apply to all supply chain participants: - Reducing costs of nonconformity

	- Reducing prevention costs - Improvement of consumer Confidence - Sustaining of customer – supplier connections
Owner	SmartAgriFood
Owner Contact	Yann Cassing (SGS), Elena Mansilla (SGS)
Complexity	Label or number describing how complex supporting the use case / feature will be: - M: Medium cost
Creation Date	5-10-2011
Last modified	5-10-2011

Id	Theme.UC.SAF.WP300.05
Name	Quality Controlled Logistics in the Flower Chain
Goal	• Reliability: This is the main goal of the grower and the retailer in this scenario. They both want to sell a quality-product with interesting product information and transparent product history. The auction wants to be a reliable partner in trading by improving on its ability to deliver/auction quality products. • Costs: This is one of the goals of the auction and trader in this scenario. They both want to optimize operational storage and stock efficiency and minimize their cost in terms of product loss. • Assets: (trader) The goal of the trader is to optimize storage and stock efficiency and optimally utilize fleet capacity. The trader wants to manage these assets to increase operational efficiency of his/her organization.
Version	V1.0
Source	(TNO), (DLO)
Scope	GLOBAL
Source Contact	(TNO)
Stakeholder	project = ‘SmartAgriFood’ organization = ‘TNO’, ‘DLO’

Scope	Projects to which the entry applies are: "Platform Generic" = It relates to a functional or non-functional feature required at platform level and general purpose "Platform Common" = It relates to a functional or non-functional feature required at platform level but whose applicability is restricted to applications in a few number of domains (Usage Areas) "Application" = It relates to a user story related to some functional o non-functional feature required at application level
Status	PENDING
MoSCoW priority	MUST
Chapter	The Platform Generic features to be addressed in the scenario will match: - "Cloud" - "Data/Context"
Enabler	
Description	The feature can be described as follows: - Actors: see section on actors - Primary Actors: see section on primary actors - Preconditions: each involved actor collects and maintains the information necessary in his/her own IT-system. This information has to be made accessible to others in the chain and for the feature to be used as event generator. - Triggers: - Main success scenario ("How to demo"): each organization in the chain can get access to their needed information through the entire chain about history, tracking/tracing and quality conditions of products. By doing this, the organizations (1) can monitor the status of products, (2) can be notified about exceptions for which simulation and control actions have been taken and (3) can make measurements for the long term based on history that is stored. - Extensions: none for the moment - Alternative paths: none - Post conditions: the functionalities described in the

	main success scenario are realized.
Actors	Producer (or product owner): • Searches the current appropriate legislation for the product using a website/software (“legislation web”) and controls its compliance. • Chooses the certificated companies available using a website/software (“certifications’ web”). • Decides the actions to undertake if any problem/risk transmitted by the IS (re-order, corrective actions, transmission of the information to RASFF, withdrawal). IS provider: • Runs the IS of certifications results (problems/risks detected) and retailer specifications, on behalf of the entire set of stakeholders in the chain. Transporter: • Transports the tomato to the warehouse/trading house/retailer. • Controls the compliance with the retailer specifications using the IS. • Uses a website/software (“routes’ web”) to recalculate the route of the product depending on various criteria (energy saving, time saving, load optimization, natural disasters or state of the road). Packer: • Packs the tomatoes. • Controls the compliance with the retailer specifications using the IS. Wholesaler/Trader: • Buys the product and stores it temporarily until he ships it to the retailer. • Controls the compliance with the retailer specifications using the IS. Certification body: • Verifies the security of the information from the websites/software/IS. • Verifies the reliability of the information from the websites/software/IS.

	• Verifies the legal compliance of the product through audits. • Verifies the compatibility of the Tracking and Tracing Systems all along the route. Website/software providers: • Run the websites/software of the legislation, the certified companies, the route calculation and the information about certifications on behalf of the entire set of stakeholders in the chain. Consumer: Sees in internet what are the certificates realized and obtained on the product all along his route in the supply chain and the details of the requirements used to certify (maximum temperature/humidity, hygiene conditions, quality conditions, packaging/warehousing/transporting integrity conditions….).
Primary Actor	Actually all actors are evenly important. We could imagine that the IS provider and the certification body are the main actors in this scenario.
Rationale	Benefits of the information when available are related to the goals of the various actors: • Reliability of the retailer specifications compliance of the companies involved in the supply chain that ensures food quality/safety (retailer). • Legal compliance (all user groups). • Quick response to any problem/risk by using the IS to transmit the information between all the stakeholders (all user groups). • Reliability of the IS and website/software used that ensure a quick and appropriate response to any problem/risk (all user groups). • Reliability of the Tracking and Tracing Systems all along the route (all user groups). • Transparency of the certifications information to the consumer (consumer).
Owner	SmartAgriFood
Owner Contact	Jack Verhoosel (TNO), Cor Verdouw (DLO)
Complexity	The complexity for supporting the use case / feature will be most probably: - M: Medium cost

Creation Date	5-10-2011
Last modified	7-10-2011

Id	Theme.UC.SAF.WP300.06
Name	**Intelligent retail store replenishment of fresh products**
Goal	• **Reliability**: predictability of the order-delivery process concerning the end of the supply chain (warehouse-retail shop). • **Responsiveness**: retail store supply is handled mucho more efficient. • **Agility**: enables warehouse to react timely and adequately according to real needs of the store. • **Costs**: contributes to reduce costs particularly in: fewer extra tours, loss in sales due to a bad image of fresh product to the consumer, reduce labor costs (less human work). • **Assets**: enhances order-delivery efficiency, strengthens quality of fresh product provided to the consumer at the supermarket, reduces product waste, adjust production according to product needs in each retail store. • **Sustainability:** adjusting production according to product needs in each retail store, helps for a more sustainable production. Reducing the amount of waste (rotten fresh products), helps for a more sustainable management of products and reduction of wastes of the supply chain.
Version	V1.0
Source	Bon Preu
Source Contact	Bon Preu: Marta Fontseré / Eloi Montcada / Joan Sabartés WP coordinator: Cor.Verdouw@wur.nl WP300
Stakeholder	project = 'SmartAgriFood' organization = 'Bon Preu'
Scope	GLOBAL
Status	PENDING

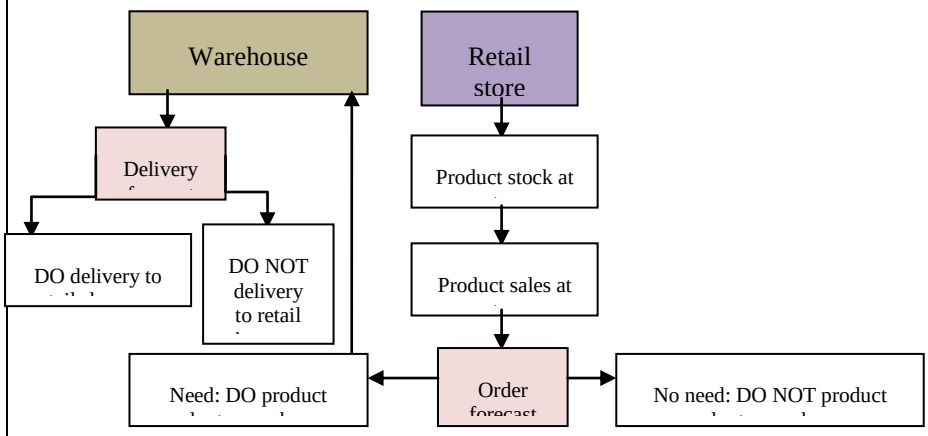
MoSCoW priority	SHOULD
Chapter	The Platform Generic features to be addressed in the scenario will match: - "Data warehouse" - "Data/Context" - “Cloud hosting provider” - “Apps”
Enabler	Data analyser, Data collector, Data management, Decision module, Configuration and communication, Notifier.
Description	The feature can be described as follows: - **Actors**: Retailer (warehouse): provides the delivery Retail outlets (supermarkets, hypermarkets, etc.): does the order - **Primary Actors**: Retailer. - **Preconditions**: • General environmental conditions: inherently vulnerable supply chain due to perishableness of goods (here: fruits and vegetables), usual supply chain structures (producer – retailer – warehouse – retail store – consumer). • Human interaction: handmade ordering by supermarket employees (inexact order). • Network connectivity of retail store and warehouse. • Required systems: Sales register: weekly register of goods sold in the retail store (CRM). Data warehouse system: management warehouse system implemented (stock control, automatic delivery, etc.) - **Main success scenario** ("How to demo"): Current logistic management of fresh products (specifically fruit and vegetables) has to be optimized in order to achieve the following objectives: - Reduce food waste due to perishableness of fresh food. - Optimize food orders from retail stores (more tailored orders according to current availability of fresh food in the retail store

and forecasted needs).

- Increase quality of fresh products provided to the consumers (always find day-fresh products in the supermarket).
- Adjust production according to product needs in each retail store.

Nowadays, retail stores are the ones who order to the central warehouse the goods that are needed (fruit and vegetables). Usually the retail store does a broad order, not a tailored order matching exactly the real needs. That generates losses of fresh food.

The *scenario's* objective is to substitute the human work (supermarket workers) on detecting what products are getting perished in the retail store and then sending the order to the central warehouse, to an automatic logistic management system that shall program deliver of fresh product to the retail store that matches the real needs in the retail store. Then, the order of fresh products would be automatically sent to the warehouse depending on the available products on the retail store (known from other variables: deliver day, amount of product, purchase register). When warehouse receives the order (e.g "X kg of tomatoes are needed in supermarket Y"), the logistics management system decides to deliver the order or not. For example, if 10 kg of tomatoes are needed, the warehouse will deliver a lot of 12 kg (box) to the supermarket; if 1 kg of tomatoes is needed, the warehouse will wait to make the deliver next week.



- **Extensions**: none for the moment

- **Alternative paths**: if the system fails, supermarket worker can do the order himself to the warehouse.

- **Postconditions**: the functionalities described in the main success scenario are realized.

- **Notes**: none

Id	Theme.UC.SAF.WP300.07
Name	RFID implementation on pallets from warehouse to retail store.
Goal	• **Reliability**: control of the process delivery (physical conditions of the load, delivery-time, delivery-place, right delivery –right product and amount -). That will help decreasing problems on the delivery from warehouse to retail store. • **Assets**: enhances delivery efficiency and knowledge, strengthens communication between warehouse-shop, increases load control and reduces problems with distribution companies (truck drivers, truck cooling conditions, etc.), increases the amount of information carried by a product (or pallet). • **Sustainability:** reduces in vain trips, helping indirectly to reduce greenhouse gases from transport (carburant consumption). • **Agility:** enables retailers to detect faster problems and deviations with the delivery or/and the load and to act faster (decreases react-time). • **Responsiveness:** critical supply chain incidents are handled much more efficient.
Version	V1.0
Source	Bon Preu
Source Contact	Bon Preu: Marta Fontseré / Eloi Montcada / Joan Sabartés WP coordinator: Cor.Verdouw@wur.nl WP300
Stakeholder	project = ‘SmartAgriFood’ organization = ‘Bon Preu’
Scope	Projects to which the entry applies are: "Platform Common" = It relates to a functional or non-functional feature required at platform level but whose applicability is restricted to applications in a few number of domains (Usage Areas)
Status	PENDING
MoSCoW priority	MUST

Chapter	The Platform Generic features to be addressed in the scenario will match: - "Data/Context" - “Cloud” - “Apps”
Enabler	
Description	The feature can be described as follows: - **Actors**: Retailer (warehouse): adds information on pallet RFID, detects any problem occurred. Retail outlets (supermarkets, hypermarkets, etc.): reads RFID info on the pallet, confirms the correct delivery. Distribution company: adds information on pallet RFID concerning load conditions in the truck and un-loading date. - **Primary Actors**: Retailer - **Preconditions**: • General environmental conditions: usual supply chain structures (producer – retailer – warehouse – retail store – consumer). • Network connectivity of retail store and ware-house. • Required systems: GPS system on trucks, MWS, Information web services. - **Main success scenario** ("How to demo"): This scenario aims to cover the gap of information between the central warehouse and the retail store. Nowadays the retailer cannot control the goods that leave the warehouse to the retail stores. When prod-ucts cross warehouse gate, the retailer doesn’t re-ceive any feedback (information) since the product leaves the supermarket (a consumer buys it). So, there is an information gap in this part of the logistic chain that has to be covered, otherwise if an anomaly happens the information takes lot of time or never notify the retailer. This scenario aims to fill the gap by using RFID tech-nology on pallets in order to control them from ware-

	house gates to retail store entrance. By adding an RFID chip to a pallet (which contains several product references) with information of the loading and unloading processes of this pallet, retailer could have knowledge of what/when/where/how is his load (pallet). - **Extensions**: can be extended to a different unit, e.g. consumer unit or trade unit. - **Alternative paths**: - **Post conditions**: the functionalities described in the main success scenario are realized. - **Notes**: none
Actors	The scenario affects the last part of the supply chain: warehouse and retail store. Consumers are an indirect actor of the scenario, as by implementing this system "suggested order" they find better quality fresh products in the supermarket. • Retail store: supermarket workers that enter information of stock and quality on the system. • Warehouse worker that receives the command for delivery. • Transport providers that are carrying the produce from A to B. • Distribution centers receiving and forwarding dispatched batches to their customers. • Retailer as key interface to the consumer. • Producer: better adjustment of his product production according to retailer demand.
Primary Actor	We could imagine that the warehouse and the retail store are the main actors in this scenario. In global could be the retailer itself (e.g. Bon Preu).
Rationale	The rational of this scenario is the control of the load from warehouse to retail store. … at the retail store: - Delay in delivery - Delivery failure - Product damaged - Incorrect delivery (wrong product, wrong amount, wrong store) - Incorrect cooling … at the warehouse: - Not control of the transit (temperature conditions, tipping of load, etc. of the truck) - Not control of the final delivery load to the right supermarket. - Not control of the final delivery load conditions. - Not control in delivery-time. - Need of more information about the process delivery. Benefits of the information when available are related to the goals of

	the various actors: • Retail store: the expected benefit for the supermarket is a decrease of delivery failures or delivery problems. Warehouse: the expected benefit for the warehouse is better control of the load in order to detect problems on the delivery and increase reaction-time.
Owner	SmartAgriFood
Owner Contact	Bon Preu: Marta Fontseré / Eloi Montcada / Joan Sabartés WP coordinator: Cor.Verdouw@wur.nl
Complexity	- L: has a significant cost
Creation Date	10-10-2011
Last modified	17-10-2011

7.3 Use cases from Smart-Food Awareness sub-domain

Id	Theme.UC.SAF-WP400-01
Name	**Consumer initiates a shopping session**
Goal	To recognize the consumer during the shopping experience
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu,ATOS
Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST
priority	PENDING
Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - "Cloud" - "Apps" - "IoT" - "I2ND" - "Security"
Enabler	"cloud hosting": All GE's "Application/services Ecosystem & Delivery": • USDL Repository • USDL Registry • Multi-channel/Multi-device Access System "Internet of Things (IoT) Services Enablement": All GE's "Interface to Networks and Devices": • Connected Device Interfacing (CDI) "Security":

	• Securitymonitoring • Identity Management • PrimeLife Policy Language (PPL) Engine
Description	As the consumer approaches a shop/supermarket, there is a manual and/or automatic identification and validation, and she/he is authenti-fied This possibly implies that she/he has some special feature in this smartphone (possibly and App) that recognizes the context of the shop and facilitates the authentication and authorization to special features - Actors: consumer, shops - Preconditions. The user has previously registered himself in the su-permarket's system - Triggers The consumer arrives to the shop - Alternative paths Manual identification, with some kiosk at the shop - Postconditions The shop is aware of the presence of the consumer, so it is possible to allow specific information
Actors	Consumer, shops
Primary Actor	Consumer, shops
Rationale	Transparency and ease of use in the -initiation, execution andfinalization of the- interaction between IT platform and services and users should be achieved in order to deploy complex systems in a simple way from the user's point of view
Owner	SmartAgrifood
OwnerCon-tact	David Quesada: david.quesada@atosresearch.eu
Complexity	- L: Has a significant cost
Creation Date	07/10/2011

Last modified	07/10/2011 12/10

Id	Theme.UC.SAF-WP400-02
Name	**Update of the consumer profile (consumer driven)**
Goal	The consumer is able to create and update her/his profile, reflecting interests, concerns and/or health issues
Version	V1.0
Source	SAF – WP400
SourceContact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST
Chapter	- "Cloud" -"Data/Context Management" - "Apps" -"I2ND" - "Security"
Enabler	"cloud hosting": All GE's -"Data/Context Management": • Complex Event Processing • Pre-processing of meta-data during/after gathering • Preprocessing of unstructured data during/after gathering • Query-access • Publish/Subscribe Broker • SemanticAnnotationenabler • Semantic Application Support enabler -"Applications/Services Ecosystem & Delivery":

	• USDL Repository • USDL Registry • Multi-channel/Multi-device Access System "Interface to Networks and Devices": • Connected Device Interfacing (CDI) "Security": • Securitymonitoring • Identity Management • PrimeLife Policy Language (PPL) Engine
Description	The consumer has means to add/modify features and interest on his/her profile. This information relates to taste (likes/dislikes), social concerns (CO2, GMO, local production, etc), health (food intolerances, etc) or moral/religious issues (vegetarian, halal, kosher). Also is able to define the privacy level on this information
Actors	Consumer
Primary Actor	Consumer
Rationale	The consumer is able to modify its daily-changing preferences so that he may receive dynamically tailored information adjusted to his/her profile.
Owner	SmartAgrifood
Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	M: Medium cost
Creation Date	09/10/2011
Lastmodified	17/10/2011

Id	Theme.UC.SAF-WP400-03

Name	**Update of the consumer profile (retailer driven)**
Goal	The retailer may provide information to feed to the consumer profile reflecting interests based in his/her behavior. This information can be managed and controlled by: - The retailer In this case, the retailer should be able in some cases to control and manage the information that he gathers from consumers' behaviour, purchases, acts, etc., and define a consumer profile that won't be necessary provided to the consumer. The retailer, by knowing the consumer profile, can provide a tailored shopping to him/her (recommend products that match consumer profile, recommend offers, etc) (see Theme.UC.SAF-WP400-06). - The consumer
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	GLOBAL
Status	PENDING
MoS-CoWpriority	COULD - Features that are nice to have but are not core features are categorized as Could.
Chapter	- "Cloud" - "Data/Context" - "Apps" - "Security"
Enabler	Only applicable to Platform features. It identifies the Enabler to which this entry (feature) in the backlog applies. - "Cloud": All GEs -Data/context Management

	• Pre-processing of meta-data during/after gathering • Preprocessing of unstructured data during/after gathering • Query-access • Publish/Subscribe Broker • Semantic Annotation enabler • Semantic Application Support enabler • Mobility Analysis • Real-time recommendations • Behavioral and Web profiling -"Applications/Services Ecosystem & Delivery": • USDL Reposiory • USDL Registry -"Interface to Networks and Devices": • Connected Device Interfacing (CDI) -"Security": • Identity Management • PrimeLife Policy Language (PPL) Engine • Securitymonitoring
Description	The retailer provides information to the consumer tailored by his/her shopping behavior.
Actors	Consumer, retailer
Primary Actor	Consumer, retailer
Rationale	The consumer may receive tailored information adjusted to his/her profile and shopping behaviour. Semantic analysis of the gathered information is therefore needed.
Owner	SmartAgrifood
Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	- L: Has a significantcost
Creation Date	09/10/2011
Lastmodified	17/10/2011

Id	Theme.UC.SAF-WP400-04
Name	**Information pulled by the consumer (manual)**
Goal	To provide information about the food items manually requested by the consumer
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST
Chapter	- "Cloud" - "Data/Context" - "Apps" -"IoT" -"Interface to Networks and Devices":
Enabler	"Data/Context" • Complex event processing • Pre-processing of meta-data during/after gathering • Query-access • Publish/Subscribe Broker • Semantic Annotation enabler • ·"Applications/Services Ecosystem & Delivery": • USDL Repository • USDL Registry • Business Elements and Models Provisioning Sys-

	tem: • Multi-channel/Multi-device Access System -“Internet of Things (IoT) Services Enablement”: All GE’s -“Interface to Networks and Devices”: • Connected Device Interfacing (CDI)
Description	After a request from the consumer, the infrastructure locates and provides the information to her/him. Manual request. From a specific item or category of food items, she/he requests additional information (location on the store, price, special offers, alternatives but also CO2, GMO, origin, health/moral/religious compatibility, etc) - Alternative paths This basic information may have different categories and the request may return a combination of several of them *Original (basic) information *Aggregated information (combination of food items) *External source (for example, CO2, general nutrition information, etc) *Certification (labelling: GlobalGAP certificate)
Actors	consumer, retailer
Primary Actor	consumer, retailer
Rationale	The consumer may receive tailored information adjusted to his/her profile and his/her instant needs.
Owner	SmartAgrifood
Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	XL: Costs a lot
Creation Date	09/10/2011
Lastmodi-	09/10/2011

fied	

Id	Theme.UC.SAF-WP400-05
Name	**Information pulled by the consumer (automatic)**
Goal	To provide information about the food items automatically requested by the consumer
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST
Chapter	- "Cloud" - "Data/Context" - "Apps" - "IoT" -"Interface to Networks and Devices": -"Security":
Enabler	- "Cloud": All GEs -Data/context Management • Complex Event Processing • Pre-processing of meta-data during/after gathering • Preprocessing of unstructured data during/after gathering • Query-access • Publish/Subscribe Broker • Semantic Annotation enabler

	• Semantic Application Support enabler • Mobility Analysis • Real-time recommendations • Behavioural and Web profiling Applications/Services Ecosystem & Delivery": • USDL Repository • USDL Registry • Business Elements and Models Provisioning System: • Multi-channel/Multi-device Access System -"Interface to Networks and Devices": • Connected Device Interfacing (CDI) -"Internet of Things (IoT) Services Enablement": All GE's -"Security": • Identity Management • PrimeLife Policy Language (PPL) Engine • Identity Mixer (IdeMix)
Description	After a request from the consumer, the infrastructure locates and provides the information to her/him. Automatic request. When the consumer picks a food item from the shelf there is a matching between the profile and the information gathered about the item, specially concerning to health issues and specific interests. If necessary, information, warnings or alerts are communicated to the consumer - Actors: consumer, retailer - Primary Actors: the same - Preconditions - Triggers - Main success scenario ("How to demo") - Extensions - Alternative paths This basic information may have different categories and the request may return a combination of several of them *Original (basic) information *Aggregated information (combination of food items)

	*External source (for example, CO2, general nutrition information, etc) *Certification (labelling: GlobalGAP certificate) - Postconditions - Notes
Actors	consumer, retailer
Primary Actor	consumer, retailer
Rationale	The consumer may receive tailored information adjusted to his/her profile.
Owner	SmartAgrifood
Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	XL: Costs a lot
Creation Date	09/10/2011
Lastmodified	09/10/2011

Id	Theme.UC.SAF-WP400-06
Name	**Information pushed by the retailer (information provision)**
Goal	The retailer sends general/tailored information to the consumer
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	GLOBAL

Status	PENDING
MoSCoW priority	SHOULD
Chapter	- "Cloud" - "Data/Context" - "I2ND" - "Security"
Enabler	- "Cloud Hosting": All GEs -Data/context Management • Complex Event Processing • Pre-processing of meta-data during/after gathering • Localization Platform • Query-access • Publish/Subscribe Broker • Semantic Annotation enabler • Semantic Application Support enabler • Mobility Analysis • Real-time recommendations • Behavioral and Web profiling -“Applications/Services Ecosystem & Delivery”: • USDL Repository • USDL Registry • Business Elements and Models Provisioning System: • Multi-channel/Multi-device Access System -“Internet of Things (IoT) Services Enablement”: All GE’s -“Interface to Networks and Devices”: • Connected Device Interfacing (CDI) -“Security”: • Identity Management • PrimeLife Policy Language (PPL) Engine • Identity Mixer (IdeMix)

Description	The retailer may provide information to the consumer. This may be triggered by several situations (or combination of situations): - physical presence in the shop/near the shop - Behavior during the shopping act (tailored to the consumer). For instance, giving directions to categories of matching products based on the current shopping cart. - existing special offers (tailored to the consumer) - Actors: consumer, retailer - Primary Actors: the same - Preconditions - Triggers Proximity to a shop, special offers, shopping act - Main success scenario ("How to demo") - Extensions - Alternative paths This basic information may have different categories and the request may return a combination of several of them *Original (basic) information *Aggregated information (combination of food items) *External source (for example, CO2, general nutrition information, etc) *Certification (labelling: GlobalGAP certificate) - Postconditions - Notes
Actors	consumer, retailer
Primary Actor	consumer, retailer
Rationale	The consumer may receive tailored information adjusted to his/her profile and also based on the geographical localization and the current's shopping activities.
Owner	SmartAgrifood

Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	XL: Costs a lot
Creation Date	09/10/2011
Lastmodified	09/10/2011

Id	Theme.UC.SAF-WP400-07
Name	**information from consumer to producer**
Goal	The consumer is able to express her/his comments retailer sends general/tailored information to the consumer
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	GLOBAL
Status	PENDING
MoSCoWpriority	SHOULD
Chapter	- "Cloud" - "Data/Context" - "I2ND" - "Security"
Enabler	Only applicable to Platform features. It identifies the Enabler to which this entry (feature) in the backlog applies.

	- "Cloud": All GEs -“Data/context Management” • Pre-processing of meta-data during/after gathering • Preprocessing of unstructured data during/after gathering • Query-access • Publish/Subscribe Broker • Semantic Annotation enabler • Semantic Application Support enabler • Opinionmining -“Security”: • Identity Management • PrimeLife Policy Language (PPL) Engine • Identity Mixer (IdeMix) • Context-based security and compliance • Optional Security Service Enabler
Description	The consumer has the opportunity to give direct feedback to the original farmer/producer of a food product, so they can obtain valuable and direct information about the impact of the products. - Actors: consumer, retailer, farmer/producer - Primary Actors: the same - Preconditions - Triggers - Main success scenario ("How to demo") - Extensions - Alternative paths - Postconditions - Notes
Actors	consumer, retailer
Primary Actor	consumer, retailer
Rationale	Although this may be ancontroversial issue, affecting the business model of several of the actors in the food supply chain, especially for

	“commodity” items. However, in the case of focused items for specific niches (organic, gourmet, local, etc) there’s a clear benefit for every stakeholder of the supply chain if each of them have the means tore-ceivethe “opinion” of the product’s quality (or other criteria) from not just only the stakeholders with whom they currentlyhave a direct busi-ness relationship (in the case of farmers, those will be the transport and warehousing entities) but also fromthe rest of the stakeholders, especially the end users.
Owner	SmartAgrifood
Owner Con-tact	David Quesada: david.quesada@atosresearch.eu
Complexity	XL: Costs a lot
Creation Date	09/10/2011
Lastmodi-fied	09/10/2011

I d	Theme.UC.SAF-WP400-08
Name	A normal day in a future supermarket
Goal	In this scenario we propose the mobile phone as the service delivery platform for shopping services. The mobile phone interacts with close and remote elements such as: shopping trolleys, personal appliances, as well as user profile information and preferences. This approach will enable users to directly interact with supermarkets’ assets as well as to make use of their personal information and their needs, in a fully in-teroperable environment.
Version	V1.0
Source	UPM
Source Contact	trobles@dit.upm.es amorales@dit.upm.es alcarria@gmail.com
Stakeholder	Project = ‘SmartAgriFood’ Organization= UPM, Ariadna

Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST - Features that absolutely have to be done are categorized as Must. If any of these features are not done, the project will be considered a failure.
Chapter	- "Cloud" - "Data/Context" - "Apps" - "IoT" - "Security"
Enabler	"Cloud": all "Data/Context": Publish / Subscribe Broker GE, Complex Event Processing GE, Big Data Management , Managing service and service components "Apps": service generation tools end-users, service components management, applications templates customisable by end-users - "IoT": Integrating things as service components - "Security": all
Description	- Actors ✓ Consumer ✓ Prosumer (end user acting as Service creator and service consumer) ✓ Service Creator (expert) ✓ Service supporting Tool: managing, storing, composing, downloading/uploading ✓ Data Base ✓ Data Management - Primary Actors ✓ Consumer ✓ Service creator (end-user) ✓ - Preconditions ✓ Ubiquitous service and service components management ✓ Sensors and actuators integrated as data providers

	✓ Sensors and actuators integrated as capabilities providers - Triggers ✓ End-users will drive the process by producing, publishing their own service. ✓ Those services once created will be uploaded for usage and or adaptation by other users ✓ Those services will integrate the interaction with Things another users in close environment - Main success scenario ("How to demo") To create a prosumer environment in an open environment using a personal device, the user should be able to define their one service or to adapt existing services to their own requirements. The service environment will be able to adapt service and service components to the context. Those user-generated services should be able to use specific user data and generic data. The data should be identified according the user context and should flow to the user service adapted to the service, the equipment and the user. - Extensions Extend the prosumer environment with tools for service creation Creation of a portfolio of services as a servicehop for investigating service and service components business models Link user created services with underlying transport network in order to improve the QoE. - Alternative paths Only users with high technical skills or just plain developers will create a large set of service components, and service templates that end-users will be able to download and to use with minor parameterization. - Postconditions Data and service should be stored preserving security and privacy requirements and ready for being used by other users

	- Notes
Actors	— Consumer — Prosumer — Service Creator (expert) — Service Network Operator — Sensors and actuators — DataManager (storage, data management, data access and processing — ISP or Mobile Operator — Service supporting Tool: managing, storing, composing, downloading/uploading
Primary Actor	Prosumer
Rationale	It is required Future internet directly supports the prosumer concept in order to natively enable end-user to define and customise their own services. Networks and context infrastructure (including sensors and actuators) should become part of the service delivery platform in ordered to enable transparent and adaptable services
Owner	SmartAgriFood
Owner Contact	Tomás Robles: trobles@dit.upm.es Ramón Alcarria:alcarria@gmail.com Augusto Morales: amorales@dit.upm.es
Complexity	- XL: Costs a lot
Creation Date	20/10/2011
Last modified	20/10/2011

Id	Theme.UC.SAF-WP400-09
Name	The Semantic Restaurant
Goal	To provide detailed information to the guests in a restaurant
Version	V1.0
Source	ASTON

Source Contact	Christopher Brewster <C.A.BREWSTER@aston.ac.uk>
Stakeholder	Project = 'SmartAgriFood' Organization= AST
Scope	GLOBAL
Status	PENDING
MoSCoW priority	MUST
Chapter	- "Cloud" - "Data/Context" - "Apps" - "IoT" - "Security"
Enabler	"Cloud": all "Data/Context": Publish / Subscribe Broker GE, Complex Event Processing GE, Big Data Management , Managing service and service components "Apps": service generation tools end-users, service components management, applications templates customisable by end-users - "IoT": Integrating things as service components - "Security": all
Description	The customer: I enter the restaurant with my companion and we are shown a table. The restaurant has received my booking via my dedicated restaurant booking smartphone app earlier in the day, and in making the booking I gave permission for access to my SmartAgriFood Profile which specified my dietary preferences, my ethnic/cultural/ethical food preferences, and a history of past meals based on an integration of data from my virtual shopping trolley, my restaurant profile, and my semantically enabled fridge. My companion was not specified (for privacy reasons) but access to my SAF profile allows their systems to make shrewd guesses as to the type and range of food interests of possible companions. I am identified as an ethically obsessed, environmentally concerned foodie, while a guess is made that my companion is more concerned with her weight and health, but is probably vegetarian. Upon sitting down, we each receive a personalised printed menu (possibly on e-paper) which shows for each menu item, the ingredients, origin, overall price and overall environmental impact (for myself) and health/dietary rating (for my companion). The same data is available

	online if we prefer to read it via our smartphones with links to further details such as the farms where the food was sourced, distance travelled, nutritional details, certifications, etc. If time and conversation permits, we can access videolinks via the establishments ultra-high speed wifi which permits us to watch video clips from the various farms from which our menu is sourced. We make our choices and the waiter recommends appropriate wines to accompany the meal. The chef and/or restaurant manager: Some days previously the chef constructed today's menu by requesting the system provide a list of all ingredients following certain criteria (e.g. seasonal, produced with 50 km or whose environmental impact is less than 500g per kilo), derived automatically from all possible suppliers. Suppliers both large and small use semantic technologies (such as the Good Relations ontology) to publish an updated version of the current product availability each day which the restaurant's system is able to consume, integrate and query. This data will include detailed data on all dimensions of relevance (quantity, price, packaging, delivery time, production methods, certifications if appropriate, environmental data (CO2, distance travelled, water, use of pesticides, use of fertilisers, etc.), health data including calories, and other benefits and disadvantages. The open system allows new suppliers to be easily added and encourages all staff and customers to have direct access to information concerning the manner of production, location, the story behind the food item whether large (a lamb) or small (spices). The chef can query for availability and construct a menu from those items, or can specify a dish and identify the cheapest/most local/most environmentally friendly/fastest suppliers for the ingredients. Quality can be checked with live video feeds to the produce (e.g. spinach or fish). Choices are made, recipes constructed or selected from past occasions of use. All data is pulled together for each item on the menu ranging from health data to environmental impact data, and prepared for inclusion in the daily menus, including personalised menus printed each day for pre-booked clients. The wholesale purchases and client choices continuously update a model of the restaurant's current environmental impacts, amount of waste, financial costs and profits. Subsets of this data can feed directly into promotional material (websites, etc.) depending on the priorities the catering establishment sets. - Actors Restaurant

	Guests (consumers)
Actors	Consumer Restaurant
Primary Actor	Consumer Restaurant
Rationale	
Owner	SmartAgirFood
Owner Contact	Christopher Brewster <C.A.BREWSTER@aston.ac.uk>
Complexity	- XL: Costs a lot
Creation Date	20/10/2011
Last modified	20/10/2011

Id	EPIC.UC.SAF-WP400-01-01
Name	**Consumer detection**
Goal	To recognize the consumer when enters in the area of influence of a shop/supermarket
Version	V1.0
Source	SAF – WP400
SourceContact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	GLOBAL
Status	PENDING
MoSCow priority	MUST

Chapter	Only applicable to Platform Generic features to be addressed in FI-WARE. Values match chapters in FI-WARE, namely: - Data/Context Management - "IoT" - "I2ND" - "Security"
Enabler	- Data/Context Management: • Complex Event Processing • Localization Platform • Query-access • Publish/Subscribe Broker • Semantic Annotation enabler • Semantic Application Support enabler • Mobility Analysis - "IoT": All GEs - "I2ND": • Connected Device Interfacing (CDI) - "Security": • Identity Management • PrimeLife Policy Language (PPL) Engine • Identity Mixer (IdeMix) • Context-based security and compliance
Description	As the consumer gets near a shop/supermarket, an application deployed in the smartphone of the user, using a service from the shop/supermarket with geographical broadcast of information, analyzes if the consumer's intentions is to go shopping. This analysis relays in the observation of the consumer behavior and/or previous actions (for example, preparing the shopping list using the smartphone, shopping schedule patterns, etc)
Actors	consumer, shops
Primary Actor	consumer, shops
Rationale	After the recognition process, the relationship between consumer and shop can be incremented. Intelligent recognition of user shopping "intentions" will provide with a better Quality of Service provided by the retailer

	and perceived by the user.
Owner	SmartAgrifood
OwnerCon-tact	David Quesada: david.quesada@atosresearch.eu
Complexity	- L: Has a significant cost
Creation Date	07/10/2011
Lastmodi-fied	07/10/2011

I d	EPIC.UC.SAF-WP400-02-01
Name	**Accessibility of the consumer profile**
Goal	To give secure and suitable access to the consumer profile
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	Platform Generic
Status	PENDING
MoSCoW priority	MUST
Chapter	- "Cloud" - "I2ND" - "Security"
Enabler	Only applicable to Platform features. It identifies the Enabler to which this entry (feature) in the backlog applies. -"Cloud Hosting": All GEs -"Security": All GEs

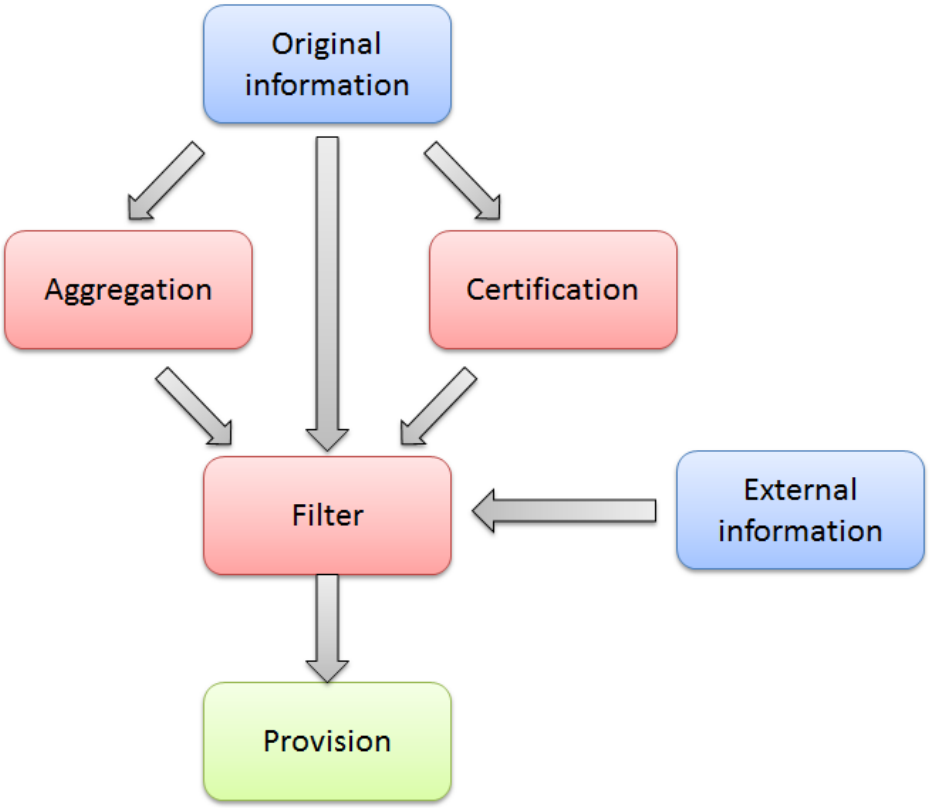
Description	The information contained in the consumer profile is owned and should be managed by her/him. So, this information could be stored either in her/his mobile device (possibly backed-up in some cloud service). Remote access to this information should be possible but restricted and secured by the infrastructure.
Actors	consumer, retailer
Primary Actor	consumer, retailer
Rationale	The consumer has direct control on the information stored in her/his profile
Owner	SmartAgrifood
Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	M: Medium cost
Creation Date	09/10/2011
Lastmodified	09/10/2011

Id	EPIC.UC.SAF-WP400-05-01
Name	**The consumer chooses a food item**
Goal	To detect the interaction between consumer and food items
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	GLOBAL
Status	PENDING

MoS-CoWpriority	MUST
Chapter	- "Cloud" - "Data/Context" - "I2ND" - "IoT"
Enabler	- "Cloud Hosting": Object Storage -Data/context Management • Complex Event Processing • Pre-processing of meta-data during/after gathering • Localization Platform • Query-access • Publish/Subscribe Broker • Semantic Annotation enabler • Semantic Application Support enabler • Mobility Analysis -“Internet of Things (IoT) Services Enablement”: All GE’s
Description	Based on the proximity and interaction between the consumer, the shopping cart, the shelf and the food item, it is detected whenever a food item is chosen
Actors	Entities that are involved in entry use case / feature description Users are not necessarely End Users. Particularly, users typically are the applications, the application developer or application providers in entries linked to Platform enablers
Primary Actor	Primary entity involved in entry use case / feature description
Rationale	Identification and localization of the items of the supermarket (cart, shelves, user, food items…) are one of the pillars to elaborate and provide the users with information tailored to his preferences and shopping behavior

Owner	SmartAgrifood
Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	XL: Costs a lot
Creation Date	09/10/2011
Lastmodified	09/10/2011

Id	EPIC.UC.SAF-WP400-05-02
Name	**Information requested from the food item**
Goal	To find the information requested by the consumer
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	Platform Generic
Status	PENDING
MoSCoWpriority	MUST
Chapter	- "Data/Context"
Enabler	- "Data/Context": Big Data Analysis, Query Broker, Semantic annotation, Semantic Application Support
Description	Based on the manual/automatic request of the consumer, the information is searched, composed and presented - Actors: consumer, retailer - Primary Actors: the same

	- Preconditions - Triggers - Main success scenario ("How to demo") - Extensions - Alternative paths This basic information may have different categories and the request may return a combination of several of them *Original (basic) information *Aggregated information (combination of food items) *External source (for example, CO2, general nutrition information, etc) *Certification (labelling: GlobalGAP certificate)  - Postconditions - Notes
Actors	consumer, retailer
Primary Actor	consumer, retailer
Rationale	The consumer receivesthe information of the food item(s) requested.

Owner	SmartAgrifood
Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	M: Medium cost
Creation Date	09/10/2011
Last modified	09/10/2011

Id	EPIC.UC.SAF-WP400-06-01
Name	**Local geographical broadcast of information pushed by the retailer**
Goal	The retailer may send information to consumer in the proximity of a shop
Version	V1.0
Source	SAF – WP400
Source Contact	David.quesada@atosresearch.eu
Stakeholder	Project = 'SmartAgriFood' Organization= CENTMA, BonPreu, ATOS
Scope	Platform Generic
Status	PENDING
Moscow priority	MUST
Chapter	- "Data/Context" - "IoT" -"I2ND" - "Security"
Enabler	- "Data/Context": Localization Platform - "IoT": IoTCommuncations, IoT Data Handling

	- "Security": Context-based security and compliance - "Cloud": All GEs -“Data/context Management” • Complex Event Processing • Pre-processing of meta-data during/after gathering • Semantic Annotation enabler • Semantic Application Support enabler • Localization platform • Mobility Analysis -“Internet of Things (IoT) Services Enablement”: All GE’s -“Interface to Networks and Devices”: • Connected Device Interfacing (CDI) -“Security”: • Identity Management • PrimeLife Policy Language (PPL) Engine
Description	The retailer may provide information to the consumer given their physical presence in the shop/near the shop
Actors	consumer, retailer
Primary Actor	consumer, retailer
Rationale	The consumer may receive tailored information adjusted to his/her profile.
Owner	SmartAgrifood
Owner Contact	David Quesada: david.quesada@atosresearch.eu
Complexity	XL: Costs a lot
Creation Date	09/10/2011

Lastmodi-fied	09/10/2011

Id	EPIC.UC.SAF-WP400-09-01
Name	The Semantic container
Goal	To provide common access to composed detailed cross-source information about the food products
Version	V1.0
Source	CENTMA, ASTON, ATB, ATOS
Source Contact	Christopher Brewster, ASTON Gerhard Schiefer, CENTMA HaraldSundmaeker, ATB David Quesada, ATOS
Stakeholder	Project = ‘SmartAgriFood’ Organization= CENTMA, ASTON, ATB, ATOS
Scope	Global
Status	PENDING
MoSCoW priority	MUST
Chapter	- "Cloud" - "Data/Context" - "Apps" - "IoT" - "Security"
Enabler	"Cloud": all "Data/Context": Publish / Subscribe Broker GE, Complex Event Processing GE, Big Data Management , Managing service and service components "Apps": service generation tools end-users, service components management, applications templates customisable by end-users

	- "IoT": Integrating things as service components - "Security": all
Description	Standardised interface with respect to information and semantically related content. For chain communication it is necessary a 'container' service with homogeneous information about the items transferred in containers together with standardized carriers. They should allow to be fed with information of various types that could be accessed through standard interfaces. The goal is to be able to map different kinds of standardised data sets. The semantic technologies could help to describe the data and enable a user to understand which data items represent a kind of similar content.
Actors	Consumer Restaurant
Primary Actor	Consumer Restaurant
Rationale	
Owner	SmartAgirFood
Owner Contact	Christopher Brewster <C.A.BREWSTER@aston.ac.uk>
Complexity	- XL: Costs a lot
Creation Date	20/10/2011
Last modified	20/10/2011