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Plan to move into FI-PPP Phase-3

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The Flspace Project

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

Project Summary

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

Project Consortium

- | | |
|--------------------------------------|--|
| – DLO; Netherlands | – Kühne + Nagel; Switzerland |
| – ATB Bremen; Germany | – University Duisburg Essen; Germany |
| – IBM; Israel | – ATOS; Spain |
| – KocSistem; Turkey | – The Open Group; United Kingdom |
| – Aston University; United Kingdom | – CentMa; Germany |
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| – KTBL; Germany | – Marintek; Norway |
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Dissemination Level

PU	Public	X
PP	Restricted to other program 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

This report aggregates relevant results concerning the Flspace platform, the required and deployed infrastructure and the performed trials as well as progress towards ecosystem building, business modelling, regulation, standardization and exploitation, in order to draft specific requirements, deployment options and recommendations for eventual FI-PPP Phase-3 projects and to draft detailed plans for the large-scale expansion of platform usage facilitated by local and regional stakeholders including SMEs. The report contains a detailed suggestions for plans how to move into Phase-3, including detailed plans for the large-scale expansion of platform usage facilitated by local and regional stakeholders including SMEs.

This deliverable of the Flspace project gives insights to prospective Phase-3 proposals concerning:

- The feasibility, usability and viability of the Flspace platform configurations
- The availability, characteristics and scalability of trials set-up within Flspace
- The availability of critical mass within the business ecosystem to set-up and/or contribute to large-scale trials, both within the project and outside
- The support of Flspace to Phase-3 proposers and successful bidders
- Some ideas that Flspace developed for Phase-3 to encourage a successful launch of the Flspace platform.

Abbreviations

AC	Administrative Coordinator	IP	Intellectual Property
App	Software Application	IPR	Intellectual Property Rights
CSE	Chief Software Engineer	IPC	IP Committee
D	Deliverable	KPI	Key Performance Indicator
DEM	Dissemination and exploitation manager	M	Month
DPC	Deputy Project Coordinator	PAB	Flspace Project Advisory Board
DoW	Description of Work	PC	Project Coordinator
EB	Executive Board	PMG	Project Management Group
EC	European Commission	PO	Project Officer
e.g.	Exempli gratia = for example	RTD	Research and Technological Development
EU	European Union	SC	Steering Committee
ETP	European Technology Platform	SME	Small and Medium Sized Enterprise
FIA	Future Internet Assembly	ST	Sub-Task
FI-PPP	Future Internet Public Private Partnership	T	Task
FP7	Framework Program 7	TA	Technical Architects
GA	Grant Agreement	WG	Working Group
GM	General Meeting	WP	Work Package
ICT	Information and Communication Technology	WPMT	Work Package Management Teams
i.e.	id est = that is to say		

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1. Introduction

The Future Internet PPP is a large European Public-Private Partnership to shape Europe's Internet for the future. The FI-PPP consists of three phases. Flspace is one of the projects in the second phase, and builds a platform for business collaboration. Within this project, work package WP500 aims at:

- (1) Mobilizing, engaging and preparing stakeholders across Europe for participation as application and service developers building on and extending the large-scale trials;
- (2) Fostering and demonstrating potential for innovation of Flspace (related to market impact in the food and logistics sector), and
- (3) Delivering a consistent plan to move into the Phase-3.

The above objectives are supported by Task 570 'Plan to move into FI-PPP Phase-3'. The objective of this task is to aggregate relevant results concerning the Flspace platform, the required and deployed infrastructure and the performed trials as well as WP500's own progress towards ecosystem building, business modelling, regulation, standardization and exploitation, in order to draft specific requirements, deployment options and recommendations for eventual FI-PPP Phase-3 projects and to draft detailed plans for the large-scale expansion of platform usage facilitated by local and regional stakeholders including SMEs.

The major outcome of this task is to deliver a detailed plan to move into Phase-3, including detailed plans for the large-scale expansion of platform usage facilitated by local and regional stakeholders including SMEs. This report is the result of that task. It has been written in the first six months of the Flspace project, mainly to inform potential bidders for the FI-PPP Phase 3 projects.

The report contains the ideas the Flspace project currently has on expansion of its platform in large-scale experimentation. Undoubtedly, these ideas will evolve. An update of this report will be made in 2014. Currently we foresee that we will then provide information on successful bids of Phase 3 and how they will help to expand the Flspace platform.

The next chapter gives more information on the EU's Future Internet Program, which is followed by an introduction to the Flspace project and what it wants to achieve. Chapter 4 discusses the Flspace proposals for large-scale experimentation of the Flspace concept, most likely in the FI-PPP Phase-3, but potentially also in national projects or in activities by the consortium partners. This is followed by a chapter on the EU's call for proposals on FI-PPP Phase-3. Chapter 6 provides information on how Flspace as a Phase-2 project will support that experimentation in Phase-3. In chapter 7 we answer a set of frequently asked questions (that are not highlighted enough in the rest of the text). We end with some reflections in an epilogue.

2. An introduction to the FI-PPP Program

The Future Internet Public-Private-Partnership Program¹ (FI-PPP) has been initiated by the European Commission to tackle the challenges where the current Internet lacks capabilities to sustain the networked society of tomorrow.

The main goal is to advance a shared vision for harmonised European-scale technology platforms and their implementation, as well as the integration and harmonisation of the relevant policy, legal, political and regulatory frameworks. As set forth in the Digital Agenda for Europe, these are considered to be prerequisites for realizing a European online Digital Single Market and, more broadly, an inclusive knowledge society.

The FI-PPP program aims to give an impulse to European industry by increasing the effectiveness of the business processes and infrastructure supporting applications in several areas, like health, energy, logistics and agri-food. The competitiveness of European technology industry is also a motive.

The FI-PPP follows an industry-driven, holistic approach encompassing R&D on network and communication infrastructures, devices, software, service and media technologies. In parallel, it promotes their experimentation and validation in real application contexts, bringing together demand and supply and involving users early in the research lifecycle. The new platform will thus be used by a range actors, in particular SMEs and Public Administrations, to validate the technologies in the context of smart applications and their ability to support “user driven” innovation schemes.

The FI-PPP program consists of three phases. In the first phase eight use cases were selected. These use cases worked on:

- identifying and describing the technical, functional and non-functional FI-specifications for experimentation,
- identifying and developing sector-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 second phase.

Figure 1, below, gives the FI-PPP Program Architecture, with the names of the eight use case projects from phase 1. It also shows projects like CONCORD, INFINITY and FI-WARE that organise the program and build the infrastructure and basic software (“generic enablers”) for the program.

¹ Taken from the program description on the EU Website: <http://www.fi-ppp.eu/about/>, where more information can be found.

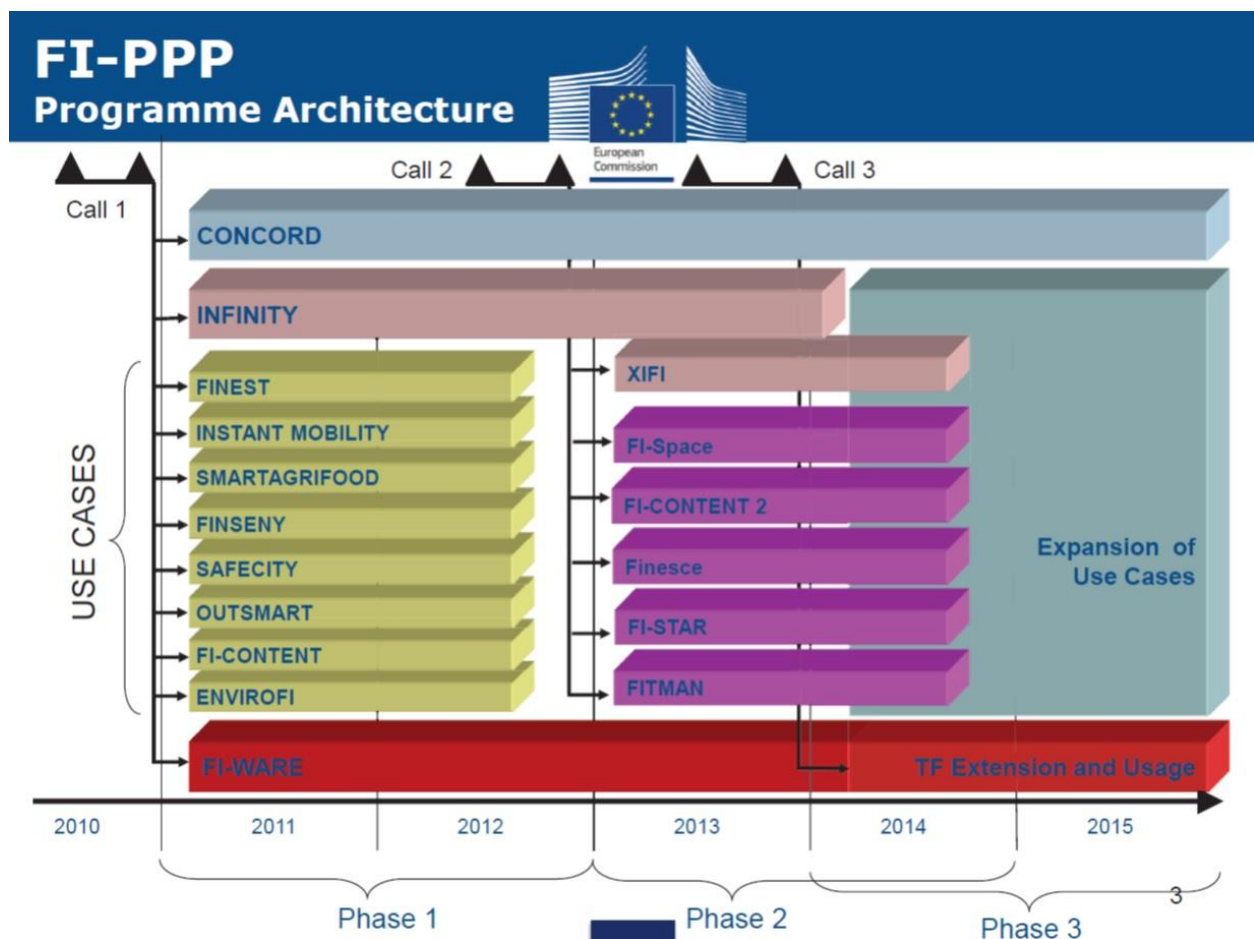


Figure 1: Program Architecture

In the second phase five trials have been selected, FIspace being one of them. These trials are working on expansion of the pilots and also include an open call, where first applications in the platforms will be developed. Chapter 3 explains this in more detail from the point of view of FIspace, a trial that follows up two use cases from Phase 1, Finest and SmartAgriFood. Note that not all use cases have evolved into trials, and that some trials (on Health and Manufacturing) work in domains not covered in the use cases. For the third phase a similar 'renewal process' can be expected.

In the third phase the use cases (trials) will be expanded into large-scale trials. For this phase 20 projects with maximized sectorial and geographic coverage will be selected. The third phase will also be used to validate the concepts and technologies developed in phases 1 and 2 of the program. Furthermore the third phase should make service infrastructures and business processes smarter and exploit open data.

This report delivers a detailed plan to move into Phase-3 from the perspective of FIspace. It presents FIspace as it stands on October 1, 2013. It should be noted that FIspace is work in progress and that some of the information provided is subject to change in the coming year.

3. An introduction to FIspace

3.1. An introduction to the rationale of FIspace²

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

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

The Future Internet – evolving from a network of computers and “static” information into a network integrating and connecting people, real world entities, as well as dynamic data streams in an unprecedented fashion – has revolutionised our social and business habits: creating and sharing content, learning, gaming or shopping, networking or phoning friends across the globe: all these activities have moved online. This change is far from over³ – but it so far has mostly influenced the business-to-consumer world: you can shop online and transactions are seamlessly integrated by payment and shipment services; numerous social media platforms help you to make choices, give feedback and create communities of interest; there are numerous online services for, e.g., finding your way through traffic, for sight-seeing, and for interacting with the government; and this experience is leveraged by tablets, smartphones and other integrating devices (e.g., in cars, trains) that enable you to access and interact with these services at any time and any place with great ease.

However, this trend has not yet reached the world of business-to-business interactions. Of course, with smartphones you are able to read your e-mail and get some “static” information about your business (such as documents, etc.). But where are the Future Internet services and apps that allow you to monitor and manage your business processes at any time and from any place with the same ease that you are used to as a consumer?⁴ There is no such a thing as a Facebook for businesses that supports interaction with your business partners, easily leverages

² Taken and adapted from the FIspace Description of Work

³ Adapted from http://ec.europa.eu/information_society/activities/foi/index_en.htm

⁴ Inspired by an interview with Ben Boeser from SAP <http://www.jd-od.com/2012/05/06/ben-boeser-on-sap-startup-culture>

your business opportunities, or facilitates the collaborative monitoring and management of cross-organizational business processes. Instead, today the actors in collaborative business networks must rely on the desktop PC at the office and use large, monolithic ERP-like software applications to manage these processes; when it comes to business-to-business processes and transactions in a supply chain, these systems are still poorly integrated and much manual intervention takes place, resulting in deficiencies and lack of visibility that hamper business efficiency as outlined above.

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

3.2. The origin of Flspace⁵

The rationale of Flspace was discussed above, as a laymen’s introduction to the need for Future Internet tools in the business environment: there is no such a thing as a Facebook for businesses that supports interaction with your business partners, easily leverages your business opportunities, or facilitates the collaborative monitoring and management of cross-organizational business processes.

The need for such a collaboration and integration service was explored in the FI-PPP Phase 1 projects SmartAgriFood and Flnest. SmartAgriFood mapped the needs of business from farm to fork (and back) in farming and the food (and flower) industry. Flnest studied needs in transport and logistics, be it transporting consumer electronics from China to Germany or the logistics of fish from Norway through EU ports to European as well as Brazilian consumers.

At first blush the two domains of agri-food and transport and logistics do not appear to have much in common. Yes, one does need to move agricultural products from the greenhouse, farm, or ranch to processing locations and retailers so there is an element of transport and logistics embedded in the domain. However, this would seem to be a peripheral element of the domain where more central activities of growing, harvesting and selling differ extensively from the conduct of operations in the transport and logistics domain.

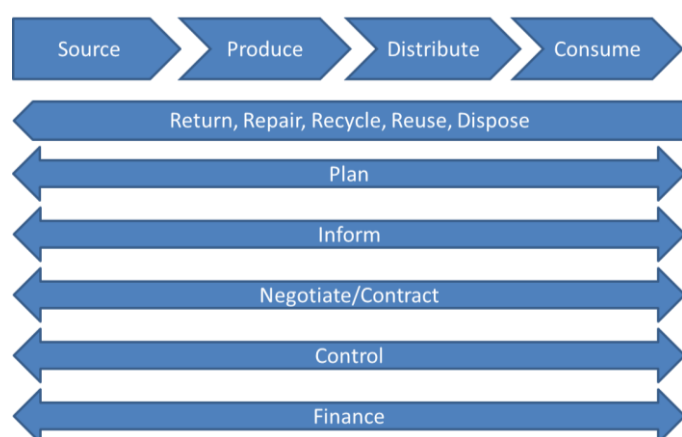


Figure 2: A stylized cross-domain operations framework

⁵ Adapted from the Flspace Description of Work

When looked at on a micro level all businesses are different. What integrates them into a comprehensible whole is the application of a logical framework that provides useful abstractions from the particular to the general. Such a framework allows surfacing commonalities between seemingly disparate activities, such as terminal management, farm operations and greenhouse operations, which allows them to be supported by general-purpose Future Internet services and, more particular to this proposal, collaboration services.

A framework that provides an integrative metaphor for this project is that of production. In a production operation one must source materials so that they can be converted by the “production” process into finished items that can be distributed and consumed. In performing all of these functional activities, the business person (whether farmer or logistics service provider) creates plans, contracts with third parties, manages financial flows, provides information to regulatory and consumer bodies, and controls their operations. This business person, using personal contacts and contacts recommended by trusted partners, collaborates with other product and service providers to bring their products to market as efficiently and effectively as possible. outlines this general business framework for a generic business. Figure 3 summaries the motivation and impact of Flspace.

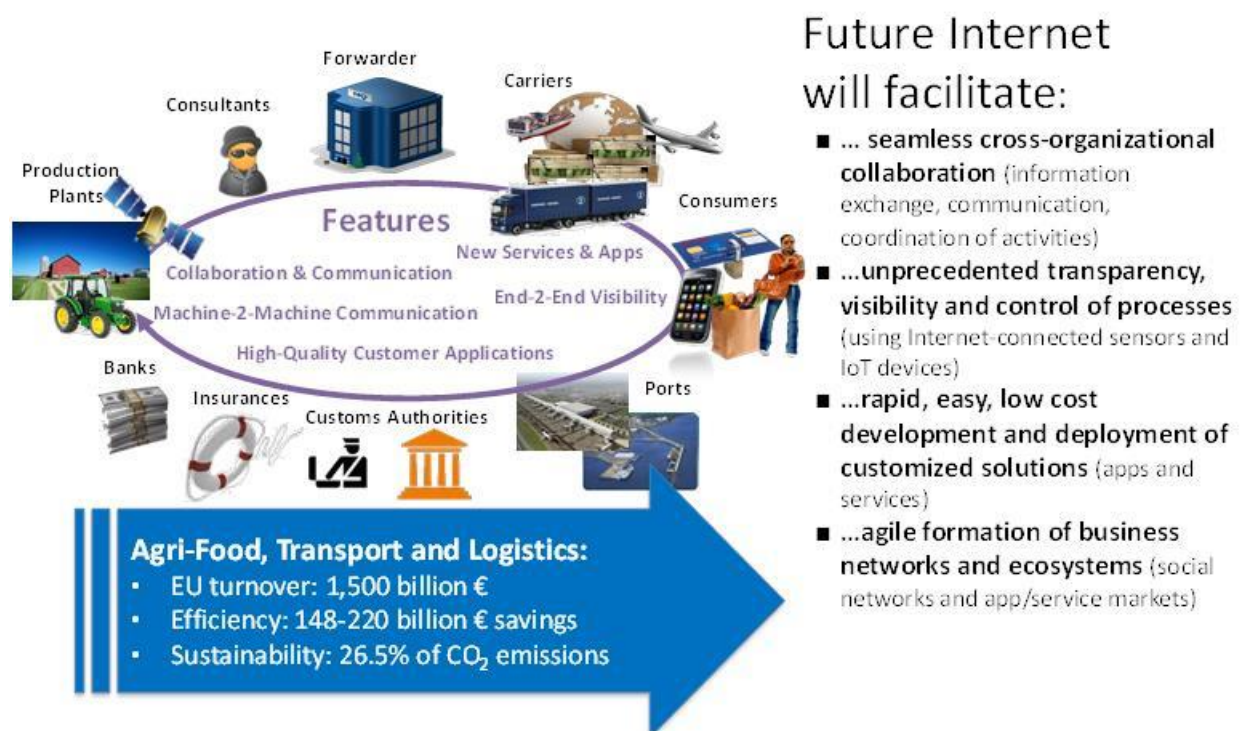


Figure 3: Motivation and impact of Flspace

Using the production metaphor allows one to see how transport and logistics operations integrate and support the operation of agri-food businesses, and how different agri-food operations actually fit within a total production chain. The general nature of the framework also demonstrates how producers in one domain operate in a similar manner to those in other domains. For instance, a producer of consumer goods actually operates in a manner similar to an agri-food producer. This framework integrates the Flnest and SmartAgriFood use case projects from Phase I of the FI-PPP program.

3.3. The Flspace concept⁶

Flspace develops a multi-domain collaboration and integration service, based on the FI-WARE core platform and Future-Internet technologies, enabling new business models that overcome these deficiencies (Figure 4).

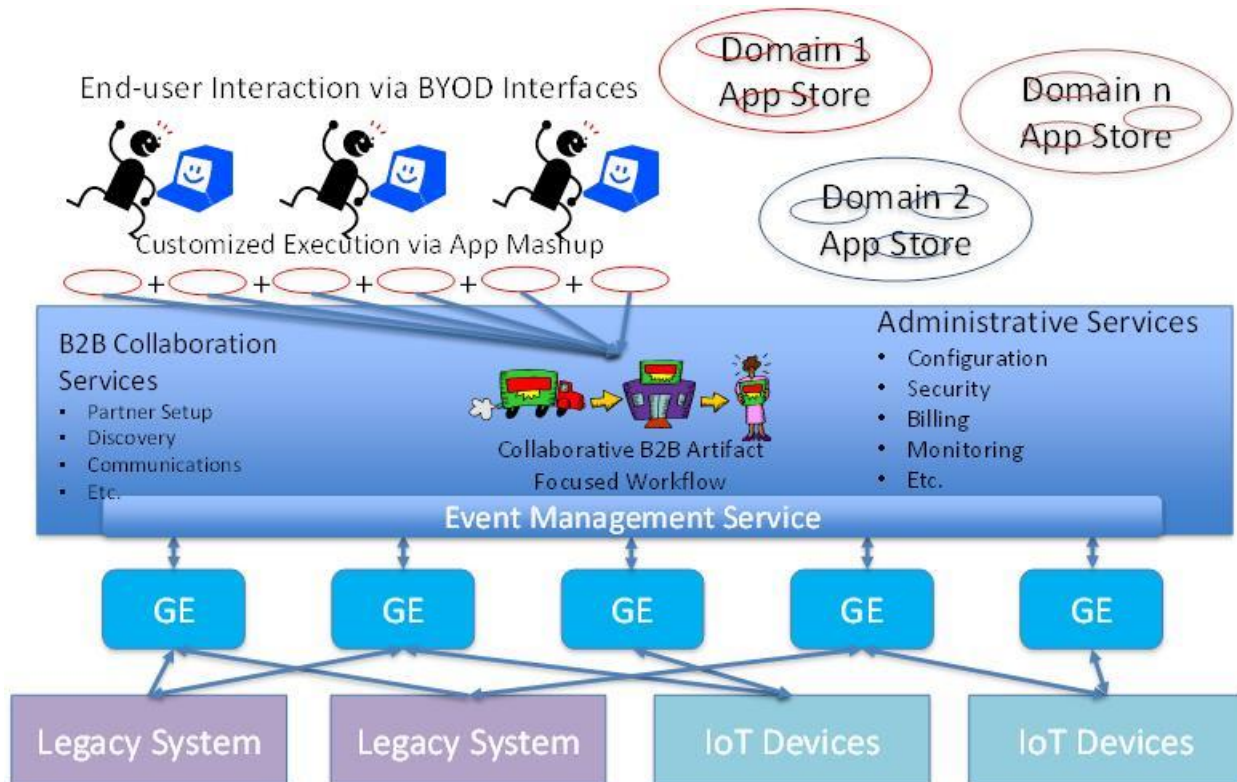


Figure 4: The function of Flspace in relation to legacy systems, Internet of Things and Generic enablers (GE)

The central features of the Flspace collaboration service are as follows:

- Provisioning of the Flspace service will follow the Software-as-a-Service delivery model, which means that Flspace services can be accessed anywhere at any time via any device;
- The Flspace service is an open service that can be extended and customized for specific stakeholder demands by integrating domain apps (similar to the iOS (iPhone) and Android business models);
- A domain app store facilitates the marketing of targeted applications that take advantage of the collaboration and mash up services of the Flspace and its underlying FI-WARE generic enablers;
- A collaboration manager for business-to-business networks supports the planning and execution of business operations from a global perspective with message-based coordination among the involved business partners;
- Integrated techniques are available for monitoring and tracking on the basis of data integration from the Internet of Things, including sensor systems and smart item technologies accessible via FI-WARE generic enablers;

⁶ Adapted from the Flspace Description of Work

- Information integration from legacy and third party systems is enabled through a service-based integration layer that is enabled and supported by FI-WARE generic enablers;
- Role-based views for the individual participants in the business networks along with integrated security and privacy management offer fine-grained access control to confidential information.

For non-ICT experts, especially those interested in food chains, Annex 1 provides an example what (an instance of) FIspace might look like in a food chain, from the perspective of a farmer, an app supplier, an input supplier and the consumer (and its retailer). The architecture of FIspace is given at a high level in Figure 5.

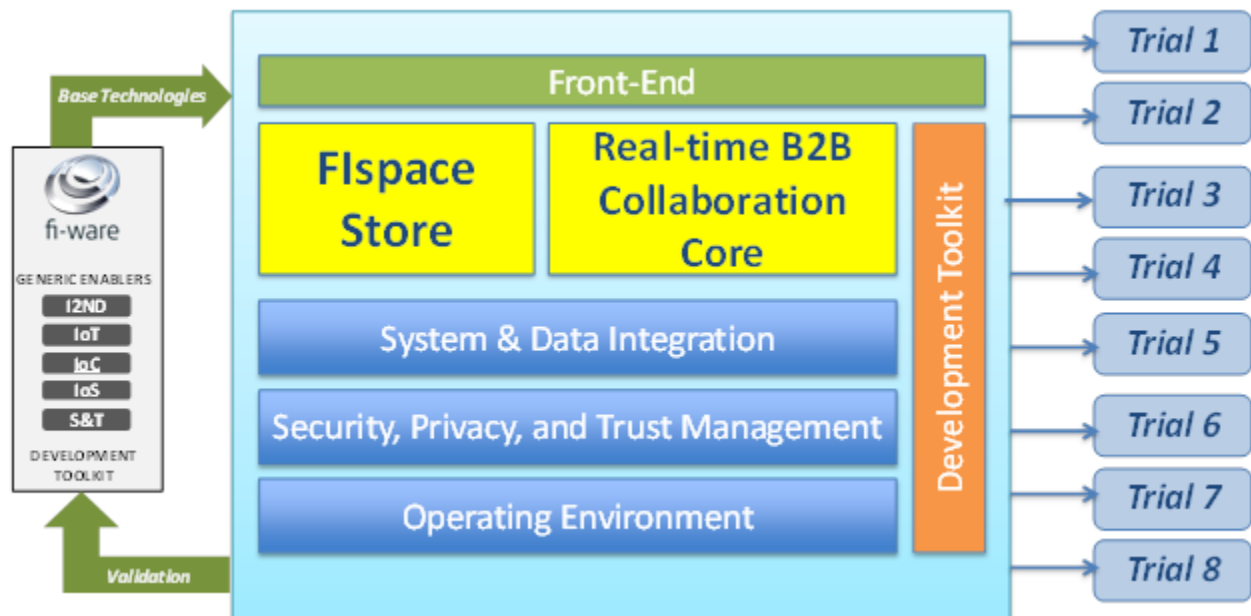


Figure 5: The High level architecture of FIspace

As indicated in this Figure (at the left side), the platform will be fully based on FI-Ware Generic Enablers. The yellow-coloured components indicate that the core features that will support business collaboration: the FIspace App store and the real-time B2B collaboration core that keeps track of the underlying business processes in these collaborations. A system & data integration module will take care of the needed integration with existing (legacy) systems and databases. Security, Privacy & Trust Management is also a basic overarching component that has to guarantee these issues at all time during business collaboration support. An operating environment is needed to make it all work together. The orange-coloured component represents the Software Development Toolkit that is needed for App developers to guide their developments and provide certain FIspace-specific requirements for their Apps. A more detailed description of the FIspace platform architecture will be published in deliverable D200.2 on the website www.fispace.eu.

In the FIspace project, there are eight use case trials that are used to develop and test the FIspace platform and will provide already several baseline functionalities (that will be described in FIspace's deliverable D600.6). More information about the trials will follow in the next section.

The green-coloured component in Figure 5 represents the front-end layer. The Flspace platform will be approachable in different manners, also without an explicit user interface (machine-to-machine communication). A user interface will most likely look like a LinkedIn or Google+ interface, but can also be integrated in back-end software or in specific apps.

3.4. The Flspace project

The project to realise the Flspace started, as the other Phase 2 projects, on April 1, 2013 and will run for two years. That implies that it partly overlaps with the Phase-3 large-scale trial projects that are expected to start May 2014 and will start calling web-developers and app-builders for proposals in the autumn of 2014). Figure 6 gives an insight into the project activities and the main milestones of Flspace. Those milestones includes release dates for the software that becomes available for Phase-3 projects.

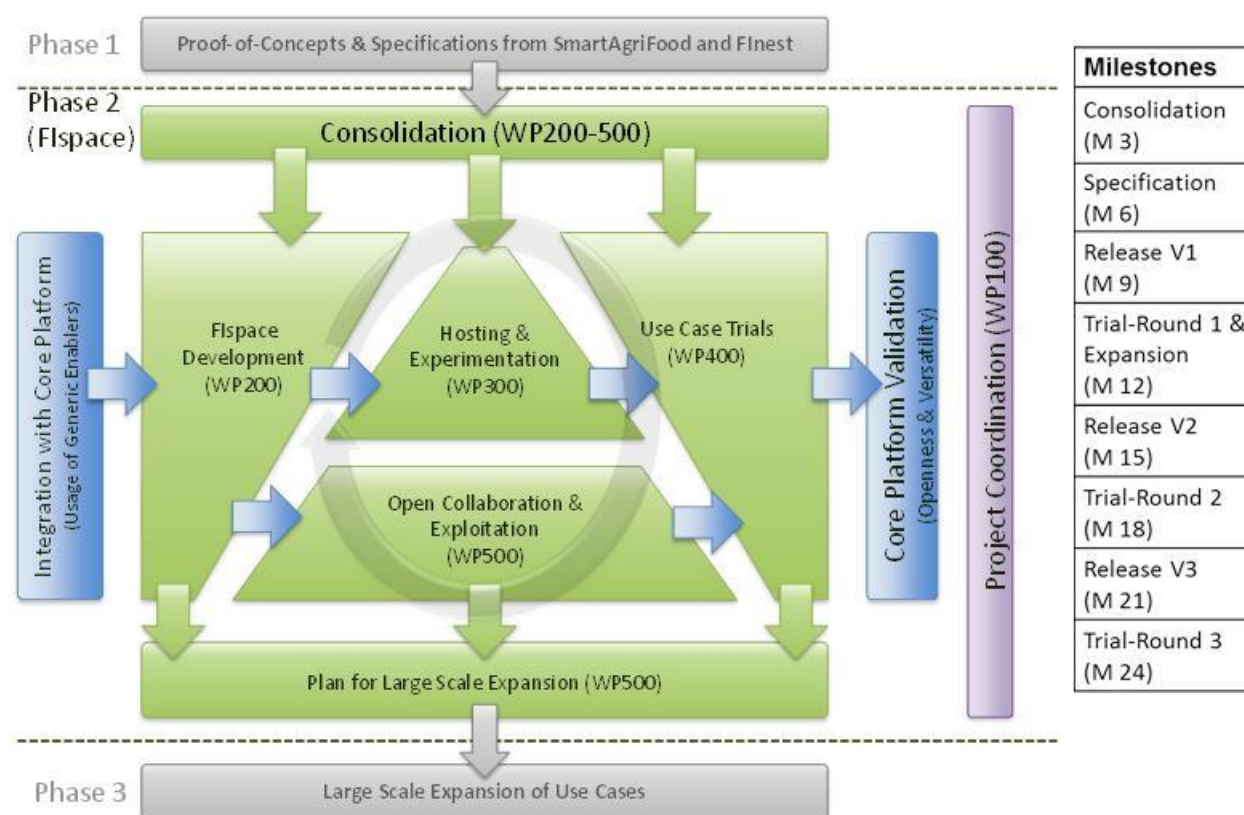


Figure 6: Approach and key results of Flspace

The Flspace project builds the Flspace business collaboration platform in different releases with interaction between the central development (based on so called Generic Enablers from the FI-WARE project and domain specific enablers developed in Flspace) and a number of use case trials. These trials build upon experiences in the projects Finest and SmartAgriFood and are described in Table 1.

Table 1: Description of use case trials in FIspace

Name	Main topics	Project partners and location
Crop protection info sharing	Farming in the cloud trial where actors in the chain exchange data on crop protection under operational circumstances	DLO, Kverneland, Lime Tri; the Netherlands
Greenhouse management	Farming in the cloud trial where actors in the chain optimize the operational management of a greenhouse	NKUA, OPEKEPE, Innov; Greece
Fish distribution and planning	Intelligent perishable goods logistics trial with fish import and re-export	MRTK, NCI, Norway, Germany
Fresh fruit and vegetables quality management	Intelligent perishable goods logistics trial for quality management of fruit and vegetables using RFID chipped boxes	CentMa, GS1, EuroPool-Systems; Germany
Flowers and plants supply chain monitoring	Intelligent perishable goods logistics trial for optimizing waste and quality management of flowers and plants	DLO, Florecom, GS1, Milo & Alexander; the Netherlands
Meat information and provenance	Smart distribution and consumption trial for tracing and tracking of meat from farm to fork	WU, GS1; the Netherlands
Import – Export of consumer goods	Smart distribution and consumption trial for the global logistics of consumer goods	ARC, K+N; China, Turkey, Germany
Tailored information for consumers	Smart distribution and consumption trial to match data from the production and logistics chain with consumer profile on handhelds of consumers	ATOS, UPM, PlusFresc, Spain

3.5. Business model FIspace

A multi-domain collaboration and integration service will only be successful if it has a sound business model. This will be developed in the FIspace project. The current thinking regarding some key aspects of the business model is as follows.

3.5.1. What will FIspace offer?

In short, FIspace will provide a multi-domain cloud-based platform that enables business collaboration with a data integration service, based on FI-WARE core platform components and Future-Internet technologies. It will be an open platform that can be extended and customized by integrating (domain specific or more generic) apps. These apps will be provided on an app store (the FIspace) and can be mashed-up with – and reused by - other apps. The core of the platform is a business collaboration “engine” that supports the planning and execution of business operations. It also includes integrated techniques for monitoring and tracking on the basis of data integration from the Internet of Things, including sensor systems; as well as from legacy- and third party systems. This is enabled, through a service-based integration layer stemming from the FI-WARE generic enablers. The platform accommodates role-based views for the indi-

vidual actors (buyers, sellers, administrators that assign roles within a company, app developers etc.) in the business networks along with integrated security and privacy management for access control to confidential information (see also Section 3.5.2 and 3.5.4).

3.5.2. Problems addressed

Flspace addresses the overall problem of limited use of ICT in business collaboration networks. It unleashes so far unrealised efficiency gains. Current enterprise information systems are generally closed and limited to one company, with limited interoperability between systems; still characterised by human intervention and the use of paper, fax, phone, mail etc. In addition tracking and tracing solutions are still very limited, not least in the agri-food value chain. The benefits pertain in particular to smaller companies (SMEs), for which business software has been too expensive and difficult to implement, while the need for flexible and customized solutions have increased in order to compete in the globalized market.

3.5.3. Positioning

Flspace differentiates itself from existing solutions through its openness, the possibility to construct a business collaboration on the platform and the possibility to mash-up and reuse applications and application components. Existing commercial platforms (e.g. GT Nexus) are closed and do not include any app store. Some experimental platforms (e.g. the Fraunhofer Logistics Mall) come close, but require from app developers to make full-service applications.

3.5.4. Actors on the Flspace platform

Flspace is envisioned to operate as a multi-level multi-sided platform. First, the platform mediates industry partners initially from the logistics and agricultural food sector and app developers that develop and provide sector-specific apps on the Flspace store. Second, each app that is developed and hosted on the platform, mediates two sides of a market (with possible expansion to even more sides, such as advertisers) most often buyers and sellers of a product or service. Hence, there are four key actors (roles) at the core of the Flspace value network:

Business user - buyer: An actor that needs a service, product or information, and seeks to establish a business relationship with service or product providers (a Logistics Services Client, e.g. a shipper that needs to ship goods, a manufacturer who needs material, a farmer that needs spraying advice). The buyer is not only interested in contacting a seller, but also wants to use the platform to draw up a contract and specify (plan) the execution of the contract, including its monitoring which requires an exchange of data.

Business user – seller: An actor that wants to sell a service or product to another business user, e.g. a Logistics Service Providers (LSPs) that provides logistics execution services for performing transport operations on behalf of a shipper or a Farm management System (FMS) provider that supports spraying planning. The seller is not only interested in contacting a buyer, but also wants to use the platform to draw up a contract and specify (plan) the execution of the contract, including its monitoring which requires an exchange of data.

Application developers/providers: Entities that develop reusable apps (or app components) in conformance with the Flspace platform's app development requirements. Apps are provided via the Flstore, and will often be linked to current services (e.g. spraying advise).

Platform Operator/Provider: A company or other entity that operates the platform, including its maintenance and the Flstore, and provides the necessary support and toolkits to app developers. The platform operators may also take on the roles of developing the platform and its components as well as hosting the platform, but these roles could also be performed by other companies. Exactly which roles the platform operator/provider should take up are still under consideration in the Flspace project.

Additional actors foreseen includes consultants who support the business users in deploying the applications, financial service providers and, possibly in the future, advertisers who would seek to advertise their goods or services on the platform.

3.5.5. Value proposition

Flspace will be commercially viable only insofar as it creates value for *all* key actors in the ecosystem. In general Flspace proposes to offer the following business benefits:

- Better satisfy customer requirements, such as: end-to-end visibility and event management, enhanced monitoring and tracking of goods as they move along the value chain, less costly and better tailored offers goods and services, significantly reduced waste of perishable products, immediate notification of deviations and the occurrence of hazardous events, lower environmental impacts through increased network efficiencies, and more transparent operations.
- Increase business efficiency and optimization throughout the value chain by: significantly reducing manual efforts for planning and re-planning, enhancing interoperability among heterogeneous systems based on business standards, automating support for coordination of operational activity execution, providing accessibility anywhere and anytime via any device, and facilitating the rapid identification and contracting of capable business partners.
- Facilitate new business opportunities by providing more efficient and transparent service offer management, optimizing partner contract negotiations, facilitating new business partner interactions and collaboration opportunities, and providing access to true end-to-end business and consumer performance metrics.

In addition, Flspace allows all business users access to a greater variety of sellers as a result of the platforms search capability. Smaller service providers will be present on the platform. Easier customization of business processes, the possibility to pay only 'per-use' and automated contracting, service level management and payment services will all be established.

While the above envisioned business benefits as specified in the proposal stage of Flspace, this value proposition needs to be translated into measureable indicators, validated, refined and adapted to different domains through testing and business impact assessment in the trials.

For application developers the main value proposition is probably the access to a larger market and the relative ease of developing new applications. For the platform provider the main value proposition is to create new revenue streams for platform software and/or from the operations of the platform (from business users and app providers).

3.5.6. Platform revenues

Key to the sustainability of business model of the platform is that all players in the ecosystem can generate revenues to cover the costs of being present on the platform.

The main source of revenue is likely to come from the business users of the platform, who in turn have to be willing to pay because of their perceived value of using the platform. Several revenue models can be foreseen including entry fees, subscriptions and transaction-based fees. The platform may in principle also generate revenues from sales of software development kits (SDKs), services supporting the development of applications and the deployment of these applications for specific business users.

However, pricing of the platform needs to take the economics of multi-sided platform markets into consideration. There is a need to rapidly build “critical mass”, by reducing the entry barriers to the platform. Hence, several types of fees likely have to be abandoned initially in order to attract early users. As an example, business partners might restrain from connecting their legacy systems to the platform if the investment is exceeding their assumed benefits. Hence the platform needs to limit their objections by providing subsidizing incentives to allure these entities.

Transaction fees for platform services will likely be used and based on the volume of services or goods managed by the use of apps. Flat rates are also foreseeable. These revenues should be shared between app providers and the platform operator, the largest share probably being kept by the app provider. App providers may also generate revenue if their apps are mashed up with and/or used by other apps.

The platform operator needs to choose whether or not to charge both sides of the business collaboration market. Plausibly the business user-sellers will be charged, possibly also the buyers. Even within this group of actors price discrimination is possible, e.g. offering discounts to influential (large) business users hoping that their presence will attract other business users. In principle the platform operator could charge for the provision of SDKs and app development support, although this is probably strategically unwise in a build-up phase since it will discourage the app developer community.

A range of other revenue streams is foreseeable. Should a large software house decide to develop the platform, but not operate it, it could license the software to platform operators along with any professional services fees from the implementation of the platform. A platform host would also charge the operator for hosting the platform. Consultants and systems integrators could generate professional service fees for deploying applications at the user side, performing backend integration services, e.g. resulting from the need to connect legacy systems or integrating IoT device to the platform. Financial service providers could generate revenue by charging a fee for clearing payment transactions.

In the next year the FIspace project will further reflect on the business model of the platform. Input from business model testing in the trials will contribute to these choices.

3.5.7. Costs

The cost structure of FIspace is not fully investigated at this point, but could (as analysed in the Finest project) in principle be divided into development, operating and marketing costs. Development costs include all costs associated with building (new features into) the platform, supporting application functionality, upgrading SDKs, and integration costs. The development of applications themselves is another cost for the entire ecosystem. Operating costs could include licence fees to the platform software developer (if different from platform operator), licence cost for the use of generic enables, hosting service costs, customer support and maintenance cost. Marketing costs include shipper and LSP acquisition costs, developer acquisition costs,

marketing events, user group events, advertising, and sales costs. The latter constitute a critical part of the ecosystem building activities.

3.5.8. Building the Flspace ecosystem

As touched upon earlier in this section, the viability of the Flspace business model depends on its ability to build a sustainable ecosystem, attracting participants at all sides of the market. The sustainability of the Flspace ecosystem rests on the one hand on providing a (statically) viable business model for all stakeholders in the value network, allowing them to realize gains via the platform and on the other hand on igniting a sustainable ecosystem for innovation, through stimulating, providing incentives and reducing barriers (i.e. increasing the innovative opportunities) for development of innovative apps (notably by, but not restricted to, SMEs and web entrepreneurs).

Clearly, Flspace needs to engage in direct marketing to business users well as app developers through, e.g., the platform operator's internal sales and marketing personnel, online website information, conference demonstrations and discussions, user group events, mailings (electronic and physical), sponsorship of events and other approaches.

Flspace will also need to provide business users with opportunities to evaluate the potential benefits of the platform. This will already happen during the Flspace project, and will be extended into the FI-PPP Phase-3. Potential buyers of products or services would need to know that there is a sufficient number of sellers and apps available to be able to execute for instance an end-to-end shipment. The system should aim to be self-explanatory in the basic but might however require education and support on both sides of that market (e.g. on how they can find business partners and execute the business process). Free apps need to be provided in the early testing phases.

Flspace also need to provide app developers not only with SDKs but also with training, testing and other support services. Even monetary incentives could be envisioned. Releasing the Flspace Store with an initial set of apps, possibly beyond the existing set of baseline apps, will stimulate early usage and demonstrates third party developer how apps are to be developed.

It will also be crucial to incentivize large influential players in the different domains to adopt Flspace. Big brand names may have crucial influence on their own (possibly smaller but more numerous) suppliers to join likewise.

3.5.9. Realising the Flspace Platform and related IPR issues

At some point in time, probably after Phase-3, Flspace needs to shift to a more commercial mode, the timing and character of this shift needs to be further specified during the course of the Flspace project. At this moment (September 2013) it is still unclear who will step forward to realise and own the Flspace platform.

The Flspace project will release an alpha-version of the software, and that means that a considerable investment could be needed to bring it to a beta-release. Back-of-the envelope calculations in the FI-space project suggest € 7 – 10 mln., or a team of 15 programmers with a talented chief software architect. It could be that one of the consortium partners of Flspace will take up this venture, but that is not guaranteed.

One could also imagine that several companies or organisations inside or outside the current consortium would like to pick up the Flspace platform. A Flspace platform could be owned and

run by a strong company in an industry (e.g. a major retail company in food, or a logistic provider to organise data exchange with its sub-contractors, or a public service like a paying agency in the Common Agricultural Policy that has to organise data exchange with 100.000+ farmers).

But for the Flspace platform to succeed (and stay close to its rationale of making data of business partners more open) it is more likely to succeed in the hands of a “neutral” party. That could be an ICT company, but also an independent industry organisation (e.g. a standard organisation or a commodity board or an industry organisation that organises e.g. the fish industry in a country). Such organisations could invest in a Flspace platform themselves or host an instance of it with an ICT company, for instance the one that builds a Flspace platform. This ICT company can then earn their development costs back from the license fees.

A situation with several Flspace platforms does not have to be problematic for interoperability. Like there are several web-browsers (Chrome, Internet Explorer, Safari etc) and several e-mail programs, there could be several Flspace platforms. That would require a standardisation of the Flspace open protocols and registration of these protocols with a standardization body, comparable to the W3C-consortium that governs the world wide web protocols (Figure 7).

The way the Flspace platform(s) will be realised, not only influences the costs of users and app developers, but also issues of intellectual property rights (IPR). These issues are still under investigation in the Flspace project.

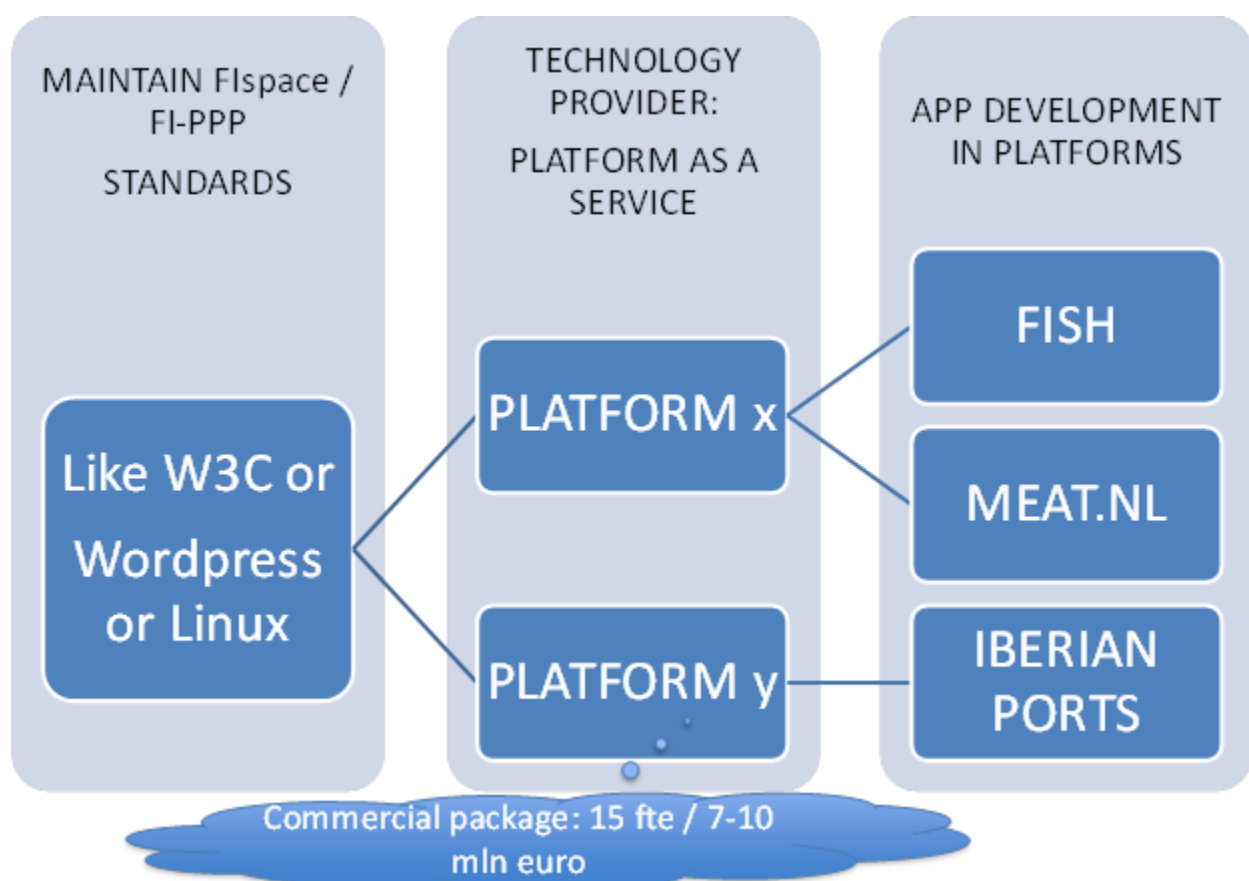


Figure 7: Potential organisation in case several Flspace instances would be build

The issue of IPR should not be problematized too much. There are some IPR issues to be solved around the generic enablers of FI-WARE that are used in Flspace, especially where FI-WARE consortium partners used some software with IPR. For the exploitation phase of Flspace the terms and conditions of the Flspace platform operator (fee for use etc.) are much more important than the IPR as such. The Flspace project is investigating if a free software licensing method (like GPLv3 that is compatible to Apache) can be used. That would turn the copyright into a 'copyleft'.

The disadvantage of not exercising a copyright is that it makes it more difficult to raise money for investments: a copyright generates an income stream that recoups investments. That is a the reason that SME can keep their IPR on what they develop for the Flspace store.

4. Phase-3 Large-Scale Expansion

4.1. Introduction

This chapter describes the large-scale expansion of the Flspace platform, as currently envisioned by the Flspace project / consortium. For the moment we focus on suggestions for that expansion that could fit in the call of the EU for the third Phase. More information on that call is given in Chapter 6. For the moment it is sufficient to realise that one of the objectives of the third phase of the FI-PPP is to involve SMEs and web-entrepreneurs as developers of highly innovative, infrastructure based, data-rich services and applications, building on, and extending, the large-scale trials and the core platform functionalities. Another one is to provide and run a stable infrastructure for the large-scale trials. The aim of the third phase is to set off the use of the innovative internet services and applications, developed in the first and second phase of the program. The target outcomes of Phase-3 are:

- development of a large set of innovative and technologically challenging services and applications
- validation of the concepts developed in previous phases
- public service infrastructures and business processes that are made significantly smarter

In the next section we identify a number of potential areas for large-scale expansion.⁷

4.2. Potential areas for expansion

Expanding the Flspace platform could be done in several ways:

- (i) The use case trials from Phase 2 in Flspace could be used as a starting point. The trials with the companies involved could be seen as trials in that industry for business collaboration and with a “snow-ball” method, probably involving industry organisations, the collaboration could be extended to other business partners. These business partners could be attracted as partner by providing more innovative apps. An example would be to roll out the experiences in the flowers and plants trial to the whole flower industry in the Netherlands or Europe, or global (as quite some flowers in Dutch auctions originates from countries like Kenya and Israel). It could be attractive to learn from experiences in different regions, so a project could be organised on a regional base. Alternatively the project could be organised by sectors that could learn from each other.
- (ii) In addition the use case trials from Phase 2 in Flspace could be combined and expanded. For instance the use case trial on flowers and plants could be merged with the use case trial on import and export of consumer goods. Also here more business partners could be attracted by providing more, innovative apps. It could be attractive to learn from different regions, or from different sectors: one region could specialise on flowers, and other on logistics and one intermediate, more combining other regions.
- (iii) The use case trials from Phase 2 in Flspace could be blended with new / other use case trials, e.g. from other Phase 2 projects, or Phase 1 projects. Purely as an example, it could be interesting to expand the Flspace use case trial on tailored information for consumers with results from the Phase 2 project on health FI-STAR, and further expand the apps in profiling on the handheld of the consumer. Something similar could be possible

⁷ In a next edition of this deliverable, we will also add a section on large-scale expansion outside the Phase-3 of the FI-PPP

between the Flspace use case trial on smart spraying and providing content to hikers in the rural area (Phase 2 project FCONTENT2). Another example is to use insights from the Phase1 project on the environment (ENVIROFI) that developed methods for plant-recognition and use them in business collaboration concerning precision farming. Also these projects could benefit from comparing experiences between regions.

- (iv) A totally different option to expand the Flspace platform is to look to a certain set of technologies or apps that are of critical importance for uptake of the platform. One could imagine for instance that several ICT-companies would like to contribute to more innovative solutions for identification management, data-authorisations and security, linked to a certain set of generic enablers. Another example could be a group of ICT-companies that would like to work on the Internet of Things with sensor technology in farming. Or a group that would like to blend insights from the gaming industry with learning in business collaboration and sustainable consumption (serious gaming).
- (v) Alternatively an expansion is possible in the field of technical integration. Flspace is working with legacy systems like ERP or traditional Farm Management Systems. It could be attractive that a company ecosystem works on expanding Flspace and make the transition from current legacy systems easier. That gives the leaders of such ecosystems (e.g. SAP for its ERP system) a natural stake in organising such a project.
- (vi) One option to expand Flspace fast in the farming and food sector is to link it with administrative data. All farmers are registered (at least those that apply for funds under the Common Agricultural Policy), land and animals are registered and food firms are registered at chambers of commerce. In addition there is much data in governments related to land use and food safety that is or could be made available as open data. This provides opportunities for regional development agencies and governments to make data available, call for innovative apps in the Flspace platform that provide advice to farmers and food business and use Flspace to create LinkedIn-like communities for businesses.
- (vii) A port or airport authority could do something similar in tracking the flows of goods in its (air)port and to support the collaboration between the different types of companies and authorities (ship pilots, traffic control, stevedores, ship brokers, logistic service companies etc.)
- (viii) Similarly logistics companies like Kuhne+Nagel could use the platform to organise their interaction with all the small suppliers to which they sometimes outsource activities like last-mile transport, ship brokering etc.

The following table provides some examples of these large-scale experimentation needs. The examples are rather detailed, to give extra insights. In many cases they can easily be combined. More suggestions on innovative developments in the domain of agriculture and the food chain can be found in a deliverable from SmartAgriFood, published on its website: SAF ICT induced innovation.⁸

⁸ <http://www.smartagrifood.eu/sites/default/files/content-files/downloads/SAF%20ICT%20Induced%20Innovation.pdf>

Table 2: Examples of large-scale experimentation needs

Potential Area for Large-scale Experimentation with the Flspace-platform	Short Description of an example in the framework of the EU call Phase-3 ⁹
Smart Spraying: technical machine / precision farming	Consortium partners (SME-associations, incubators, regional development authorities etc.) introduce Flspace to farmers, spraying contractors, food processing industry, machinery dealers etc. and lure them in as users by providing more (innovative) apps.
B2B tracing and tracking in fish, meat and vegetables	Consortium partners (SME-associations, incubators, regional development authorities etc.) introduce Flspace to all partners in the food chain for business-to-business solutions on tracing and tracking of perishable goods, including the prevention of food identity fraud. This is based on the three use case trials.
Horticulture on the move	Consortium partners (SME-associations, incubators, regional development authorities etc.) introduce Flspace to farmers, spraying contractors, food processing industry, logistic service providers, transport companies, retailers etc. and lure them in as users by providing more (innovative) apps.
Smart Spraying: Connecting farmers and hikers	Consortium partners (SME-associations, Tourism board, regional development authorities etc.) introduce Flspace to farmers, spraying contractors, food processing industry, machinery dealers, but also to hikers, tourists, nature management firms etc. and lure them in as users by providing more (innovative) apps that provide hikers and tourist information on farm management as they pass by (or intend to do so).
Food and health: Profiling and advice on the smartphone of the consumer	Consortium partners (SME- and consumer associations, incubators, regional development authorities etc.) introduce Flspace to retailers, consumers, food processors and health organisations and lure them in as users by providing more (innovative) apps.
Tracking and Tracing towards the consumer and patient	Consortium partners introduce Flspace to retailers, consumers, food processors, but especially also to hospitals, doctors and pharmacies to use Flspace's tracing and tracking options for food, medicines and personal food (with medicines added), and lure them in as users by providing more (innovative) apps in a secure environment with new options to advise and support patients at home. This has a potential mix with wearable technology (gadgets that measure health and sports activities).
(Food) Consumers in urban setting	Consortium partners introduce Flspace to retailers, consumers, food processors and logistic solution providers lure them in as users by providing more (innovative) apps. This is based on the idea that urban farming is a new niche and that innovative solutions could be provided by using Flspace and work in Phase-1 by the use case Instant Mobility on the Last-Mile Delivery issue.
Food and Out of Home	Consortium partners introduce Flspace to retailers, consumers, food processor,

⁹ In the example we assume often three regions, as the EU call requires at least 3 countries to collaborate. However it is not allowed that only SME ICT companies in three regions are targeted. The consortium should target ICT companies all over the EU or the European Research Area. As Flspace has strong network-effects (like telephones, the more businesses are connected, the more attractive it is to join), a regional approach can however be attractive by other criteria or just in practice by building the ecosystem of businesses that use the platform in that region.

Potential Area for Large-scale Experimentation with the Flspace-platform	Short Description of an example in the framework of the EU call Phase-3 ⁹
	food service companies and restaurants; lure them in as users by providing more (innovative) apps based on the Flspace project as well as trials on content (travel guides, restaurant services, recipes) developed in FICONTENT.
Food waste	Consortium partners introduce Flspace to partners in the food chain; lure them in as users by providing more (innovative) apps based on the Flspace project to deal with tracing and tracking and reduction of food waste, as well as optimizing its use in the bio-based economy (including energy).
Cows in the Cloud; Sensor data in Livestock	Consortium partners (SME-associations, incubators, regional development authorities etc.) introduce Flspace to farmers, veterinaries, slaughterhouses, machinery dealers (milking robots) etc. and lure them in as users by providing more (innovative) apps for precision livestock farming.
Satellite data	A consortium introduces Flspace to businesses that can innovate in their operations by making extensive use of satellite data that becomes available freely from Europe's Galileo program. Companies (e.g. farmers, food business, logistics) are lured into using the Flspace platform by providing innovative apps that use satellite / remote sensing data.
Privacy consortium	A consortium introduces Flspace to businesses that are attracted to Flspace due to a high level of privacy and security. Companies that provide identity management, solutions with one-(credit)-card for all password protect access, encryption services etc. are targeted to provide Flspace add-ons that make the platform attractive for sectors / businesses with a high demand for such add-ons.
Virtualisation and serious gaming	A consortium introduces Flspace to businesses that can innovate in their business by making extensive use of virtualisation and (serious) gaming. In Flspace the data from a (food) chain becomes available, and this provides opportunities to exploit such techniques. Companies (e.g. farmers, food business, logistics) are lured into using the Flspace platform by providing innovative apps that provide add-ons that virtualise the chain or let one play (serious) games for learning or what-if scenario analysis..
SAP (or Atos or ..) Eco system	A consortium led by a large ICT company (like SAP or ATOS) that has an ecosystem of spin-outs, start-ups and add-on suppliers, invites them to create innovative apps, also (but not only) in the area of linking Flspace to its current legacy systems (like ERP systems). At the same time it introduces Flspace to its current clientele.
Start-up communities	A consortium of venture capitalists and business angels or tech park managers offers Flspace to start-up communities in web-and apps development and runs a competition for attractive apps. Having these proposals judged by Chief Information Officers from food businesses and logistic solution providers it promotes the use of the enriched Flspace platform.
"Green" - Eco / Sustainability	A consortium of venture capitalists and business angels offers Flspace to start-up communities in web-and apps-development, as well as current providers of websites that support consumers in 'green' choices of food and transport, and runs a competition for attractive apps in the area of sustainability. Having these proposals judged by Chief Information Officers from food businesses and logistic solution providers in addition to experts from the sustainability organisations it promotes the use of the enriched Flspace platform.

Potential Area for Large-scale Experimentation with the Flspace-platform	Short Description of an example in the framework of the EU call Phase-3 ⁹
Flspace as LinkedIn for Farmers	A consortium of (semi) governmental organisations (like CAP paying agencies and chambers of agriculture / levy boards) and farmers' organisations organise the take up of Flspace by farmers and their business relations. Farmers and their business relations are lured into using the Flspace platform by providing innovative apps (to be developed by apps developers) that provide add-ons for application for CAP direct payments (with GIS component), register animal movements, records for GlobalGAP, BRC and related private standards, and all other paperwork between farmers on one hand and food producers and governmental agencies on the other hand.
Big/Open data	A consortium of regional development organisations / venture capitalists organise the take up of Flspace by farmers, food chain partners and consumers. They are lured into using the Flspace platform by providing innovative apps (to be developed by apps developers) that are based on exploiting open data sets and harvest data for big data analysis.
Services to Africa or BRIC: 'Broadband Aid'	A consortium of development agencies and content providers (university, international publisher) promotes the take up of Flspace in African (or BRIC) food chains, working for the European market as well as for improving local (African / BRIC) food markets. Many African farmers use smart phones to get advice and there is a starting ICT industry. European content providers might realise that this is an excellent chance to make European expertise available under new business models. Specific innovative apps are to be developed to support this.
Port management	A port or airport authority could set up a Flspace platform for tracking the flows of goods in its (air)port and to support the collaboration between the different types of companies and authorities (ship pilots, traffic control, stevedores, ship brokers, logistic service companies etc.).
Logistic network	In a similar way logistics companies like Kuhne+Nagel could use the platform to organise their interaction with all the small suppliers to which they sometimes outsource activities like last mile transport, ship brokering, container storage, etc.

The next figures provide slides that illustrate some of these ideas.

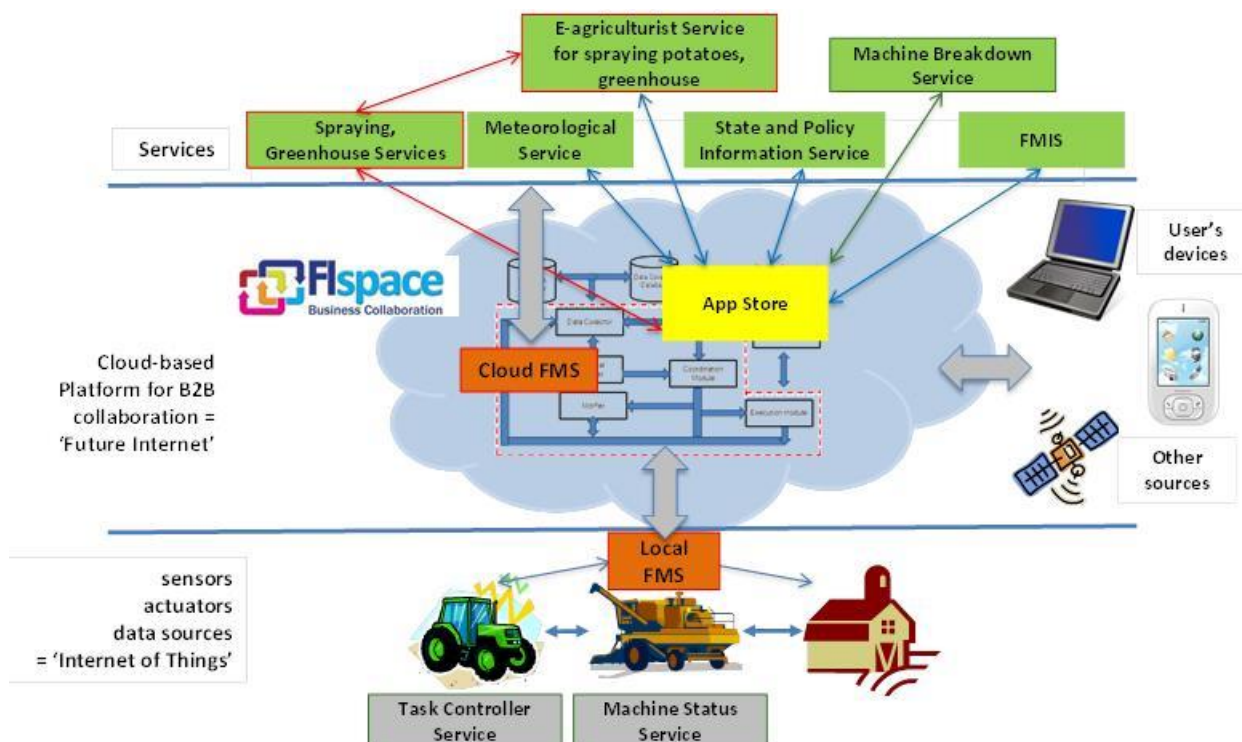


Figure 8: A concept for Smart Farming based on a cloud-proxy architecture

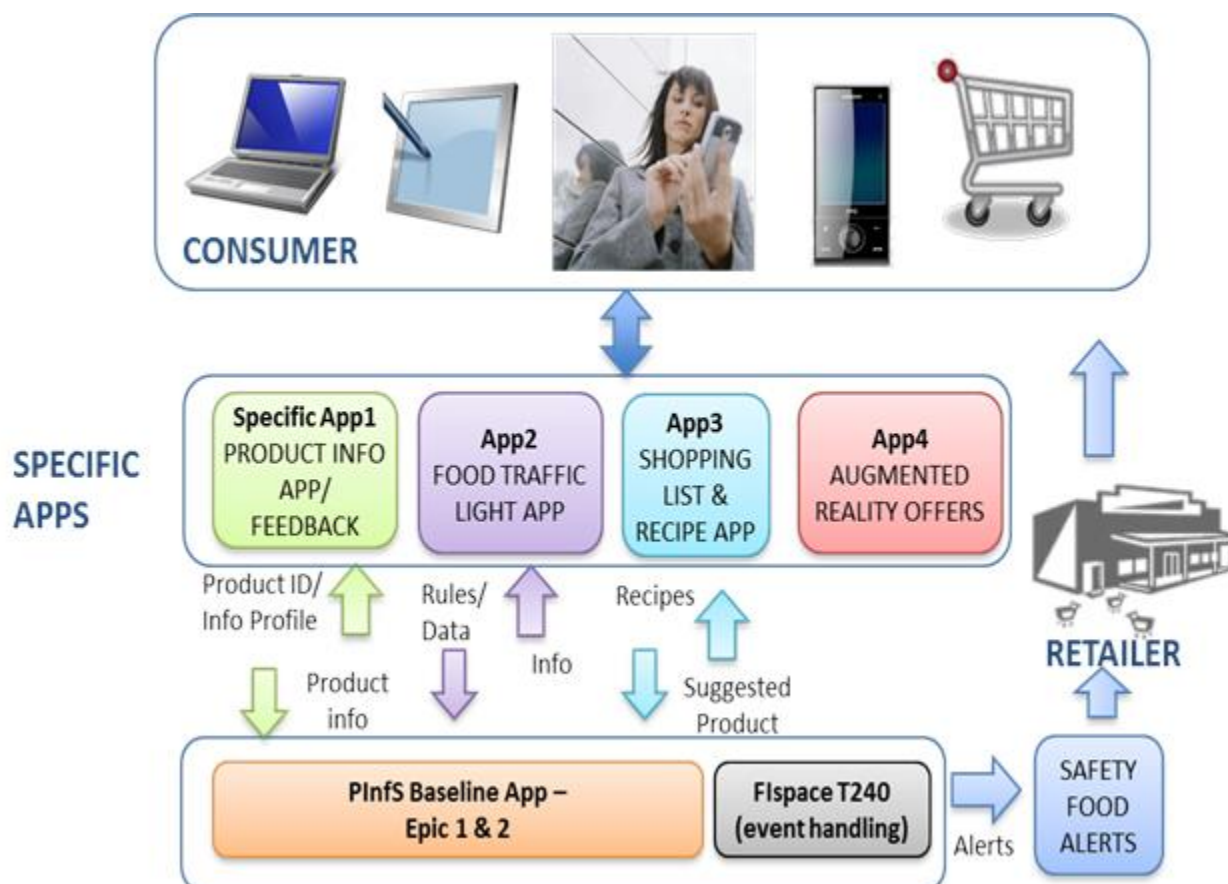


Figure 9: A concept for Smart Consumer Information on food

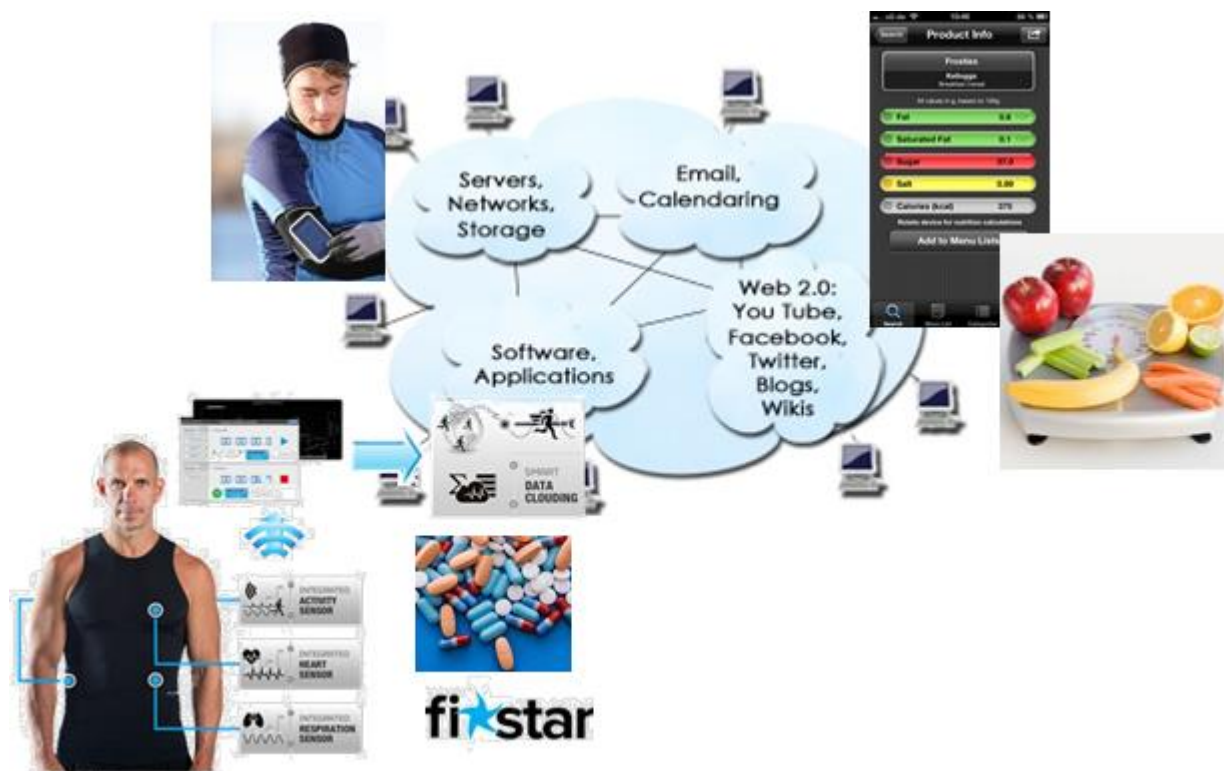


Figure 10: A concept for consumer / patient food and health services

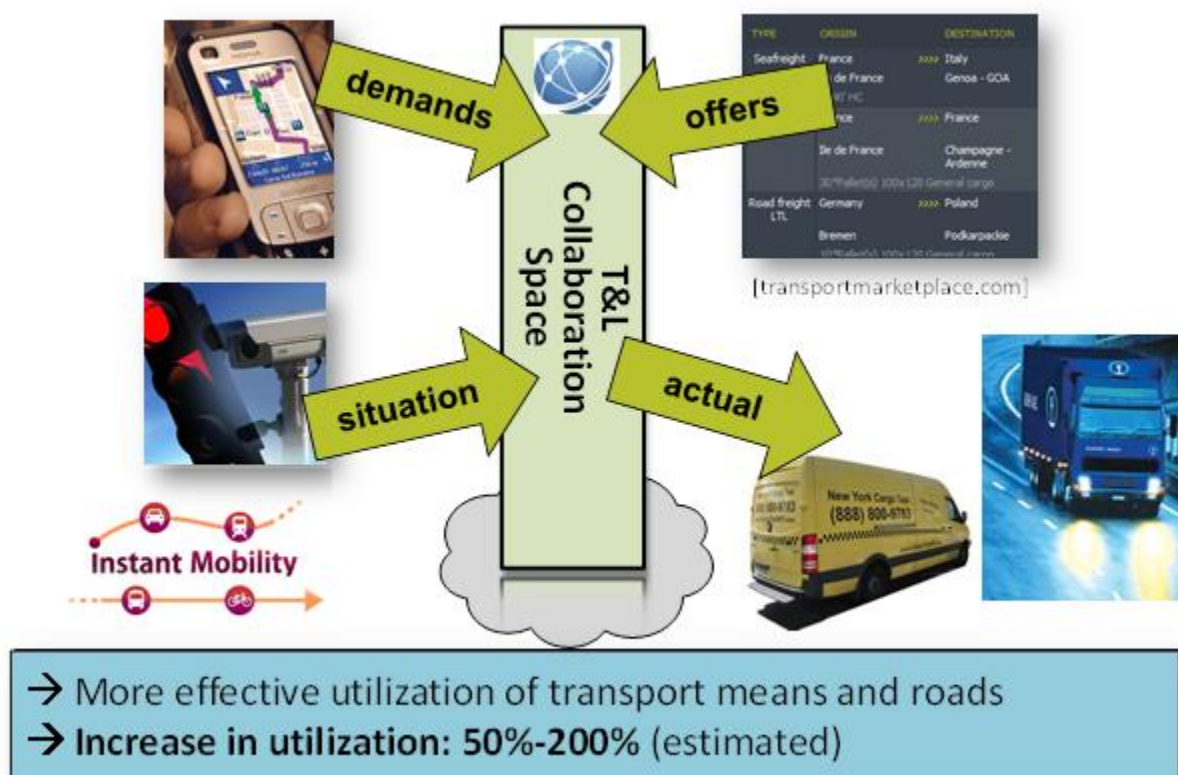


Figure 11: A concept for integrated freight and people transport

5. FIspace support for the Large-Scale Experimentation

FIspace will support the expansion of its platform in the large-scale experimentation in two ways. The first one is of course by releasing the FIspace platform according to a certain schedule. This is discussed in the next section. The second one is to collaborate in the period both phases are running.

As the FIspace project is running until the end of March 2015, there is a considerable overlap in time between Phase 2 and Phase-3 of the FI-PPP. This will make it possible to support the projects that start up large-scale experimentation in 2014 and the first months of 2015, when –if everything develops according to plan- the first batch of ICT developers are actively adding functionality to the platform, to make it more attractive for businesses to work with. Our ideas on how this support will be organised are discussed in section 5.2.

5.1. FIspace releases with Generic Enablers (GE) and Domain Specific Enablers (DSE)

The release dates for FIspace as planned are:

1. Month 6 (September 30, 2013): Open technical specification. Instrumental to engage with external developer community (Open Call Members) and key information for Phase-3 proposers;
2. Month 12: Development & Validation Cycle 1: First release of platform, experimental environment & Baseline Apps; Working platform for development community to use and build upon;
3. Month 18: Development & Validation Cycle 2: Second release of platform including first domain apps;
4. Month 24: Development & Validation Cycle 3: Final release of platform with all planned domain apps.

FIspace Front-End: Cloud Edge GE (Apps & Services Chapter), WireCloud: CompositionExecution GE / CompositionEditor GE (Apps & Services Chapter), Identity Management GE (Security Chapter), Data Handling GE (Security Chapter).

FIspace Store: Repository GE (Apps & Services Chapter), Marketplace GE (Apps & Services Chapter), Registry GE (Apps & Services Chapter), Revenue Sharing System GE (Apps & Services Chapter).

B2B Collaboration Core: Complex-Event-Processing GE (Data Chapter), Publish/Subscribe Broker GE (Data Chapter).

System & Data Integration: Publish/Subscribe GE (Data Chapter), Cloud Edge GE (I2ND Chapter), Data/Context Management GE (Data Chapter), Metadata Preprocessing GE (Data Chapter), Mediator GE (Apps & Services Chapter).

FIspace Operating Environment: DataCenter Resource Management GE (Cloud Chapter), Marketplace GE (Apps & Services Chapter), Mediator GE (Apps & Services Chapter), Things Management GE (IoT Chapter).

SPT Mechanisms: IDM GE, Security Monitoring GE, Data Handling GE, Context Based GE, Anti Malware GE, Secure Storage GE, Role Base Access GE (all within the SPT Chapter).

FIspace Development Toolkit: WireCloud: CompositionExecution GE / CompositionEditor GE (Apps & Services Chapter), CDE (Developer Community & Tools Chapter), Catalogue (Developer Community & Tools Chapter), Testing Validation (Developer Community & Tools Chapter).

Figure 12: Planned use of Generic Enablers in FIspace

Figure 12 gives an overview of the Generic Enablers used in Flspace. More information can be found on the website of FI-WARE an XIFI.

5.2. Support from Flspace to Phase-3 projects

The Flspace project will support the FI-PPP Phase-3 projects by:

- Transferring knowledge
- Supporting the community building (mainly referring to the community of developers)
- Supporting the development of sustainable ecosystems

Figure 13 visualizes, in a three-year view, the plan to support Phase-3 projects in alignment with the Flspace different releases. It can be summarized as follows:

Apr 2013 – Apr 2014: Promote Phase-3 and preparations to engage with Phase-3

May 2014 – Sep/Oct 2014: Engagement with Phase-3 projects

Sep 2014 – Apr 2013: Massive knowledge transfer, educational and training activities. Support to community building and ecosystem incubation.

The engagement period (May 2014 – September 2014):

The engagement period is defined by Flspace project as the period from when the Phase-3 projects get on board until the when the SME/Web-entrepreneurs (winners of their open calls) get on board. Phase-3 projects will start at May 1, and we assume that by autumn 2014 they will bring SME/web-entrepreneurs in the Flspace community.

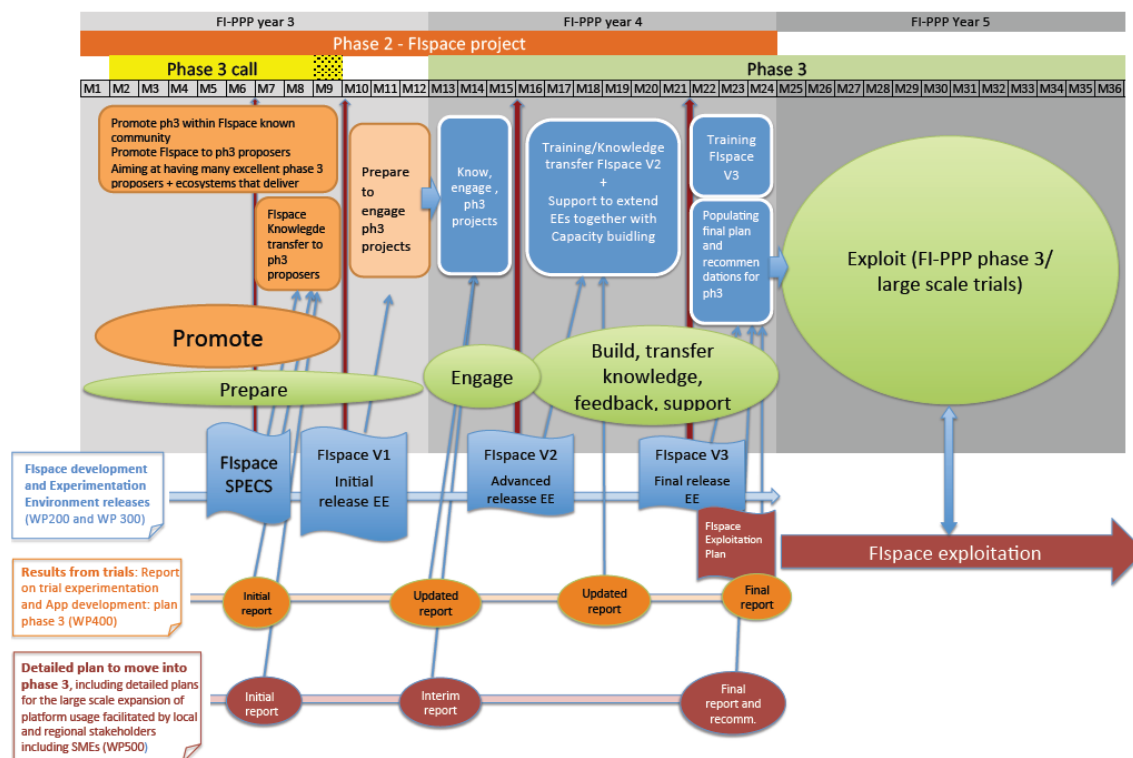


Figure 13: Planning of Flspace to support large-scale experimentation

Phase-3 projects will be of a very different nature, and will have a different structure, capabilities and focus. From the engagement point of view, Flspace will differentiate them in two different groups:

- Phase-3 projects that built their proposals already considering the Flspace platform, and having certain level of knowledge on the platform capabilities.
- Phase-3 projects that did not build their proposals considering Flspace platform but could be interested in exploring possibilities because they follow a multi-domain approach (e.g smart city type of proposals, or a health and food type of proposals, etc.), or because they deal with business-to-business collaboration and would profit from the benefits that the Flspace platform will offer.

The only difference in engagement between these two groups is the speed of engagement. During the engagement period Flspace project will offer to the Phase-3 projects:

- **Flspace “Welcome package” and welcome face-to-face session(s).** This welcome package will consist of information about the Flspace platform capabilities for development, experimentation, and exploitation. This welcome package and sessions will target SME umbrella organisations (or similar organisations that in the Phase-3 consortia have a role to (technically) support SME/web-entrepreneurs.
- **Collaborative and online supporting tools:** includes the online version of the welcome package in addition to the guides for the Flspace for users and for developers, technical documentation for all Flspace components and apps.
- **Dedicated workshops and meetings** to understand project needs to adjust the training and knowledge transfer activities to those needs as much as possible (within the limits of the available resources for the Flspace project).
- **Support for the preparation of the Phase-3 project Open Calls** (within the limits of Flspace project resources)
- **Preliminary training for trainers:** content will depend on the timing for the Phase-3 projects open calls, their needs and the progress in the delivering of the Flspace platform versions. Webinars, face-to-face training and online supporting tools will be used to deliver this training.

The development and experimentation period (starting in autumn 2014):

Defined as the period from when SME/web-entrepreneurs (developers) are engaged. During this period Flspace will provide:

- **Knowledge transfer and training activities** covering the following topics:
- Flspace capabilities for developers;
- Experimentation (design your experiment);
- Building the innovation ecosystem around Flspace (best practices from the trials and other supporting tools, e.g. Living Labs); the Flspace project will assess the dynamics in each of the project trials, interview some of the project experts in specific domain areas that already have the knowledge about what the main challenges are when working with user communities, assess how the Living Lab methodology could support and improve these interaction in between stakeholders (working in close collaboration to the

project trials) and transfer knowledge (best practices) and methodologies (e.g Living Labs methodologies) to Phase-3 projects and to the Flspace community in general;

- Possibilities for exploitation.

These activities will mainly target SME intermediaries. For these educational activities the Flspace project does not differentiate much between the engagement and development stage, but will provide training based on the Flspace releases as listed at the beginning of this section. It is estimated that in addition to the educational material provided as a welcome package, Flspace will have two iterations of training, covering release 2 and 3 of the platform.

- **Collaborative and online supporting tools:** the guides for the Flspace for users and for developers, technical documentation for all Flspace components and apps. Updates will be regularly provided.
- **Support to the community of developers:** most likely using the web-based hosting service for software development used by Flspace internal developers. Support to developers will be done based on the peer-to-peer support from the community.
- **Workshops, webinars and documentation**
- **Single point of contact** (inbox email) for questions and feedback (not focused on supporting developers but SME intermediaries)
- **Engagement with FI-PPP projects and program:** Flspace project is totally committed to the FI-PPP program objectives and will deliver activities in alignment with the program guidelines for collaboration.

6. Call from the European Commission for Phase-3

6.1. Description of the call¹⁰

June 28, 2013 the FP7 ICT Work Program 2013, with the call for the third phase of the FI-PPP has been published. The objective of the third phase of the FI-PPP is:

- to provide and run a stable infrastructure for the large-scale trials, expand the core platform, the use case specific functionalities and their demand-driven instantiations, and
- to involve through open calls SMEs and web-entrepreneurs as developers of highly innovative, infrastructure based, data-rich services and applications, building on, and extending, the large-scale trials and the core platform functionalities.

From the viewpoint of expanding FIspace we focus here on objective (ii). The aim of the third phase is to set off the use of the innovative internet services and applications, developed in the first and second phase of the program. Even more than Phases 1 and 2 the third phase has to connect and establish synergies with regional developments and policies, in order to accelerate regional smart growth.

The target outcomes of Phase-3 are:

1. development of a large set of innovative and technologically challenging services and applications
2. validation of the concepts developed in previous phases
3. resulting in significantly smarter public service infrastructures and business processes

In this call the European Commission is not searching directly for consortia of SMEs and web-entrepreneurs themselves but to intermediaries like venture capitalists, regional development authorities, SME-associations, ICT infrastructure providers, company managed funds, tech park managers etc., that have good connections with existing communities of small and innovative ICT users and developers. In order to involve SMEs and web-entrepreneurs in participating in Phase-3 the partners will provide the full ecosystem of a platform.

The European Commission reserved a budget of 100 million euro and intends to finance up to 20 projects. That means on average 5 million per project. At least 80% of the project budget should be reserved for open calls for SMEs and web-entrepreneurs. Projects must publish widely their open calls using the Commissions publishing channels for public calls and adhere to FP7 standards with respect to evaluation, conflict of interest and confidentiality. Projects must also promote widely the participation in their open calls, e.g., by tapping into venture capital communities and corporate venture activities, public/private accelerators and others. SMEs and web entrepreneurs that are successful in the open calls will be granted financial assistance which is typically in the order of EUR 50.000-150.000. This implies that project partners should be able to manage the funds and infrastructure of the project, which involves open calls for between 27 and 80 projects.

The basic idea of the FI-PPP call is summarized in the following figure:

¹⁰ Based on the call text of the European Commission. More information on the FI-PPP work program: <http://cordis.europa.eu/fp7/ict/netinnovation/docs/wp2011-13.pdf> Interpretations is ours from the view point of expanding FIspace. We urge potential proposers to carefully study the full call text and the answers to the frequently asked questions, that can be found at the following website: http://cordis.europa.eu/fp7/ict/netinnovation/call3_en.html



Figure 14: The basic idea of the FI-PPP call

Important checklist items for bidding consortia are¹¹:

1. Capacity to manage open calls (define, evaluate, monitor, administer)
2. Knowledge of the FI-PPP (managerial, technical)
3. Capacity to call upon and mobilise an SME / web entrepreneur eco-system
4. Capacity to offer training to SME on innovation, entrepreneurship, business opportunities, IPR, etc.
5. Building relationship with related innovation actions, programs, funds (European, regional, local).

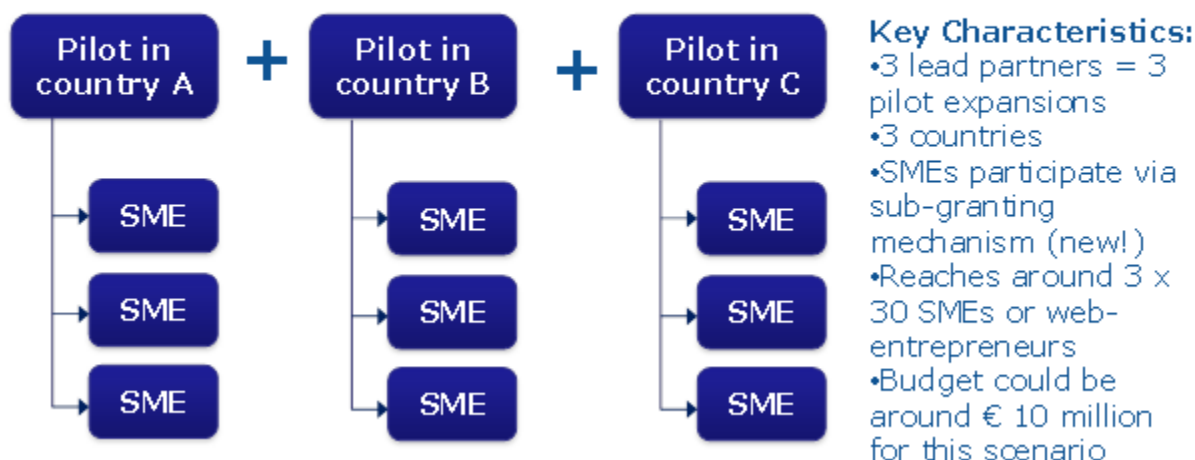
The next section discusses some of these items from a Flspace perspective.

6.2. Flspace suggestions to use the Phase-3 call: activities to support ICT development

To expand the use of the Flspace platform the Flspace project would welcome several proposals for the Phase-3 call: 10 to 15 proposals (realising that there will be a strong competition) that refer at least partly to the uptake of the Flspace platform would be desired. In Section 4.2 we provided a list of project suggestions, not as a limited list but to support creativity. That list focused on the business communities that could uptake the Flspace platform and how they could be drawn into adopting the platform by additional innovative functionality with (add-on) apps. The figure below (created by the Commission) provide some possibilities for a consortium on how it could organise itself (not exclusive, other scenarios are possible):

¹¹ Based on a public presentation by a member of the Commission staff in Eindhoven, June 2013

Possible implementation scenario - I



Possible implementation scenario - II

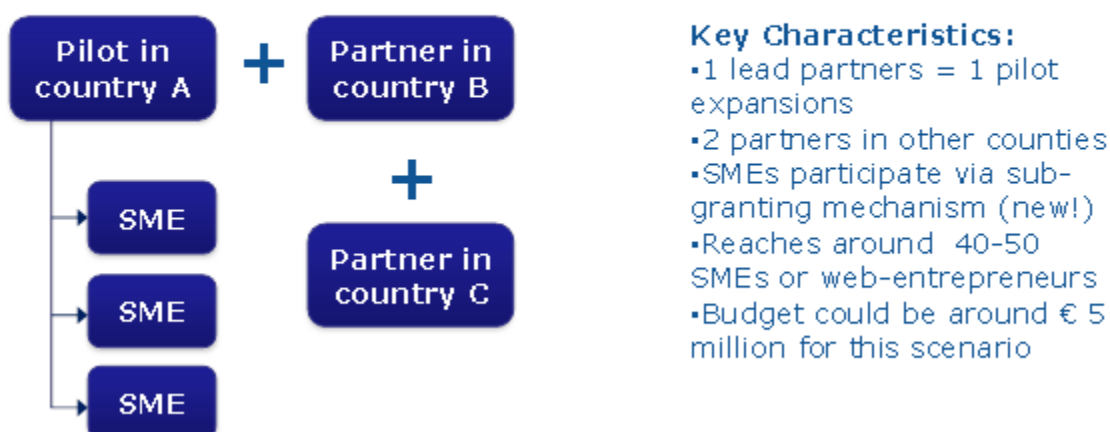


Figure 15: Potential organisation consortium Phase-3

Given the requirement in the EC tender to provide a full ecosystem for the development of ICT tools and the checklist items presented at the end of the previous section, we provide in this section some ideas on how a consortium could support the development of innovative applications in the Flspace platform:

1. Provide training to ICT developers on certain technical aspects like cloud computing, virtualisation, data mining, serious gaming etc. and how these techniques work optimally with the Flspace platform;
2. Provide training to ICT developers in the area of IPR and business models, e.g. with a boot camp method;
3. Organise a living lab community for ICT developers;
4. Organise creative processes between companies (e.g. in the food chain, farmers, logistic solution providers) and the ICT community to discuss innovative ideas to expand the Flspace platform;

5. Provide scientific information (like crop-growing or logistic models) to ICT developers;
6. Provide a test bed facility with data from logistics or the food chain to test new developed software;
7. Provide a facility for testing new software, in relation to the FIspace platform;
8. Provide open data sets (and work with owners of data sets to make them available);
9. Provide super computer facilities for data handling, virtualisation etc.;
10. Organise the development of data exchange standards and protocols (EDI, XBRL, SDMX etc.) for data-exchange in the FIspace platform where such standards and protocols are not yet available.

Of course these suggestions are not all relevant to the same extent for all the suggestions we made in section 4.2.

6.3. FIspace support for consortium development

The FIspace project understands that support of the consortium development for the Phase-3 call is a critical point for a successful exploitation of FIspace project results and for a successful FI-PPP Phase-3 at a program level. The FIspace project has supported and supports the Phase-3 consortium development in the following ways:

- By providing **relevant content** that helps proposers to understand FIspace and FIspace capabilities, and provides examples of potential project configuration and themes. This relates to this specific document and a powerpoint presentation. This information will be posted on the FIspace website (www.fispace.eu) from October 1 onwards.
- By **promoting** FIspace to potential proposers. This includes:
 - Internal transfer of knowledge to all FIspace partners of the meaning and conditions of the FI-PPP Phase-3. Internal promotion to stimulate proposals and support dissemination to local and regional stakeholders. This has been done through the FIspace project meetings;
 - Participation in all the FI-PPP info-days and matchmaking events: FIspace has been and will be present in all the international events organized at a program level, presenting FIspace and FIspace capabilities to potential proposers;
 - Organisation of local/regional events (e.g. The Netherlands, Turkey, ...) to inform the FIspace community about FI-PPP Phase-3;
 - Provision of an email info account (Fispaceinfo@fispace.eu) to support potential proposers;
 - Promotion of Phase-3 to its associated and supporting partners;
 - Creation of a repository of potential proposers (based on stakeholders that contacted the project), used to promote the Phase-3 info-days and to support the brokering function.
- By **supporting proposal preparation**: FIspace has not planned specific international workshops (FIspace only) to support Phase-3 proposers but will offer support on demand. FIspace could organise one or two webinars during October/November 2013 if desired.

6.4. Role of Flspace partners in the third phase consortia

The partners in the Flspace project are sometimes questioned on their role in Phase-3 and participation in bids. In this report we have tried to make clear how we will support Phase-3 projects and bids for those projects. This also raises the obvious question how Flspace partners are involved in Phase-3 projects. As phase 2 and Phase-3 overlap, there could be sensitivities in this area and for some partners there might occur a potential conflict of interest between our roles as Flspace partners to help bidders and being part of a consortium that bids itself for Phase -3.

Although we respect the normal commercial practice that Flspace partners are secretive on their plans to bid for Phase-3, the consortium management has encouraged partners that they provide information on involvement in the preparation of a bid / bids, preferably also disclosing in a broad sense the topic. However we feel it is normal not to disclose details of the partnership nor more detailed aspects of the proposal. For full transparency the following table lists this information as of September 15, 2013.

Table 3: Disclosure topics of interest for Flspace partners

	Topic of interest
DLO	<ol style="list-style-type: none"> 1. Junior partner in a consortium on smart / precision farming and livestock; 2. Investigating options for a consortium on horticulture / perishable products, logistics and consumer / patient feed back; 3. Could be interested to provide Flspace know-how and content knowledge in consortia around urban farming and reaching out to Africa.
NKUA	Investigating possibilities for a consortium with neighbouring Western Balkan countries;
iMinds	<p>In general iMinds can provide the following to a Phase-3 project</p> <ol style="list-style-type: none"> 4. act as a local SME contact point, organise marketing and network events, define and run open calls 5. support SMEs and Web entrepreneurs in incubation, entrepreneurship and business modelling. 6. iMinds is able to help SME to access tools and services provided by the technology projects and run trials for living labs <p>iMinds is currently involved in discussion in a few potential Phase-3 consortia, of which one is related to Flspace.</p>
Wageningen University and GS1	Investigate possibilities to build a consortium upon the Meat trial and perhaps the Consumer Information (TIC) trial.
ENoLL	<p>As an international association and network of innovation ecosystems, it is not ENoLL's role to reach SMEs directly in the context of the FI-PPP but to:</p> <ul style="list-style-type: none"> • Support dissemination the Open Calls all over Europe, through its members, to enlarge outreach of SMEs for Phase-3 open calls (minor role) • European platform to expose the tools, best practices and results of the umbrella organisations part of the consortia (harmonizing results and for dissemination and further

	exploitation), <ul style="list-style-type: none">• Give continuity to a thematic European Network of Living Labs/local and regional ecosystems that use Flspace in B2B, Logistics and Agrifood.
EuroPool Systems	Investigates options for a consortium on Business to Business Collaboration and electronic communication of data in the fruit and vegetable business.

7. Frequently Asked Questions

Flspace partners have taken part in a number of presentations on Phase-3 and received direct questions. Several of them have been used to write the text in the previous chapters. The European Commission has a FAQ section concerning the Phase-3 call on their website, which we strongly recommend.

We end this report with a list of some additional questions, and their answers:

1. Which level of subsidy will SME receive in Phase-3, and under what conditions is this calculated: 75% labour costs or lump sum?
 - a. The consortium that bids for the call has to design such rules and make them clear in their application
2. Can Flspace partners join a Phase-3 consortium?
 - a. Yes, see the last section of chapter 6
3. Can (Flspace) partners join more than 1 consortium?
 - a. Yes, legally the FI-PPP Phase-3 it is an FP7 project. That are subsidies on innovative actions an organisation undertakes and an organisation is allowed to do more than 1 proposal.

8. Epilogue

This report has been written in the first 6 months of the Flspace project, mainly to inform potential bidders for the FI-PPP Phase-3 projects. The report contains the ideas the Flspace project currently has on expansion of its platform in large-scale experimentation.

Undoubtedly these ideas will evolve. An update of this report will be made in 2014. Currently we foresee that we will then provide information on successful bids of Phase-3 and how they will help to expand the Flspace platform.

We are also very interested to learn about unsuccessful bids and discuss with them other opportunities to contribute to the expansion of the Flspace platform, and of course we would like to come into contact with businesses and government agencies in the food chain, logistics or other sectors that are considering taking up the Flspace platform.

More relevant public information can be found in the following documents:

1. D200.2 Flspace Technical Architecture and Specification
2. D400.2 Progress report on trial experimentation and App development and initial plan for Phase-3 rollout
3. D550.2.3 Aggregation and Feedback to Generic Business Model and FI-PPP

These will be published on 30 September 2013 at www.Flspace.eu. For ideas on domain specific applications, readers could also have a look at the previous project's deliverables www.Flnest.eu and www.SmartAgriFood.eu.

We realise that consortia in the making for Phase-3 would have preferred a more stable situation with perhaps a first release of Flspace, a clear view on the commercialisation of the Flspace platform including its business model and licensing arrangements. However given the design of the FI-PPP (see chapter 2) that is not feasible. We hope to provide that information in the coming 18 months. That means that consortia that join Phase-3 of the FI-PPP will join a journey, just as previous projects did and do in Phase-1 and Phase-2. The journey has a more or less clear destiny, but the roads to be travelled and the weather conditions to be experienced are uncertain. That is something innovation and business development have in common.

For further information the Flspace website: www.fispace.eu is available. Mails can be sent to our info account (Fispaceinfo@fispace.eu). In case you want to contact the coordinating authors of this report, mail to: Krijn.Poppe@wur.nl or Annelise.deSmet@wur.nl

9. Annex 1 – How Flspace might look like in the food chain

DISCLAIMER

This annex provides an imaginary example of a Flspace application for the food chain. It is work in progress. The example is totally imaginary, although some inspiration has been taken from the Dutch farm that the author co-owns. Of course developers could choose to make screens with a very different user interface and other functionality. The mock-up of the screens are partly in Dutch/English, as they partly originate from a Dutch national project that looks into the possibilities to introduce a Flspace instance. All company logo's used are taken from the internet and do not involve any commitment of the companies shown.

9.1. Introduction

Users, especially with a non-ICT background, have problems to understand the value of a Flspace application. And probably some developers in the consortium would also benefit from an example. Therefore this paper gives an example.

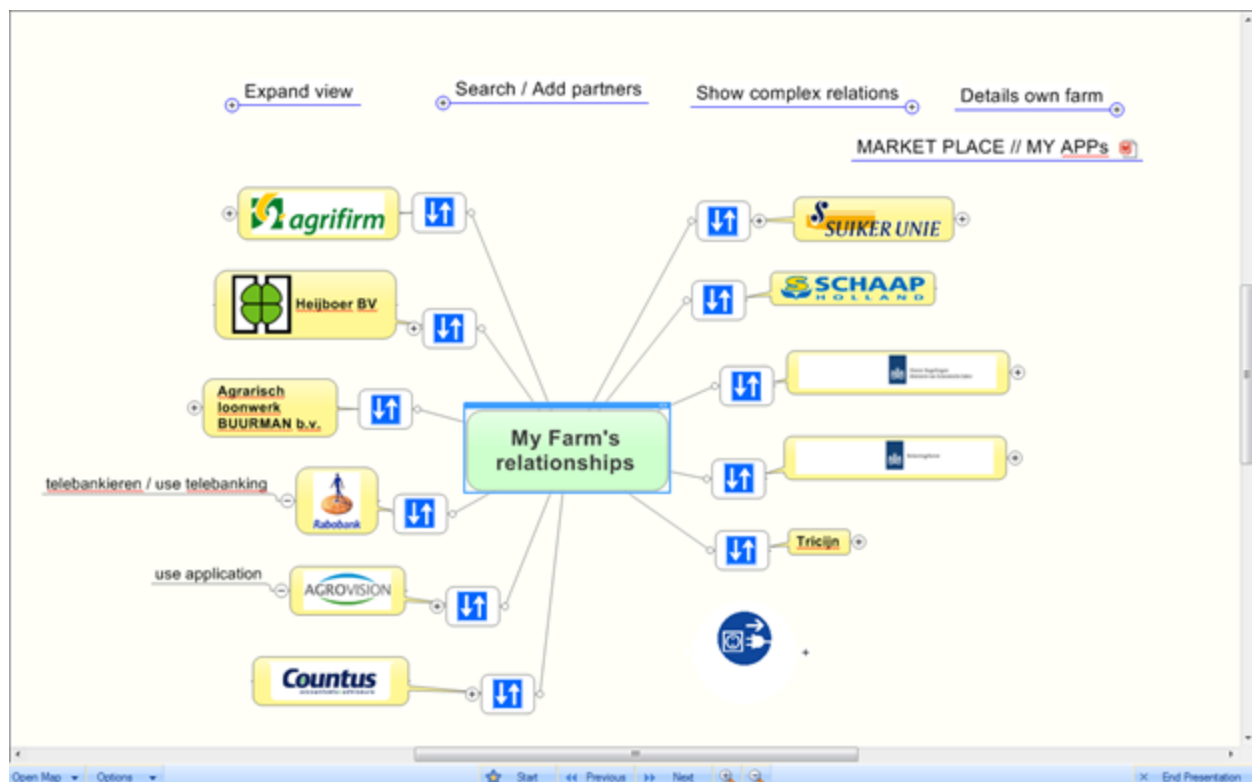
The screen dump below shows the login page to the platform. Compare it to the opening page of Google+ or Facebook – with the difference that the login procedure can be different for different groups. I imagine that for a secure business environment you have to log in not only with a password but with a more secure device as you currently do in the Netherlands for your bank account or the government's tax authority.



In the next chapters I discuss the screens for the three different types of users.

9.2. Farmers' view

The screen dump below is the opening page of software (in the cloud) that was created for the farmer, based on the business relation concept. Competing companies might provide different programs with a more or less similar functionality (just like browsers as Chrome and Safari work differently in the same internet-environment). But in general, think of a Linked-In (of Facebook) facility in which the business partners of My Farm are shown. For this arable farm that includes the input suppliers Agrifirm and Heyboer B.V. (crop protection), the sugar cooperative Suiker-Unie and the potato company Schaap B.V. Also shown are some government agencies (tax authority, paying agency Common Agricultural Policy), a factoring company that collects tax payments for the water authority (Tricijn), the accounting office (Countus), the supplier of a farm management system (AgroVision) and Rabobank. Also the neighbour who does some contracting work is shown as a business relation.



On top of the screen there are some functions of the software that can be used: *Expand view* provides a view on the business partners in the second order: SuikerUnie is a daughter of Cosun, both tax authorities are both part of the central government, Tricijn works for the Water Authority Zuiderzeeland, the neighbour-contractor Buurman uses John Deere tractors¹².

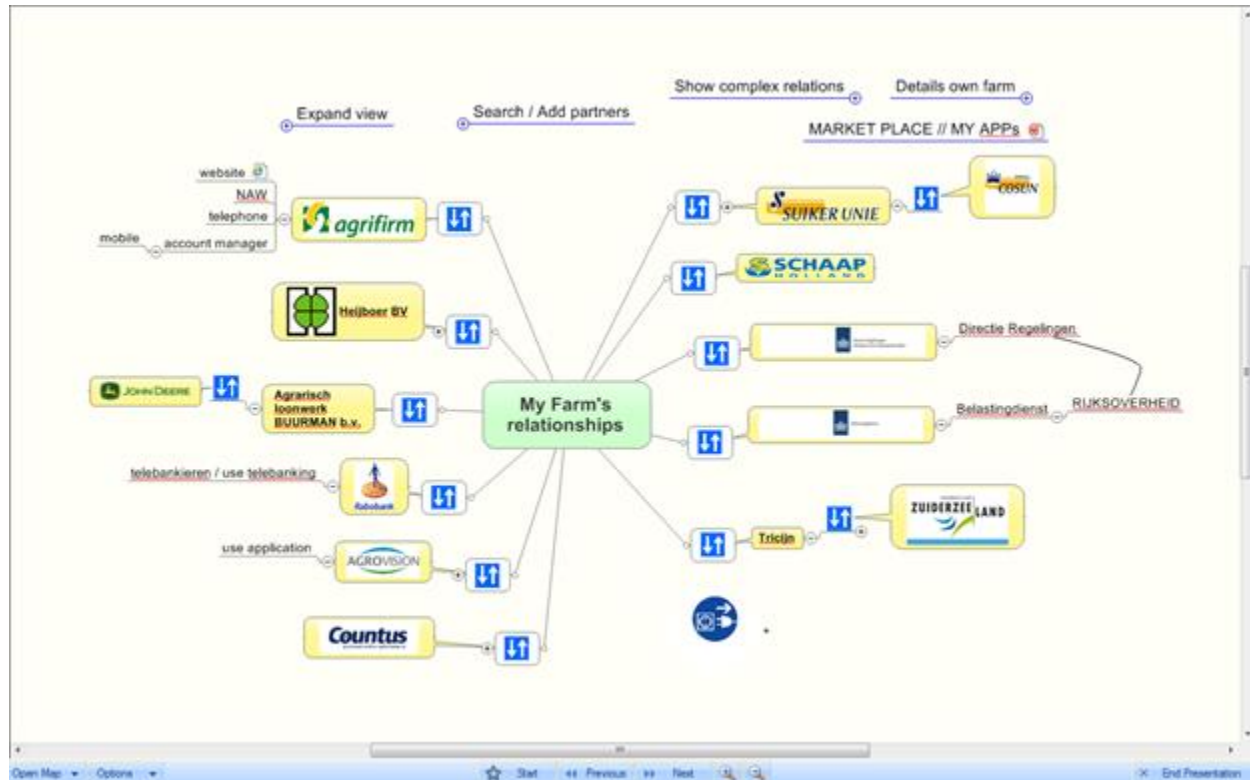
The option *Search / add partners* provides a search engine with which new business partners could be found on the net and added to the customer relationship diagram on the screen.

The option *Show complex relations* makes it possible to break down the relationship with a business partner into more than one relationship. For instance the relationship with a cooperative is sometimes threefold: buying inputs from it, selling products to it and being a member.

¹² These relationships have a bit different meaning, in building such software that should be sorted out.

Details own farm gives more information on the own farm. That can be a complex set of data as a farm business has sometimes more than one location, and different farm households connected to it. Especially as the composition of a farm changes over time¹³.

We deal with the link to the *Market Place / App store* later. If some of the options above would be used, the screen would look like this:



The road signs with the arrows pointing up and down in the relationship have been used to signal a possibility for data exchange between the business relation and my farm. An essential remark is that data exchange is a wrong expression in Flspace. The Flspace concept assumes that everybody (including farmers and consumers) are owner of their own data. They keep it, store it and make it available via a web service (so that it will be “in the cloud”). Flspace connects such web services, at the moment the business partners develop and design a transaction and decide to exchange data. In such a collaboration business partners grant others access to the data, with an authorisation that also stipulates what the user that gets the access is allowed to do with the data (and if she has to pay for it). So if we talk on “getting data” we should say “getting a permit to access the data”.

For farmers, SME and consumers that do not set up a web service themselves there will be cloud hosting services like Google+, Facebook, farm management packages or others who provide these services (in Dutch farming Crop-R and CRV are currently examples with a dashboard where farmers can store data and give others like their accountant rights to download or view the data).

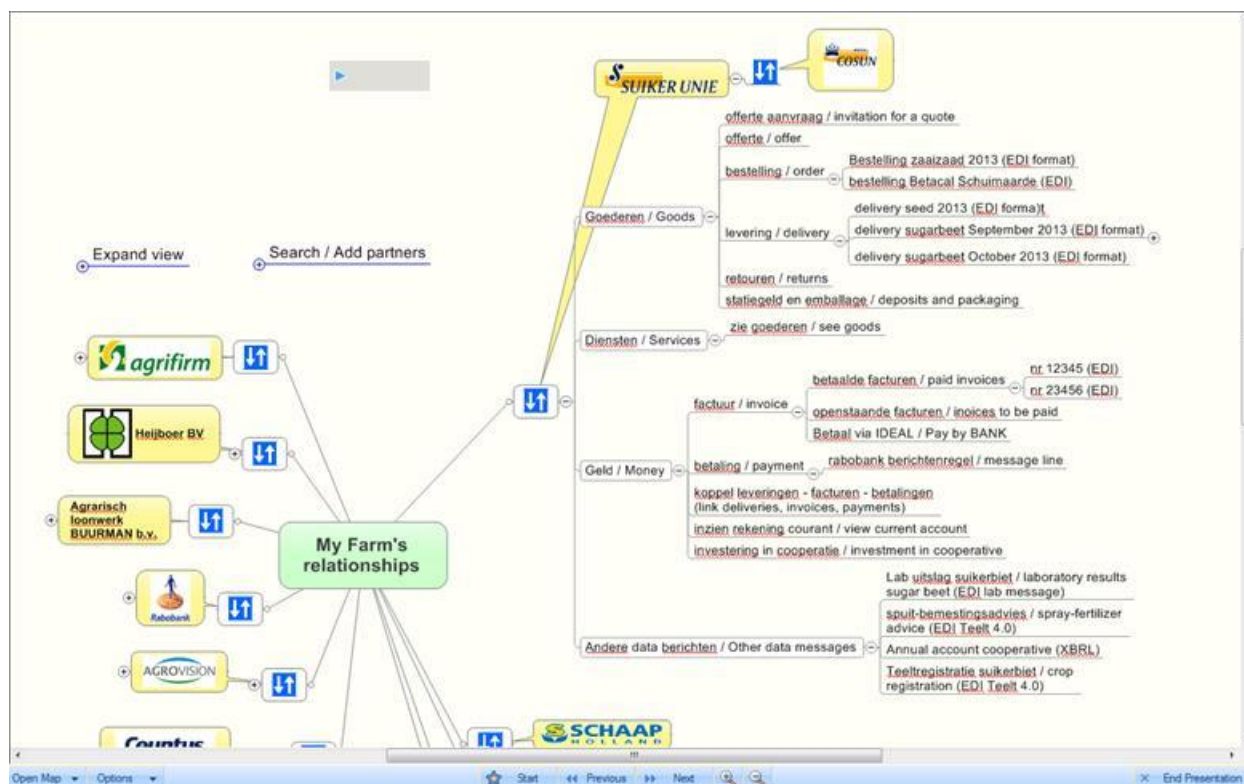
¹³ For a data model see: K.J. Poppe, H. van der Veen, K. van Bommel and W. van Everdingen: Developments in the organisation of the farm and their policy implications. Paper for the SFER Conference ‘Developments in farm families: policy implications’, Paris, April 2004. Also published in: K.J. Poppe: Pacioli 12 – Income issues in farm households and the role of the FADN, LEI, 2004

In reality the ownership of data is currently not that clear. Who is the owner of the data from a laboratory analysis of raw milk, sample taken by the dairy factory on the farm (from milk owned by the farmer) but analysed in the laboratory of the factory? Who owns the accounting report of a farm: the farmer or does his accountant also have an intellectual property right (in the Netherlands the answer is yes). Who owns the credit card data of your purchase, can a bank sell this to a marketing research company? Or who owns the invoice of the sugar beet delivery, that is in agriculture for efficiency reasons not made by the selling farmer but the buying factory.

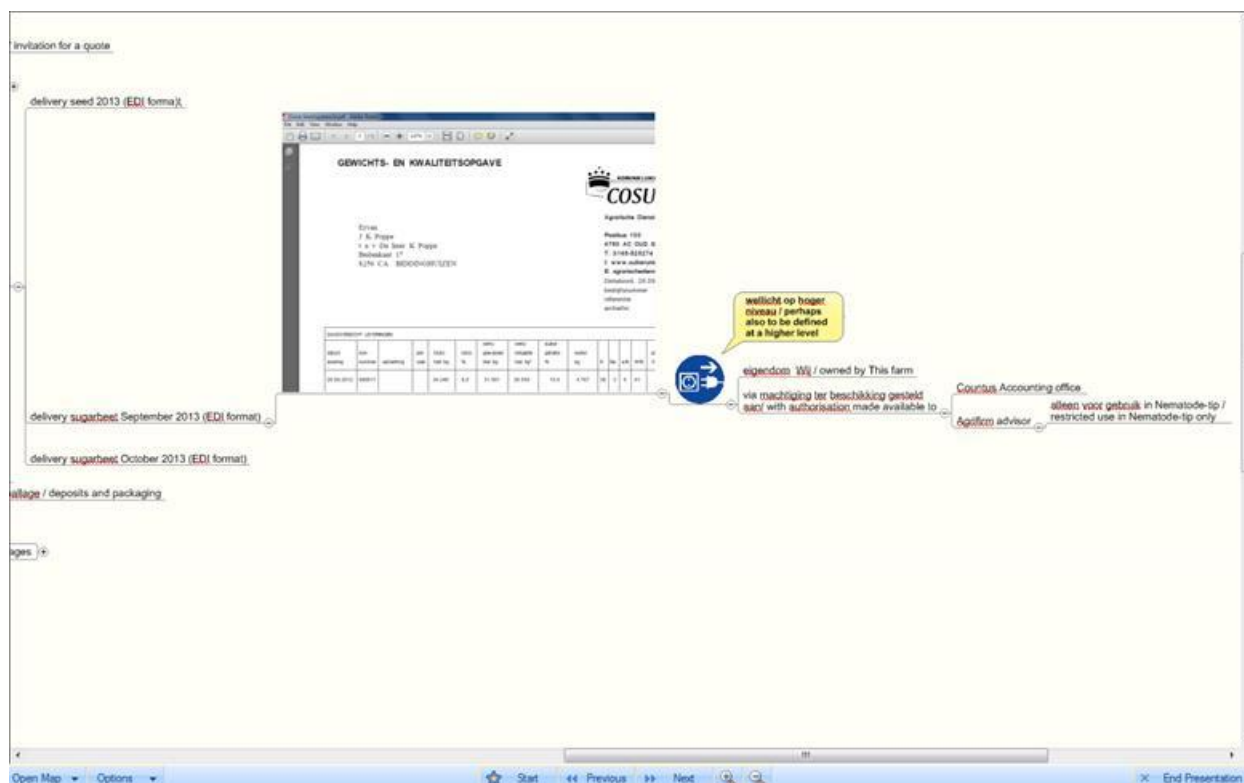
The next two screens illustrate how the farmer can manage his data with this screen. First we look into the data exchange with the sugar company. The screen shows which data have been “exchanged” with the sugar cooperative. “Exchanged” mean that (depending on the ownership?) the data is available via the webserver of the cooperative or on the computer / cloud-service of the farm. This data follows the normal flow of documents: invitations for a quote, a quote, order (in this case for seeds and for Betacal, a fertilizer that is a by-product of the sugar factory), delivery information on seed and sugar beet, returns (of unused seed for example) and packaging deposits. These data is available in EDI format (currently the sugar company already provides this on their extranet website in PDF format). In case of services ordered and delivered, this could be handled in the same way.

Next item displayed on the screen is (a bit more complex) the invoice and payment data. Invoices are shown in EDI and a good software package should show a button here to go to the website of the bank and pay. Payments themselves could also be shown by taking the relevant ones from a download of banking information. There are three other options shown at this place on the screen: delivery information, invoices and payments could be connected here (if not done automatically) to keep track of the status of the orders / deliveries / payments. In some cases like the sugar cooperative, a running / checking account method is used to handle the financial relationship. And there can be money transfers that deal with investments in the cooperative.

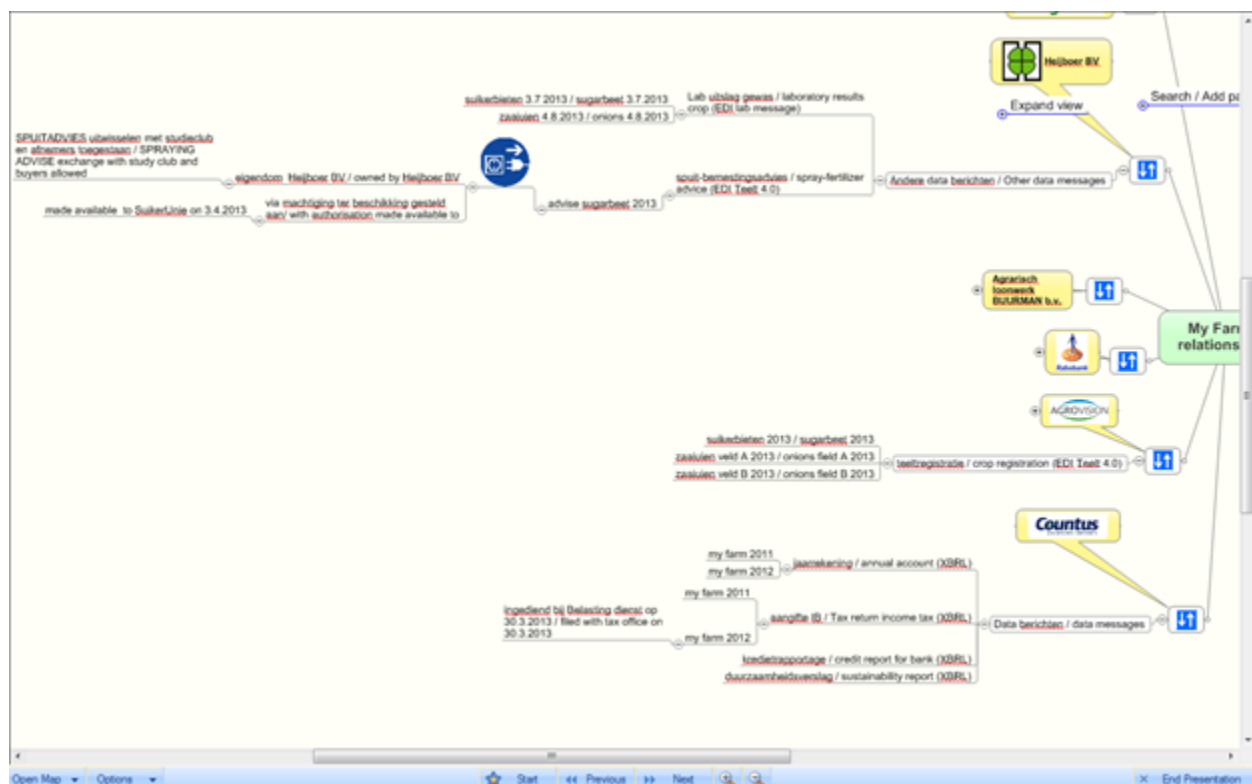
The point I want to highlight here is that with such a screen based on Flspace collaboration (business relationship Enablers) a farm can have a good overview of his business partners and the transactions with them, and authorise data exchange.



This is also illustrated by zooming in on the data of the sugar beet delivery of September 2013. By clicking on this item the software (and activating the collaboration object in Flspace), using the web service of the sugar company and the EDI format, shows the report and besides this a connector button / sign. By clicking this the software reveals that the farm is owner of the data and that the data has been made available with an authorisation to the accounting office Countus (unconditional) and to the input supplier Agrifirm with the condition that it may only be used in the Nematode-Tip farm advise application.



For the farm management software the screen shows that data are available in the standard EDI Crop 4.0 format for the crops onions (field A as well as field B) and sugar beet. For the accounting office Countus the software shows that the webserver of the accounting office has annual reports available (2011 and 2012) in XBRL format (format currently in test in the Netherlands), as well as income tax accounts (already available), on which it has been recorded that they have been filed with the authority. In the same way one could imagine XBRL standards for a credit report for the bank (currently in test in the Netherlands), and a sustainability report (that farmers could submit to their clients, like GlobalGap data).



¹⁴ This should also be available for all other data sets on web services with the business partners, but is not shown here.



Here we show only 7 apps. Nematode-tip, Uni-Tip and Fertilizer Advise by different organisations are typically apps that use data from different sources (EDI-lab for soil laboratory data, EDI Crop 4.0 data with crop records, weather data etc) to provide detailed operational advise. The LEI App with benchmark data could be an app that based on the FADN data of the LEI and the annual census data of the individual farm provides a benchmark with sustainability data for an individual farm. Stichting Veldleeuwerik is a farmers' association of study clubs that look into the sustainability of arable farming and would like to have an app in which farmers can swap their data with their advisor and the study group. Crop-R is a cloud hosting and file sharing service for farming. DCA Finance runs some market places for agricultural products and is a risk management advisory. One could imagine that a farmer makes its annual accounts (XBRL) with its solvency position and its crop records on potatoes (EDI Crop 4.0) available, which is then combined with remote sensing data and weather forecast data to give an advise on hedging on future markets.

For this app we ask your authorisation to access:

- your accounting statements (XBRL format)
- your potato crop records (EDI-Teelt 4.0)

By adding weather data and using crop and risk models we advise on using future markets



Price Quotes and Risk Management Advise

Apps are downloadable by the farmer like in the Android or Apple store (and probably are available there) and can be run with the data made available in the Flspace business relation screen (shown above).

The development of such apps will benefit from the availability of Generic and Domain Specific Enablers of the FI-PPP in the Flspace platform. Such enablers can be seen as blocks of standard software that will make the life of app developers much easier and their apps cheaper.

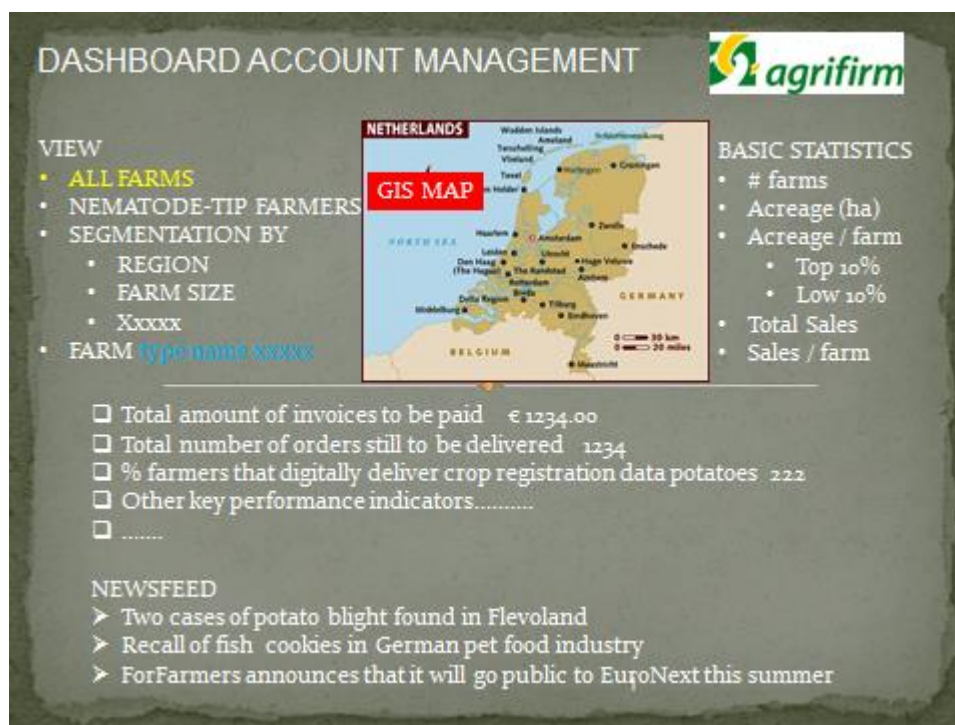
9.3. The Food Business' view

A food business company would probably have a very different view, with different software packages (in the cloud or on its own servers) on the same data. For the sugar company one could easily imagine that all the data described above comes from the ERP (SAP) system and is made available via a web service. But also a more complete application can be imagined. Here we show one for the input supplier, Agrifirm.



For AgriFirm as an example from the food chain, we show three aspects: a dashboard for account management (of course much more complete packages are available in the market), the interaction with the ERP (treated as a legacy system), and a view per farm / client as it could be used by a farm advisor of the cooperative on his tablet on the road.

The dashboard is shown here. Notice the different touch and feel from that of the farmer, suggesting the use of very different software package, bought on the market (or developed on specification from AgriFirm, either by service provider or in house). The dashboard shows a GIS map and option to select different groups of farms: all clients, only those



SAP ERP links with WEBSERVICE **agrifirm**

Document made available to clients	Real time	Delay in hours
REQUEST FOR A QUOTE	xx	
ORDERS	xx	
DELIVERIES		24
INVOICES		96
PAYMENTS	xx	
OTHER DATA		48

map and key performance indicators on orders and payments are shown in the mid-pane. The bottom shows a newsfeed. Of course this is just an example, standard Business Intelligence software provides more options. The issue here is that the dashboard can be filled via the collaboration object of the Flspace platform by data from

the ERP and the EDI messages from the different web services with farmers data.

The link with the ERP is shown here above. The ERP legacy software is connected with a web service via a simple screen that allows managers to delay ERP data for a number of hours before it is put on the webserver to be available for those who are authorised to use it, like farmers.

The next figure shows the view by an advisor of Agrifirm on the data of an individual client / farmer where he has a choice between the data on the farmer and the specific smart spraying advice.



The screen shot below shows the data on the individual farmer (client): a GIS map of the farm and the fixed farm data in the right hand panel. On the left is the data on orders, deliveries, invoices etc. as was shown above in a different format for the farmer (in relation to the sugar company). There is also an option on the screen to manage the data authorisations and see which data the farmer has made available for Agrifirm (e.g. the fertilizer advise by the sugar company).

DASHBOARD ACCOUNT MANAGEMENT

FARM Q5 K.J. Poppe , Flevoland	open	history
REQUEST FOR A QUOTE		
<ul style="list-style-type: none"> Fertilizers delivery March 2014 Round up farm delivery a.s.a.p 		
ORDERS		
<ul style="list-style-type: none"> 10 ton P₂O₅ fertilizer xxx 		
DELIVERIES		
<ul style="list-style-type: none"> 75 ton wheat at intake Dronten 	Plan date	
INVOICES		
PAYMENTS		
OTHER DATA MADE AVAILABLE		
<ul style="list-style-type: none"> Crop registration data (EDI 4.0) Smart Spraying advise generated 	1.6.2013	
DATA AUTHORISATIONS		
<ul style="list-style-type: none"> Data owned by Farmer 		

GIS MAP FARM

FARM DATA

- Name
- Address
- Phone
- E-mail
- Website

CLIENT STATUS

- A/B/C
- Acc manager
- xxx

The smart spraying advise is shown in the next screen shot. It shows how the software / app has calculated an advise, based on release 2.3 of the program, and using data on the farms' soil and its farm management records (both EDI messages) that have been retrieved from web services of the farms' management system and the soil laboratory (both backed up by authorisations of the farmer). And of course Agrifirm would like to track if this advice has led to sales.

DASHBOARD ACCOUNT MANAGEMENT

SMART SPRAYING ADVISE Q5 K.J. Poppe Flevoland	
DIAGNOSIS	
<ul style="list-style-type: none"> Low yields in last years Mediocre know how farmer Soil prone to drought 	
ADVISE	
<ul style="list-style-type: none"> Spray next week with BAYER's 12345 	
BASICS FOR ADVISE	
<ul style="list-style-type: none"> Crop Registration previous year (EDI Teelt 4.0) Lab data soil analysis BLGG (EDI) 3.3.2013 Weather data 10 days forecast MeteoConsult 5.6.2013 Nematode-Tip release 2.3 	
ORDERS following this advise	
<ul style="list-style-type: none"> 40 liter BAYER's 12345 to be delivered at farm 	

GIS MAP FARM

OUTLOOK PANE

- MAIL
- CALENDER
- TASK
- APPOINTMENT
- MEMO

9.4. The consumers' view

The view of the consumer is imagined as a rich tracing and tracking option, e.g. in apps on a smart phone. Rich as it could not only contain the tracing and tracking data as such, but be accompanied by a video of the farm or recipes provided by the food industry of the retailer. The screen shot is below:

*** Flspace for the consumer**

SCAN Product or click on retailer for your buying list

Price: € 2.34

Product: Campbell Andy Warhol tomato soup #12345

PRODUCT INFO	Ingredients: E1234; E3456; salt Warning: not if you have cheese allergy Organic; Fair Trade; xx
Retailer	Albert Heijn, shop XXL, Rotterdam Nesse
Transporter	Kuhne & Nagel logistics from Campbell factory Italy to DC Ahold, Utrecht
Food factory	Campbell Italia spa, Calabria, It. (>map)
Quality Inspection	SGS agro, Naples, It
Farmer	Giovanni di Livorno, Reggio di Calabria xxx
Seed company	Rijk Zwaan, De Lier, Netherlands

Testimonials on social media for this product

Tests by Consumer Organisations for this product

Put product on shopping list

Mail to:

- Retailer
- Campbell
- Farmer
- Friends

TESCO

Once again a different type of screen, as this is a totally different application supplied by a different ICT company.

The consumer could use his smart phone to take a picture / read a bar code and then can trace back the history of the product: the seed of the tomatoes came from the Netherlands, they were grown in

Italy, inspected by a company SGS, and made into soup by Campbell Italia. Transported by Kuhne + Nagel to Ahold in Utrecht and sold in a shop in Rotterdam. Information on the product could be displayed, including e.g. sustainability aspects (that can partly be calculated on the history of the product, as presented here). The website provides additional consumer information such as testimonials in social media, consumer organisations' tests etc. It can be put on

a shopping list and mails could be send to anyone that was involved in the food chain (as well as to friends).

The data is gathered by using some of the essential functions of Flspace. One central element is the EPC – Electronic product code register that identifies (individual) products. Changes in location are provided either by RFID chips that pass portals /

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Food factory	Campbell Italia spa, Calabria, It. (>map)
Quality Inspection	SGS agro, Naples, It
Farmer	Giovanni di Livorno, Reggio di Calabria xxx
Seed company	Rijk Zwaan, De Lier, Netherlands

Testimonials on social media for this product

Tests by Consumer Organisations for this product

Put product on shopping list

Mail to:

- Retailer
- Campbell
- Farmer
- Friends

TESCO

Based on EPC and changes in location via RFID chip / portals

Based on EDI Teelt 4.0 (links inputs and product) in EPC (electronic product code)

beam a different location to the owner of the product. Changes in product characteristics are provided by access via web services to the data with the collaborating business partners, using e.g. EDI formats that are essentially recipes, like the EDI Crop message that shows how much fertilizer has been used in sugar beet at a certain moment. The only thing that Flspace stores is the collaboration object that links the partners.

Technically the data flow can be traced as the app on the smart phone of the consumer connects to the web service of the retailer or (in this case) the food business that created the branded product. That web service contacts the web service of the factory in Italy. That connects the cloud service that the farmer uses, which links to the web service of the seed company. In this way the whole chain is tracked. This based on the Flspace collaboration tools in which partners in the food chain have designed there common business process and specified the data exchange, using EDI and other standards available in the Flspace platform.

Legally this is possible as each business partner will ask his trade partner in the previous stage of the chain to make his data available through a web service, and to ask that to his suppliers. Those that do not cooperate will be quickly out of business, that probably only asks for a few food crises more.

9.5. The essentials of the Flspace collaboration platform

The example above helps to understand the essential functions of the Flspace collaboration platform. Let's take once again a user perspective.

The most import user will be the business user, like the farmer, food company (or even the consumer). In case he would like to use the Flspace platform he first has to go to the webpage of Flspace and as a first time user identify himself (or his company) and characterise himself: "I am a shipper / farmer etc." He could then invite business partners to sign up, e.g. by e-mail or a chat function etc. (and it is very likely he is invited himself to do so, certainly in agriculture by his cooperative or a government service).

Assume the user wants to do business. He makes a query to search a new business partner for an action (e.g. shipping flowers from Amsterdam to Paris, or order chemicals with an input company). Like on LinkedIn he can do a detailed search on characteristics (e.g. search for shippers), and use ratings by stars or "likes" etc., in the same way you search a restaurant.

Next step is to use a market place function from the app store, e.g. to run an auction to get the most attractive bid. Imagine the app store has 5 apps available, that have also been rated by other users, e.g. different types of auction apps (English, Dutch, Vickrey), a Request for proposal app, or an app to support a negotiation process. The Flspace platform handles the payment for using the app.

After selecting the app the user can invite the business partners he selected to jointly use the app (like selecting GoTo Meeting or Skype for a conference call). Some of these apps will support an if-and-then option to prepare a bid at a "higher" level (ask a truck owner a price before you bid as a shipper to a sugar company).

Next step after the negotiation is to contract with the selected business partner. That can be done by selecting a contracting support app from the app store, and making a choice for e.g. contracts for US-EU trade, a French law contract etc. Probably apps offered by important legal service companies or notaries. With such an app the contract can be built between partners. Of course in many of the agricultural examples above, there will be standard contracts (docu-

ments) that e.g. the sugar company or dairy company offers to its members / clients, where the farmer only has to sign at the end of the standard contract for the order. This can be easily modelled as an app too (by the juridical service of the company). Such apps can be based on standards like EDI, XBRL which are then available in the FIspace platform (perhaps even as an app themselves, as it could be that some business partners sell standards or reference models for an industry with options for mapping data streams via the standards).

The contracting apps deliver a service level agreement (SLA) with key performance indicators (KPI) in the FIspace-platform. Based on the contract, planners detail the production and delivery process in FIspace, much like a data flow / process diagram, with conditions, actions as time dependent processes (e.g. the truck has to load its flowers in Amsterdam on address X between 08.00 and 08.30 on day Y or on every Monday, keep them cool at a temperature between 8 and 10 degrees Centigrade with moisture content Z and arrive in Paris, between 22.00 and 22.30 hours on the same day). FIspace should have a simulation facility that tests the business process, including apps that are called in the process.

Once the contract has been specified, it has to be monitored. This is also done via the business collaboration platform FIspace. For instance the contract can have specified that the truck should beam the condition in the truck every hour / 50 km / big city passed. The FIspace platform has an event processor that listens out to signals from e.g. sensor data networks (like an e-mail reader that constantly checks if new mail arrived on a POP-3 server). In case the event processor would signal that the condition in the truck is out of bounds, an action is triggered as foreseen in the contract specification (e.g. a problem warning or stop the truck or an sms to the sales department to reschedule the sale of the product). And at the end of the drive, as the event processor concludes the contract has been fulfilled, it triggers a payment process.

When it comes to tracing and tracking of the history of a product, this process needs to be specified by the business partners in the FIspace-platform. As described above, there must be an identifier of e.g. a piece of meat (barcode), the farmer has to authorise that data for query (by at least the slaughterhouse with the right to provide access to the slaughterhouse's clients, and in the next contract also the slaughterhouse has to authorise queries on the data, etc.). Also here the FIspace event processor with the farmer (or his cloud service) listens for a call on data. A supermarket that wants to have (or offer its consumers) tracing and tracking buys meat where previous links in the chain have made data available. Some central registers like those on animal movements can be modelled in as a service from the government (based on legal obligation), or they can be replaced by an obligation to farmers to authorise a government service (the current register) to query the data in the same way the supermarket and slaughterhouse will do.

In addition to the business user the FIspace collaboration platform will have an administrator of access rights as a user. That can be the business user himself, or his internal accountant. In that function much more information is stored in the business profile on the platform e.g. the IBAN bank number, the number of the chamber of commerce etc. In that administrator function also access rights to roles within the company can be handled, e.g. the contract planner has other rights than the finance department or the legal department.

A third category of users are the app developers who sell their products in the app store. They have to ask themselves: "what will be my service to a business user"? They can do some market research on the platform (chat, statistics) and in the app store on competitors. In the design of the app the app developers have to specify what will be the inputs, and what will then be the output (and which logic is in between). In addition to apps that are part of a business process,

there will most likely be apps that “listen out” free services like the Met Office (“is temp > 20 C, it is time to spray / sell ice cream”).

The Flspace platform checks if input / output streams of the app that are bundled / linked to each other, will match. Flspace has a testing service/ certification scheme before uploading apps to see if they do what they promise to do. And apps can be queried by potential users on how apps have collaborated in the past.

Another category of users of the FI-space collaboration space are the back end integrators. They connect the legacy systems to the collaboration platform or e.g. Internet of Things sensor data networks. For example data from the Mercedes telematics system can be uploaded to Flspace and made available by the owner to other business partners. For these backend API, Flspace has connectors to EDI transactions (EDIFACT), E-docs, X.400, XML, to EPCIS (GS1), or standards from AgGateway, AgroXML in Germany, EDI Crop 4.0 NL, CAN bus, ISOBUS etc. Flspace provides a mapper to connect datasets and –streams with such standards.

In addition to this list of users (business partners, administrators, app developers, back end integrators) functions for other users are important. Of course for the owners of the platform, but perhaps also for advertisers on the platform (depending on the business model) and statistical analysis of the use of the platform.

9.6. Discussion and conclusion

With the paper in this Annex we tried to stimulate the discussion what Flspace is, from a layman’s perspective. It in no way tries to prescribe how in Phase-3 of the FI-PPP software and apps should be developed. But it hopefully supports the imagination and creativity and provides an incentive to use the Flspace platform.

