

Deliverable D500.1.3

Online tools to Support Developers and Users

WP 500

Project Acronym & Number:	Flspace – 604 123
Project Title:	Flspace: Future Internet Business Collaboration Networks in Agri-Food, Transport and Logistics
Funding Scheme:	Collaborative Project - Large-scale Integrated Project (IP)
Latest version of Annex 1:	03.10.2013
Start date of the project:	01.04.2013
Duration:	24
Status:	Final
Editor:	Andreas Metzger (UDE)
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Document Identifier:	Flspace-D500.1.3-OnlineTools-V002.docx
Date:	30.10.2013
Revision:	002
Project website address:	http://www.Flspace.eu

The Flspace Project

Leveraging on outcomes of two complementary Phase 1 use case projects (Finest & 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

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- IBM; Israel
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- ENoLL; Belgium
- KTBL; Germany
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Dissemination Level

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

Change History

Version	Notes	Date
001	Creation of the document (to accompany the actual deliverable of type "P")	17.09.2013
002	Completion and finalization of document	30.01.2013

Document Summary

This deliverable reports on the online tools that have been set up under Sub-task 513 (Collaborative and online Supporting tools) in order to support the FIspace ecosystem and in particular to support internal, as well as external software developers. This means that the online tools are targeted to two distinct audiences and thus two specific tools have been set up in order to address their needs: (1) External Ecosystem Information (linked from <http://www.fispace.eu/>), which comprises information relevant for App Developers and Business Architects provided in form of a public website that features typical content such as API specifications, documentation, tutorials, and so forth (<https://bitbucket.org/fispace/doc/wiki>); (2) Internal Developer Support, which is targeted to FIspace platform developers and internal App developers, and which includes code repositories, issue trackers and an internal Wiki for communication (<https://bitbucket.org/fispace/>). This internal tool allows sharing relevant technical information, as well as a commercial team development environment allowing jointly developing code and managing development progress. To support alignment with external information, the same tool as for (1) was chosen, but configured differently.

It should be noted that deliverable D500.1.3 is of type "P" (prototype), i.e., constitutes the installation and configuration of tools. The document at hand provides a brief summary about the actual result that has been delivered.

Abbreviations

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

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1 Introduction

Sub-Task ST513 has differentiated to two distinct audiences and thus two specific tools have been set up in order to address their needs:

External Ecosystem Information, which comprises information relevant for App developers provided in an online form that features typical content such as API specifications and documentation (see Section 2 and <https://bitbucket.org/fispace/doc/>).

Note: There is also more general information material, deliverables and training material that will be hosted on the main project website (www.fispace.eu), allowing the website to become a single entry point.

Internal Team Development Environment, which is targeted to FIspace platform developers and includes an internal Wiki for sharing relevant technical information, as well as a shared code repository and issue tracker to develop code and manage development progress (see Section 4 and <https://bitbucket.org/fispace/core>).

The task has been focused in the first 6 months in the internal developer community, delivering an internal Wiki and stimulating conversations for the decision of final internal/external developer collaborative tools to develop working towards the delivery of D500.1.3. Towards the end of the 6 months, first material has been made available to the external community (e.g., see D200.2).

2 Choice of Tooling

The overall aim of setting up the online tool support for providing information to external and internal stakeholders was to provide an online, collaborative, cloud-based environment, such that contents can be collaboratively created and accessed from everywhere.

After assessing several alternatives of potential tool candidates (including IBM Rational Team Concert, Atlassian JIRA, as well as simple tools such as MediaWiki), the FIspace consortium has chosen and agreed to employ Atlassian bitbucket, which is a solution readily hosted in the cloud. The aforementioned alternatives would have had downsides, such as requiring installation on the premises of FIspace partners and would have imposed further limitations concerning use and flexibility.

Additionally, Atlassian bitbucket can readily be configured to provide both open and closed source developments and thus lends itself readily for using the same tool for both external and internal ecosystem information provisioning. Using one single tool for both stakeholders ensures that FIspace documentation and API specification are in sync with the platform code that is being developed by the internal development team.

3 External Ecosystem Information

As mentioned above, the tools to be set up for **External Ecosystem Information**, should allow providing information relevant for App developers in an online form that features typical content such as API specifications and documentation. Again, please note that more general information material, deliverables and training material will be hosted on the main project website (www.fispace.eu), allowing the website to become a single entry point.

Based on the aforementioned tool choice, the documentation of the FIspace modules and their API specification are accessible online from:

<https://bitbucket.org/fispace/doc/>

This online material includes two main pieces of information:

- The **documentation of the FIspace modules**, which will be presented as Wiki pages. Figure 1 and Figure 2 below provide screenshots that exemplify those pages.
- The **API Specification of the FIspace modules**, which will be made available in two forms: (1) as Java code, see Figure 3; (2) as documentation generated from the javadoc, see Figure 4.

The screenshot shows the Bitbucket interface for a repository named 'doc' under the user 'fispace'. The main content area is titled 'FIspace Documentation and APIs' and includes a paragraph of introductory text. Below the text is a detailed architectural diagram of the FIspace platform. The diagram is organized into several layers and components:

- Security, Privacy, Trust** (outermost layer, purple background):
 - Operating Environment** (left side, green background): Cloud Service Bus, Registry, Consistency Management, Monitoring.
 - User Front-End** (top red box): Customizable End-user Dashboards, Ubiquitous Access, Social Networking & Collaboration.
 - App Store** (middle blue oval): Provisioning, Purchase, Discovery, Repository, Financial & Revenue Sharing.
 - B2B Collaboration Core** (middle red box): B2B Collaboration, Event Handling.
 - System & Data Integration** (bottom red box): Business & Legacy Systems, IoT/loS Integration, Data Mediation.
 - Software Development Toolkit** (right side, green background): IDE, Libraries, Authoring Tools.
 - Core Layers / Tiers** (bottom, purple background): Identity Management, Access Control, Authentication, Data Security, Security Assurance.

Below the diagram, the text reads: 'Core Layers / Tiers: The FIspace platform consists of the following three major tiers (or layers):'

- **User Front-End:** The User Front-End serves as the main point of access for users of the platform services and Apps, and constitutes a configurable and graphical user interface.
- **B2B Collaboration Core:** The B2B Core ensures that all information and status up-dates are provided to each involved stakeholder in real-time. The B2B core allows for the creation, management, execution, and monitoring of collaborative business processes in the

Figure 1: Documentation of FIspace Modules: Landing Page

The screenshot shows a Bitbucket repository page for a repository named 'doc' owned by 'finspace'. The page is viewed in the 'Wiki' tab. The main content is a wiki page titled 'b2b'. The page contains the following text:

At the heart of the envisaged Flspace platform reside the Business-to-Business Core Modules. The B2B Core ensures that all information and status updates are provided to each involved stakeholder in real-time. The B2B core allows for the creation, management, execution, and monitoring of collaborative business processes in the Flspace platform. The B2B Core consists of two interrelated components:

- A Collaboration Engine that captures, in form of so-called Business Entities, the information that are to be exchanged among collaborating stakeholders along with status and control of the a collaborative business processes. The BCM component is responsible to orchestrate the different processes from different stakeholders and assure the correct sequence of the tasks execution;
- An Event Processing Engine that detects and analyses events coming from activities in the collaborative processes or from IoT devices. The Event Processing Module (EPM) component monitors events and detect situations of interest, i.e., situations that require appropriate reactions;
- Authoring tools: Both engines will be accompanied by respective authoring tools that allow defining business entities resp. event rules.

The BCM component is responsible to orchestrate the different processes from different stakeholders and assure the correct sequence of the tasks execution. The BCM is based on the entity-centric approach (for more details, please refer to deliverable D400.10). This approach relies on the notion of entities (aka, as business entities, artefacts, or dynamic artefacts, or business collaboration objects). These provide a holistic marriage of data and process, both treated as first-class citizens, as the basic building block for modelling, specifying, and implementing services and business processes. A (business) entity is a key conceptual concept that evolves as it moves through a business (or other) process. An entity type includes both a data schema and a lifecycle schema which are tightly linked. The data schema provides an end-to-end conceptual view of the key data for this entity type. The lifecycle schema of an entity type specifies the different ways that an entity instance might evolve as it moves through the overall process. In Flspace we will use the GSM (Guards, Stages, and Milestones) model to specify the lifecycle schema of the business entities.

The Event Processing Module (EPM) component monitors events and detect situations of interest, i.e. situations that require appropriate reactions. The events sources (aka events producers) can be the actual execution of the collaboration (i.e., the BCM), external systems, or sensors. The EPM processes these events and by applying pattern matching derives situations of interest (for a background on event processing refer to [7]). Examples of situations of interest can be: Missing documentation at a certain point in time, a sensor reading outside a permitted range, a delay in a delivery. In general, we can distinct between situations that result from the actual execution of the process or collaboration and situations that result from external events (i.e., events coming from external systems or sensors). The EPM in Flspace supports two types of situation detection capabilities: reactive and proactive. Reactive rules analyse past events and derive situations by applying pattern matching over a single or a set of events over time. Proactive rules, on the other hand, relate to situations that are likely to happen in the (near) future. In general, we refer to proactive event-driven computing as the ability to mitigate or eliminate undesired states, or capitalize on predicted opportunities—in advance. This is accomplished through the online forecasting of future events, the analysis of events coming from many sources, and the application of online decision-making processes.

API Specification: [Link](#)

Figure 2: Documentation of Flspace Modules: B2B Core Module

The screenshot shows a Bitbucket repository page for a repository named 'core' owned by 'fispace'. The file path is 'core / api / csb / src / main / java / eu / fispace / api / csb / NotificationMessage.java'. The commit hash is 'fb0a814' from 21 hours ago. The code is as follows:

```

1 package eu.fispace.api.csb;
2
3 import java.io.Serializable;
4 import java.util.Calendar;
5
6 public class NotificationMessage implements Serializable {
7
8     /**
9     *
10    */
11    private static final long serialVersionUID = -4876281592472074192L;
12
13    private String fispaceUserId;
14    private String type;
15    private String message;
16    private long created;
17
18    public String getFispaceUserId() {
19        return fispaceUserId;
20    }
21
22    public void setFispaceUserId(String fispaceUserId) {
23        this.fispaceUserId = fispaceUserId;
24    }
25
26    public String getType() {
27        return type;
28    }
29
30    public void setType(String type) {
31        this.type = type;
32    }
33

```

Figure 3: Example for Java Code Expressing Module API by Means of Message POJO

Overview Package **Class** Use Tree Deprecated Index Help

Prev Class Next Class Frames No Frames

Summary: Nested | Field | Constr | Method Detail: Field | Constr | Method

eu.fispace.api.csb

Class NotificationMessage

java.lang.Object
eu.fispace.api.csb.NotificationMessage

All Implemented Interfaces:

Serializable

```
public class NotificationMessage
extends Object
implements Serializable
```

See Also:

Serialized Form

Constructor Summary

Constructors

Constructor and Description
NotificationMessage ()

Method Summary

Methods

Modifier and Type	Method and Description
long	getCreated ()
String	getFispaceUserId ()
String	getMessage ()
String	getType ()

Figure 4: Example of Documentation (Javadoc) Generated from Message POJO

4 Internal Team Development Environment

The internal team development environment (again, as mentioned above, we configure the bitbucket service as mentioned above) provides three main features elaborated below: (1) code repository, (2) issue tracker, (3) wiki.

The main landing page for the team development environment of Fispace can be accessed from:

<https://bitbucket.org/fispace/>

It features access to the repositories for the various Fispace modules (see Figure 5), as well as one distinct repository for documentation (“doc”; see Section 3).

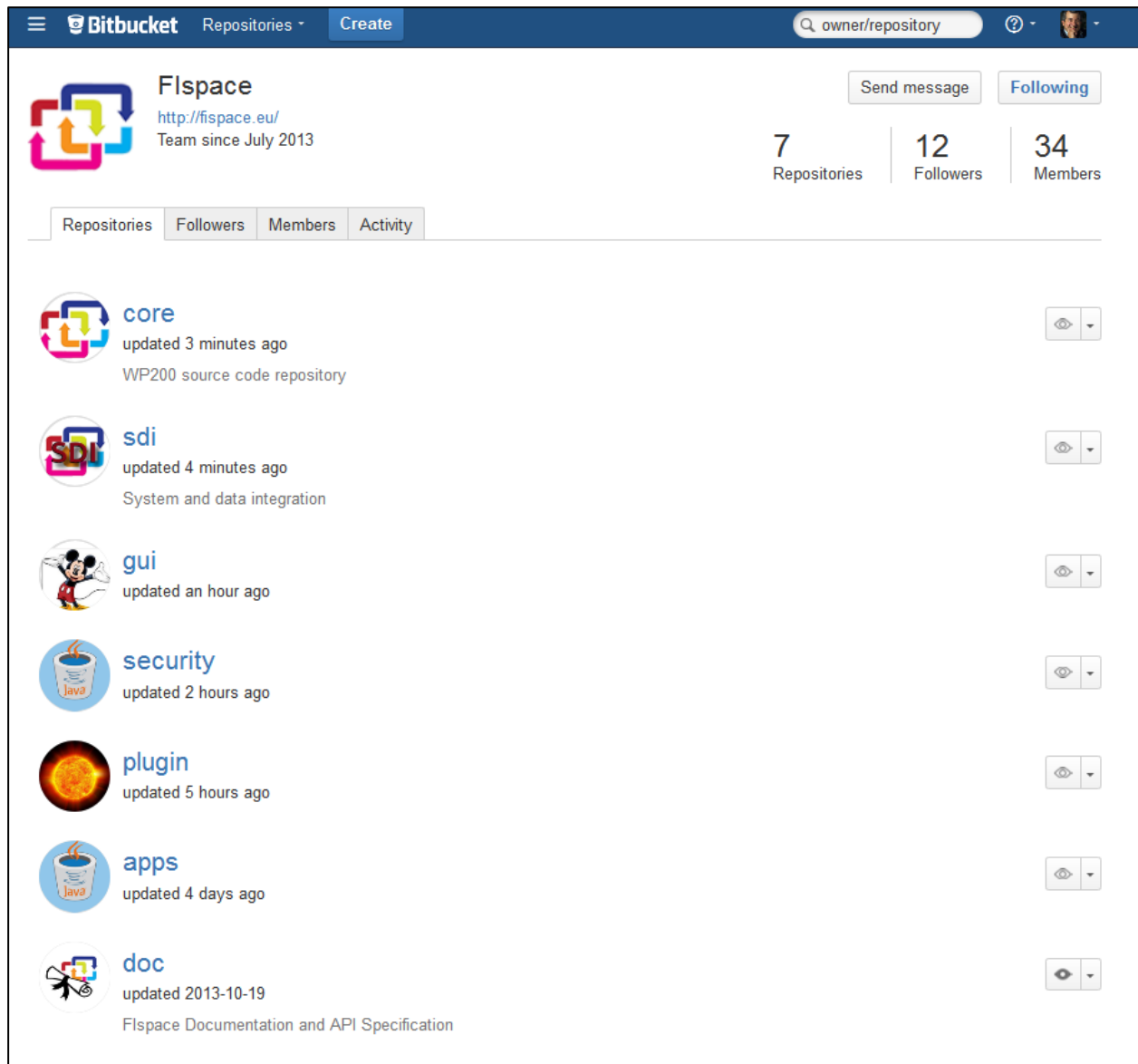


Figure 5: Landing page for different code / documentation repositories of FIspace

4.1 Code Repository

Each of the repositories hosts the code as well as the API specifications for the FIspace modules. “A Bitbucket repository is where you can store your code or other project files. Bitbucket is great for sharing and collaborating on projects. You can have a private repository, where only the people you choose can see the code. Or you can let everyone see the repository and choose the people who can update it.”¹ FIspace will make use of private repositories for some of the modules, where required by the IPR regime of members.

The landing page of each repository shows recent activities and thus allows observing and coordinating activity of team members (see Figure 6).

¹ <https://confluence.atlassian.com/display/BITBUCKET/Bitbucket+101>

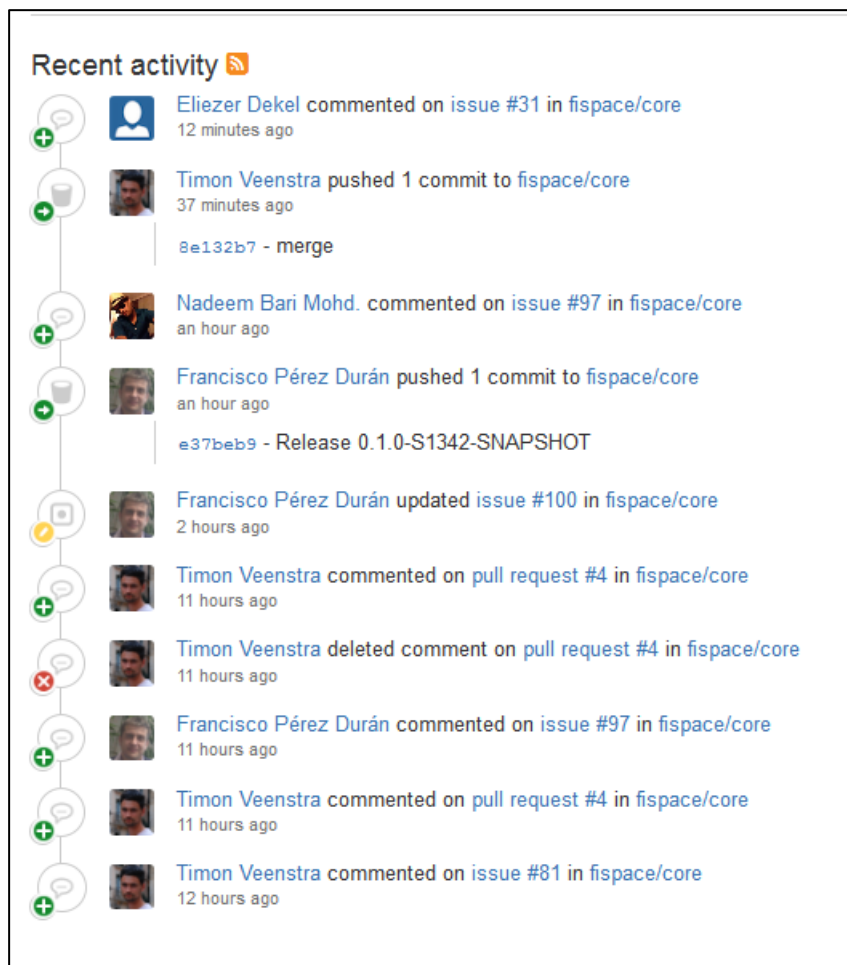


Figure 6: Landing page for of repository showing recent activity

Code can be checked out from the repositories using state of the art versioning control systems, such as Git and Mercurial. This allows parallel, concurrent work, and thus efficient development.

4.2 Issue Tracker

The issue tracker “is the place to track your project's feature requests, bug reports and other project management tasks. We keep the Bitbucket issue tracker very simple and yet somewhat flexible. It has just a few configurable fields (component, version and milestone) – you can use them any way you want.”²

The issue tracker in Fispace is used and configured to support communication within and beyond repositories, as well as to jointly agree on cross-cutting architectural issues (Figure 7 shows a screenshot of some of the architectural issued managed by the tracker).

² <https://confluence.atlassian.com/display/BITBUCKET/Bitbucket+101>

The screenshot shows the GitHub-style issue tracker for the 'core' repository of 'finspace'. At the top, there are navigation tabs for Overview, Source, Commits, Branches, Pull requests (2), Issues (37), Wiki, and Downloads. Below these are filters for 'All', 'Open', 'My issues', and 'Watching', along with an 'Advanced search' box. The main content area is titled 'Issues (1-5 of 5)' and shows a list of five issues. The first issue is '#98: App Internal or External to FIspace and the impact on the communication API' with a status of 'NEW' and assigned to 'Andreas Metzger'. The other issues are '#10: FIspace user profile information', '#6: Store / Marketplace GE's', '#84: Which component is responsible to create the BE instance and start the collaboration?', and '#83: Which component is responsible to create the Correlation Keys? Where does this "piece of logic" reside?'. Each issue row includes icons for tracking, a status label, a vote count, an assignee name, and creation/updated dates.

Title	T	P	Status	Votes	Assignee	Milestone	Version	Created	Updated
#98: App Internal or External to FIspace and the impact on the communication API Architectur...	+	⊘	NEW		Andreas Metzger			5 days ago	3 hours ago
#10: FIspace user profile information Architectur...	Ⓜ	↑	OPEN	1	ozgur_sonmezer			2013-09-16	5 days ago
#6: Store / Marketplace GE's Architectur...	Ⓜ	↑	OPEN		Eliezer Dekel			2013-09-15	2013-10-24
#84: Which component is responsible to create the BE instance and start the collaboration? Architectur...	Ⓜ	↑	NEW		Fabiana Fournier			2013-10-23	2013-10-23
#83: Which component is responsible to create the Correlation Keys? Where does this "piece of logic" reside? Architectur...	Ⓜ	↑	NEW		Fabiana Fournier			2013-10-23	2013-10-23

Figure 7: FIspace issue tracker

4.3 Wiki

Wikis are known to be a good tool for documentation and communication. In a project like FIspace, imagine multiple development teams from different work packages and tasks spread geographically co-ordinating towards a common goal.

With the help of wiki anyone can interact, work together in teams, get the best people on the right tasks and produce better overall results by letting everyone contribute which is different than a traditional mailing system, where most of the information and knowledge is often trapped in emails.

An important feature of Wiki is its in-built quick navigation and search, which makes sure you find what you're looking for, fast and instantly. It suggests pages, blogs, files and people as and when you type.

As a project team, one can easily customize and brand their team with wiki themes for a unique identification and extend add-ons for enhanced support for technical documentation, content importers, users list, organizing and controlling resources.

The internal development Wiki, includes the following information at the time of writing:

- **Contacts**

- [Product Owners](#)

- **Announcements**

- [Announcement](#)

- **Integration Team**

- [Integration Team](#)

- **Components**

- [Component diagram](#)
- [GUI Graphical user interface](#)
- [B2B-BCM Business Collaboration Module](#)
- [B2B-EPM Event Processing Module](#)
- [SDI System and Data Integration](#)
- [CSB Cloud Service bus](#)
- [Store](#)

- **Developers Guide**

- [Installation](#)
- [Coding](#)
- [Revision Control](#)
- [Standards](#)
- [Logging](#)

- **HowTo**

- [Create a new bundle](#)
- [Register a service implementation](#)
- [Include or exclude specific gui](#)
- [Create a specific domain](#)
- [Configure specific repository with user and password in your local environment](#)
- [run web-gui](#)
- [run JavaFX-gui](#)
- [publish a component api](#)
- [Run Editor Plugin](#)
- [Create an app](#)
- [Generate javadoc with jaxb](#)
- [Openid in web-gui](#)

- **Sprints**

- [Sprint structure](#)
- [Sprint week 37 2013](#)
- [Sprint week 38 2013](#)
- [Sprint week 39 2013](#)
- [Sprint week 40 2013](#)
- [Sprint week 41 2013](#)
- [Sprint week 42 2013](#)
- [Sprint week 41-44](#)

- **Work Packages**

- [WP200](#)
- [WP300](#)
- [WP400](#)
- [Others](#)

- **Teams and Task Forces**

- [T220 & T280](#)
- [T250](#)
- [Architects](#)
- [FIspace Technical Leads Meetings](#)
- [ALL](#)

- **Information and Documentation**

- [FI-PPP-AB](#)

- **Generic Enablers**

- [GE-Hints](#)
- [GE-Experiences and problems](#)

5 Conclusions

At the end of month 6, and as foreseen in the DoW, the online tools to support developers and users are in place in Flspace. This includes the online tools that have been set up under Sub-task 513 (Collaborative and online Supporting tools) in order to support the Flspace ecosystem and in particular to support **internal**, as well as **external** software developers. This deliverable has reported about them.

In addition, this set of tools includes the general project website, which complements the specific information provided by the tools described in this document (and which has been set up as part of Sub-Task 562).

