

INFORMATION TECHNOLOGIES FOR SHIFT TO RAIL

D6.5 Business Analytics Additional Integration Report

Due date of deliverable: 28/02/2017

Actual submission date: 30/05/2017

Leader of this Deliverable: Guido Mariotta (LEONARDO)

Reviewed: Y

Document status		
Revision	Date	Description
1	25/01/2017	First draft released
2	31/01/2017	Version after WP6 partners review
3	28/02/2017	Version with further contributions described by WP6 partners
4	30/05/2017	Final version after TMC approval

Project funded from the European Union's Horizon 2020 research and innovation programme		
Dissemination Level		
PU	Public	X
CO	Confidential, restricted under conditions set out in Model Grant Agreement	
CI	Classified, information as referred to in Commission Decision 2001/844/EC	

Start date of project: 01/05/2015

Duration: 30 months

EXECUTIVE SUMMARY

This deliverable contains a complete report concerning tests envisaged for the Business Analytics planned for the IT2Rail Additional Release. Furthermore the document includes a complete description concerning the configuration for the infrastructure and hardware in order to run the tests described in this document.

Finally, a list of all tests is provided along with a short description concerning which functionality the test verifies preconditions, expected and observed results. All tests are grouped by category and verify the effectiveness of the Business Analytics functionalities developed for the IT2Rail Additional Release. The last section of the document describes the test runs with the observed results.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
LIST OF FIGURES	7
LIST OF TABLES.....	8
1. INTRODUCTION	9
2. REFERENCED DOCUMENTS	9
2.1 APPLICABLE DOCUMENTS	9
2.2 NORMATIVE DOCUMENTS	9
3. CAMPAIGN STRATEGY	9
4. TEST MATERIALS DESCRIPTION	9
4.1 CONFIGURATION	9
4.1.1 INFRASTRUCTURE AND HARDWARE	10
4.1.2 SETUP & CONFIGURATION.....	10
4.1.3 TESTED SYSTEM.....	11
4.1.4 SYSTEM DATA PARAMETERS	11
4.1.5 SIMULATORS	12
4.1.6 PERSONNEL	12
5. TEST DESCRIPTIONS	13
5.1 [TEST CATEGORY 6.1] PROVIDING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS	13
5.1.1 [TEST CASE 6.1.1] GENERATING TICKETING SYSTEMS DATA.....	14
5.1.2 [TEST CASE 6.1.2] COMPUTING KEY PERFORMANCE INDICATORS	15
5.2 [TEST CATEGORY 6.2] SHOWING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS ON THE DASHBOARD	17
5.2.1 [TEST CASE 6.2.1] SHOWING KEY PERFORMANCE INDICATORS ON TABLES	18
5.2.2 [TEST CASE 6.2.2] SHOWING KEY PERFORMANCE INDICATORS ON CHARTS	21
[TEST CATEGORY 6.3] SHOWING WEATHER INFORMATION AND FORECASTS	24
5.2.3 [TEST CASE 6.3.1] SHOWING WEATHER INFORMATION ON TABLES.....	24
5.2.4 [TEST CASE 6.3.2] SHOWING WEATHER INFORMATION ON CHARTS.....	26
5.2.5 [TEST CASE 6.3.3] SHOWING WEATHER FORECASTS ON TABLES.....	30
5.2.6 [TEST CASE 6.3.4] SHOWING WEATHER FORECASTS ON CHARTS.....	32
5.3 [TEST CATEGORY 6.4] PROVIDING WEATHER INFORMATION AND FORECASTS	35
5.3.1 [TEST CASE 6.4.1] COLLECTING WEATHER INFORMATION FROM OPENWEATHERMAP	36
5.3.2 [TEST CASE 6.4.2] STORING WEATHER INFORMATION INTO THE BUSINESS ANALYTICS REPOSITORIES.....	37

5.3.3 [TEST CASE 6.4.3] EXPOSING WEB SERVICES TO RETRIEVE WEATHER INFORMATION.....	38
5.3.4 [TEST CASE 6.4.4] COLLECTING WEATHER FORECASTS FROM OPENWEATHERMAP	40
5.3.5 [TEST CASE 6.4.5] STORING WEATHER FORECASTS INTO THE BUSINESS ANALYTICS REPOSITORIES.....	41
5.3.6 [TEST CASE 6.4.6] EXPOSING WEB SERVICES TO RETRIEVE WEATHER FORECASTS.....	43
5.4 [TEST CATEGORY 6.5] SHOWING INDICATORS ON SOCIAL NETWORK MESSAGES .	44
5.4.1 [TEST CASE 6.5.1] SHOWING KPIS CONCERNING SOCIAL NETWORK MESSAGES ON TABLES	45
5.4.2 [TEST CASE 6.5.2] SHOWING KPIS CONCERNING SOCIAL NETWORK MESSAGES ON CHARTS	47
5.5 [TEST CATEGORY 6.6] PROVIDING KPIS ON SOCIAL NETWORK MESSAGES	51
5.5.1 [TEST CASE 6.6.1] COLLECTING SOCIAL NETWORK MESSAGES.....	52
5.5.2 [TEST CASE 6.6.2] STORING SOCIAL NETWORK MESSAGES INTO THE BUSINESS ANALYTICS REPOSITORIES.....	53
5.5.3 [TEST CASE 6.6.3] COMPUTING KPIS ON SOCIAL NETWORK MESSAGES	54
5.5.4 [TEST CASE 6.6.4] STORING KPIS CONCERNING SOCIAL NETWORK MESSAGES INTO THE BUSINESS ANALYTICS REPOSITORIES.....	58
5.5.5 [TEST CASE 6.6.5] EXPOSING WEB SERVICES TO RETRIEVE KPIS COMPUTED ON SOCIAL NETWORK MESSAGES.....	60
5.7 [TEST CATEGORY 6.7] PROVIDING KPIS ON TRAVEL COMPANION WALLET (WP5) STORED USER INFORMATION	61
5.7.1 [TEST CASE 6.7.1] SIMULATING TRAVELLER INFORMATION	62
5.7.2 [TEST CASE 6.7.2] PREFERRED TRANSPORT MODE PER PASSENGER TYPE	63
5.7.3 [TEST CASE 6.7.3] PREFERRED CARRIER	64
5.7.4 [TEST CASE 6.7.4] PREFERRED LOYALTY CARDS	66
5.7.5 [TEST CASE 6.7.5] EXPOSING WEB SERVICES TO RETRIEVE COMPUTED KPIS AND VISUALIZATION OF RESULTS.....	67
6. TEST EXECUTION.....	70
6.1 TEST RUN 6.1	73
6.1.1 PROVIDING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS – GENERATING TICKETING SYSTEMS DATA.....	73
6.1.2 PROVIDING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS – COMPUTING KEY PERFORMANCE INDICATORS	73
6.2 TEST RUN 6.2	73
6.2.1 SHOWING KEY PERFORMANCE INDICATORS CONCERNING THE TICKETING SYSTEMS ON THE DASHBOARD – SHOWING KEY PERFORMANCE INDICATORS ON TABLES	73

6.2.2	SHOWING KEY PERFORMANCE INDICATORS CONCERNING THE TICKETING SYSTEMS ON THE DASHBOARD – SHOWING KEY PERFORMANCE INDICATORS ON CHARTS	73
6.3	TEST RUN 6.3	73
6.3.1	SHOWING WEATHER INFORMATION AND FORECASTS – SHOWING WEATHER INFORMATION ON TABLES	73
6.3.2	SHOWING WEATHER INFORMATION AND FORECASTS – SHOWING WEATHER INFORMATION ON CHARTS	74
6.3.3	SHOWING WEATHER INFORMATION AND FORECASTS – SHOWING WEATHER FORECASTS ON TABLES	74
6.3.4	SHOWING WEATHER INFORMATION AND FORECASTS – SHOWING WEATHER FORECASTS ON CHARTS	74
6.4	TEST RUN 6.4	74
6.4.1	PROVIDING WEATHER INFORMATION AND FORECASTS – COLLECTING WEATHER INFORMATION FROM OPENWEATHERMAP	74
6.4.2	PROVIDING WEATHER INFORMATION AND FORECASTS – STORING WEATHER INFORMATION INTO THE BUSINESS ANALYTICS REPOSITORIES	74
6.4.3	PROVIDING WEATHER INFORMATION AND FORECASTS – EXPOSING WEB SERVICES TO RETRIEVE WEATHER INFORMATION	74
6.4.4	PROVIDING WEATHER INFORMATION AND FORECASTS – COLLECTING WEATHER FORECASTS FROM OPENWEATHERMAP	75
6.4.5	PROVIDING WEATHER INFORMATION AND FORECASTS – STORING WEATHER FORECASTS INTO THE BUSINESS ANALYTICS REPOSITORIES	75
6.4.6	PROVIDING WEATHER INFORMATION AND FORECASTS – EXPOSING WEB SERVICES TO RETRIEVE WEATHER FORECASTS	75
6.5	TEST RUN 6.5	75
6.5.1	SHOWING INDICATORS ON SOCIAL NETWORK MESSAGES – SHOWING KPIS CONCERNING SOCIAL NETWORK MESSAGES ON TABLES	75
6.5.2	SHOWING INDICATORS ON SOCIAL NETWORK MESSAGES – SHOWING KPIS CONCERNING SOCIAL NETWORK MESSAGES ON CHARTS	75
6.6	TEST RUN 6.6	76
6.6.1	PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – COLLECTING SOCIAL NETWORK MESSAGES	76
6.6.2	PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – STORING SOCIAL NETWORK MESSAGES INTO THE BUSINESS ANALYTICS REPOSITORIES	76
6.6.3	PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – COMPUTING KPIS ON SOCIAL NETWORK MESSAGES	76
6.6.4	PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – STORING KPIS CONCERNING SOCIAL NETWORK MESSAGES INTO THE BUSINESS ANALYTICS REPOSITORIES	76
6.6.5	PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – EXPOSING WEB SERVICES TO RETRIEVE KPIS COMPUTED ON SOCIAL NETWORK MESSAGES	76

6.7 TEST RUN 6.7	76
6.7.1 SIMULATING TRAVELLER INFORMATION	76
6.7.2 PREFERRED TRANSPORT PER PASSENGER TYPE	77
6.7.3 PREFERRED CARRIER	77
6.7.4 PREFERRED LOYALTY CARDS	77
6.7.5 EXPOSING WEB SERVICES TO RETRIEVE KPIS COMPUTED AND VISUALIZATION OF RESULTS.....	77

LIST OF FIGURES

Figure 1 - Example of Ticketing KPIs Presentation	17
Figure 2 - Example of Ticketing KPIs Table Presentation.....	20
Figure 3 - Example of Ticketing KPIs Chart Presentation.....	23
Figure 4 - Example of Historic Weather Data Table Presentation.....	26
Figure 5 - Example of Historic Weather Data Chart Presentation.....	29
Figure 6 - Example of Weather Forecast Data Table Presentation.....	32
Figure 7 - Example of Weather Forecast Data Chart Presentation.....	35
Figure 8 - Example of KPIs on Social Network Messages Table Presentation	47
Figure 9 - Example of KPIs on Social Network Messages Graph Presentation	50
Figure 10 - Example of KPIs on Social Network Messages Cloud Presentation.....	51
Figure 11 - Example of Computation of KPIs on Social Network Messages.....	57

LIST OF TABLES

Table 1: Execution of test cases	70
--	----

1. INTRODUCTION

The following sections of this document describe:

- the description of the configuration needed for running all tests;
- the system used for running the tests;
- all tests planned and executed for verifying the functionalities of the IT2Rail Business Analytics for the Additional Release;
- the expected and observed results achieved by means of this test campaign.

2. REFERENCED DOCUMENTS

2.1 APPLICABLE DOCUMENTS

This chapter lists the applicable documents for the current deliverable:

- **D6.1 – Business Analytics Ontology document**
- **D6.2 – Business Analytics Specifications document**
- **D6.4 – Business Analytics Core Integration Report**

2.2 NORMATIVE DOCUMENTS

Not Applicable.

3. CAMPAIGN STRATEGY

This campaign strategy has the aim to test and verify the Business Analytics functions delivered for the IT2Rail Additional Release.

The following chapters will describe:

- the test materials description meant as infrastructure and hardware settings in order to perform the test use cases planned for this IT2Rail release (i.e. Additional Release);
- the detailed test use cases planned for this campaign;
- the tests execution.

4. TEST MATERIALS DESCRIPTION

This chapter lists the assets required to perform the Business Analytics test use cases.

4.1 CONFIGURATION

This paragraph describes the configuration of the Business Analytics platform envisaged for the Additional Release. The configuration includes the infrastructure and hardware settings of the Business Analytics module. The former describes the infrastructure chosen for running the software modules, the latter specifies the hardware the Business Analytics components relies on.

4.1.1 INFRASTRUCTURE AND HARDWARE

INFRASTRUCTURE

The Business Analytics components run on several virtual machines. Tomcat 8 has been chosen as application server that is running on each virtual machine. The different VMs communicate each other by using web services. REST technology has been chosen for implementing web services. Information formatted in JSON is exchanged by means of HTTP requests by using both POST and GET methods.

HARDWARE - LEONARDO CONTRIBUTION

The Business Analytics infrastructure is based on a cluster of nodes. Each of these nodes has the following hardware configuration:

- Centos 7 64 bit
- 8 Gb Ram
- CPU & Core Xeon 1.9

HARDWARE - UPC CONTRIBUTION

The Social Network Analytics infrastructure is based on components that are distributed in, currently, one node. Each of these nodes has the following hardware configuration:

- Debian 3.16.1 64 bit
- 32 GB Ram
- 2 TB disk
- 8 CPUs Intel® Xeon® CPU ES-2623 v3 @ 3.00GHz

HARDWARE - INDRA CONTRIBUTION

Sofia2 node for interoperability, KPI management from real time processing and visualization requires approximately the following basic software and hardware characteristics:

- JRE 7 or higher version.
- Tomcat 7 application server.
- Linux 64bits distribution.
- 4 cores.
- 8GB RAM.
- 500 GB HD.

4.1.2 SETUP & CONFIGURATION

This section contains the setup and configuration for performing the test campaign envisaged for the Additional Release. In order to accomplish the test phase, the personnel in charge of testing the Business Analytics platform needs to have an internet connection perfectly working. In addition the following software applications have to be installed on the laptop where the tests are carried out:

- A web browser (Google Chrome preferably).

- POSTMAN as Google Chrome plugin.
- Any other REST client tool

4.1.3 TESTED SYSTEM

During this test campaign several modules of the Business Analytics platform have been tested in order to verify the functionalities foreseen for the Additional Release. The behaviour of the following WP6 software components has been checked against a list of tests defined in the following sections:

- The **Presentation component** of the Business Analytics is used by the operators in order to show weather information, KPIs computed on social networks messages, indicators measuring the trends concerning ticketing systems and KPIs concerning user preferences with associated dashboards.
- The computation capabilities of the **Information Management & Analysis** module that allows computing the KPIs on social networks messages and ticketing systems and user preferences.
- **Web services of the Data Management component** used by the Presentation component to retrieve information from the Business Analytics repositories. This information is concerned with:
 - KPIs computed on the social network messages;
 - weather information and forecasts of the cities included in the IT2Rail Corridor use case;
 - KPIs concerning ticketing systems
 - KPIs concerning user preferences.

In addition, the Presentation module for the Core Release includes the following components:

- a web based Geographic Information System (GIS) that shows on map several information concerning events (*happenings*) and weather conditions;
- a dashboard showing KPIs selected for the Milan-Rome travel leg computed by the Information Analysis and Management component of the Business Analytics module.

The web services exposed by the Business Analytics platform for the Core Release are responsible for making KPIs, happenings available to the Presentation layer. Further web services have been developed for the Additional Release in order to expose new KPIs and data to the other IT2Rail work packages.

4.1.4 SYSTEM DATA PARAMETERS

The following information has been used in order to test the Business Analytics components developed for the Additional Release:

- Social network messages collected from Twitter;
- Weather information and forecasts gathered from OpenWeatherMap;
- Simulated data for computing KPIs on the ticketing systems.
- Simulated data for computing KPIs on user preferences.

4.1.5 SIMULATORS

Indicators computed for the ticketing systems are based on raw data generated automatically by LEONARDO. The indicators have been then computed with Pentaho – Business Analytics and then shown on the Presentation Layer of the Business Analytics module.

Raw data generated automatically by INDRA based on WP5 preferences structure has been used for user preferences KPI computation. KPI results have been exposed on a REST service and presented on a different dashboard after their computation.

4.1.6 PERSONNEL

The personnel required to run this test campaign has to be high-qualified people with a professional background in Information Technology and Computer Science.

5. TEST DESCRIPTIONS

This chapter contains a list of test cases provided for describing how Business Analytics components are checked in order to deliver the functionalities for the IT2Rail Additional Release.

5.1 [TEST CATEGORY 6.1] PROVIDING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS

One of the major aims of the Business Analytics module is to compute a list of indexes and Key Performance Indicators in order to provide a general overview concerning ticketing systems. The following KPIs are computed for a generic ticketing system involved in the IT2Rail scenario:

- Daily Number of sold tickets
- Number of tickets sold by week
- Daily Ticket price
- Average ticket price by week
- Daily number of refunded tickets
- Total number of refunded tickets by week
- Percentage of refunded tickets by month
- Daily number of claims
- Total number of claims by week
- Percentage of claims by month

5.1.1 [TEST CASE 6.1.1] GENERATING TICKETING SYSTEMS DATA

6.1.1	
Method Of Test	Demonstration
Type of test	Automated
Objectives	To check the software component responsible for generating ticketing systems data.
Description	This test case checks the generation of information that will be used as input for computing the Key Performance Indicators concerning ticketing systems.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> The software component for simulating ticketing systems data is available. 				
1	Upon launching the application, when the Tester sets filtering data, the windows of the application displays the data originally generated by the simulator, subsequently loaded into the application and filtered by the Tester acting as End User.	Ticketing systems data generated by the simulator is used for computing and presenting KPIs to the user.	Ticketing systems data generated by the simulator is used for computing and presenting KPIs to the user.	Passed	[used for traceability]

5.1.2 [TEST CASE 6.1.2] COMPUTING KEY PERFORMANCE INDICATORS

6.1.2	
Method Of Test	Demonstration
Type of test	Automated
Objectives	To check the Business Analytics module computes KPIs for the ticketing systems.
Description	This test case verifies the KPIs computation for the ticketing systems. The KPIs computed by the Business Analytics module are related to generic ticketing systems.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at the following URL address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User sets the Rome-Milan route, Start Date = 01/05/2016, End Date = 31/05/2016	KPIs for the ticketing systems are computed, filtered and made available to the Presentation layer according to route, start date and end date.	KPIs for the ticketing systems are computed, filtered and made available to the Presentation layer according to route, start date and end date.	Passed	[used for traceability]

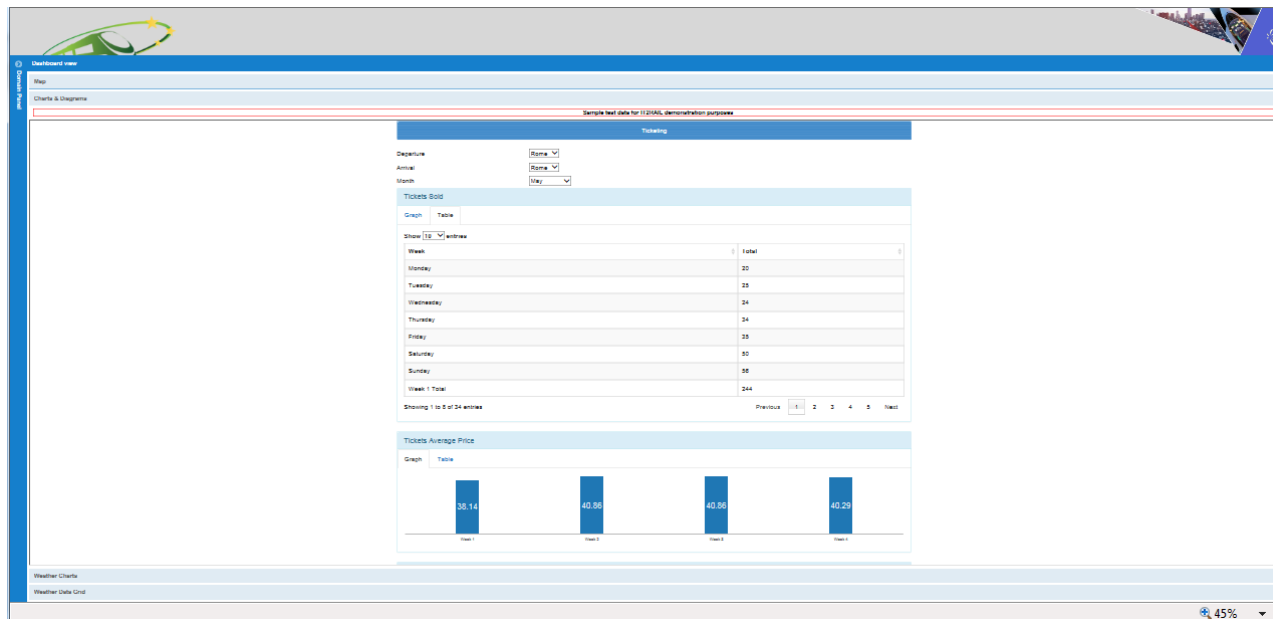


Figure 1 - Example of Ticketing KPIs Presentation

5.2 [TEST CATEGORY 6.2] SHOWING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS ON THE DASHBOARD

The dashboard included in the Presentation component shows KPIs by means of tables and charts and is used in this test campaign in order to check the functionality offered by the Presentation component to show KPIs computed by the Information Management & Analysis component concerning the ticketing systems.

5.2.1 [TEST CASE 6.2.1] SHOWING KEY PERFORMANCE INDICATORS ON TABLES

6.2.1	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check KPIs are retrieved and shown on tables.
Description	This test checks whether KPIs concerning ticketing systems are retrieved and shown on tables. The Presentation layer of the Business Analytics module encapsulates a dashboard containing indicators that evaluate the ticketing systems.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	<p>Preconditions:</p> <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at IP address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User sets the Rome-Milan route, Start Date = 01/05/2016, End Date = 31/05/2016.	KPIs concerning ticketing systems and filtered according to route, start date and end date are shown on tables within the dashboard.	KPIs concerning ticketing systems and filtered according to route, start date and end date are shown on tables within the dashboard.	Passed	[used for traceability]

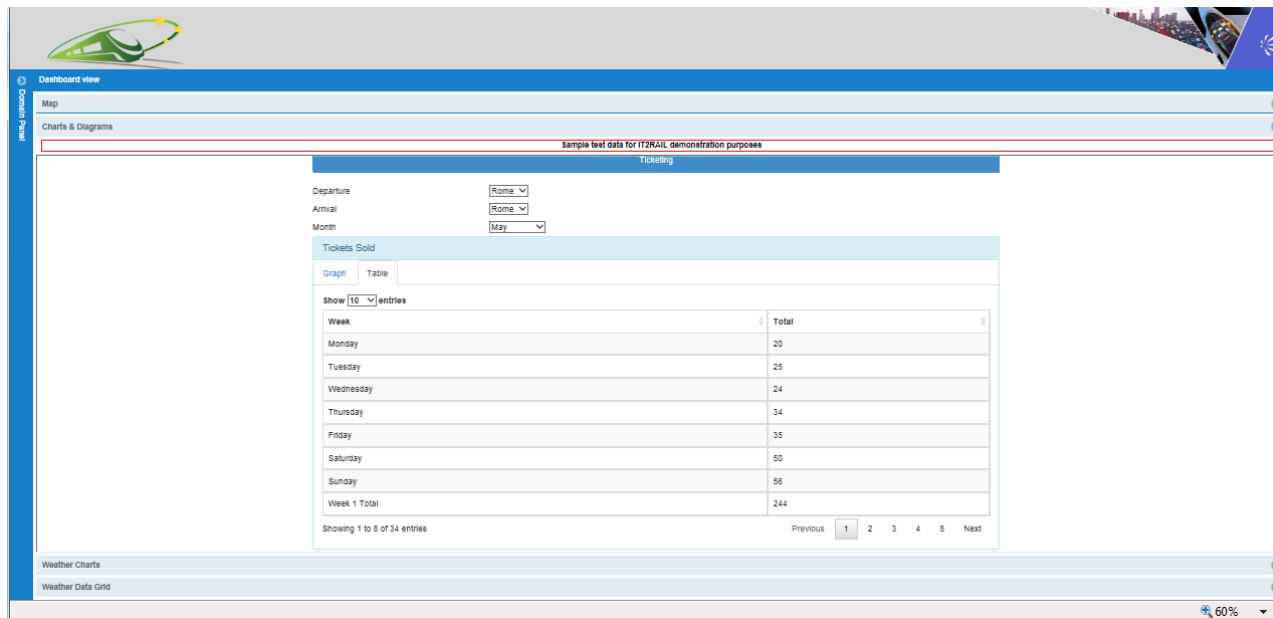


Figure 2 - Example of Ticketing KPIs Table Presentation

5.2.2 [TEST CASE 6.2.2] SHOWING KEY PERFORMANCE INDICATORS ON CHARTS

6.2.2	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check KPIs are retrieved and shown on charts
Description	This test checks whether KPIs are retrieved and shown on charts. The Presentation layer of the Business Analytics module encapsulates a dashboard containing indicators that evaluate the ticketing systems. This test shows that key performance indicators can easily evaluated when they are shown on charts included in the dashboard of the Presentation component.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	<p>Preconditions:</p> <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at ip address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User sets the Rome-Milan route, Start Date = 01/05/2016, End Date = 31/05/2016.	KPIs concerning ticketing systems are shown on charts within the dashboard.	KPIs concerning ticketing systems are actually shown on charts within the dashboard.	Passed	[used for traceability]

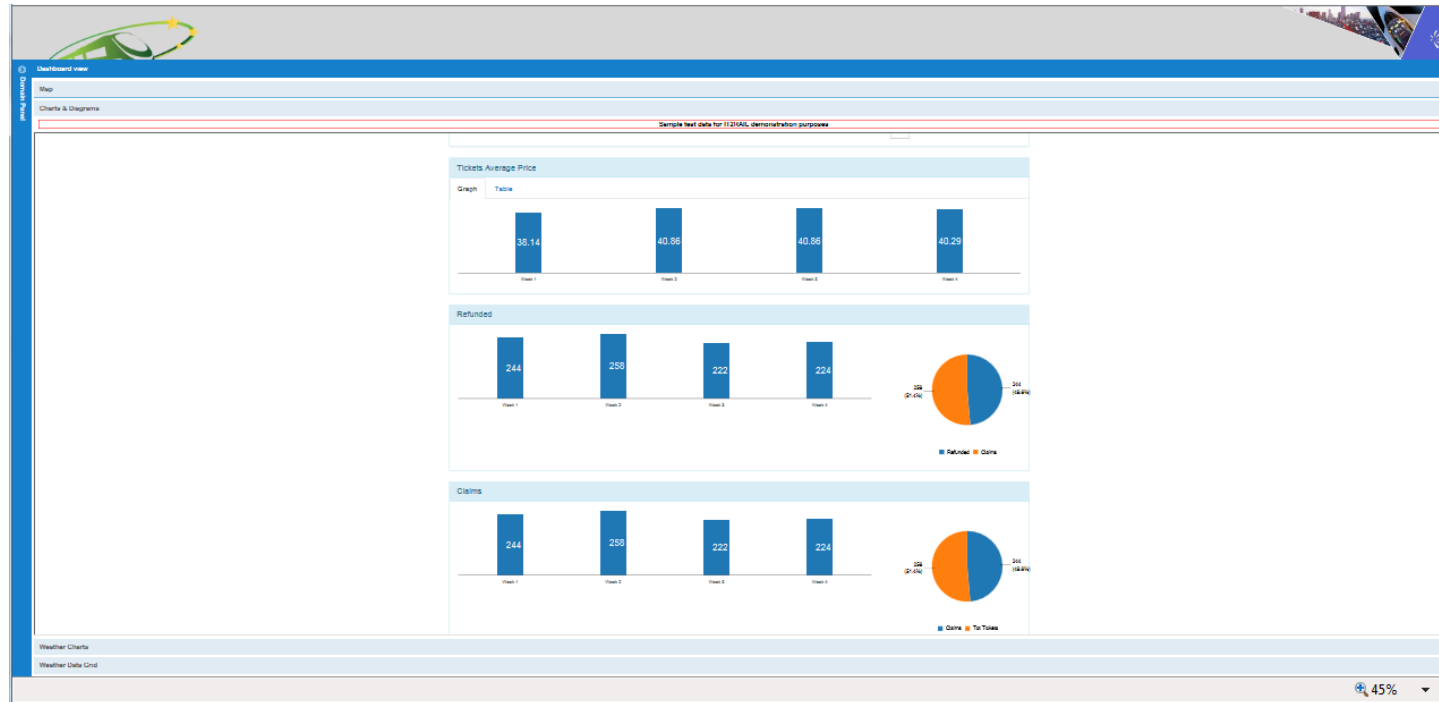


Figure 3 - Example of Ticketing KPIs Chart Presentation

[TEST CATEGORY 6.3] SHOW ING WEATHER INFORMATION AND FORECASTS

This test category verifies by means the following test use cases the functionalities of the Presentation component to show weather information and forecasts on the dashboard of the Presentation layer.

5.2.3 [TEST CASE 6.3.1] SHOWING WEATHER INFORMATION ON TABLES

6.3.1	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check weather information are retrieved and shown on tables.
Description	This test checks whether weather information are retrieved and shown on tables. The Presentation layer of the Business Analytics module encapsulates a dashboard containing detections that evaluate the current weather situation.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	<p>Preconditions:</p> <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at ip address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User opens the Weather Data Table tab and filters by Historical Data and Temperature.	Weather information is shown on tables within the dashboard.	Weather information is actually shown on tables within the dashboard.	Passed	[used for traceability]

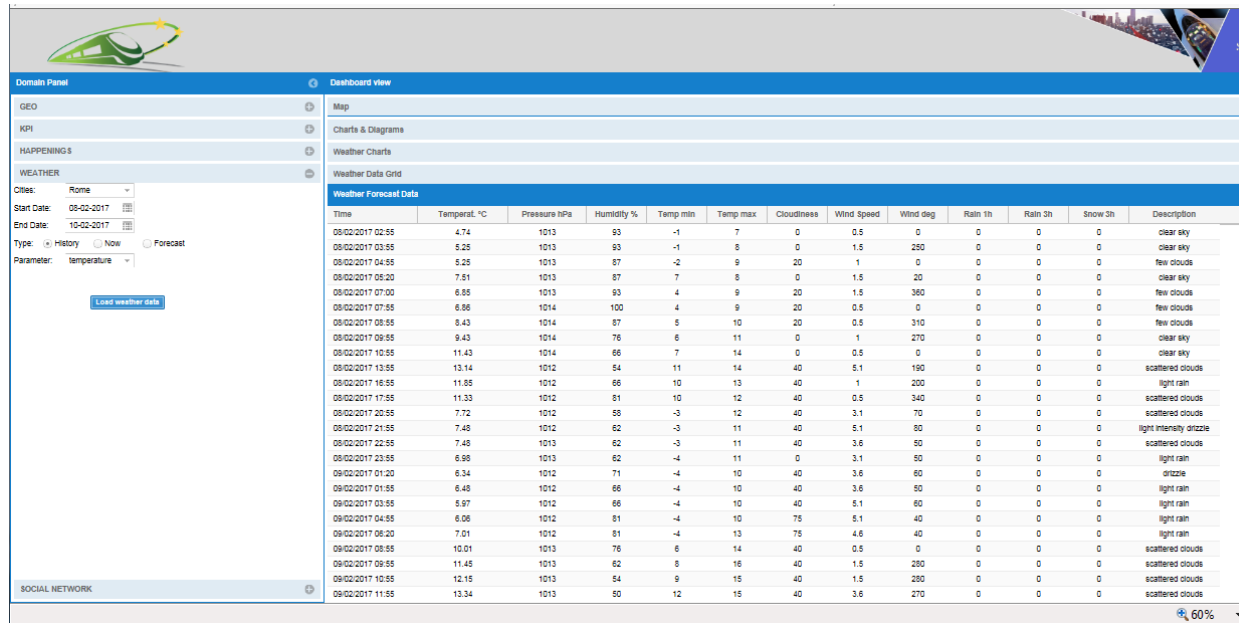


Figure 4 - Example of Historic Weather Data Table Presentation

5.2.4 [TEST CASE 6.3.2] SHOWING WEATHER INFORMATION ON CHARTS

6.3.2	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check weather information are retrieved and shown on charts.

6.3.2	
Description	This test checks whether weather information are retrieved and shown on charts. The Presentation layer of the Business Analytics module encapsulates a dashboard containing detections that evaluate the current weather situation. This test shows that detections concerning weather information can easily be evaluated when they are shown on charts included in the dashboard of the Presentation component.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	<p>Preconditions:</p> <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at ip address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User opens the Weather Chart tab and filters by Historical Data and Temperature.	Weather information is shown on charts within the dashboard.	Weather information is actually shown on charts within the dashboard.	Passed	[used for traceability]

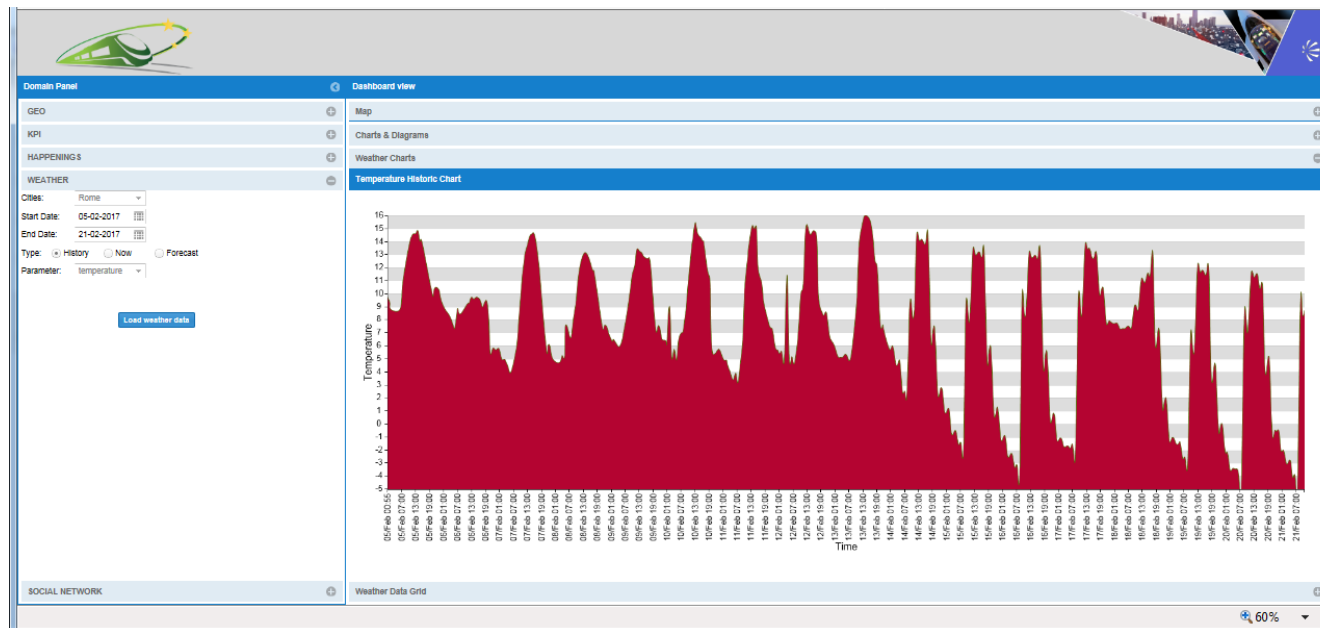


Figure 5 - Example of Historic Weather Data Chart Presentation

5.2.5 [TEST CASE 6.3.3] SHOWING WEATHER FORECASTS ON TABLES

6.3.3	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check weather forecasts are retrieved and shown on tables.
Description	This test checks whether weather forecasts are retrieved and shown on tables. The Presentation layer of the Business Analytics module encapsulates a dashboard containing forecasts for the next days.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	<p>Preconditions:</p> <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at ip address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User opens the Weather Data Table tab and filters by Forecast and Temperature.	Weather forecasts are shown on tables within the dashboard.	Weather forecasts are actually shown on tables within the dashboard.	Passed	[used for traceability]

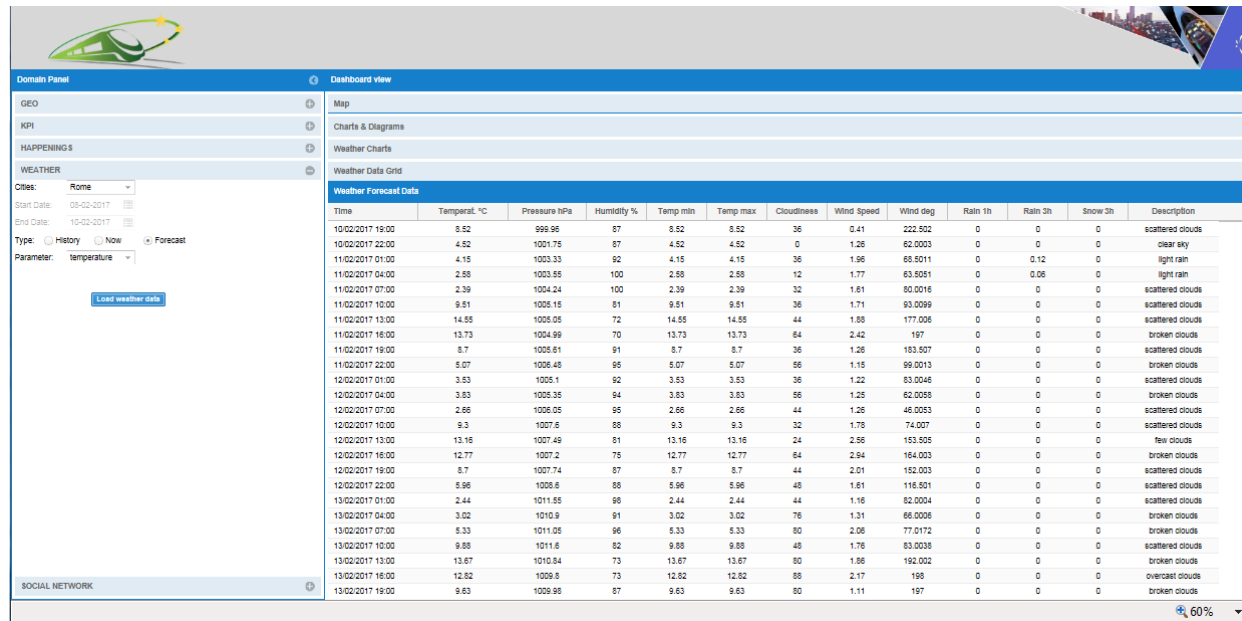


Figure 6 - Example of Weather Forecast Data Table Presentation

5.2.6 [TEST CASE 6.3.4] SHOWING WEATHER FORECASTS ON CHARTS

6.3.4	
Method Of Test	Demonstration
Type of test	Manual

6.3.4	
Objectives	To check weather forecasts are retrieved and shown on charts.
Description	This test checks whether weather forecasts are retrieved and shown on charts. The Presentation layer of the Business Analytics module encapsulates a dashboard containing forecasts for the next days. This test shows that the weather forecasts for the cities included in the IT2Rail Corridor scenario can easily be evaluated when they are shown on charts included in the dashboard of the Presentation component.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	<p>Preconditions:</p> <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at IP address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User opens the Weather Chart tab and filters by Forecast and Temperature.	Weather forecasts are shown on charts within the dashboard.	Weather forecasts are actually shown on charts within the dashboard.	Passed	[used for traceability]

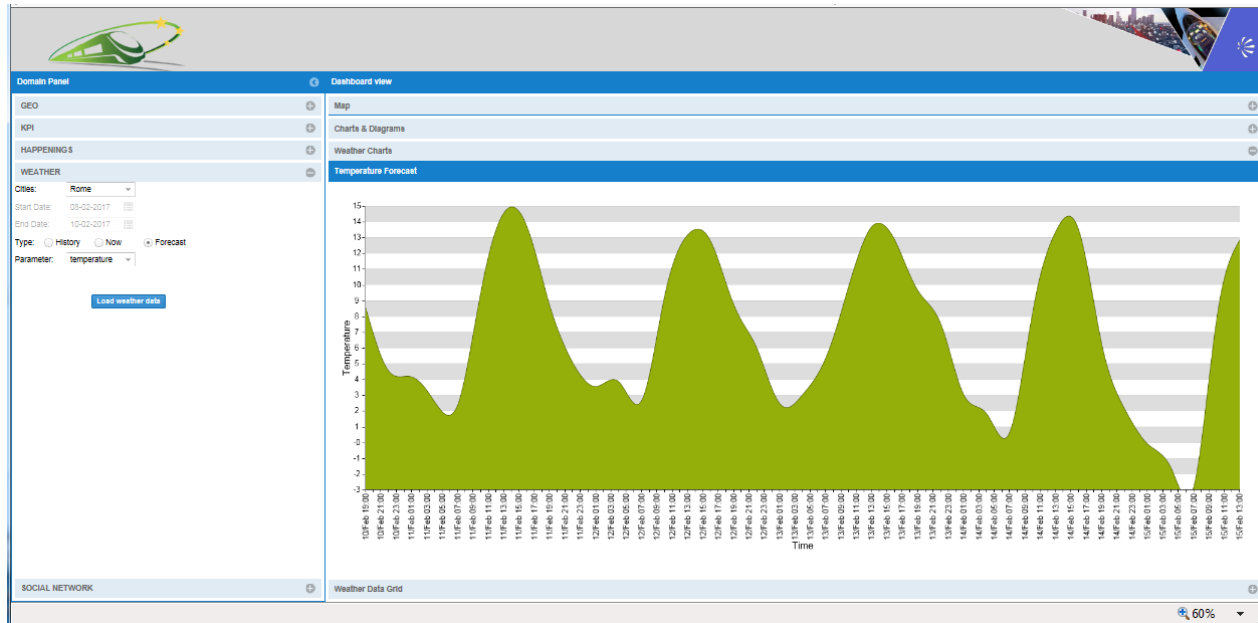


Figure 7 - Example of Weather Forecast Data Chart Presentation

5.3 [TEST CATEGORY 6.4] PROVIDING WEATHER INFORMATION AND FORECASTS

This test category describes the tests performed in order to check the Business Analytics functions used to:

- collect weather information and forecasts from OpenWeatherMap;
- store weather information and forecasts into the Business Analytics repositories;
- make weather information and forecasts available to the Presentation layer and the other IT2Rail modules by means of web services.

5.3.1 [TEST CASE 6.4.1] COLLECTING WEATHER INFORMATION FROM OPENWEATHERMAP

6.4.1	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To verify weather information are collected from OpenWeatherMap.
Description	This test verifies that weather information is collected from OpenWeatherMap. Information about the current weather situation is gathered by invoking web services made available by OpenWeatherMap.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> An Internet connection is available OpenWeatherMap webservices are available 				

Id	Step description	Expected result	Observed result	State	Associated defect
1	Tester invokes an OpenWeatherMap webservice.	Information about the current weather situation is returned.	Information about the current weather situation is returned.	Passed	[used for traceability]

5.3.2 [TEST CASE 6.4.2] STORING WEATHER INFORMATION INTO THE BUSINESS ANALYTICS REPOSITORIES

6.4.2	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To verify weather information is stored into the Business Analytics repositories
Description	This test verifies weather information is stored into the Business Analytics repositories. Information about the current weather situation from OpenWeatherMap is parsed and then stored into the Business Analytics repositories.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> • An Internet connection is available. • OpenWeatherMap webservices are available. • Data management module of the Business Analytics is running. 				
1	OpenWeatherMap webservices are launched by the Tester.	Information concerning current weather information is parsed in JSON format and stored in the WP6 repositories by the Data management module.	Information concerning current weather information is parsed in JSON format and stored in the WP6 repositories by the Data management module.	Passed	[used for traceability]

5.3.3 [TEST CASE 6.4.3] EXPOSING WEB SERVICES TO RETRIEVE WEATHER INFORMATION

6.4.3	
Method Of Test	Demonstration

6.4.3	
Type of test	Manual
Objectives	To check WP6 web services make the current weather information available to the Presentation layer and the other IT2Rail modules
Description	This test checks whether weather information can be retrieved by using the WP6 web services. The Business Analytics exposes web services in order to collect the current weather information stored in its repositories. These web services are created by using REST technology and allow retrieving the current weather information by city. Data are formatted in JSON.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> An Internet connection is available Web services of the Data Management component of the Business Analytics are available and can be invoked. 				

Id	Step description	Expected result	Observed result	State	Associated defect
1	Tester invokes the webservices of the Data Management BA component.	Information concerning the current weather information is retrieved by using the WP6 web services.	Information concerning the current weather information is properly retrieved by using the WP6 web services.	Passed	[used for traceability]

5.3.4 [TEST CASE 6.4.4] COLLECTING WEATHER FORECASTS FROM OPENWEATHERMAP

6.4.4	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To verify weather forecasts are collected from OpenWeatherMap.
Description	This test verifies that weather forecasts are collected from OpenWeatherMap. Information about the weather forecasts is gathered by invoking web services made available by OpenWeatherMap.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> Internet connection is available Data management module of the Business Analytics is running. OpenWeatherMap webservices are available 				
1	Tester invokes OpenWeatherMap webservices.	Information concerning the weather forecasts is returned.	Information concerning the weather forecasts is effectively returned.	Passed	[used for traceability]

5.3.5 [TEST CASE 6.4.5] STORING WEATHER FORECASTS INTO THE BUSINESS ANALYTICS REPOSITORIES

6.4.5	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To verify weather forecasts are stored into the Business Analytics repositories

6.4.5	
Description	This test verifies whether the weather forecasts are stored into the Business Analytics repositories. Information about the weather forecasts from OpenWeatherMap is parsed and then stored into the Business Analytics repositories.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> Internet connection is available Data management module of the Business Analytics is running. OpenWeatherMap webservices are available 				
1	OpenWeatherMap webservices are launched by the Tester.	Information concerning current weather forecasts is parsed in JSON format and stored in the WP6 repositories.	Information concerning current weather forecasts is parsed in JSON format and stored in the WP6 repositories.	Passed	[used for traceability]

5.3.6 [TEST CASE 6.4.6] EXPOSING WEB SERVICES TO RETRIEVE WEATHER FORECASTS

6.4.6	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check WP6 web services make the weather forecasts available to the Presentation layer and the other IT2Rail modules
Description	This test checks whether the weather forecasts can be retrieved by using the WP6 web services. The Business Analytics exposes web services in order to collect the weather forecasts stored in its repositories. These web services are created by using REST technology and allow retrieving the weather forecasts by city. Data are formatted in JSON.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> • Internet connection is available • Web services of the Data Management component of the Business Analytics are available and can be invoked. 				
1	Tester invokes the webservices of the Data Management BA component.	Information concerning the weather forecasts is retrieved.	Information concerning the weather forecasts is retrieved.	Passed	[used for traceability]

5.4 [TEST CATEGORY 6.5] SHOWING INDICATORS ON SOCIAL NETWORK MESSAGES

The dashboard included in the Presentation component shows KPIs by means of tables and charts and is used in this test campaign in order to check the functionality offered by the Presentation component to show KPIs computed by the Information Management & Analysis component concerning the social network messages retrieved from Twitter.

The following listing shows the indicators computed on social network messages:

- number of tweets crawled per day;
- words more used (removing stop words);
- users who tweeted more about the words in the configuration;
- users with more followers who tweeted more about the words in the configuration.

5.4.1 [TEST CASE 6.5.1] SHOWING KPIS CONCERNING SOCIAL NETWORK MESSAGES ON TABLES

6.5.1	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check KPIs are retrieved and shown on tables.
Description	This test checks whether KPIs concerning social network messages are retrieved and shown on tables. The Presentation layer of the Business Analytics module encapsulates a dashboard containing indicators computed on the basis of messages retrieved from Twitter.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	<p>Preconditions:</p> <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at IP address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. • A remote SN API is available in order to retrieve the necessary information for the KPIs. 				
1	Tester acting as End User chooses the Social Network tab.	Social Network tab is presented in the forefront at the right-hand side of the window.	Social Network tab is presented in the forefront at the right-hand side of the window.	Passed	[used for traceability]
2	Tester acting as End User enters Type of Social Data, Start Date and, optionally, End Date and presses the View Social Data button.	KPIs related to filter on Social Network messages are shown on tables within the dashboard.	KPIs related to filter on Social Network messages are shown on tables within the dashboard.	Passed	

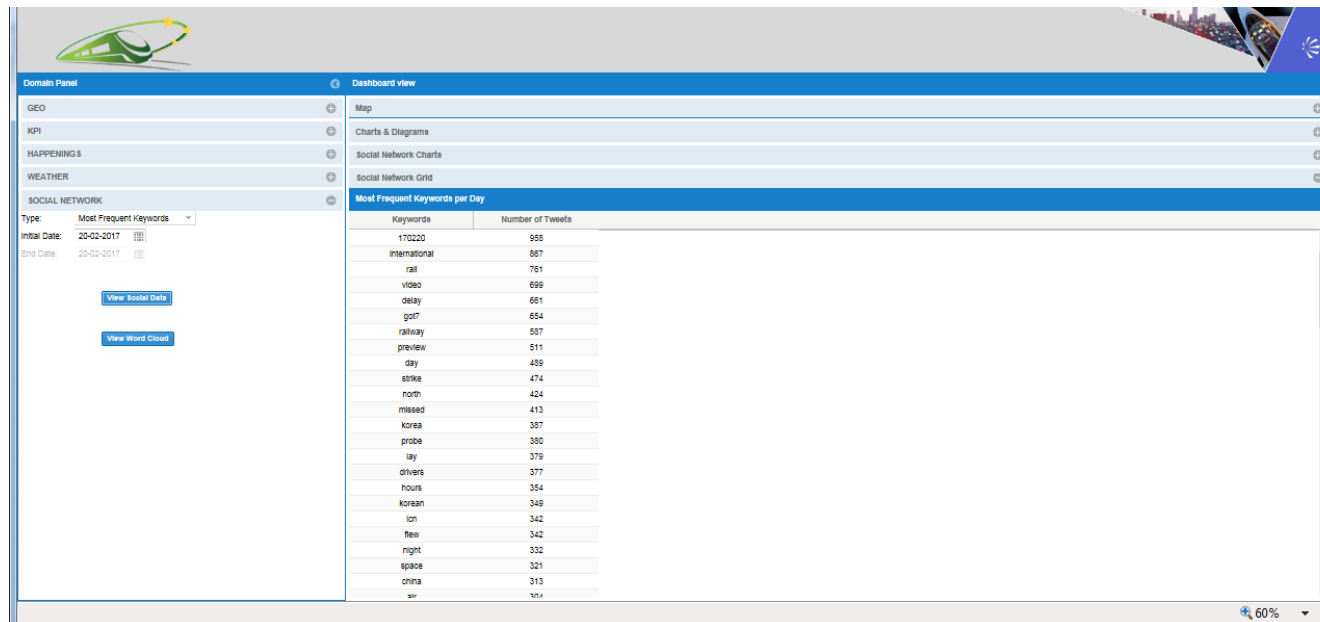


Figure 8 - Example of KPIs on Social Network Messages Table Presentation

5.4.2 [TEST CASE 6.5.2] SHOWING KPIS CONCERNING SOCIAL NETWORK MESSAGES ON CHARTS

6.5.2	
Method Of Test	Demonstration
Type of test	Manual

6.5.2	
Objectives	To check KPIs are retrieved and shown on charts.
Description	This test checks whether KPIs concerning social network messages are retrieved and shown on charts. The Presentation layer of the Business Analytics module encapsulates a dashboard containing indicators computed on the basis of messages retrieved from Twitter.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> • An Internet connection is available. • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at ip address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User chooses the Social Network tab.	Social Network tab is presented in the forefront at the right-hand side of the window.	Social Network tab is presented in the forefront at the right-hand side of the window.	Passed	[used for traceability]
2a	Tester acting as End User enters Type of Social Data, Start Date and, optionally, End Date and then presses the View Social Data button.	KPIs related to filter on Social Network messages are shown on charts within the dashboard.	KPIs related to filter on Social Network messages are shown on charts within the dashboard.	Passed	
2b	Tester acting as End User optionally presses View Cloud Data button.	KPIs related to filter on Social Network messages are shown on cloud charts within the dashboard.	KPIs related to filter on Social Network messages are shown on cloud charts within the dashboard.	Passed	

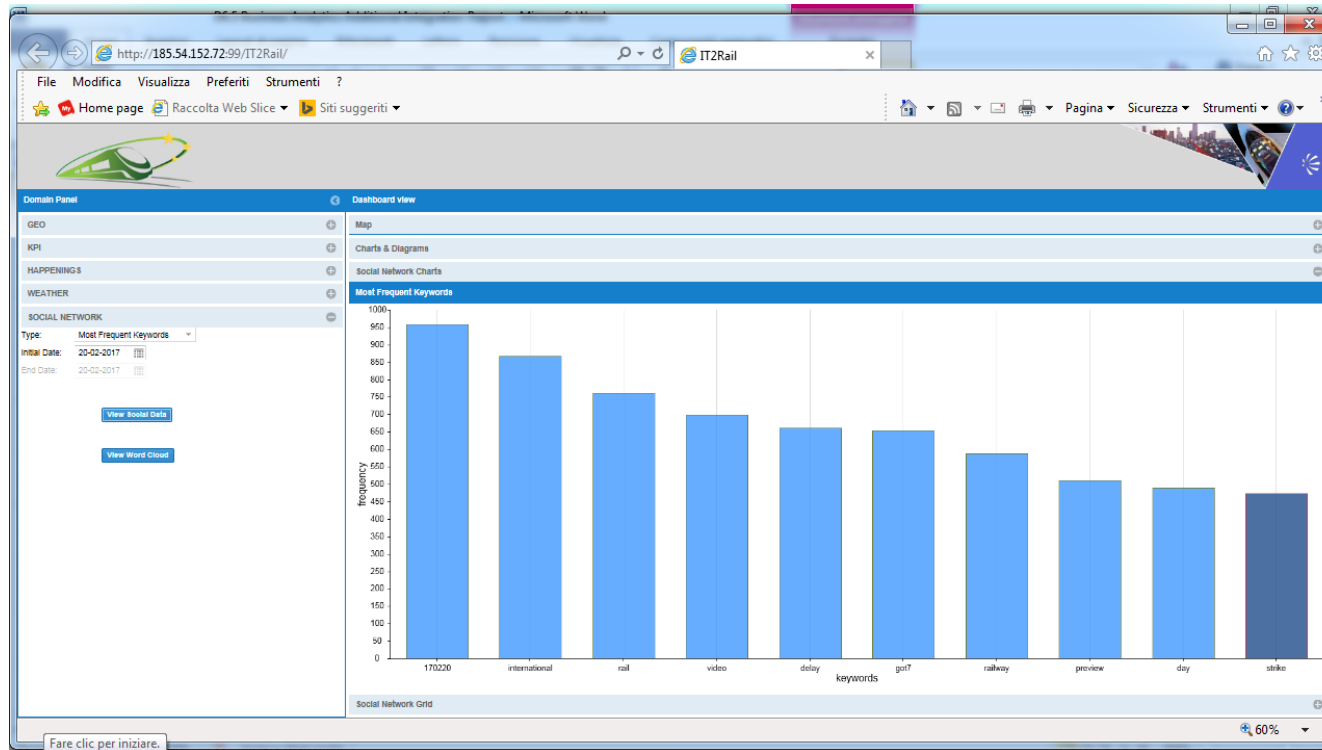


Figure 9 - Example of KPIs on Social Network Messages Graph Presentation

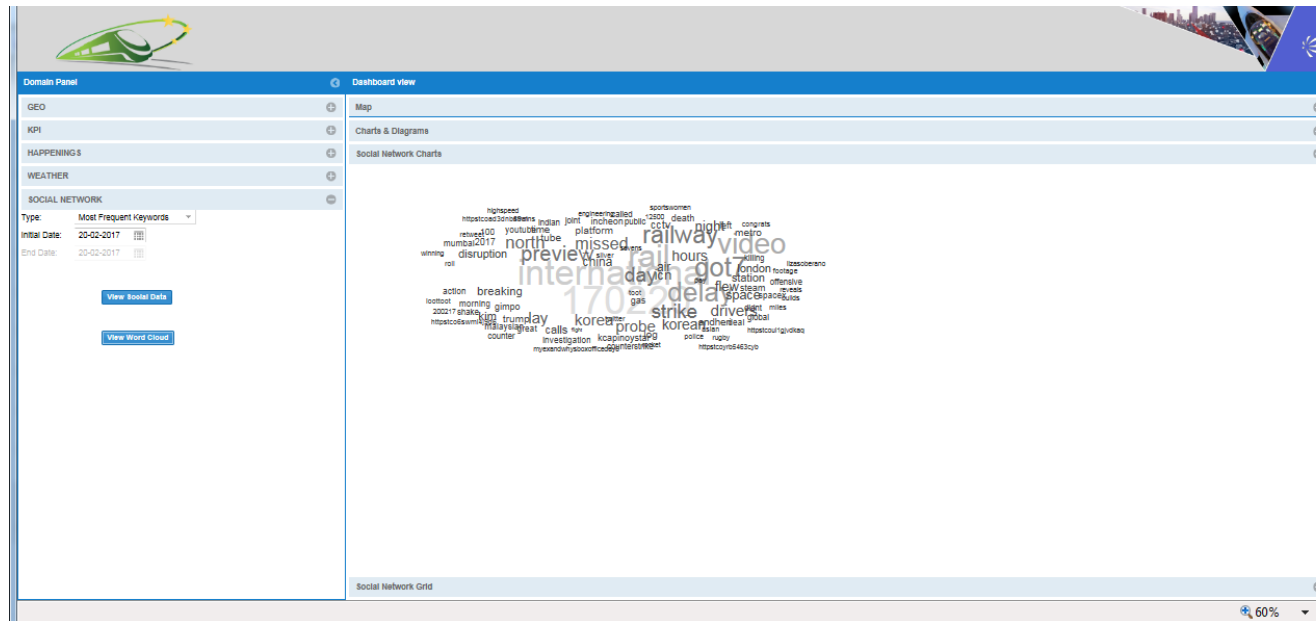


Figure 10 - Example of KPIs on Social Network Messages Cloud Presentation

5.5 [TEST CATEGORY 6.6] PROVIDING KPIS ON SOCIAL NETWORK MESSAGES

This test category describes the tests performed in order to check the Business Analytics functions used to:

- collect social network messages from Twitter;
- store social network message into the Business Analytics repositories.
- compute KPIs on social network messages;
- expose web services to retrieve KPIs computed on social network messages.

5.5.1 [TEST CASE 6.6.1] COLLECTING SOCIAL NETWORK MESSAGES

6.6.1	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To verify social network messages are collected from Twitter.
Description	This test verifies that social network messages are collected from Twitter.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> Internet connection is available Twitter APIs are available The Data Management component of the Business Analytics is available and can be launched. 				

Id	Step description	Expected result	Observed result	State	Associated defect
1	Tester launches the Data Management component which in turn invokes Twitter APIs.	Social network messages are gathered from Twitter.	Social network messages are effectively gathered from Twitter.	Passed	[used for traceability]

5.5.2 [TEST CASE 6.6.2] STORING SOCIAL NETWORK MESSAGES INTO THE BUSINESS ANALYTICS REPOSITORIES

6.6.2	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To verify social network messages are stored into the Business Analytics repositories
Description	This test verifies social network messages are stored into the Business Analytics repositories.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> • Internet connection is available • Twitter APIs are available • The Data Management component of the Business Analytics is available and can be launched. 				
1	Tester launches the Data Management component which in turn invokes Twitter APIs.	Social network messages are properly parsed and then stored into the WP6 repositories.	Social network messages are properly parsed and then stored into the WP6 repositories.	Passed	[used for traceability]

5.5.3 [TEST CASE 6.6.3] COMPUTING KPIS ON SOCIAL NETWORK MESSAGES

6.6.3	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check the Business Analytics module computes KPIs based on social network messages.
Description	This test case verifies the KPIs computation for the messages collected from Twitter.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> Internet connection is available Twitter APIs are available A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. The Presentation component of the Business Analytics is available at ip address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	Tester acting as End User chooses Social Network KPIs	Social Network Charts tab appears on the right of the application window.	Social Network Charts tab appears on the right of the application window.	Passed	[used for traceability]

Id	Step description	Expected result	Observed result	State	Associated defect
2	<p>Tester acting as End User enters values for the desired filter fields on the left-hand side of the application window:</p> <p>Type: Number of Tweets crawled</p> <p>Initial Date: 05-12-2016</p> <p>End Date: 19-12-2016</p> <p>and presses the View Social Data button.</p>	<p>The User-chosen KPI (Number of Tweets crawled) related to Twitter messages are computed and then made available to the Presentation layer.</p>	<p>The User-chosen KPI (Number of Tweets crawled) related to Twitter messages are computed and then made available to the Presentation layer.</p>	Passed	

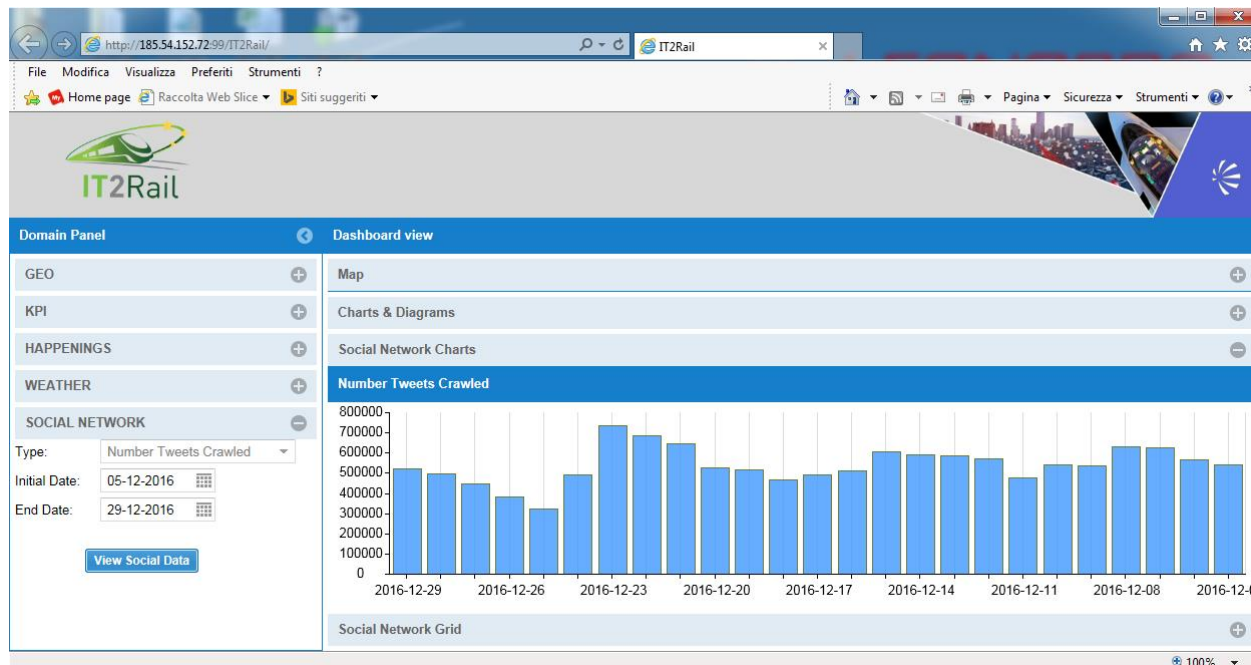


Figure 11 - Example of Computation of KPIs on Social Network Messages

5.5.4 [TEST CASE 6.6.4] STORING KPIS CONCERNING SOCIAL NETWORK MESSAGES INTO THE BUSINESS ANALYTICS REPOSITORIES

6.6.4	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To verify KPIs computed on social network messages are stored into the Business Analytics repositories
Description	This test verifies KPIs computed on social network messages are stored into the Business Analytics repositories.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	<p>Preconditions:</p> <ul style="list-style-type: none"> • Internet connection is available • Twitter APIs are available • A web browser (preferably Google Chrome) is installed on the laptop where the test is performed. • The Presentation component of the Business Analytics is available at IP address http://185.54.152.72:99/IT2Rail/ and can be visualized by using the web browser installed on the laptop. 				
1	The BA component is running and desired KPIs are computed and presented to the Tester.	KPIs on social network messages are stored into the WP6 repositories.	KPIs on social network messages are actually stored into the WP6 repositories.	Passed	[used for traceability]

5.5.5 [TEST CASE 6.6.5] EXPOSING WEB SERVICES TO RETRIEVE KPIS COMPUTED ON SOCIAL NETWORK MESSAGES

6.6.5	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To check WP6 web services make the KPIs computed on social network messages available to the Presentation layer and the other IT2Rail modules
Description	This test checks whether the KPIs computed on social network messages can be retrieved by using the WP6 web services. The Business Analytics module exposes web services in order to collect the KPIs on social network messages stored in its repositories. These web services are created by using REST technology and enable to retrieve this kind of indicators. Data are formatted in JSON.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> • Internet connection is available • Web services of the Data Management component of the Business Analytics are available and can be invoked. 				
1	Tester invokes the WP6 social network webservice indicating a certain number of parameters such as: type of social network KPI and interval dates.	KPIs computed on social network messages are retrieved by using the WP6 web services.	KPIs computed on social network messages are retrieved by using the WP6 web services.	Passed	[used for traceability]

5.7 [TEST CATEGORY 6.7] PROVIDING KPIS ON TRAVEL COMPANION WALLET (WP5) STORED USER INFORMATION

This test category describes the tests performed in order to check the Business Analytics functions used to:

- collect traveler information from WP5 wallet storage;
- compute KPIs into Business Analytics module;
- Visualize results and Expose Rest Services to retrieve KPIs

Currently the amount of information stored in WP5 is limited in quantity, so for A-REL testing purposes, information from different users will be simulated in aggregated mode. For this release, the functions of *collecting information from WP5* and *storing it in the BA repositories* will be replaced by a function able to simulate data from users and feed the ontologies for the analytic services.

5.7.1 [TEST CASE 6.7.1] SIMULATING TRAVELLER INFORMATION

5.7.1	
Method Of Test	Demonstration
Type of test	Manual
Objectives	To generate data from users to perform KPIs
Description	This test verifies that data is simulated following the correct structure used in WP5 to store traveller information.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester]

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> A simulator is available in order to provide data related to a number of Travellers and their associated information according to the WP5_AccessWalletManager_API specifications and data model. 				
1	Tester performs loading of simulated data into the analytical ontological model. Data will be aggregated.	The ontologies required by the analytics services are loaded.	The ontologies required by the analytics services are loaded.	Passed	[used for traceability]

5.7.2 [TEST CASE 6.7.2] PREFERRED TRANSPORT MODE PER PASSENGER TYPE

5.7.2	
Method Of Test	Demonstration
Type of test	Manual
Objectives	Analyse the preferred transport mode (Subway, Tram, Bus, Hailed shared taxi, Ferry, Taxi...) per type of passenger (older, pregnant, wheelchair...). This statistic provides a breakdown of transport mode use and preferences based on passenger types. Aggregated data is stored in ontologies and provided by a Rest service or in a chart mode.
Description	Provide transport preferences according to user type.
Status	OK

5.7.2	
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester] end_point: http://sofia2.com/sib-api/api/v1/it2raildemo2es header: X-SOFIA2-APIKey:0cc4c1f08ecc4cd88911d94cc1c01f0b

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> The analytics ontology with the aggregated data has been loaded (by simulated statistics). Web services of the Travel Companion Wallet Business Analytics are available and can be invoked. 				
1	Tester invokes the Rest service Preferred transport per passenger type.	KPI is calculated and provided by the Rest Service.	KPI is calculated and provided by the Rest Service.	Passed	[used for traceability]

5.7.3 [TEST CASE 6.7.3] PREFERRED CARRIER

5.7.3	
Method Of Test	Demonstration
Type of test	Manual
Objectives	Analyse the preferred carriers (Trenitalia, SNCF, AirFrance, Lufthansa) per transportation (Subway, Tram, Bus, Hailed shared taxi, Ferry, Taxi...).
Description	Statistic of preferred carries of the main transport services
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester] end_point: http://sofia2.com/sib-api/api/v1/it2raildemo3es header: X-SOFIA2-APIKey:0cc4c1f08ecc4cd88911d94cc1c01f0b

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> The analytics ontology with the aggregated data has been loaded (by simulated statistics). Web services of the Travel Companion Wallet Business Analytics are available and can be invoked. 				

Id	Step description	Expected result	Observed result	State	Associated defect
1	Tester invokes the Rest service Preferred Carrier of Main Transport Mode.	KPI is calculated and provided by the Rest Service.	KPI is calculated and provided by the Rest Service.	Passed	[used for traceability]

5.7.4 [TEST CASE 6.7.4] PREFERRED LOYALTY CARDS



5.7.4	
Method Of Test	Demonstration
Type of test	Manual
Objectives	Calculation of the preferred Loyalty/Reduction/Payment card.
Description	Statistics of most used loyalty cards.
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester] end_point: http://sofia2.com/sib-api/api/v1/it2raildemoes header: X-SOFIA2-APIKey:0cc4c1f08ecc4cd88911d94cc1c01f0b

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> The analytics ontology with the aggregated data has been loaded (by simulated statistics). Web services of the Travel Companion Wallet Business Analytics are available and can be invoked. 				
1	Tester invokes the Rest service Preferred Loyalty Card.	KPI is calculated and provided by the Rest Service.	KPI is calculated and provided by the Rest Service.	Passed	[used for traceability]

5.7.5 [TEST CASE 6.7.5] EXPOSING WEB SERVICES TO RETRIEVE COMPUTED KPIS AND VISUALIZATION OF RESULTS

5.7.5	
Method Of Test	Demonstration

5.7.5	
Type of test	Manual
Objectives	The results of the KPIs for Business Analytics in the Travel Companion Wallet are obtained by the invocation of a Rest Service and are shown directly to the tester by accessing a BA dashboard through an URL where each widget displays the chart of a KPI.
Description	 
Status	OK
% passed	100%

[Configuration to apply]	
Regression	N
Test Case Tester	[ID of tester] http://sofia2.com/console/dashboard/9e8193f8-0574-4b39-bb5f-9547b2eec0ea

Id	Step description	Expected result	Observed result	State	Associated defect
	Preconditions: <ul style="list-style-type: none"> • The analytics ontology with the aggregated data has been loaded (by simulated statistics). • Web services of the Travel Companion Wallet Business Analytics are available and can be invoked. 				
1	Sofia2 Business Analytics Services are available.	The get method of the REST service sends the requested KPI to the Travel Companion. The Dashboard-widget presents the KPIs.	The get method of the REST service sends the requested KPI to the Travel Companion. The Dashboard-widget presents the KPIs.	Passed	[used for traceability]

6. TEST EXECUTION

The following table provides the results of the tests described in the previous paragraphs.

Table 1: Execution of test cases

Test Category	Test Case ID	Number of test /Date of test	Results (passed/failed) More details of results in section 4	Comments / Changes to be done
6. 1: PROVIDING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS	Test Case 6.1.1	Test Run 6.1 - 24/01/2017	Passed	
	Test Case 6.1.2	Test Run 6.1 - 24/01/2017	Passed	
6.2 : SHOWING KEY PERFORMANCE INDICATORS CONCERNING THE TICKETING SYSTEMS ON THE DASHBOARD	Test Case 6.2.1	Test Run 6.2 - 24/01/2017	Passed	
	Test Case 6.2.2	Test Run 6.2 - 24/01/2017	Passed	
6.3: SHOWING WEATHER INFORMATION AND FORECASTS	Test Case 6.3.1	Test Run 6.3 - 24/01/2017	Passed	
	Test Case 6.3.2	Test Run 6.3 - 24/01/2017	Passed	
	Test Case 6.3.3	Test Run 6.3 - 24/01/2017	Passed	

Test Category	Test Case ID	Number of test /Date of test	Results (passed/failed) More details of results in section 4	Comments / Changes to be done
	Test Case 6.3.4	Test Run 6.3 - 24/01/2017	Passed	
6.4: PROVIDING WEATHER INFORMATION AND FORECASTS	Test Case 6.4.1	Test Run 6.4 - 24/01/2017	Passed	
	Test Case 6.4.2	Test Run 6.4 - 24/01/2017	Passed	
	Test Case 6.4.3	Test Run 6.4 - 24/01/2017	Passed	
	Test Case 6.4.4	Test Run 6.4 - 24/01/2017	Passed	
	Test Case 6.4.5	Test Run 6.4 - 24/01/2017	Passed	
	Test Case 6.4.6	Test Run 6.4 - 24/01/2017	Passed	
6.5 SHOWING INDICATORS ON SOCIAL NETWORK MESSAGES	Test Case 6.5.1	Test Run 6.5 - 24/01/2017	Passed	
	Test Case 6.5.2	Test Run 6.5 - 24/01/2017	Passed	
	Test Case 6.6.1	Test Run 6.6 - 24/01/2017	Passed	

Test Category	Test Case ID	Number of test /Date of test	Results (passed/failed) More details of results in section 4	Comments / Changes to be done
6.6 PROVIDING KPIS ON SOCIAL NETWORK MESSAGES 6.7 – USER PREFERENCES ON TRAVEL COMPANION - WALLET	Test Case 6.6.2	Test Run 6.6 - 24/01/2017	Passed	
	Test Case 6.6.3	Test Run 6.6 - 24/01/2017	Passed	
	Test Case 6.6.4	Test Run 6.6 - 24/01/2017	Passed	
	Test Case 6.6.5	Test Run 6.6 - 24/01/2017	Passed	
	Test Case 6.7.1	Test Run 6.7 - 31/01/2017	Passed	
	Test Case 6.7.2	Test Run 6.7 - 31/01/2017	Passed	
	Test Case 6.7.3	Test Run 6.7 - 31/01/2017	Passed	
	Test Case 6.7.4	Test Run 6.7 - 31/01/2017	Passed	
	Test Case 6.7.5	Test Run 6.7 - 31/01/2017	Passed	

6.1 TEST RUN 6.1

6.1.1 PROVIDING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS – GENERATING TICKETING SYSTEMS DATA

This test case checks the generation of information that will be used as input for computing the Key Performance Indicators concerning ticketing systems.

Test succeeded.

6.1.2 PROVIDING KEY PERFORMANCE INDICATORS CONCERNING TICKETING SYSTEMS – COMPUTING KEY PERFORMANCE INDICATORS

This test case verifies the KPIs computation for the ticketing systems. The KPIs computed by the Business Analytics module are related to generic ticketing systems.

Test succeeded.

6.2 TEST RUN 6.2

6.2.1 SHOWING KEY PERFORMANCE INDICATORS CONCERNING THE TICKETING SYSTEMS ON THE DASHBOARD – SHOWING KEY PERFORMANCE INDICATORS ON TABLES

This test checks whether KPIs concerning ticketing systems are retrieved and shown on tables. The Presentation layer of the Business Analytics module encapsulates a dashboard containing indicators that evaluate the ticketing systems.

Test succeeded.

6.2.2 SHOWING KEY PERFORMANCE INDICATORS CONCERNING THE TICKETING SYSTEMS ON THE DASHBOARD – SHOWING KEY PERFORMANCE INDICATORS ON CHARTS

This test checks whether KPIs are retrieved and shown on charts. The Presentation layer of the Business Analytics module encapsulates a dashboard containing indicators that evaluate the ticketing systems. This test shows that key performance indicators can be easily evaluated when they are shown on charts included in the dashboard of the Presentation component.

Test succeeded.

6.3 TEST RUN 6.3

6.3.1 SHOWING WEATHER INFORMATION AND FORECASTS – SHOWING WEATHER INFORMATION ON TABLES

This test checks whether weather information is retrieved and shown on tables. The Presentation layer of the Business Analytics module encapsulates a dashboard containing a table description of the current weather situation. This test shows that data concerning weather information can easily be evaluated when it is shown in tables included in the dashboard of the Presentation component.

Test succeeded.

6.3.2 SHOWING WEATHER INFORMATION AND FORECASTS – SHOWING WEATHER INFORMATION ON CHARTS

This test checks whether weather information is retrieved and shown on charts. The Presentation layer of the Business Analytics module encapsulates a dashboard containing a chart description of the current weather situation. This test shows that data concerning weather information can easily be evaluated when it is shown in charts included in the dashboard of the Presentation component.
Test succeeded.

6.3.3 SHOWING WEATHER INFORMATION AND FORECASTS – SHOWING WEATHER FORECASTS ON TABLES

This test checks whether weather forecasts are retrieved and shown on tables. The Presentation layer of the Business Analytics module encapsulates a dashboard containing forecasts for the next days. This test shows that the weather forecasts for the cities included in the IT2Rail Corridor scenario can easily be evaluated when they are shown in tables included in the dashboard of the Presentation component.
Test succeeded.

6.3.4 SHOWING WEATHER INFORMATION AND FORECASTS – SHOWING WEATHER FORECASTS ON CHARTS

This test checks whether weather forecasts are retrieved and shown on charts. The Presentation layer of the Business Analytics module encapsulates a dashboard containing forecasts for the next days. This test shows that the weather forecasts for the cities included in the IT2Rail Corridor scenario can easily be evaluated when they are shown on charts included in the dashboard of the Presentation component.
Test succeeded.

6.4 TEST RUN 6.4

6.4.1 PROVIDING WEATHER INFORMATION AND FORECASTS – COLLECTING WEATHER INFORMATION FROM OPENWEATHERMAP

This test verifies that weather information is collected from OpenWeatherMap. Information concerning the current weather situation is gathered by invoking web services made available by OpenWeatherMap.
Test succeeded.

6.4.2 PROVIDING WEATHER INFORMATION AND FORECASTS – STORING WEATHER INFORMATION INTO THE BUSINESS ANALYTICS REPOSITORIES

This test verifies weather information is stored into the Business Analytics repositories. Information about the current weather situation from OpenWeatherMap is parsed and then stored into the Business Analytics repositories.
Test succeeded.

6.4.3 PROVIDING WEATHER INFORMATION AND FORECASTS – EXPOSING WEB SERVICES TO RETRIEVE WEATHER INFORMATION

This test checks whether weather information can be retrieved by using the WP6 web services. The Business Analytics exposes web services in order to provide upon request the current weather

information stored in its repositories. These web services are created by using REST technology and allow retrieving the current weather information by city. Data are formatted in JSON.

Test succeeded.

6.4.4 PROVIDING WEATHER INFORMATION AND FORECASTS – COLLECTING WEATHER FORECASTS FROM OPENWEATHERMAP

This test verifies that weather forecasts are collected from OpenWeatherMap. Information concerning the weather forecasts is gathered by invoking web services made available by OpenWeatherMap.

Test succeeded.

6.4.5 PROVIDING WEATHER INFORMATION AND FORECASTS – STORING WEATHER FORECASTS INTO THE BUSINESS ANALYTICS REPOSITORIES

This test verifies whether the weather forecasts are stored into the Business Analytics repositories. Information about the weather forecasts from OpenWeatherMap is parsed and then stored into the Business Analytics repositories.

Test succeeded.

6.4.6 PROVIDING WEATHER INFORMATION AND FORECASTS – EXPOSING WEB SERVICES TO RETRIEVE WEATHER FORECASTS

This test checks whether the weather forecasts can be retrieved by using the WP6 web services. The Business Analytics exposes web services in order to provide upon request the current weather forecasts stored in its repositories. These web services are created by using REST technology and allow retrieving the weather forecasts by city. Data are formatted in JSON.

Test succeeded.

6.5 TEST RUN 6.5

6.5.1 SHOWING INDICATORS ON SOCIAL NETWORK MESSAGES – SHOWING KPIS CONCERNING SOCIAL NETWORK MESSAGES ON TABLES

This test checks whether KPIs concerning social network messages are retrieved and shown on tables. The Presentation layer of the Business Analytics module encapsulates a dashboard containing indicators computed on the basis of messages retrieved from Twitter.

Test succeeded.

6.5.2 SHOWING INDICATORS ON SOCIAL NETWORK MESSAGES – SHOWING KPIS CONCERNING SOCIAL NETWORK MESSAGES ON CHARTS

This test checks whether KPIs concerning social network messages are retrieved and shown on charts. The Presentation layer of the Business Analytics module encapsulates a dashboard containing indicators computed on the basis of messages retrieved from Twitter.

Test succeeded.

6.6 TEST RUN 6.6

6.6.1 PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – COLLECTING SOCIAL NETWORK MESSAGES

This test verifies that social network messages are collected from Twitter.

Test succeeded.

6.6.2 PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – STORING SOCIAL NETWORK MESSAGES INTO THE BUSINESS ANALYTICS REPOSITORIES

This test verifies social network messages are stored into the Business Analytics repositories.

Test succeeded.

6.6.3 PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – COMPUTING KPIS ON SOCIAL NETWORK MESSAGES

This test case verifies the KPIs computation for the messages collected from Twitter.

Test succeeded.

6.6.4 PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – STORING KPIS CONCERNING SOCIAL NETWORK MESSAGES INTO THE BUSINESS ANALYTICS REPOSITORIES

This test verifies KPIs computed on social network messages are stored into the Business Analytics repositories.

Test succeeded.

6.6.5 PROVIDING KPIS ON SOCIAL NETWORK MESSAGES – EXPOSING WEB SERVICES TO RETRIEVE KPIS COMPUTED ON SOCIAL NETWORK MESSAGES

This test checks whether the KPIs computed on social network messages can be retrieved by using the WP6 web services. The Business Analytics module exposes web services in order to collect the KPIs on social network messages stored in its repositories. The Business Analytics exposes web services in order to provide upon request the KPIs on social network messages stored in its repositories. These web services are created by using REST technology and enable to retrieve this kind of indicators. Data are formatted in JSON.

Test succeeded.

6.7 TEST RUN 6.7

6.7.1 SIMULATING TRAVELLER INFORMATION

This test verifies that the travel companion provides information for the user preferences. The data is stored in the travel companion wallet repository, loaded in aggregated mode into the business analytics ontology and analysed by the analytical services of WP6.

Test succeeded.

6.7.2 PREFERRED TRANSPORT PER PASSENGER TYPE

This test verifies that the travel companion wallet service provides useful information for the user's preferences. The data analysed is the preferred transport per passenger type.

Test succeeded.

6.7.3 PREFERRED CARRIER

This test verifies that the travel companion wallet service provides useful information for the user's preferences. The data analysed is the preferred carrier for the user's main transport mode.

Test succeeded.

6.7.4 PREFERRED LOYALTY CARDS

This test verifies that the travel companion wallet service provides useful information for the user's preferences. The data analysed is the user's most used loyalty card.

Test succeeded.

6.7.5 EXPOSING WEB SERVICES TO RETRIEVE KPIS COMPUTED AND VISUALIZATION OF RESULTS

This test verifies that the Business Analytics Services for the Travel Companion wallet provides useful KPIs by Rest services and Widget-Dashboards.

Test succeeded.