FP7 2013 Cooperation Work Programme
Theme 6: Environment (Including Climate Change)

Novel indicators for identifying critical *INFRA*structure at *RISK* from Natural Hazards

Deliverable D7.3

IDST System v1.0

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Rev01	27/05/2015	Final Version	Panos Melas and Zoheir Sabeur (IT Innovation)

Executive Summary

This report document is a follow on complementary report to the software deliverable D7.3 in WP7 which was made live on the 31/03/2015. It provides user guidance on how to access and use the first version of the IDST software in the INFRARISK project. The document provides a “go through” experience for the user to work with the IDST tool and perform an early version of risk management on critical infrastructure. With this current version of the IDST software, early implementations of geo-specified database information, processes and visualisation methods with an intuitive graphical user interface in the system are demonstrated. The IDST is currently on line and directly accessible live using a web browser using the following URL: http://infrarisk.it-innovation.soton.ac.uk

Future releases of the IDST using HTTPS secure connections will be supported.

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Glossary

Table 1, below, provides the terminology and abbreviations that are used in this document. These also include certain terms defined in D4.1 (Adey et al, 2014), thus achieving consistency throughout the project development.

Table 1 Glossary

Term	Definition
AJAX	Asynchronous JavaScript and XML. A method to create dynamic content on the client side via asynchronous calls for data to the server
API	Application Programming Interface
CI	Critical Infrastructure
database	A collection of data, their related data structures (schema), and relationships. There may be one of more data structure required to encapsulate all the data.
DBV2	Former name for the ISTD (referred to in WP7)
DEM	Digital Elevation Model
DoW	Description of Work (for the project)
GEM	Global Earthquake Model
GIS	Geographic Information System
GUI	Graphical User Interface
HTML	Hypertext Markup Language
HTTP(S)	Hypertext Transfer Protocol. This is the application protocol that all devices connected to the WWW use to communicate. The “S” variant is secured via SSL.
IDST	INFRARISK Decision Support Tool – the main integrated software output for the INFRARISK project.
IDST system	The set of interacting or interdependent software components forming the integrated whole IDST
ISTD	Integrated Spatio-Temporal Database
JSON	JavaScript Object Notation
KB-MGIF	Knowledge Base of Major Global Infrastructure Failures
LOD	Linked Open Data
Mock-up	Sometimes known as a “wireframe”. A visualisation/model of a UI or web page.
NetCDF	Network Common Data Form
ORM	Object-Relational Mapper
ORMF	Overarching Risk Management Framework
qHD	Display resolution of 960x540 which is one quarter of a Full HD (1080p) frame.
requirement	A requirement is a single documented functional need that the system must perform. This is then translated into one or more use cases.
SRA	Single Risk Analysis
SSL	Secure Sockets Layer
Stakeholder	An individual, group or organization that can affect, be affected by, or perceive itself to be affected by, a risk. Also used to refer to a user of the IDST.
System	A set of interacting or interdependent components forming an integrated whole
UI	User Interface
URL	Uniform Resource Locator
use case	A list of steps, defining interactions between people, to describe a specific goal. In terms of computer processes this is a series of steps that can be programmed and thus are quite specific.
workflow	A workflow is a series of connected steps to a goal.

1 INTRODUCTION

The purpose of the INFRARISK Decision Support Tool (IDST) is to allow infrastructure owners and managers to assess the risks associated with a particular infrastructure network subject to natural hazards such as earthquakes, landslides and flooding. The IDST will provide access to generated databases and scenario simulations results for the two case study regions (Italy & Croatia) in order to demonstrate how the methodology works. However, the user will also have the option to apply the methodology to any network of interest provided the necessary data is uploaded to the IDST.

This document describes the first release of the IDST portal manual. The portal does not cover all the functionality and datasets of the IDST specification. Future releases of the software will extend portal functionality. A more advanced version of this document will be achieved in order to reflect the improved and extended design specification of the IDST (version 2.0), by M36.

2 Connecting to the IDST

The IDST is designed to be used from any web browser. This includes mobile as well as desktop operating systems. The IDST will be tested in the following browsers:

- Linux: Firefox, Chromium
- Apple: Firefox, Safari
- Windows: Firefox, Chrome, IE9+
- Android tablets: Chrome
- iPad: Safari

In addition the IDST will support most smart phones browsers with qHD or higher display resolutions.

The IDST is directly accessible from a browser using the following URL:

http://infrarisk.it-innovation.soton.ac.uk

Future releases of the IDST will support secure HTTP connections.

3 Public view of the Portal

The initial page of the portal (Figure 1) provides users a brief explanation of the IDST as well as the terms and conditions of the IDST portal. The initial page also allows authenticated users access INFRARISK datasets, i.e. databases, workflows, as well as to create and store their own case studies.

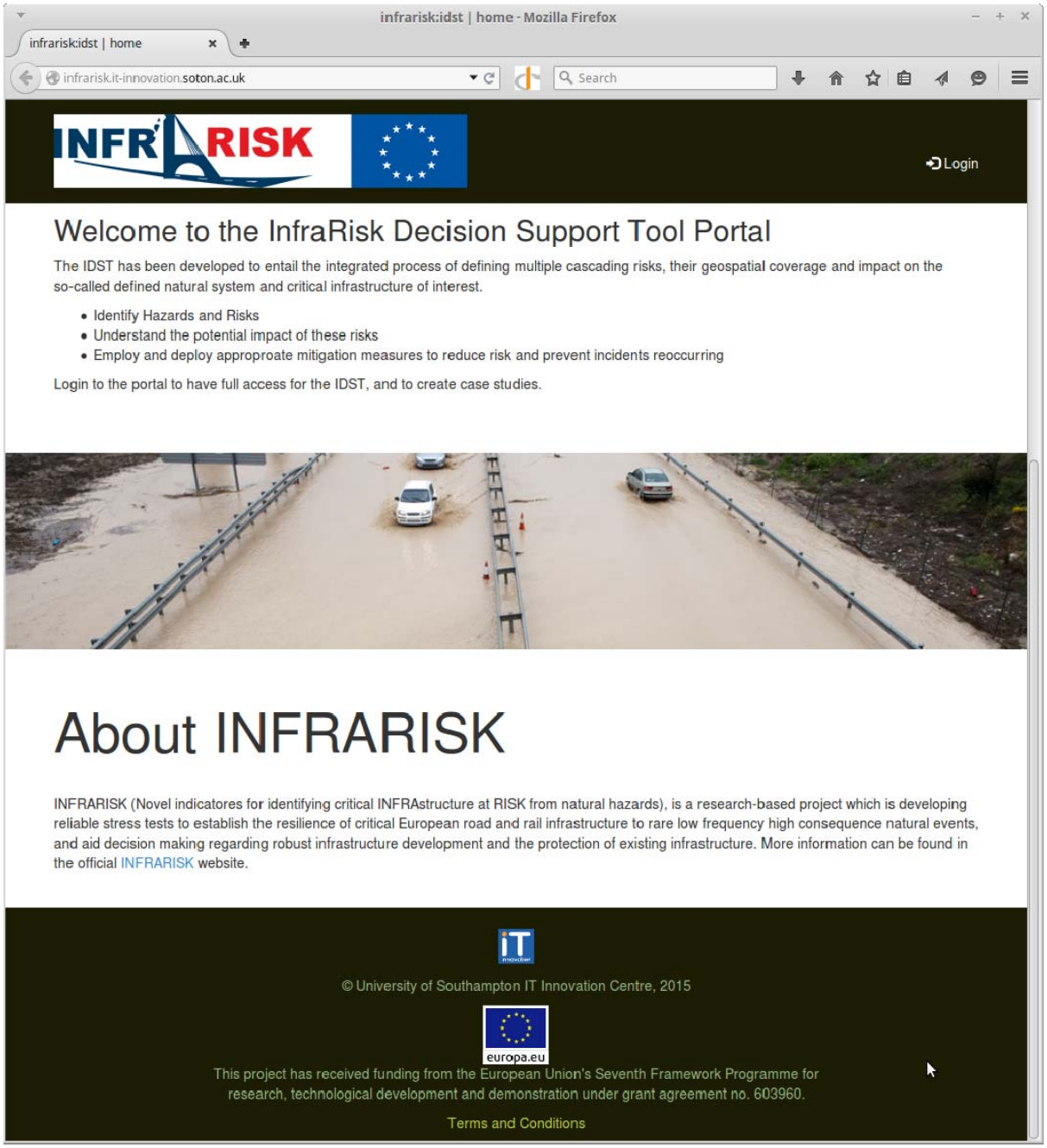


Figure 1 IDST initial page

4 Logging into the Portal

In order to log into the portal the user can click on the login button at the top right corner of the initial page. IDST authenticates users from the following authentication services:

- Mozilla Persona
- Google (*)
- Yahoo
- Facebook (*)
- Linkedin (*)

In the initial release of the software Mozilla Persona and Yahoo accounts are authenticated. Google, Facebook and Linkedin user account authentication will be added later.

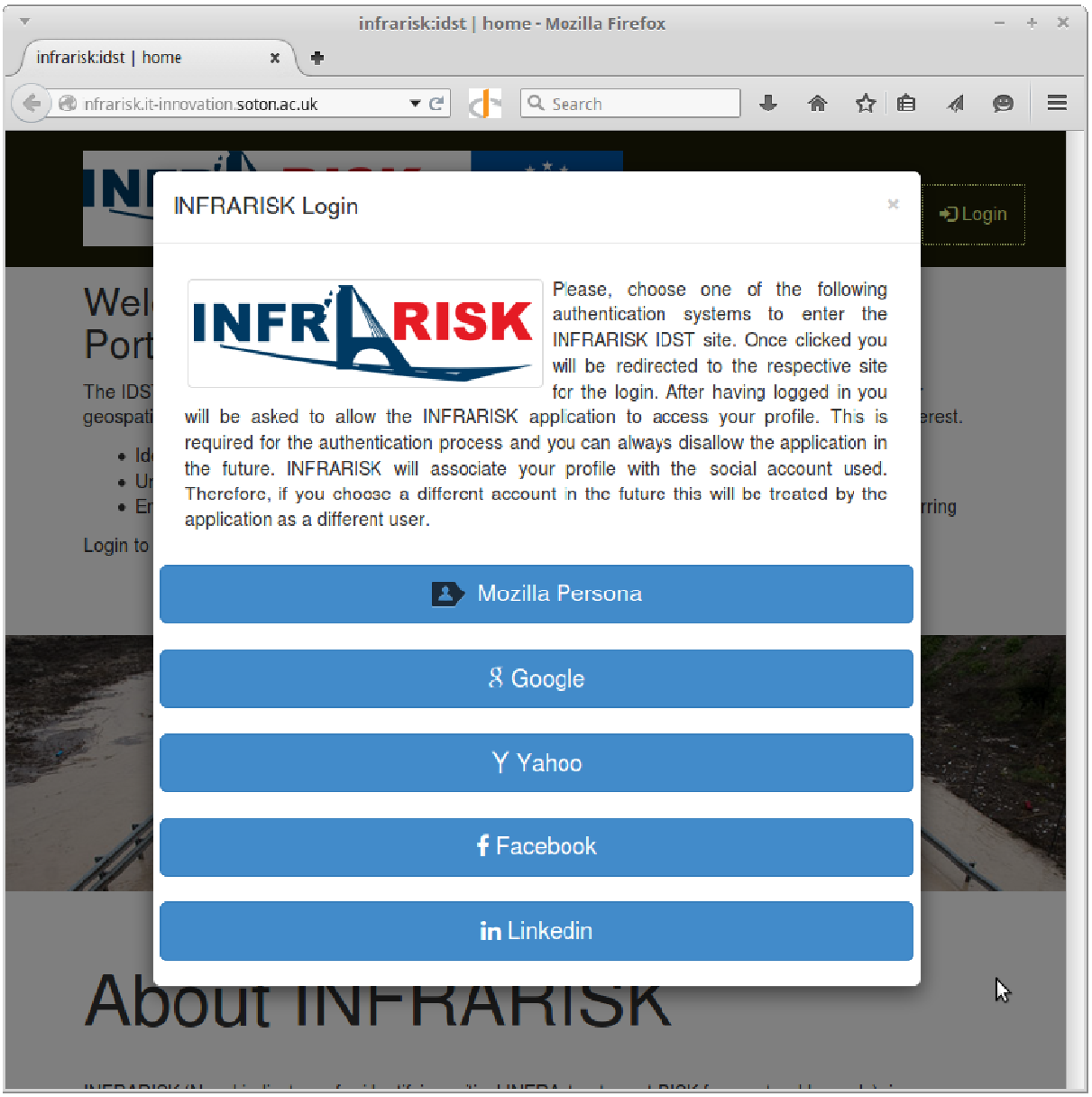


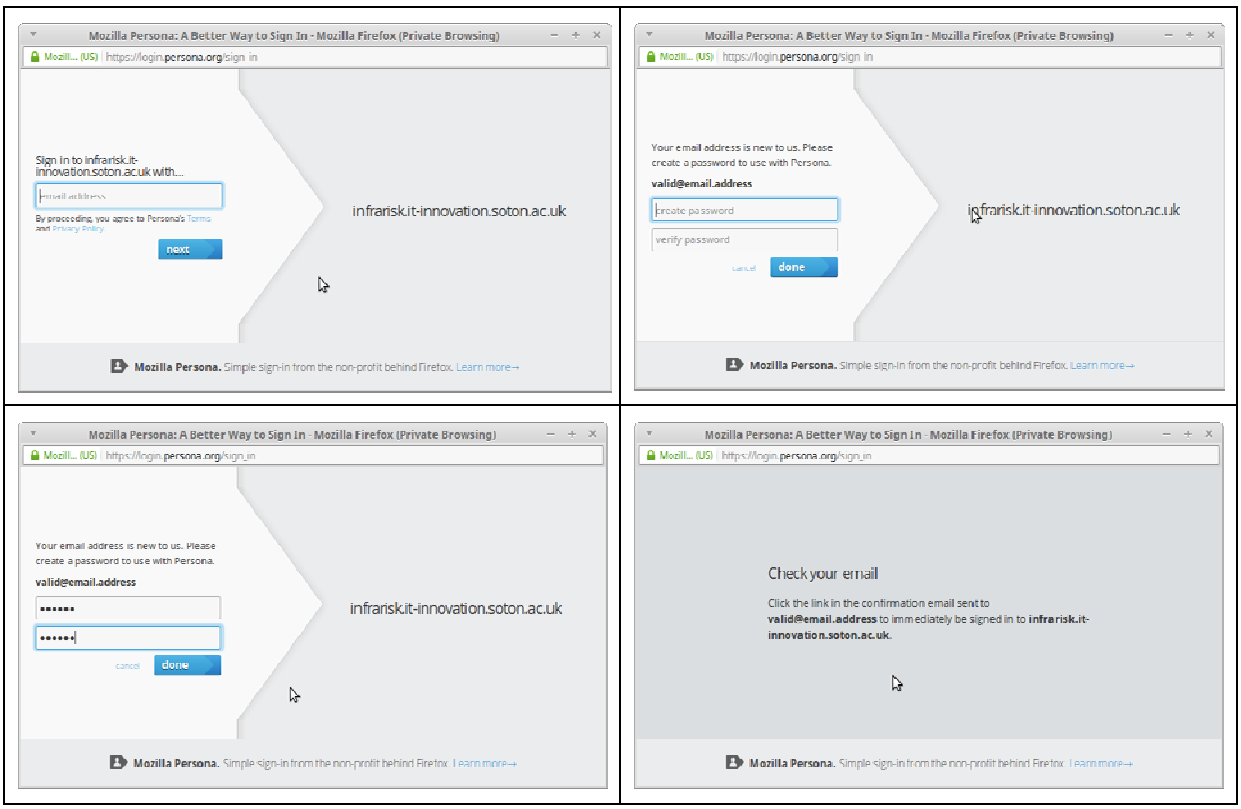
Figure 2: Logging to IDST

If users do not want to authenticate using their social media account, Mozilla Persona provides an alternative authentication mechanism. Creating a Mozilla Persona account is very simple, and requires a valid email address only.

4.1 Mozilla Persona Registration

In order to register with persona, click on the Mozilla Persona button (Figure ~~Figure 2~~) and follow the registration procedure steps:

1. Click on the “sight in” button
2. Enter a valid email address, by which the account can be identified
3. Provide a password for your personal account (not your email account password)
4. The user is then sent an email to the provided email address for validation.



Once the account is created the logging onto the IDST is simple, click on the login button and provide the registered email address and the persona password.

5 User Home Page

After a successful login the user is presented with the home page (Figure 3). This page will allow user to access IDST datasets, tools and their own case studies. Users also can access their profile page that shows the IDST user profile information as well as user IDST tool usage statistics.

User case studies are private to that user, while IDST datasets and tools are accessible to authenticated users.

Currently, authenticated users can access the IDST Process Workflow Engine via the "activate" button and create their own case studies. Future updates of the software will allow from the user home page access to other workflows and tools.

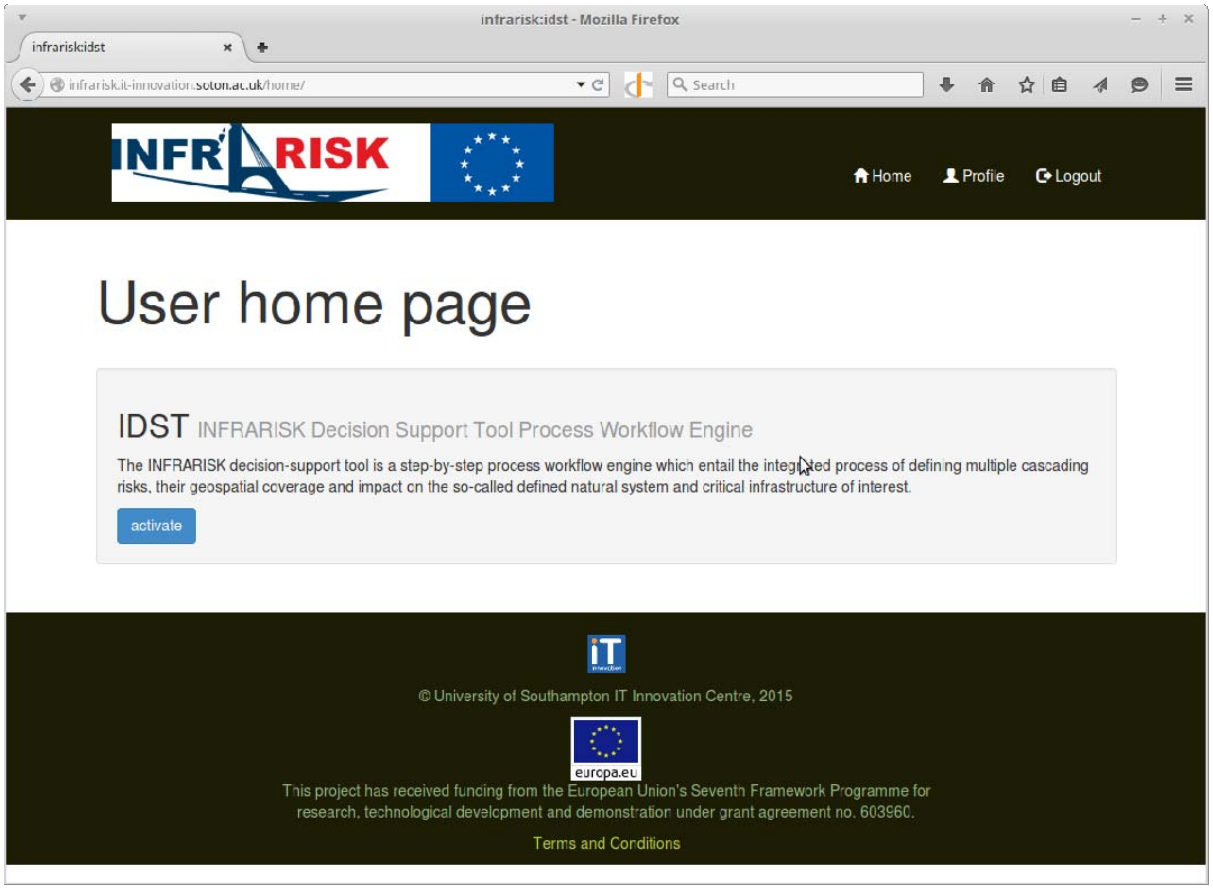


Figure 3: IDST user home page

6 IDST Case Studies

Figure 4 shows the IDST case study summary page, the user can get detailed information about the IDST workflow steps.

This page shows a list of existing IDST case study reports and allows the user to create a new report. In the summary list the name, status, and actions for each case study are shown.

The state gives what part of the IDST the survey is up to or “COMPLETE” for a finished survey.

The following actions on IDST reports are allowed:

- "Execute" allows the user to continue where they left off in an existing survey
- "Delete" allows a survey to be removed

Finally, to create a new survey, the user clicks the "New Report" button.

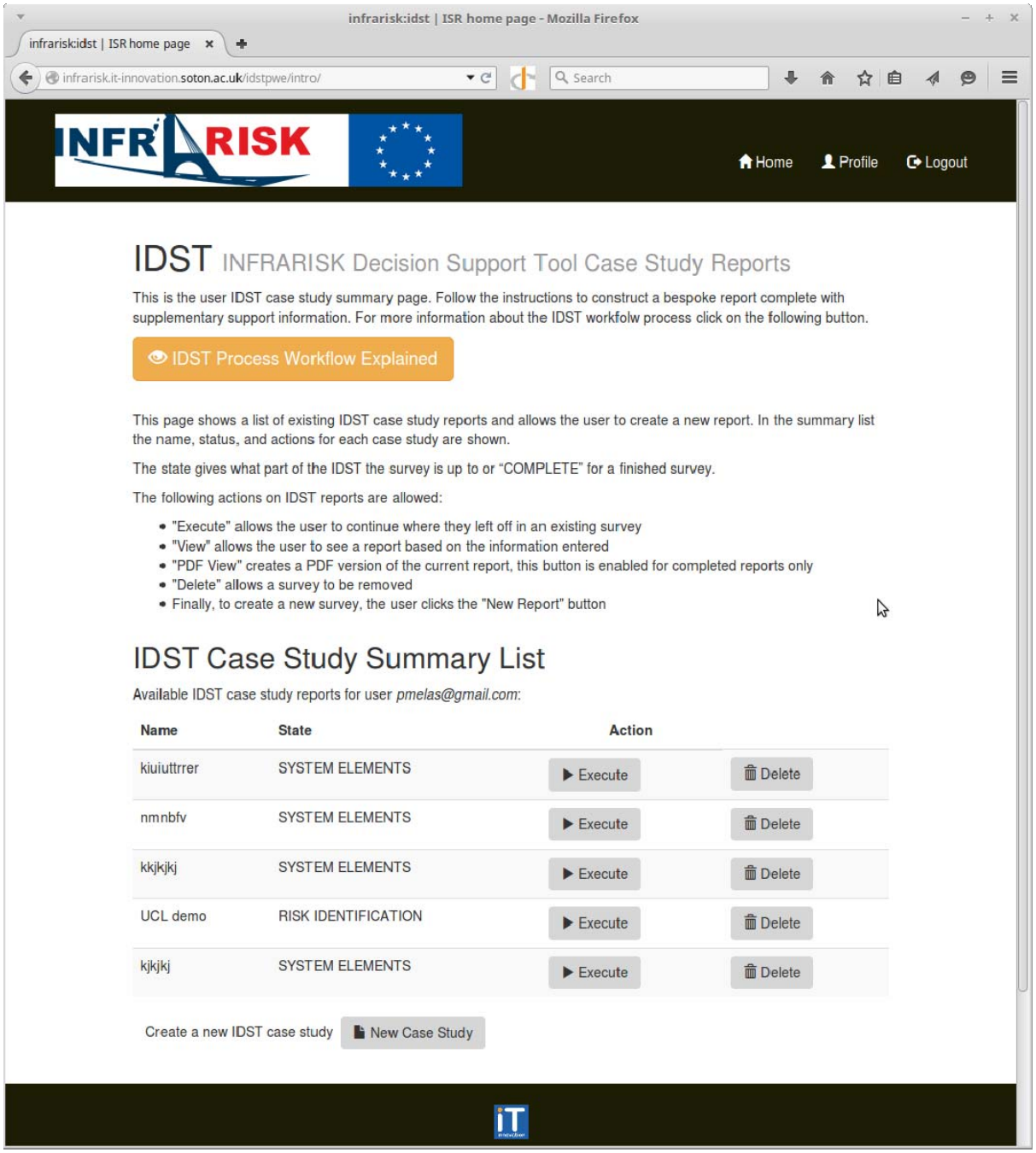


Figure 4: IDST case study initial page

Figure 5 shows how to create a new case study in IDST. Each case study has a name field and a few other optional fields that the user can provide more information about the case study itself, e.g. introduction, or a questions section that the case study will seek answers.

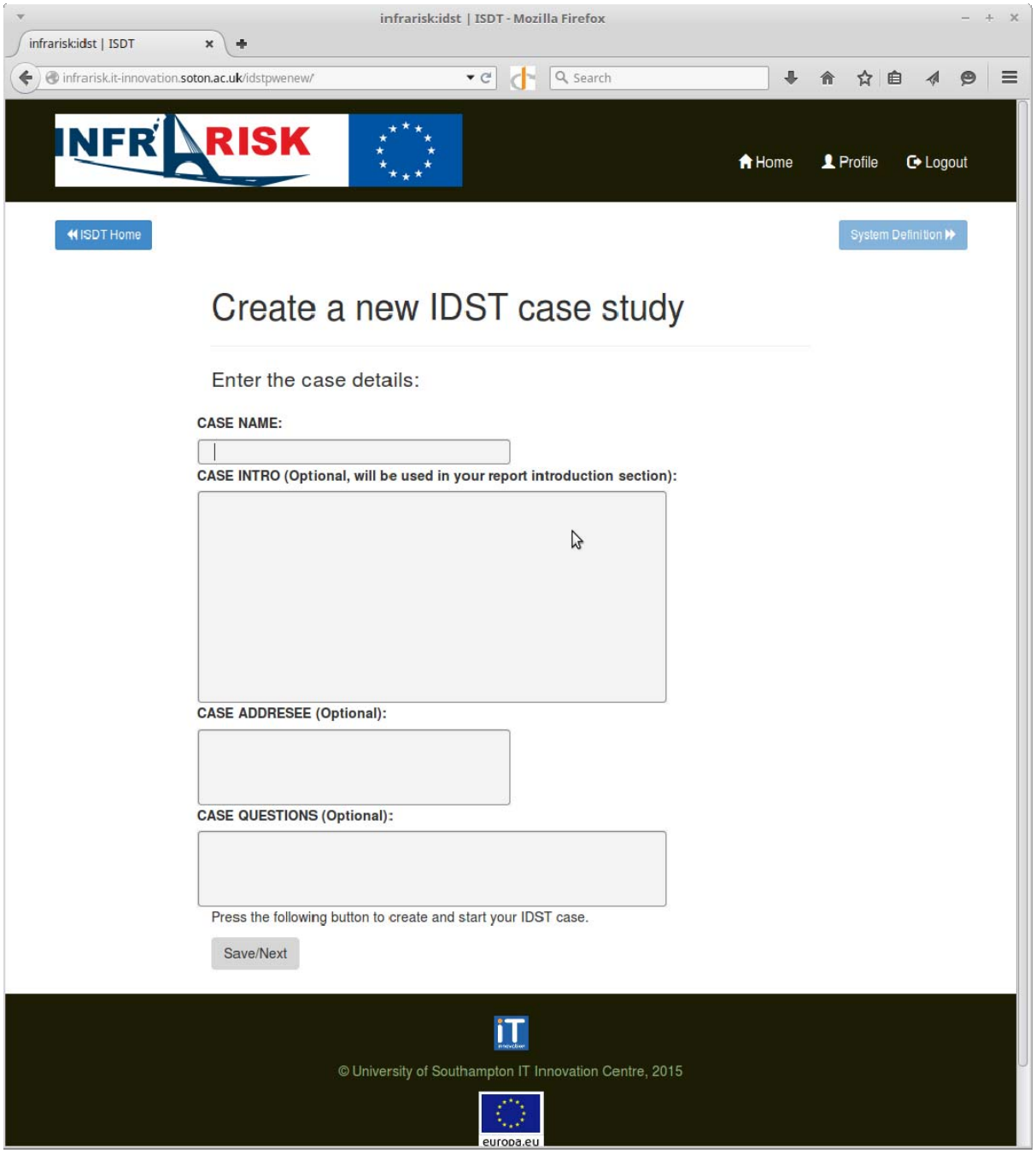


Figure 5: Creating new case study

After the initialization of the case study the user has to proceed with the case study "system definition". At the current stage the IDST page shows a map of Italy with the area of interest where the portal has sufficient datasets is highlighted in red (Figure 6).

The user should provide spatial and temporal boundaries for the case study which must be within the highlighted area of interest:

- Use map to locate region of interest

- Drag a rectangle to define a region (hint: press shift, click mouse and drag)

The next step is to define the system elements.

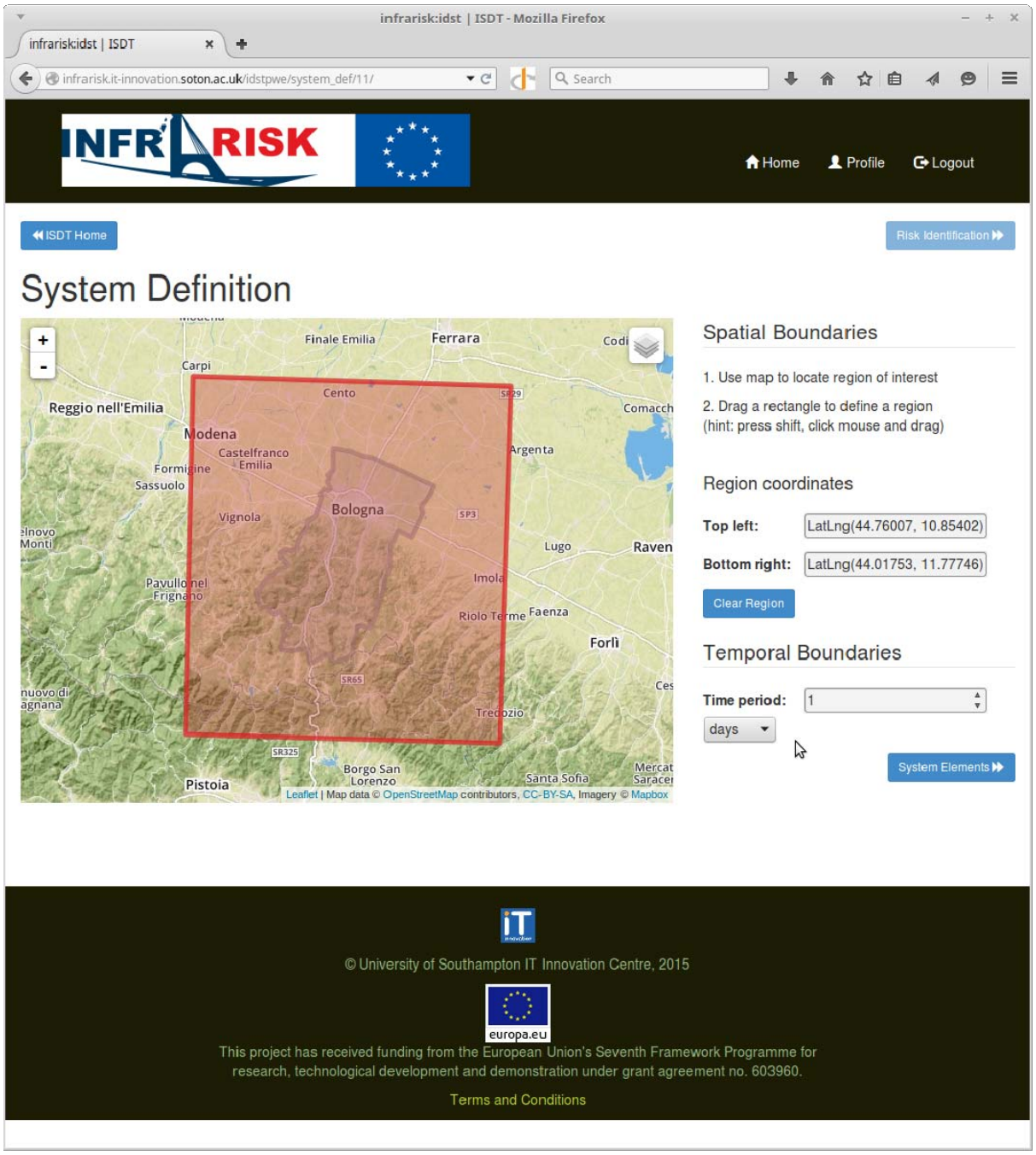


Figure 6: System definition regional and temporal boundaries

The user can choose the system element for the selected area from the drop down menus, as Figure 7 shows. The map will be automatically updated with user selections.

- Source event, e.g. rainfall, tectonic plate movements;
- Hazard event, e.g. flood, earthquake;
- Infrastructure, e.g. tenT network, bridges, tunnels;
- Network event, e.g. traffic;
- Social event, e.g. direct or indirect consequences.

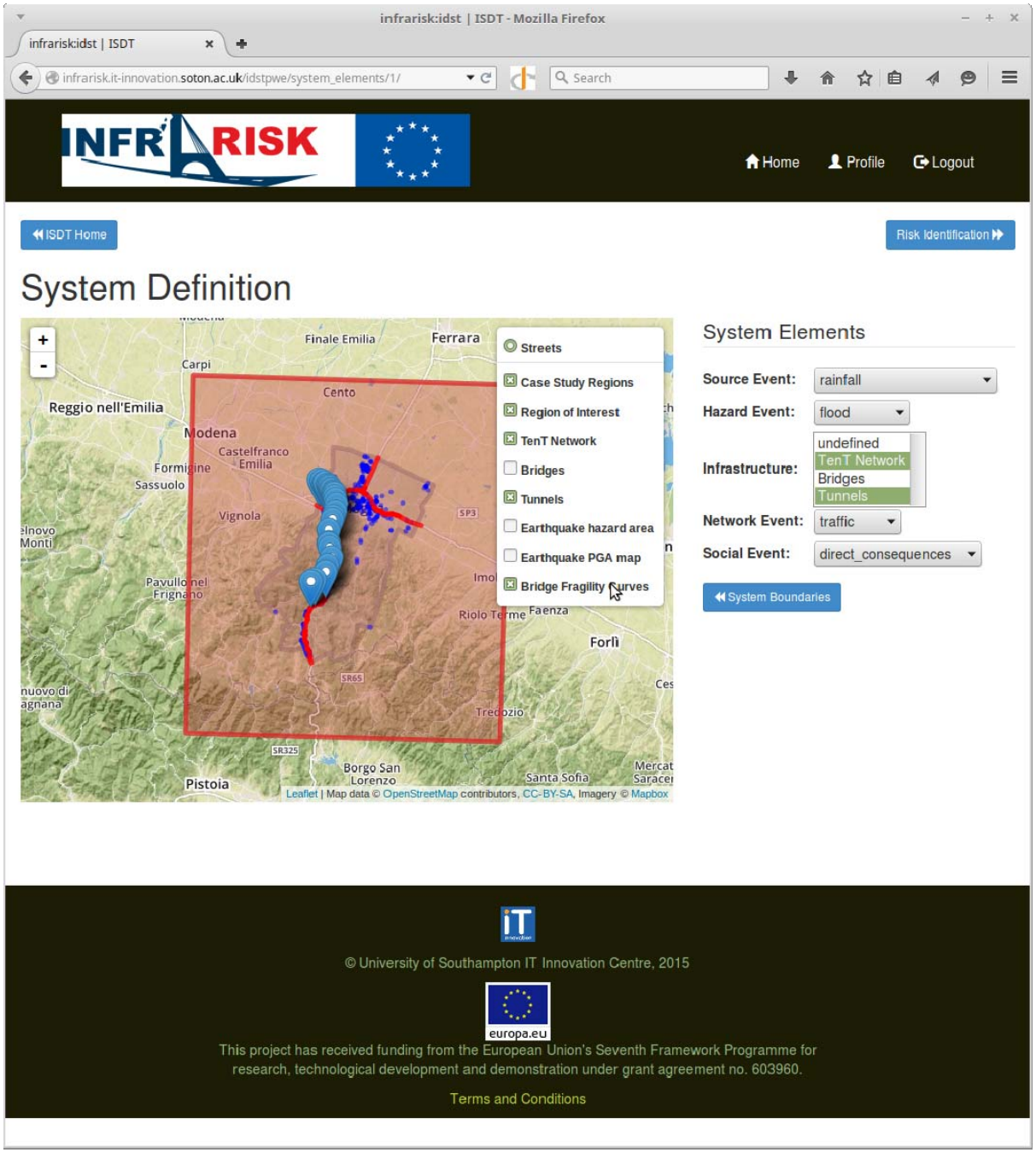


Figure 7: System definition elements

The IDST can calculate bridge fragility curves for the area of interest as Figure 8 shows. The user can access vulnerability curves directly from the map layer button (top right corner of the map) and select the “Bridge fragility curves” layer.

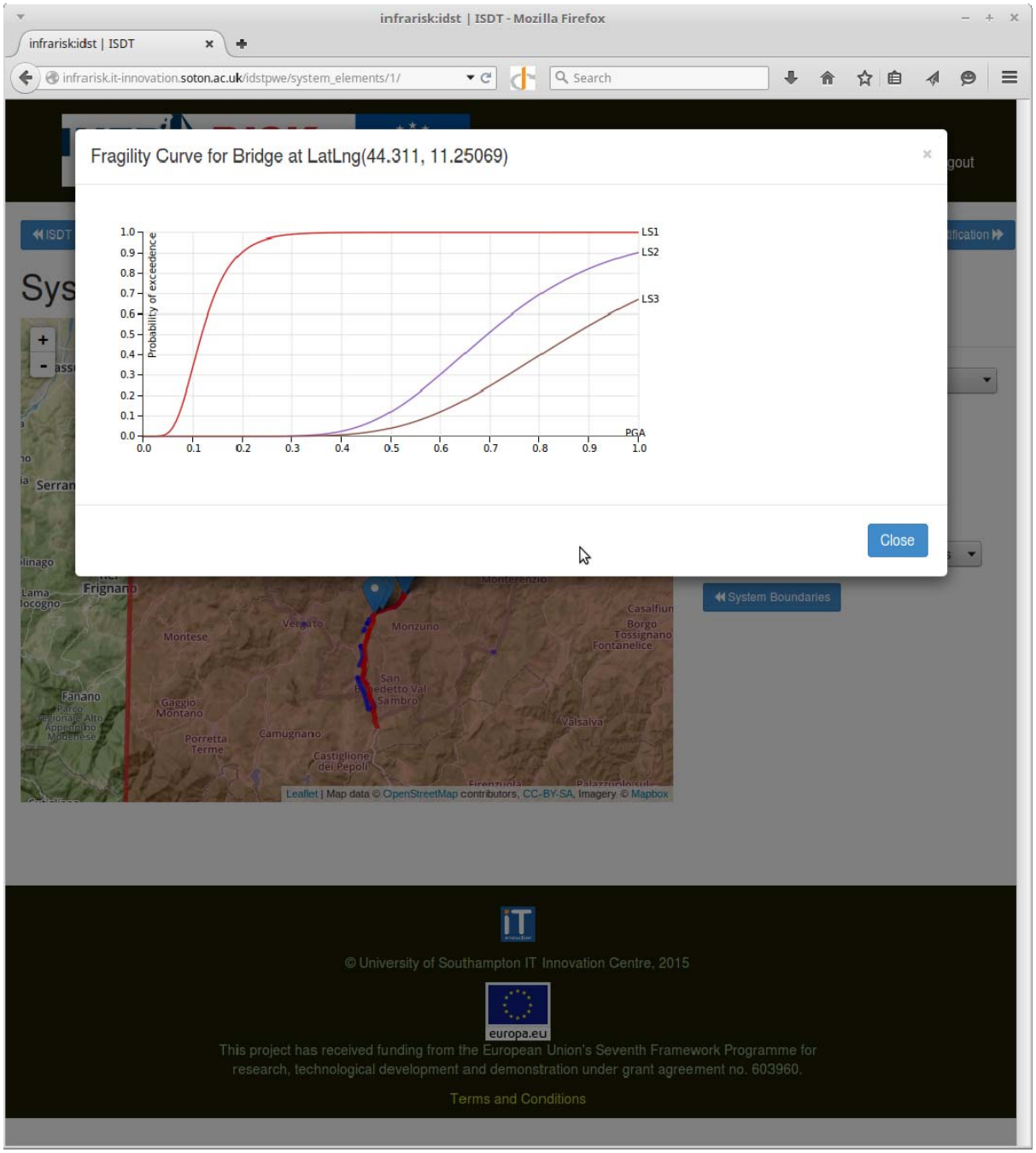


Figure 8: Bridge fragility curves

After defining the system elements, the next step for the IDST workflow is to identify the risk. Figure 9 shows the relevant page that presents the case study system elements and is ready to identify the risk involved. Calculation of the risk is not yet implemented at this stage.

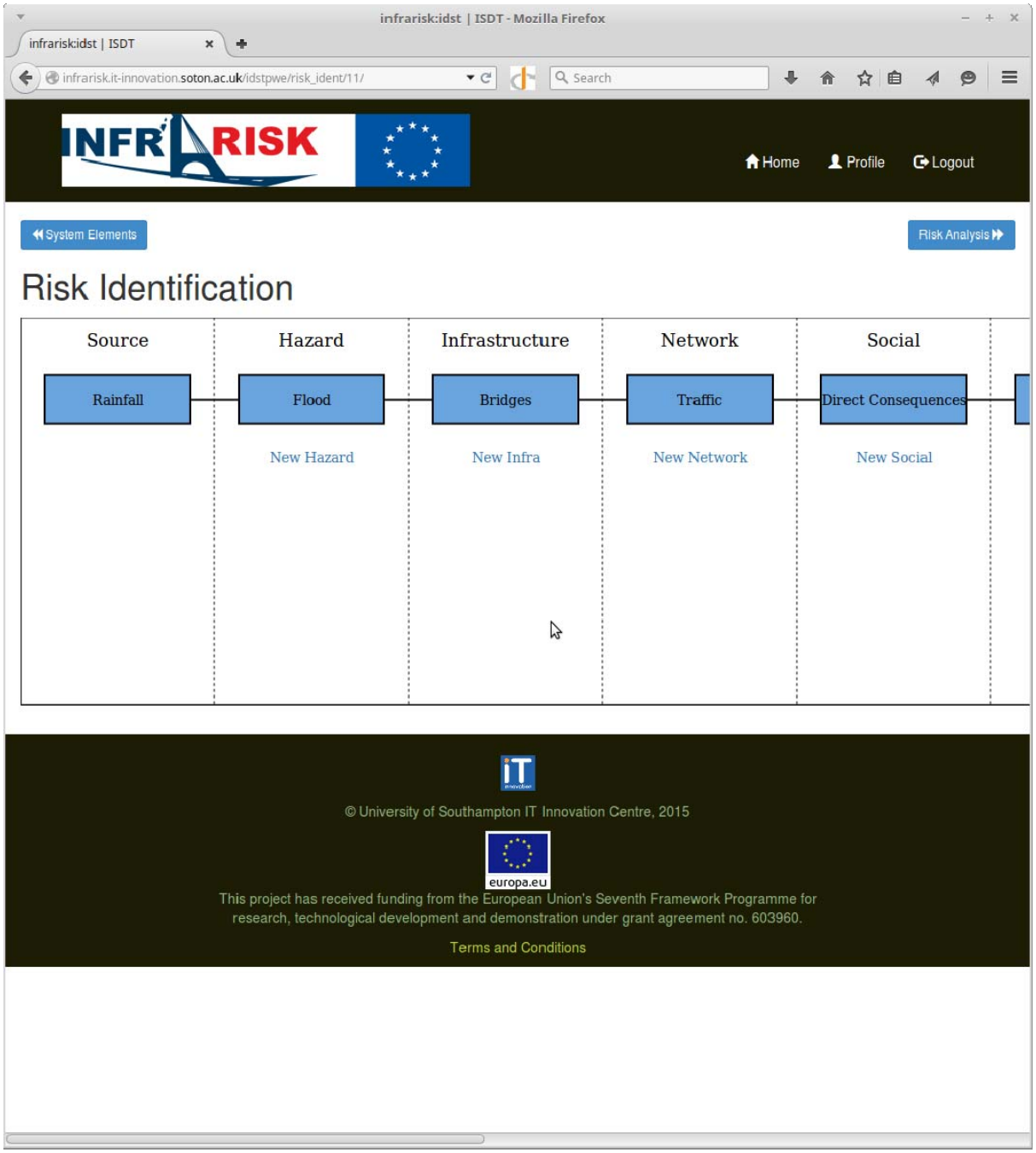


Figure 9: IDST Risk identification

7 Conclusion

This document provides a user guide for the INFRARISK IDST software. It describes the main functionalities of the IDST v1.0 software and how to use the implemented features in it. The system currently supports the first stages of the main IDST workflow. Also, the provided datasets which cover the North Italy study in the project are supported in a database. Future releases of the IDST portal will provide full cover of the IDST workflow, further databases and analytic based processes for multi-risk evaluations.