FInest – **F**uture **In**ternet **e**nabled optimi**s**ation of **t**ransport and logistics networks

D1.2

Transport and logistics domain dictionary

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Abstract

This document describes the FInest Transport and Logistics Domain Dictionary. The requirements for the dictionary, its development, current features and future developments are discussed. The Domain Dictionary can be accessed via the FInest website at www.finest-ppp.eu.

Document History

Version	Date	Comments
V1.0	30 Sept. 2011	Initial release
V2.0	29 Dec. 2011	Revised second release

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1 Introduction

This report presents the deliverable **D1.2 Transport and logistics domain dictionary**, which is one of the two planned deliverables from task T1.1 – Establishing a Common Domain Understanding, which is part of Work Package 1 - Domain Characterization and Requirement Analysis.

The structure, content, and instructions for using and updating the dictionary are presented in this report. The Domain Dictionary is an online interactive dictionary, accessible through the project website (www.finest-ppp.eu). The dictionary is a "living" source of information with updating occurring throughout the duration of the project.

1.1 Work Package 1

The overall goal of Work Package 1, which includes development of the domain dictionary, is to determine the business requirements for the next generation of ICT solutions for the transport and logistics domain. These requirements will be used to ensure the suitability of the technological solution that shall be designed in the project for satisfying the domain's business needs. To ensure a common understanding of the domain by all partners, the domain analysis is to be conducted on the basis of a shared understanding of the central domain concepts. The identified business requirements will form the foundation for designing the technological solution in WP3 and the conceptual prototypes in WPs 5–8, and be demonstrated within the use case scenarios defined in WP2.

For achieving these outcomes, the specific objectives of this work package are to:

- Establish a common understanding of the important elements of the transport and logistics domain;

- Identify the business challenges arising in transport and logistics, and define a detailed set of business requirements for the next generation of ICT solutions;

- Provide a comprehensive state-of-the-art analysis on ICT solutions for collaboration and integration that are currently employed in the transport and logistics domain;

- Review and assess the design of the envisioned technological solution with respect to its suitability for satisfying the identified business requirements; and

- Investigate business models and identify business opportunities for the envisioned technological solution.

1.2 Task 1.1 - Establishing a Common Domain Understanding

This task focuses on developing a common understanding amongst consortium members of the important concepts of the transport and logistics domain. Taking existing industrial standards into account, elements such as terminology, definitions, operating descriptions and other relevant information (size, volume, flow, etc.) will be standardized so that each member of the consortium is able to clearly understand what is meant when a particular transport and logistics term or process description is used. This is a pre-requisite for designing appropriate ICT solutions and facilitating broad industrial adoption.

2   Domain Dictionary

The Domain Dictionary is an online interactive dictionary accessible through the project website (www.finest-ppp.eu). The Dictionary has been developed to collect knowledge (definitions, etc.) concerning the transport and logistics domain in an interactive database that is integrated into the FInest website. It provides users with a number of features that are described in Section 3 of this report.   The purpose of the Dictionary is to provide the consortium partners with:

- Relevant information about logistic terms;
- Standardized definitions; and
- A common understanding of domain specific terms.

2.1   Requirements

Based on discussions with FInest partners and analysis of other dictionaries, the following initial requirements were identified for the Domain Dictionary:

- Ability to find the definition of a term easily (e.g., by use of a search engine, by selecting from a list of primary categories, by clicking on an area of interest on a diagram, etc.)
- Provide the possibility to access an extended description of a term (e.g., by providing pictures, illustrations, more detailed descriptions, examples from external information sources and references, etc.)
- Ability to sort definitions by various categories (by term [alphabetically], or by domain, process, role, actors, objects, etc.)
- Provide access to related elements by enabling cross-references

In addition, user interaction requirements were identified that can be summarized as ensuring ease of use, enablement of modifications and updating, and ensuring that lookups are fast and efficient.

2.2   Proposals for realization

In order to deliver a Domain Dictionary that is both user-friendly and easy to update, it was decided to build an interactive online dictionary on the project website. Several alternatives were examined to see what the most appropriate technology for the dictionary should be. However, once the technology for the website was determined (Joomla! CMS), it became apparent that using the same technology for the dictionary made the most sense.

2.2.1   Joomla! CMS

Joomla! CMS is a free open source content management system (CMS) for publishing content on the Internet. Joomla! includes a model view controller (MVC) web application framework that makes it a logical choice for website development. Its ease of use and extensibility have made it very popular with web developers.

The FInest project website migrated from static HTML pages to Joomla! CMS during the summer of 2011. This migration occurred because of the capabilities of Joomla! and the belief that its extensibility would prove to be an asset over the long term for the website. One of the benefits of using Joomla! is its powerful search engine. The capability of this search engine, and its ability to support meta search criteria, convinced the FInest team that it would be an acceptable solution for the Domain Dictionary.

2.2.2 Joomla! component E-Glossary

One of the biggest advantages of Joomla! is its architecture, which allows the user to extend its capabilities by adding components. There are several components available for free for nearly any requirement. Changes and improvements can be implemented by editing the component independent from the website itself thus allowing the website to operate while changes are being effected.

The Joomla! component E-Glossary by AP Computación (http://www.apcomputacion.cl) is specially designed to create dictionaries. It is able to list terms and has extensive search capabilities. The E-Glossary has an easy to use backend that allows administrators and authorised editors to add new terms quickly. All content is saved in a database so that no information gets lost even if the component is updated or modified.

The component fulfils many of the requirements pointed out in Section 2.1. Because the component is "open source", which means that everyone can get a free copy of its source code, it has been possible to do add functionality and to extend the component so that it perfectly fits all requirements of the FInest Domain Dictionary. For example, the original E-Glossary component did not include a print function. But because of its extensibility, it was possible to add such a function by programming it manually.

The advantages of Joomla! CMS, in combination with the component E-Glossary, were superior to any of the alternatives examined for the Domain Dictionary. Its ability to meet the requirements for search functionality, flexibility and frame structure ensures that it will meet the needs of the project team. Because of its fit, Joomla! and E-Glossary have been chosen by the team as the technology upon which the Dictionary is based. A list of its features is described in the following section.

3   Features and how to use them

The Domain Dictionary (www.finest-ppp.eu/index.php/domain-dictionary), which is implemented using Joomla! CMS and the component E-Glossary, provides a number of features that are shown in the following screenshot from the Dictionary's start screen.

Figure 1 - Domain Dictionary integrated in FInest Homepage

Field 1 shows the link to the Domain Dictionary in the Joomla! framework on the FInest home page. By clicking this link a user can reach the start page for the Dictionary (list view). In this view terms, including the first part of their description, are listed alphabetically by default.

Field 2 provides the user with the opportunity to select and show all terms beginning with a particular letter (further information in Section 3.2).

Field 3 shows the search engine. Terms can be searched for from here. Different search options can be set by checking the appropriate box to manipulate the results:

- Match in title: Only titles are included in the search

- Match in content: The whole text of articles is included in the search

- Nothing checked: If nothing is checked the search engine uses meta data that is identified in the term's description to search the database

Field 4 contains a dropdown menu that makes it possible to choose how many terms should be displayed on one page. It can be set to show 5, 10 or 15 results per page.

In Field 5 the term title is displayed.

Field 6 shows the option to extend the article if it is too long to be displayed in the list view.

3.1   Search function

This section describes the search function and shows how to use it in order to find the requested information.

As can be seen from Figure 1, the search option is displayed on the home page of the Dictionary along with the common list view of all terms. To access the Dictionary's home page and begin searching for a term, the procedure described below should be followed.

1. Go to the FInest project web-site (www.finest-ppp.eu).
2. Click on "Domain Dictionary" under the heading "About Transport and Logistics" in the left border.
3. The main page of the Domain Dictionary appears in the main portal of the browser.
4. The search function appears under the alphabetical selection in the main frame.
5. Here you can type the term you want to search for in the search field.
6. You can also check / uncheck any of the search options.
7. Pressing the magnifying glass icon begins the search.
8. The results of the search are returned and additional information concerning the term(s) can be obtained by expanding the text shown (if more text is available) or by clicking on embedded hyperlinks (if included in the term definition).

It is also possible to find articles by clicking on the alphabetical letters at the top of the main Dictionary screen.

Figure 2 - Domain Dictionary Search function demonstration

Figure 2 shows an example of the use of the search function. In this case, information about a "unit load device" is requested. Field 7 shows the search field filled with the search request. In Field 8 the search option "match in title" is checked so that only titles are searched. Field 9 contains the title of the search result. Below the title is the definition of the item described by the title.

3.2 Glossary

Figure 3 - Domain Dictionary Glossary – demonstration of letter "S"

The Glossary function provides the user with the ability to select a letter of the alphabet and have all titles starting with that letter returned for viewing. Figure 3 shows how the glossary function can be used. By clicking on a letter, in this case "S", all available terms (titles) beginning with "S" are shown as results.

3.3 Meta functionality

Meta information is information about other information. For instance, characteristics of an object can be meta information about the object. In the case of the Domain Dictionary, similar terms can be organized under an umbrella term that can help the user find the information desired.

When you search for "buyer", as an example, results will show the umbrella term "consignor", which is the common word for buyer in the domain. Meta information can be set as described in Section 5.

3.4   Other features

The Domain Dictionary can include pictures as well as text. The pictures can be either static views supporting the definition in the Dictionary (Figure 4) or act as active hyperlinks so that clicking on an area of the picture takes the user to a description of that area.
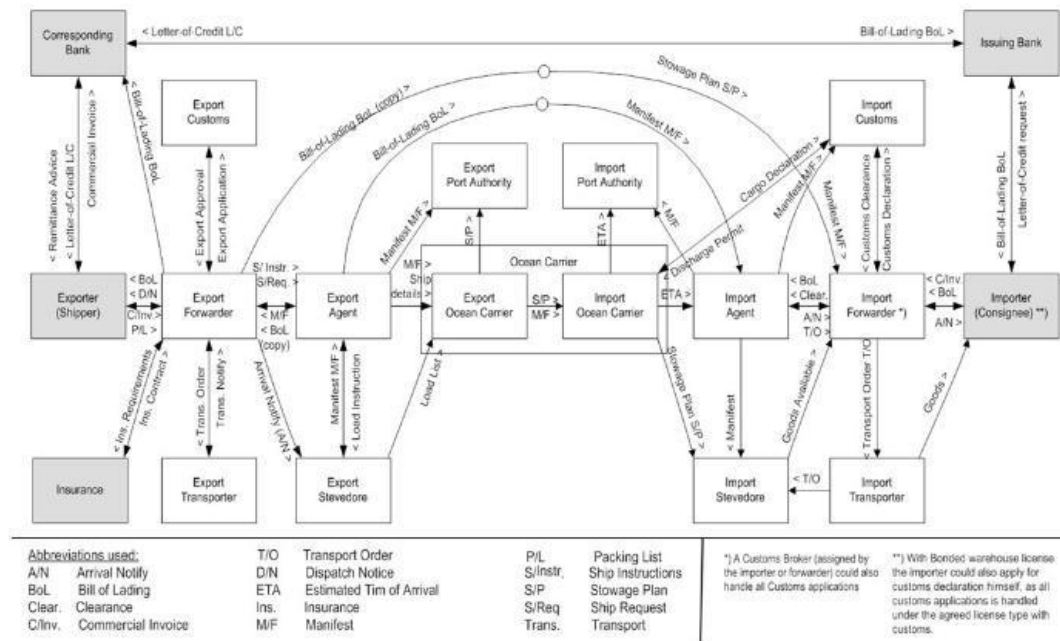
Figure 4 - Article detail view with images

Figure 5 – Article detail view with Hyperlinks and print symbol

Figure 5 shows two different uses of hyperlinks in the Dictionary. Field 10 is a hyperlink to a print function that has been added to the base functionality of the E-Glossary Joomla! component. Field 11 shows a hyperlink that, if clicked on by the user, will take the user to additional information on the term Ex Works. Hyperlinks can be used to jump to other information within the Dictionary or to websites outside the FInest website where additional information resides.

A click on the printer icon shown in Field 10 of Figure 5 will cause a pop-up menu to appear. This menu contains a print view of the term (Figure 6). The article can be printed by clicking on the printer icon depicted in Field 12. It is also possible to choose a PDF writer as the printer to create a PDF version of the term.

Field 13 shows the date of creation and the last change to the term definition. This information is pulled from the database where the terms/descriptions are stored.
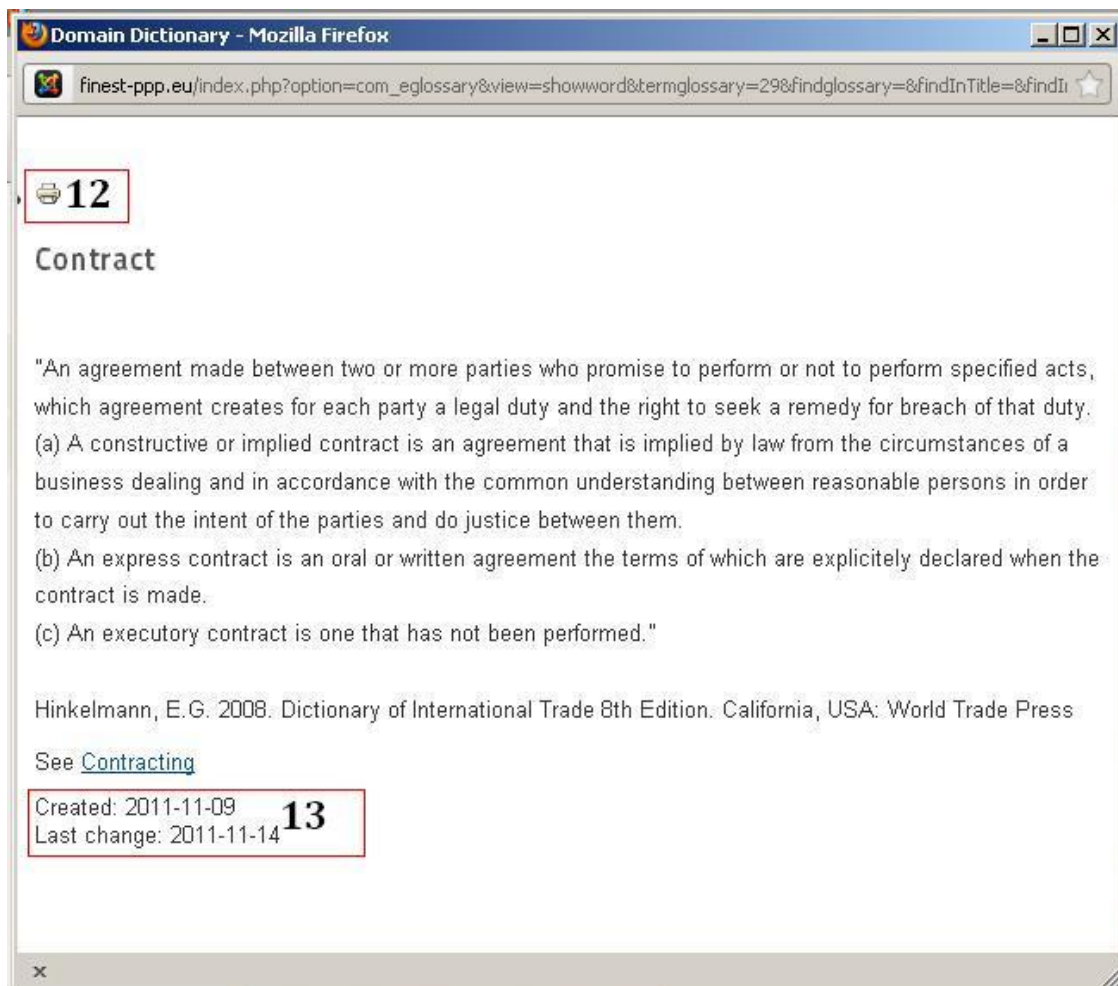
Figure 6 - Print view

In summary, the Domain Dictionary developed using the Joomla! CMS platform meets the requriements identified by the FInest partners for such the project's Dictionary. It is:

- Web based – accessible from any device with a web browser and a connection to the Internet

- Easy to use and update - new users with different rights can be registered to add new terms or change existing content

- Flexible - pictures and graphics can be included

- Extensible - hyperlinks to other articles or websites can be added

- Easy to print – definitions can be printed out to a local printer or to a PDF file

4   Domain Dictionary Content

The main processes for transforming raw data into a user-friendly dictionary format using the Joomla! system are:

1. Collection of raw data and combining it in a data repository
2. Uploading the repository to the online Dictionary as described in Section 5

It is important to note that the sequence presented in the figure below refers to the transformation and processing of data, and not a sequence of processes. This means that the activities can be carried out in parallel to each other (data collection; dictionary structure development; and online user interface development).
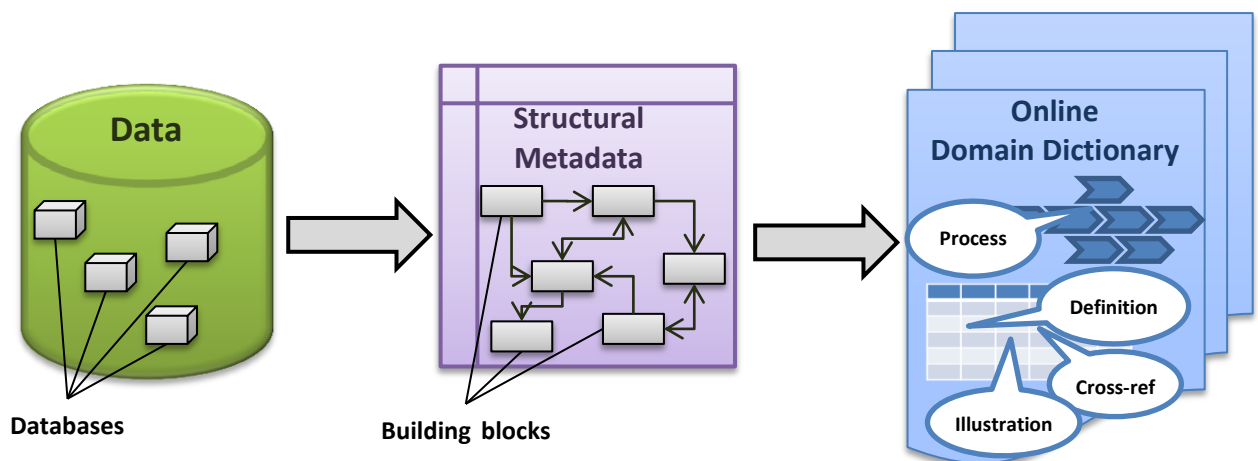
Figure 7 – Data collection, structuring and uploading

4.1   Data collection

The Domain Dictionary is a living repository of information about the transport and logistics domain. It receives contributions such as definitions, terminology, illustrations, examples, etc. from sources that are relevant to the project. The collection of information to be included in the Dictionary is performed through a defined and controlled update process. Terms that are

thought to be relevant for inclusion are first uploaded to the FInest eRoom in a standard format (Section 4.3). A person wishing to add a term to the dictionary can include pictures, hyperlinks, etc. in their request.

The information that is uploaded for consideration for inclusion in the Dictionary is discussed via an on-going dialog in the eRoom. To maintain quality, integrity and homogeneity of terms in the Dictionary, three roles have been identified in the approval process:

1) The proposer – the individual who is requesting that a term be added to the Dictionary. The proposer must submit the term, its definition and any pictures, graphics, links, etc. that they believe should be included along with the term in the Dictionary.

2) The reviewer – an individual assigned the responsibility of ensuring that the submitted material is complete, that the definitions conform to standard usage and that proper references to sources, etc. are made.

3) The approver – an individual who has final authority to allow the term and associated material to be added to the Dictionary. This individual also provides a final review of the material to ensure conformance with common standards and usage.

The status of a proposed term depends on where it is in the review process. Statuses include:

- Under consideration - In this phase proposers issue definitions that have not been officially approved or agreed to.
- Open for discussion - In this phase the reviewer(s) are invited to add and comment on the proposed material.
- Closed - The definition has been reviewed and approved and is now ready for uploading to the dictionary.

4.2 Copyright

It is the responsibility of the proposer to ensure that all material proposed for inclusion in the dictionary is absolutely free for publishing and not protected by any copyrights. If the material is copyrighted permission to use the material must be obtained. If the source of a definition is from another written document proper attribution must be made in the dictionary to that source.

4.3 Homogeneity

Uniformity of content must be ensured by enforcing uniform article structures. The following article structure is used in the Domain Dictionary:

1. [Term]
2. [Definition]
3. [Information including pictures, tables, links etc.]
4. [References]

5 Upload data – Administration of the Dictionary

In this section user and administrator functions are discussed for the handling of information uploads and maintenance for the Domain Dictionary.
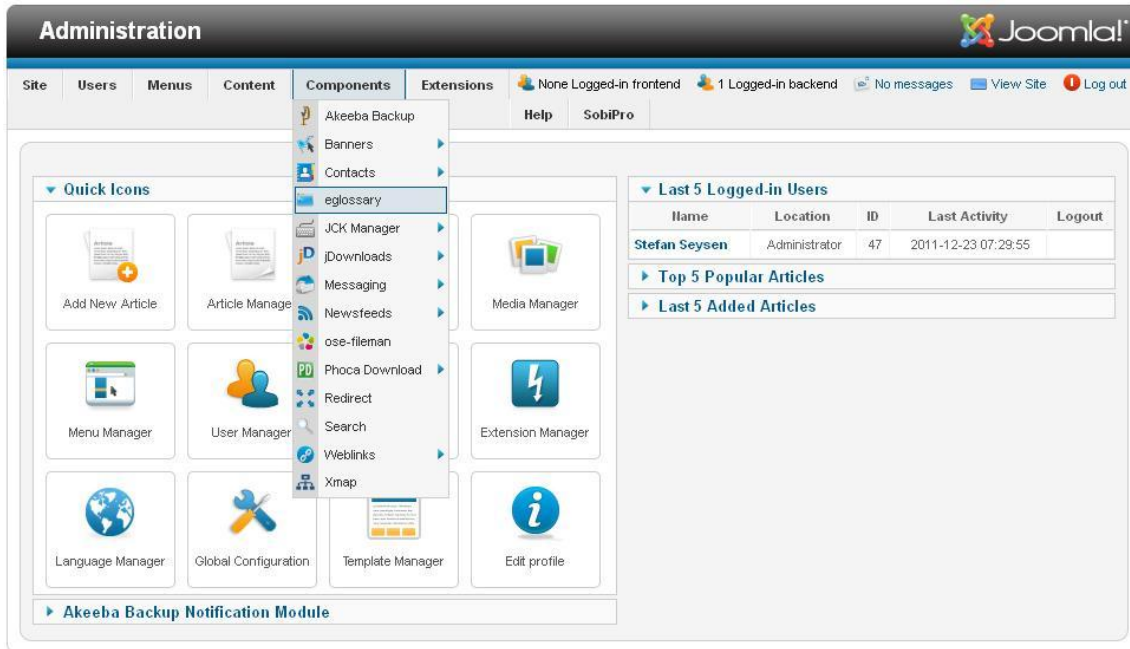

Figure 8 - Joomla! Administration Functions

Figure 8 shows the Administration screen for Joomla! in which several administrative activities can be performed. The administrative functions in Joomla! can be reached by adding "/administrator" to the FInest website URL (i.e., http://www.finest-ppp.eu/administrator/). In order to login as an administrator the user must be given the appropriate access rights by the FInest website administrator. The E-Glossary component can be accessed from the administrator's screen as shown in Figure 8 above.
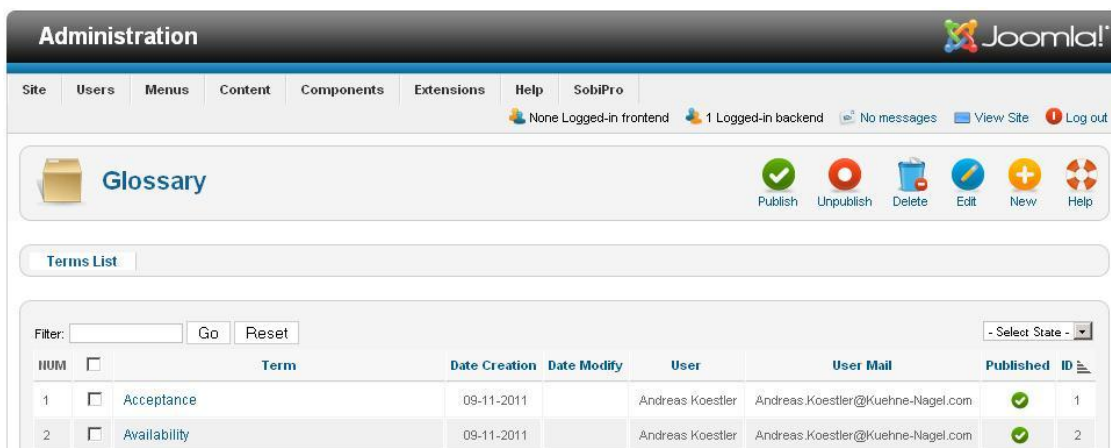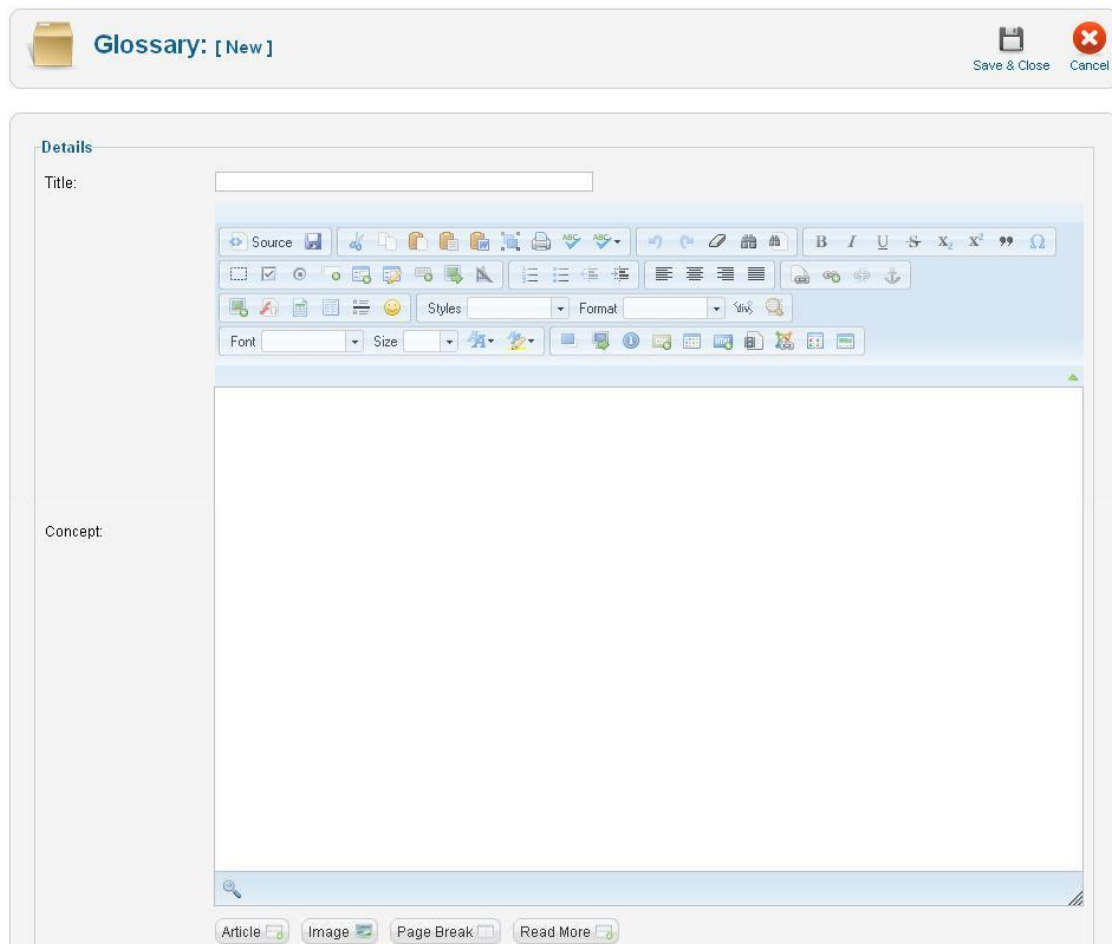

Figure 9 - E-Glossary Administration Screen

Figure 9 shows a screenshot of the administration screen for the E-Glossary component. This screen allows the user to add new content or edit / delete existing terms in the Domain Dictionary. By clicking on the "New" button the editor screen is opened as shown in Figure 10.

Figure 10 - E-Glossary Editor

This built in editor allows the user to add content, including hyperlinks, images and metadata in an easy and straight forward way.

6   Conclusion

A Domain Dictionary that can be enhanced in an easy manner has been developed for the FInest project. Joomla! CMS is used as the content management system for project website and it is extended by the E-Glossary component, which was modified to fulfil all the needs of a proper Domain Dictionary. Improvements to the Dictionary will be performed in an on-going manner. Content for the Dictionary will be added throughout the two year period of the FInest project. At this point there are approximately 100 terms and definitions available in the

dictionary. This count is being added to in an on-going manner so that, as terms arise that require a common project definition, these terms are added.

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MSAMR

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