EU Framework Program for Research and Innovation
(WATER-4a-2014 - H2020)

Project Nr: 641821

Applying European market leadership to river basin networks and spreading of innovation on water ICT models, tools and data.

Deliverable D6.2
Final virtual Marketplace report

Version 1.0

Due date of deliverable: 31/10/2016
Actual submission date: 31/10/2016
<table>
<thead>
<tr>
<th><strong>Document control page</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
</tr>
<tr>
<td><strong>Creator</strong></td>
</tr>
<tr>
<td><strong>Editor</strong></td>
</tr>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Publisher</strong></td>
</tr>
<tr>
<td><strong>Contributors</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Format</strong></td>
</tr>
<tr>
<td><strong>Language</strong></td>
</tr>
<tr>
<td><strong>Creation date</strong></td>
</tr>
<tr>
<td><strong>Version number</strong></td>
</tr>
<tr>
<td><strong>Version date</strong></td>
</tr>
<tr>
<td><strong>Last modified by</strong></td>
</tr>
<tr>
<td><strong>Rights</strong></td>
</tr>
<tr>
<td><strong>Dissemination level</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Nature</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Review status</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Action requested</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Requested deadline</strong></td>
</tr>
</tbody>
</table>
### Revision history

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Modified by</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>06-10-2016</td>
<td>CS_52N</td>
<td>Created the first draft version based on D6.1 First virtual Marketplace report</td>
</tr>
<tr>
<td>0.2</td>
<td>17-10-2016</td>
<td>CDB_52N</td>
<td>Modified complete Section 4 (Presentation of the Prototype) and some minor text recommendations</td>
</tr>
<tr>
<td>0.3</td>
<td>19-10-2016</td>
<td>CS_52N</td>
<td>Revision of Section 1 and 4. Section 5 added.</td>
</tr>
<tr>
<td>0.4</td>
<td>24-10-2016</td>
<td>EJ_52N</td>
<td>Extend Section 2.2 User Roles, extend section 3 – Implementation, extend section 5 – Marketplace API, update screenshots, review all sections, added Annex B</td>
</tr>
<tr>
<td>0.5</td>
<td>27-10-2016</td>
<td>CS_52N</td>
<td>Section 6 moved to Section 2; major revision of Section 2; general proofread and minor edits.</td>
</tr>
<tr>
<td>0.6</td>
<td>28-10-2016</td>
<td>LP_CREAF</td>
<td>Proofread and minor edits and comments.</td>
</tr>
<tr>
<td>1.0</td>
<td>31-10-2016</td>
<td>CS_52N, EJ_52N</td>
<td>Final revisions according to comments and feedback.</td>
</tr>
</tbody>
</table>

Copyright © 2016, WaterInnEU Consortium

The WaterInnEU Consortium grants third parties the right to use and distribute all or parts of this document, provided that the WaterInnEU project and the document are properly referenced.

THIS DOCUMENT IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS DOCUMENT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
Executive Summary

This report describes the final WaterInnEU Marketplace prototype at month 20 of the project. The prototype serves as a proof-of-concept for novel ideas developed in the project in order to facilitate matchmaking between products, potential users and service providers in the domain of river basin management. The prototype has been implemented to address the requirements identified in the other work packages (Section 2) and is developed in an agile manner. It has been presented to stakeholders workshops to the advisory board and feedback has been considered in the second phase of the project.

With the publication of this report, the marketplace is ready for community contributions and publicly available at:

https://marketplace.waterinneu.org

The implementation is based on Drupal and all extensions made are published as open source code and maintained in the following GitHub repository (Section 3):

https://github.com/52North/waterinneu

The marketplace provides the following core functionalities (Section 4):

- **browsing** through entries, i.e. products, services, projects, and organisations, (Section 4.1 and 4.2)
  - by scrolling through lists
  - by linked categories (i.e. clicking on a category in a description of a product leads to a list of other products with same category)
- simple keyword **search** and advanced search facilities (Section 4.3)
- simple and advanced **filtering** on entries (Section 4.2)
- common panel for upcoming **events** (Section 4.8)
- user **registration** and management with different roles, i.e. author, moderator, administrator, translation manager (Section 2.2 and 4.4)
- **collaborative creation** and **editing** of products, organisations, projects, and events; tracking of edit history (Section 4.5)
- a common place for adding and browsing **service requests** and **service offerings** and linking them to products (Section 4.6)
- user **feedback** in the form of comments and a forum for open **discussions** about products or other related information (Section 4.5.3 and 4.7)
- an integrated **e-learning platform** (Section 4.2.6)
- **contact brokering** between registered users and between non-registered users and product/service providers (if optional public contact information is given) (Section 4.10)
- **alerts** about new products or services or updates of them by a subscription system (Section 4.9)
- an **open API** that provides access to the underlying product and service entries in a machine-readable way (Section 5)

The final next steps until the end of the project are as follows: Since the implementation of the e-learning platform is due in month 22 of the project, the e-learning integration will be finalized by the end of the project. Concepts how the virtual platform can be sustained beyond the project duration will be provided in the Marketplace Sustainability Concept (D6.4), which is due in month 23 of the project, and are hence not yet described in this report.
# Table of Contents

1 Introduction ................................................................................................................................. 9

2 Requirements and User Stories ................................................................................................. 10
   2.1 Requirements ......................................................................................................................... 10
   2.2 User Roles .............................................................................................................................. 11
   2.3 User Stories ........................................................................................................................... 12

3 Implementation ............................................................................................................................ 14
   3.1 Data Types for Marketplace Entries ..................................................................................... 14
   3.2 General Implementation Overview ...................................................................................... 16
   3.3 Implementation Process ......................................................................................................... 17

4 Virtual Marketplace Prototype .................................................................................................. 19
   4.1 Entering the Marketplace ....................................................................................................... 19
   4.2 Browsing the Marketplace .................................................................................................... 22
      4.2.1 Products & Services panel ............................................................................................ 22
      4.2.2 Browsing Products ........................................................................................................ 23
      4.2.3 Browsing Organisations ............................................................................................... 28
      4.2.4 Matchmaking & Support Page ..................................................................................... 29
      4.2.5 Success Stories ............................................................................................................... 31
      4.2.6 e-learning ..................................................................................................................... 32
   4.3 Searching the Marketplace .................................................................................................... 33
   4.4 Registration, Login and Logout ............................................................................................ 36
   4.5 Collaborative Content Creation ............................................................................................ 41
      4.5.1 Adding Entries ............................................................................................................... 41
      4.5.2 Editing Entries and Edit History ................................................................................... 52
      4.5.3 Adding Comments ......................................................................................................... 59
      4.5.4 Moderator ..................................................................................................................... 61
   4.6 Service Requests and Service Offerings ............................................................................... 65
      4.6.1 Service Requests ............................................................................................................ 66
      4.6.2 Service Offerings .......................................................................................................... 74
   4.7 Using the Forum ..................................................................................................................... 77
   4.8 Events .................................................................................................................................... 79
   4.9 Alerts ..................................................................................................................................... 83
   4.10 Contacting Experts .............................................................................................................. 85

5 Integration with other platforms ............................................................................................... 88
   5.1 Integration with other platforms .......................................................................................... 88
   5.2 Marketplace API .................................................................................................................... 89

Annex A .......................................................................................................................................... 92

Annex B .......................................................................................................................................... 98
List of Figures

Figure 1: Content creation workflow including moderation .......................................................... 12
Figure 2: Overview on the technical architecture of the Marketplace .......................................... 16
Figure 3: Early prototype of the Marketplace released in autumn 2015 ........................................ 17
Figure 4: Marketplace prototype at month 13 .................................................................................. 18
Figure 5: Landing page of the WaterInnEU Marketplace prototype – Part 1 .................................. 20
Figure 6: Landing page of the WaterInnEU Marketplace prototype – Part 2 (available when scrolling down) .......................................................................................................................... 21
Figure 7: Products & Services panel of the Marketplace ................................................................. 22
Figure 8: Products panel of the Marketplace .................................................................................. 24
Figure 9: Detailed product view ...................................................................................................... 25
Figure 10: Listing of all products that relate to “Coastal and transitional waters” ......................... 26
Figure 11: Supported standards in product description (test data) ................................................ 27
Figure 12: Individually named links to supporting material and case studies in product description ................................................................................................................................. 28
Figure 13: Organisations page of the Marketplace ......................................................................... 28
Figure 14: Detailed view of an organisation description ................................................................. 29
Figure 15: Basic Matchmaking subpage .......................................................................................... 30
Figure 16: Matchmaking site with activated panel for .................................................................... 31
Figure 17: Success Stories site ........................................................................................................ 32
Figure 18: e-learning site ................................................................................................................ 33
Figure 19: Detailed view of a course in the e-learning platform ..................................................... 33
Figure 20: Basic search mask ........................................................................................................... 34
Figure 21: List containing search results .......................................................................................... 35
Figure 22: Selection of entry type in advanced search .................................................................... 35
Figure 23: Advanced search for products ......................................................................................... 36
Figure 24: Join Us button from the landing page ............................................................................ 37
Figure 25: Join Us page promoting the membership benefits for visitors ........................................ 37
Figure 26: Activated registration and login bar on the top of the Marketplace ............................... 38
Figure 27: Registration Form of the Marketplace ............................................................................ 38
Figure 28: Thank you for registering - page shown after registering a new account ..................... 39
Figure 29: Login form of the Marketplace ....................................................................................... 39
Figure 30: Member landing page with option for adding content .................................................. 40
Figure 31: Activated Account/Logout bar in the Marketplace ......................................................... 40
Figure 32: Create Product page ...................................................................................................... 41
Figure 33: Adding text and links ...................................................................................................... 42
Figure 34: Choosing a product category .......................................................................................... 43
Figure 35: Additional field Type of Software, if Category is Software tools ..................................... 43
Figure 36: Selecting several terms using checkboxes ..................................................................... 44
Figure 37: Defining an additional term that is not pre-defined ....................................................... 45
Figure 38: Defining an additional License/Copyright item ............................................................ 46
Figure 39: Choosing a Standard Category ..................................................................................... 47
Figure 40: Selecting previously defined standards ......................................................................... 47
Figure 41: Suggesting previously defined standards ...................................................................... 48
Figure 42: Defining a new standard .................................................................................................. 48
Figure 43: Selecting an existing organisation .................................................................................. 48
Figure 44: Display of organisation in create project form ............................................................... 49
Figure 45: Adding a new project ...................................................................................................... 50
Figure 46: Display of a project in the create product form ............................................................... 51
Figure 47: Error message, if one or more mandatory field value is missing .................................... 52
Figure 48: Detailed product view for portal members with option to edit (highlighted red because the product is not yet published) ..................................................................................... 53
Figure 49: Form for editing a product description .......................................................................... 54
Figure 50: Previewing product description or viewing changes made when editing products ........ 55
Figure 51: Comparing changes when editing a product ........................................... 56
Figure 52: Adding a revision log message before saving the product .......................... 56
Figure 53: Success message after editing a product .................................................. 57
Figure 54: Viewing the edit history of a product ....................................................... 58
Figure 55: Commenting links at the end of a detailed entry view ............................... 59
Figure 56: Form for adding comments on an entry .................................................. 60
Figure 57: Success message after adding a comment ................................................. 61
Figure 58: Pending revisions for moderator after login .............................................. 61
Figure 59: Revision view of a pending entry ........................................................... 62
Figure 60: Revision history of a pending product ..................................................... 62
Figure 61: Comparing a pending version to the current published version ................. 63
Figure 62: Publishing an entry .................................................................................. 64
Figure 63: Revision information screen with Submit for Publish button .................... 65
Figure 64: Success message after publishing an entry ................................................. 65
Figure 65: Service requests and offers in the matchmaking page .............................. 66
Figure 66: List of service request with filter option on category ................................. 67
Figure 67: Detailed view of a service request ............................................................ 69
Figure 68: Form for adding a new service request ..................................................... 70
Figure 69: Selecting products for a new service request ......................................... 71
Figure 70: Create service request with selected products and preview button ............. 72
Figure 71: Saving new service requests .................................................................... 73
Figure 72: Success message after adding a new service request ............................... 74
Figure 73: Service offerings tab on matchmaking page ............................................. 75
Figure 74: List of service offerings .......................................................................... 76
Figure 75: Form for adding service offerings ........................................................... 77
Figure 76: Landing page of the forum ..................................................................... 78
Figure 77: Posts of a single thread in the forum ....................................................... 78
Figure 78: Creating a post in a forum thread ............................................................. 79
Figure 79: Display of new post in forum thread ....................................................... 79
Figure 80: Events section in matchmaking page ....................................................... 80
Figure 81: List of upcoming events showing the teaser of one event with a trimmed image and event description ................................................................. 81
Figure 82: Form for creating events ....................................................................... 82
Figure 83: Entry specific subscription form; here: a product node ......................... 84
Figure 84: Subscribing for new entries on the Matchmaking page ......................... 85
Figure 85: Ask the expert ....................................................................................... 86
Figure 86: Ask the expert form .............................................................................. 87
Figure 87: Idea of a common database for water-related metadata ....................... 88
Figure 88: Overview on Marketplace REST API ..................................................... 89
Figure 89: Landing Page of the API endpoint .......................................................... 90
Figure 90: JSON encoding of organisations provided by the API ............................ 90
Figure 91: JSON encoding of a single organisation selected with title attribute filter provided by the API ................................................................. 91
Figure 92: Dependency of the Drupal modules developed and created within the project. 99
List of Tables

Table 1: List of user requirements (RQ) for the WaterInnEU Marketplace ...................................................... 10
Table 2: User roles of the Marketplace .................................................................................................................. 12
Table 3: User stories for end users .......................................................................................................................... 12
Table 4: User stories for portal member .................................................................................................................. 13
Table 5: User stories for portal moderator ............................................................................................................... 13
Table 6: User stories for portal admin .................................................................................................................... 13
Table 7: Data type for project .................................................................................................................................. 14
Table 8: Data type for organisations ........................................................................................................................ 15
Table 9: Data Type for service request .................................................................................................................... 15
Table 10: Data type for service offering .................................................................................................................. 15
Table 11: Data type for event ..................................................................................................................................... 16
Table 12: Icons for Stage of Commercial Development and Product Categories ............................................ 23
1 Introduction

This report describes the final prototype of the virtual Marketplace at month 20 of the project and is an updated version of D6.1 - First virtual Marketplace report. The corresponding implementation is maintained in an open repository (see Section 3 for more details). The Marketplace prototype serves as a demonstrator for the concepts and services defined in the other work packages and, as a supporting action, uses default functionality of Drupal, a common framework for online platforms, as much as possible.

The Marketplace provides the following core functionalities:
- browsing by linked categories through products, organisations, service requests, and service offerings
- common panel for upcoming events
- collaborative creation and editing of products, organisations, service requests/offers and events
- a common place for adding and browsing service requests and service offerings
- option to subscribe for new products, service offerings, or service requests
- simple keyword search and advanced search facilities
- option to provide user feedback in the form of comments
- forum for open discussions about products or other related information
- learning tutorials on usage of certain products
- use the matchmaking functionality
- contact an expert with special requests
- read about success stories of product application

Before the actual implementation of the prototype was started, the requirements identified in work package 3 have been translated into user stories (Task 6.1) ending in milestone number 6 (MS6 – Use case definition and open user story platform ends). Afterwards, the implementation of the prototype was started in an agile manner considering requirements and feedback from the other work packages. The prototype implementation itself consists of two phases:

**Phase 1** has started in month 7 and ended in month 13 with milestone number 9 (MS9 - Prototype of collaborative tool/company editor and tool search), where a first version of the prototype should be ready to be tested and the pilot cases start (MS13 – Pilot Cases Start).

**Phase 2** will continue until month 20 and includes three milestones: At month 17 the prototype should be up and running and should support user feedback (MS12 - Prototype supports user feedback) and in month 20 the prototype should be ready for community contributions (MS14 – Prototype integration completed). At the same time, the prototype conclusions should be shared and the prototype and API documentation should be public (MS 15 – Prototype and API documentation public).

The general structure of the report is as follows: Section 2 describes the user requirements and user stories that were identified for the portal prototype. Section 3 provides some information about the general implementation including a description of the data types and the technologies used and the development. Section 4 describes the functionalities provided by the Marketplace prototype in the style of a user guide. Finally, Section 5 describes the integration with other platforms and the Marketplace API, an open API that allows accessing the underlying metadata about products, services and events in a machine-readable way.

This report is an updated version of the first virtual marketplace report (D 6.1, month 13). Major updates are as follows:
- Section 2: The user roles were updated, since there is a new role of a translation manager.
• Section 3: New Drupal modules have been added and descriptions of existing modules were updated. An overview on most relevant modules was moved to Annex B for better readability.
• Section 4: Since the appearance of the portal was changed according to feedback from stakeholders, this section has been completely updated.
• Section 5: This chapter was added, since the Marketplace API allows an integration into other platforms and applications, which was also the subject of the second phase of the project.

Usage and application of the marketplace beyond the project will be discussed in a separate sustainability report (D6.4) that is due in month 23 of the project.

2 Requirements and User Stories

This section describes the user requirements (Section 2.1), the user roles (Section 2.2), and the user stories (Section 2.3) for the platform that have been derived from the work of the other work packages. They have been developed in an iterative process, where the different partners were able to edit and comment on the requirements and user stories on the Wiki page, where they are still maintained and updated, if needed1.

2.1 Requirements

The user requirements have been identified and summarized in the WaterInnEU Draft Guidance Report (D3.1). A list of specific requirements for the Marketplace has been derived from this report and is shown in Table 1.

Table 1: List of user requirements (RQ) for the WaterInnEU Marketplace

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1</td>
<td>Provision of &quot;application-oriented&quot; products: products that help in the daily work of River Basin Managers (RBMs)</td>
</tr>
<tr>
<td>RQ2</td>
<td>Product Specification Sheet for support with product selection and application</td>
</tr>
<tr>
<td>RQ3</td>
<td>Commenting function (+ lessons learned)</td>
</tr>
<tr>
<td>RQ4</td>
<td>Sortable inventory of products</td>
</tr>
<tr>
<td>RQ5</td>
<td>Presentation of Case Studies</td>
</tr>
<tr>
<td>RQ6</td>
<td>Support of product applications (external references, metadata, training)</td>
</tr>
<tr>
<td>RQ7</td>
<td>Events calendar; newsfeed</td>
</tr>
<tr>
<td>RQ8</td>
<td>Keyword search</td>
</tr>
<tr>
<td>RQ9</td>
<td>Interaction between users and with experts</td>
</tr>
<tr>
<td>RQ10</td>
<td>Interfaces should be simple and focused</td>
</tr>
</tbody>
</table>

The first requirement (RQ1) states that only application-oriented products should be provided in the portal; hence, information about purpose as well as success stories/best practices should be given. A Product Specification Sheet (PSS) has been developed iteratively with the collaboration of all partners in order to identify common fields that should be contained in product descriptions. A PSS describing key elements of tools is needed for supporting end users in the selection and application of tools (RQ2). This includes adding and collaborative editing of products (and projects/organisations linked to these products). The final version of the PSS from February 2016 is given in Annex A.

1 The Wiki Page on user stories is available at http://Wiki.waterinneu.org/Wiki/bin/view/WaterInnEUIntranet/UserStories.
The third requirement (RQ3) states that users should be able to add comments to products and describe lessons learned. Furthermore, users should be able to browse through the products available and to sort them by different description fields from the PSS, e.g. by title of the product (RQ4). Case studies on successful application of products should be accessible (RQ5). The sixth requirement (RQ6) includes the accessibility to external references, additional metadata and training material for products.

In order to be aware of events, matchmaking events should be announced (RQ7) and recent news should be displayed on the portal. Besides browsing and sorting products as described in (RQ4), users should also be able to search for products, organisations, events, service requests and service offerings (RQ8). In case a user is not able to find matching products or has specific questions for experts, she should be able to interact with others or with experts (RQ9). In general, the interfaces should be simple and focused (RQ10). This means that overloading the portal with rarely used complex functionality should be avoided.

To sum up, most important from the user perspective is the access to practical products, to get more information on successful applications of the product, and the ability to discuss or provide feedback on products as well as to interact with other river basin managers and experts. The portal should be kept simple and focused.

2.2 User Roles

Five different roles of Marketplace users have been identified in the project: End user, portal member, portal moderator, portal translation manager and portal admin. The end user can access all functionalities that do not require registration and login to the portal, e.g. exploring the content of the Marketplace, searching for products or organisations or reading service requests or offers. A portal member is a registered user who has also access to restricted functionalities after registration and login to the portal. Basically, all end users could become members by registration to the portal. Functionalities for portal members are, for example, adding or editing products or commenting on products. The portal moderator is responsible for checking new entries and comments or any updates of them, either by doing it by herself or by delegating this task to other experts. The according moderation workflow is outlined in Figure 1. The portal translation manager maintains the content translation jobs. Hence, the content of the portal can be provided in various languages. The portal admin is responsible for technically maintaining the portal and updating the general content. He is also the one who is able to finally delete entries. Therefore, the moderator needs to delegate that task to the admin.
In general, the roles are defined as extensions starting from the end user up to the portal admin. This means that the admin has all functionalities of the other roles. The moderator has the functionalities of the end user and portal member meaning that he can also add and edit entries. Portal members can also use the functionalities of end users.

2.3 User Stories

The description of user stories is structured by the different user roles defined in the previous section. Table 3 shows the user stories for end users. The core functionalities for end users are browsing and searching the Marketplace, as well as contacting experts. In order to access the functionality that is offered to portal members, the end user has also the option to register and login to the portal.

Table 3: User stories for end users

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Corresp. Requirement(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US1</td>
<td>User searches for entries by keywords</td>
<td>RQ2, RQ8</td>
</tr>
<tr>
<td>US2</td>
<td>User searches for entries per search mask (pre-defined categories)</td>
<td>RQ1, RQ2, RQ4, RQ8</td>
</tr>
<tr>
<td>US3</td>
<td>User registers or logins at portal.</td>
<td>RQ3, RQ7, RQ9</td>
</tr>
<tr>
<td>US4</td>
<td>&quot;ask the expert&quot;: User uses contact form to ask experts</td>
<td>RQ9</td>
</tr>
<tr>
<td>US5</td>
<td>User browses the content of the portal (e.g. list of tools)</td>
<td>RQ1, RQ2, RQ4, RQ5, RQ6</td>
</tr>
</tbody>
</table>
Initially, it was intended that all end users could edit entries and comments without login. However, this may result in a large number of spam comments or entries. Furthermore, it does not allow for a history of entries where certain changes can be assigned to users who have edited a product description. It was hence decided to only offer this functionality to registered users, the portal members. The user stories for portal members are shown in Table 4. A member is able to add or edit entries, e.g. product or organisation descriptions. Before or after editing, she may also check former edits in the history. A portal member can also add comments on certain entries. To start topic discussions, portal members can open a new thread in the forum, or post in an existing thread to contribute to a discussion.

Table 4: User stories for portal member

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Corresp. Requirement(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US6</td>
<td>User searches information in the Virtual Marketplace</td>
<td>RQ1,RQ2,RQ4,RQ5, RQ6,RQ8</td>
</tr>
</tbody>
</table>

The portal moderator is responsible for checking new or updated entries (see Table 5). Although it is recognized that the work of the moderator requires additional resources, it was considered being important in order to check the correctness of new entries or updates and to avoid misuse, e.g. deleting an entry of a similar product or service or updating it with incorrect information. Also, the moderator is able to make sure that only products of interest for river basin managers are described in the portal. In general, domain experts in the field of river basin management who are able to decide on correctness of products and the potential interest for river basin managers should take the role of a moderator in the portal.

Table 5: User stories for portal moderator

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Corresp. Requirement(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US7</td>
<td>Registered user adds entry</td>
<td>RQ2, RQ9</td>
</tr>
<tr>
<td>US8</td>
<td>Registered user edits entry.</td>
<td>RQ2, RQ9</td>
</tr>
<tr>
<td>US9</td>
<td>Registered user comments on entry.</td>
<td>RQ3, RQ9</td>
</tr>
<tr>
<td>US10</td>
<td>Registered user writes an item in the forum.</td>
<td>RQ9</td>
</tr>
<tr>
<td>US11</td>
<td>Registered user starts new discussion (thread) in the forum</td>
<td>RQ9</td>
</tr>
<tr>
<td>US12</td>
<td>Registered user subscribes for new entries.</td>
<td>RQ7</td>
</tr>
<tr>
<td>US13</td>
<td>Registered user checks revision of collaboratively edited entry.</td>
<td>RQ9</td>
</tr>
</tbody>
</table>

As can be seen by Table 6, the portal admin is responsible for maintaining the portal technically. This includes updating basic technology of the portal or changing the structure of a certain item, if required. Entries can only be deleted by the administrator. This avoids deleting entries accidentally or misusing deletion functionality. The admin is also able to make sure that the entries are also removed from the underlying database.

Table 6: User stories for portal admin

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Corresp. Requirement(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US18</td>
<td>Admin maintains portal technically.</td>
<td>All</td>
</tr>
</tbody>
</table>
3 Implementation

Before describing the current functionality in Section 4, this section provides some details on the technical implementation in this section. The source code of the portal was delivered in D6.3 – Virtual Marketplace Implementation, which also includes an installation description. The implementation is maintained in the GitHub repository as described in Section 3.3.

This section starts with the specification of the core data types for the different entries like product or organisation (Section 3.1), followed by a general overview on the implementation and technologies (Section 3.2). Finally, the implementation process is briefly described (Section 3.3).

3.1 Data Types for Marketplace Entries

Entries in the portal are specific data items that follow a pre-defined structure and are searchable in a structured way. Thus, we need to define data types for these entries. As a result from the requirements and discussion of user stories, five different types of entries have been identified in the project²: Product, Organisation, Project, Service Request, Service Offering, and Event.

The most important entries of the portal are products that are outcomes of EU-funded research projects in the water domain. The data type for products has been defined in the PSS. Several fields of interest are defined in the PSS, including, for example, general title, description, related organisations, support of standards, etc. For the reason of limited space, the detailed specification is provided in Annex A.

As the products have been specified or are developed further by certain projects, some basic information about the projects needs to be provided as well. Originally, the complete project metadata gathered in the inventory of work package 2 has been imported in an early version of the prototype. However, after reviewing the data and its usability in the prototype, it was considered that the focus should rather be on the products as results of the projects than on the projects itself. Hence, only basic information is provided about the project, as described in Table 7.

Table 7: Data type for project

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Cardinality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>String</td>
<td>1</td>
<td>Title of the project</td>
</tr>
<tr>
<td>Logo</td>
<td>Image format like png, jpeg, etc.</td>
<td>0..1</td>
<td>Logo of the project</td>
</tr>
<tr>
<td>Description</td>
<td>Text</td>
<td>1</td>
<td>Description of the project</td>
</tr>
<tr>
<td>Website</td>
<td>URL</td>
<td>1</td>
<td>Website of the project</td>
</tr>
<tr>
<td>End Date</td>
<td>Date</td>
<td>1</td>
<td>The date when the project has ended or will end</td>
</tr>
</tbody>
</table>

A product can be related to zero or more projects. Furthermore, a product can have links to one or more organisations, who may also offer services in the Marketplace. Hence, organisations are another data type that has been specified, shown in Table 8. Marketplace. The organisations of the work package 2 inventory have been removed and only the project partners and product owner organisations of the promoted products are present at the Marketplace.

² The data types have also been defined and discussed in the WaterInnEU Wiki in a collaborative manner at http://Wiki.waterinneu.org/Wiki/bin/view/WaterInnEUIntranet/DataSpecifications.
As mentioned above, the portal also allows registering specific service request or offerings for specific products. Hence, the service requests and offerings also needed to be specified for the portal prototype as shown in Table 9 and Table 10.

**Table 9: Data Type for service request**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Cardinality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>String</td>
<td>1</td>
<td>Title of the service request</td>
</tr>
<tr>
<td>Product</td>
<td>Product entry reference</td>
<td>0..n</td>
<td>Link to one or more products for which a service is requested</td>
</tr>
<tr>
<td>Category</td>
<td>Term from pre-defined vocabulary</td>
<td>1</td>
<td>Category of the service</td>
</tr>
<tr>
<td>Description</td>
<td>Text</td>
<td>1</td>
<td>Textual description of the service request</td>
</tr>
</tbody>
</table>

**Table 10: Data type for service offering**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Cardinality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>String</td>
<td>1</td>
<td>Title of the service offering</td>
</tr>
<tr>
<td>Product</td>
<td>Product entry reference</td>
<td>0..n</td>
<td>Link to one or more products for which a service is offered</td>
</tr>
<tr>
<td>Category</td>
<td>Term from pre-defined vocabulary</td>
<td>1</td>
<td>Category of the service</td>
</tr>
<tr>
<td>Description</td>
<td>Text</td>
<td>1</td>
<td>Textual description of the service offering</td>
</tr>
<tr>
<td>Organisation</td>
<td>Organisation entry reference</td>
<td>1</td>
<td>Link to one organisation that is offering the service</td>
</tr>
</tbody>
</table>

Finally, as the portal allows portal members to post new events or edit event description, an additional data type for events has been specified (Table 11).
Table 11: Data type for event

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Cardinality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>String</td>
<td>1</td>
<td>Title of the event</td>
</tr>
<tr>
<td>Description</td>
<td>Text</td>
<td>1</td>
<td>Description of the event</td>
</tr>
<tr>
<td>Links</td>
<td>URL</td>
<td>0..n</td>
<td>Links useful for the event, e.g. detailed information, conference homepage, registration form.</td>
</tr>
<tr>
<td>Date</td>
<td>Date</td>
<td>1</td>
<td>Define the duration of the event (in days).</td>
</tr>
<tr>
<td>Venue</td>
<td>Postal Address</td>
<td>0..1</td>
<td>Optional Postal Address of the venue of the event.</td>
</tr>
<tr>
<td>Category</td>
<td>Term from predefined vocabulary</td>
<td>1</td>
<td>Category of the event, e.g. matchmaking.</td>
</tr>
</tbody>
</table>

3.2 General Implementation Overview

In order to reuse existing functionality as much as possible in the portal prototype implementation, we have been reviewing several content management systems (CMS) and frameworks for building Web applications. The decision was to use Drupal\(^3\) as a basis for the Marketplace implementation for the following reasons:

- Drupal is implemented as Open Source with General Public License version 2 or higher (GPL-2).  
- Drupal is one of the most widely used CMS and a variety of tutorials and documentation exists.  
- The modular structure of Drupal allows for a flexible re-use and composition of existing functionality and also allows implementing extensions as new modules.  
- Drupal technology is widely used and this option facilitates the integration and reusability to other solutions in similar environments. Hence, some of the concepts developed in this project may be easily integrated into existing portals, such as EIP-water portal\(^4\).

\(^3\) General information about Drupal can be found at: https://www.Drupal.org/

\(^4\) http://www.eip-water.eu/my-market-place
The environment for deploying the WaterInnEU Marketplace prototype is shown in Figure 2. The Marketplace is using a MySQL database\textsuperscript{5} version 5.5.47 for storing the information of the portal and is therefore re-using Drupal's default support for MySQL. For executing Drupal code, PHP 5.6.17 is used. The portal uses.apache Solr 5.4.1\textsuperscript{6} for indexing and searching.

In the development of the Marketplace, several default modules of Drupal have been used. In the following only the most important modules are listed. The current set-up uses around 200 modules at all. Hence, the full list of used modules is provided in the WaterInnEU wiki topic for this report.\textsuperscript{7} A description of the important core, contributed, and developed modules is given in Annex B. Drupal is deployed in an nginx Server\textsuperscript{8} version 1.6 which is run on a Linux Server running Debian GNU/Linux 8.2 “Jessie”.

### 3.3 Implementation Process

The implementation is done in an agile manner. Thus, an early version of the prototype was already released in autumn 2015 (06/10/2015), as shown in Figure 3, and used as a basis for discussing and refining the requirements and users stories maintained in the Wiki. In order to gather a first amount of descriptions about products of interest in the portal, partners from work packages 3, 4 and 8 have circulated the PSS and have synthesized product descriptions in the portal.

---

\textsuperscript{5} More information about MySQL can be found at: http://dev.mysql.com/

\textsuperscript{6} More information about Apache Solr can be found at: http://lucene.apache.org/solr/

\textsuperscript{7} http://Wiki.waterinneu.org/Wiki/bin/view/WaterInnEUIntranet/D6_2

\textsuperscript{8} More information on the nginx server can be found at: http://nginx.org/
Subsequently, several updates of the Marketplace have been released and discussed. First decisions on the design and functionalities of the Marketplace were made in the WaterInnEU consortium meeting in Berlin (26 & 27/01/2016). Afterwards, the Marketplace was re-designed and updated to the version available at month 13 and described in the previous deliverable D6.1 (see Figure 4).

![Marketplace Prototype](https://marketplace.waterinneu.org)

*Figure 4: Marketplace prototype at month 13*

During the project meeting in Plovdiv (month 18), the final layout and functionality was defined based on the feedback from partners and stakeholders. The redesign results in a new layout of the front page and an adjustment of the global styling. This can be seen in the figures in the next sections. As an example, the new landing page layout is shown in Figure 5 in Section 4.1.

The source code of the prototype is managed in a Git repository at

[https://github.com/52North/waterinneu](https://github.com/52North/waterinneu)

A snapshot of this repository is delivered as D6.3 – Marketplace Platform. The requirements and user stories are maintained in the Wiki (see Section 2). The Marketplace is now accessible to the public and ready for community contributions at:

4 Virtual Marketplace Prototype

This section describes the functionality of the Marketplace prototype in the style of a user guide with some additional background information about the functionality. It starts with a general overview of the Marketplace landing page (Section 4.1) and then describes the different functionalities, i.e. search, browsing, registration/login, collaborative content creation, forum, alerts and events in more detail (Sections 4.1 - 4.10).

4.1 Entering the Marketplace

An overview of the landing page is given in Figure 5 and Figure 6. The landing page provides basic information about the Marketplace. The central quick links section provides access to the most relevant subpages/features of the marketplace, including Products & Services, Search, e-learning and Join (Registration). In the upper right, a certain language can be chosen (English by default). Furthermore, a simple search form is also provided in the upper right. The search options are described in more detail in Section 4.3. The blue-white arrow down in the upper right corner hides the functionality for registration and login, as described in 4.4. On the lower left, latest news from the WaterInnEU Twitter account are shown. On the right side, information about upcoming events are provided (at the time of taking the screenshot, there were no available events). When scrolling down, additional information is revealed, as shown in Figure 6. First, latest updates are shown, structured by entries, comments or forum threads/posts. Second, at the bottom of the landing page, general information about the marketplace portal as well as hints for marketplace usage and the team behind the portal are given.

9 Note: The current implementation only is in English. However, the portal implementation supports Internationalization. Examples for other languages supporting the marketplace are German and Bulgarian. However, for both languages, several sections of the marketplace still require translation. Further languages may be added, depending on resources available.
The WaterInnEU Marketplace is a market led innovation platform that screens the most relevant products and services for River Basin Managers and accelerates their uptake through targeted dissemination and support services.

Figure 5: Landing page of the WaterInnEU Marketplace prototype – Part 1
Figure 6: Landing page of the WaterInnEU Marketplace prototype – Part 2 (available when scrolling down)
4.2 Browsing the Marketplace

This subsection illustrates how to navigate through the content of the site and describes the different subpages in more detail.

4.2.1 Products & Services panel

From the landing page, clicking on the quick link *Products & Services* opens a subpage displaying the product of the month (Figure 7). In addition to the product’s title a descriptive image as well as a short description is included. On the top right of the product element, two additional symbols (a cloud-like symbol and a checkbox item within the screenshot) offer additional information about the product category as well as it’s stage of commercial development. The information appears when hovering over one of the symbols. Note that the displayed symbols change for different values. Table 12 shows all icons available.

![Navigation Bar](Image)

**Figure 7: Products & Services panel of the Marketplace**
Table 12: Icons for Stage of Commercial Development and Product Categories

<table>
<thead>
<tr>
<th>Icon</th>
<th>Product Category</th>
<th>Icon</th>
<th>Stage of Commercial Development</th>
<th>Icon</th>
<th>Meta</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Icon" /></td>
<td>best practice guidance technology (hardware)</td>
<td><img src="image2" alt="Icon" /></td>
<td>commercially available looking for first markets</td>
<td><img src="image3" alt="Icon" /></td>
<td>Category or Stage undefined</td>
</tr>
<tr>
<td><img src="image4" alt="Icon" /></td>
<td>software products</td>
<td><img src="image5" alt="Icon" /></td>
<td>looking for development partners awaiting product validation/certification</td>
<td><img src="image6" alt="Icon" /></td>
<td>Other</td>
</tr>
<tr>
<td><img src="image7" alt="Icon" /></td>
<td>dataset list methodology</td>
<td><img src="image8" alt="Icon" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image9" alt="Icon" /></td>
<td>standard other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Being on a subpage of the portal, an additional navigation bar appears, located at the top of the subpage. The navigation bar offers access to other sections of the Marketplace, such as Products, Organisations, Matchmaking & Support as well as Success Stories. The Home menu leads back to the landing page. Furthermore, on the right side of each submenu, a section called You can also provides hints and links to other key features of the marketplace.

4.2.2 Browsing Products

Using the navigation bar, the Products subpage can be accessed. It reveals an overview on the products available (Figure 8). The section starts with general information about available products and the functionalities of the Product subpage. The drop-down boxes at the centre in the filters container allow to sort and filter the products using pre-defined categories from the Product Specification Sheet, e.g. by product category. The blue-white arrow up in the right lower corner allows scrolling up to the top of the page again.
H2020 Project Nr: 641821. Project start date: 01 Mar 2015
Acronym: WaterInnEU
Project title: Applying European market leadership to river basin networks and spreading of innovation on water ICT models, tools and data
Theme: WATER-4a-2014. Water Innovation: Boosting its value for Europe

Figure 8: Products panel of the Marketplace
The product overview only shows so called teasers (brief descriptions) of the products. The full information about a product can be accessed, if the Read more link in a product description is clicked. A screenshot of a full product description is given in Figure 9. The fields of the full description are defined in the product specification sheet (see Annex A). Next to each field is an information icon, which provides the description of the field if the icon is clicked. While the first fields offer general information about the product owner or the target markets, an additional Details section can be expanded to see more descriptive fields about the product.

![Figure 9: Detailed product view](image-url)
Pre-defined terms are shown in blue and appear as links. Once the user has clicked on such a term-link, a new page opens that lists all other products linked to this term. Figure 10 shows such a listing after clicking on the term *Coastal and transitional waters* in the detailed product description from Figure 9. The term is given in the bar on the top of the listing. The linkage of terms allows users to flexibly browse through products and linked organisations.

**Figure 10: Listing of all products that relate to “Coastal and transitional waters”**

Supported standards are given in a similar manner and can be browsed as well (see Figure 11). For example, when clicking on the standard category *Sensor Data* from a particular product description, all products supporting the same category are listed afterwards. When the author is giving more details on the specific standard category, each supported standard is listed as link as outlined in the figure. This allows the fast identification of products supporting a certain standard.
Figure 11: Supported standards in product description (test data)

Furthermore, as expressed in the requirements and user stories (compare Section 2), external material, trainings, success stories, applications, case studies etc. can be linked from the corresponding product specification. Therefore, links with specific names can be provided in the product description, as shown in Figure 12, where several links to case studies and a link to supporting material are provided for the product.
4.2.3 Browsing Organisations

Similar to products, the Organisations panel provides an overview of the organisations that are registered in the Marketplace (see Figure 13). Filtering and sorting is also supported by pre-defined categories. In the organisation teasers, only title, logo, class and description are visible. Note that description and logo of the company are optional and hence may not be displayed in the teaser or the detailed view.

Clicking on the name of an organisation, the full information is shown including links to products and/or service offerings (Figure 14). Again, similar to the product descriptions, there are links provided for pre-defined terms or other entries that can be used to browse, for example from a company to its products and vice versa.
Enabling matchmaking between potential users and service providers as well as promoting the usage and uptake of products from research projects is one of the core aims of the WaterInnEU project.

In general, all functionalities offered by the Marketplace support the matchmaking process. For example, browsing products may lead a river basin manager to a product he is looking for. However, after discussing how to explicitly help users in doing the matchmaking and emphasize the different options for matchmaking facilities in the portal, the consortium decided to provide a dedicated Matchmaking & Support subpage that aggregates the different matchmaking options in the Marketplace.

A screenshot of the Matchmaking & Support page is shown in Figure 15. The page is structured using an accordion that lists the different matchmaking functionalities. These are as follows:

- **Search**: Search on the different entries, i.e. products, organisations, service requests, service offerings, and matchmaking events (Section 4.3). This matchmaking feature is available on each page of the portal via the search form on the top right.
- **Service Requests and Offerings**: Users can browse or add new service requests; organisations can provide service offerings (described in detail in Section 4.6).
- **Ask the expert**: If none of the functionalities offered by the portal facilitate matchmaking, the users can ask the expert panel for support (described in detail in Section 4.10).
- **Alerts**: Users can subscribe for entries and are notified per mail, if a new entry matching their subscription has been added or existing ones are updated or commented (described in detail in Section 4.9).
• **Events:** If matchmaking events are considered as an option, they can be explored here (described in detail in Section 4.8).

![Basic Matchmaking subpage](image)

The central accordion of the matchmaking subpage allows expanding the associated panel. For example, clicking on *Alerts* expands the *Alerts* panel as shown in Figure 16. Note that the options to create a subscription are only visible after successful login. Otherwise, you are prompted to login first. The login process is described in section 4.4.
4.2.5 Success Stories

The Success Stories will provide examples of successful matchmaking using the WaterInnEU marketplace. Since the marketplace will be opened to community users from month 20, there are not yet success stories listed. However, a placeholder providing information that success stories will be added as soon as they are available, is shown when invoking the page, as shown in Figure 17.
4.2.6 e-learning

The WaterInnEU e-learning platform will become available in a subpage of the WaterInnEU marketplace. It is developed as Drupal feature module with its own dependencies. Hence, the seamless integration in the overall platform will be achieved.

Figure 18 shows the result of an earlier integration test with the e-learning platform and the portal. In a nutshell, the e-learning platform allows creation, maintenance and participation for courses and tutorials as shown in Figure 19. The topics of these will be the promoted products of the marketplace.
Figure 18: e-learning site

Since the e-learning platform will be delivered at month 22 and described in D7.3, the e-learning platform is not described here in detail and not yet integrated in the prototype is publicly available.

Figure 19: Detailed view of a course in the e-learning platform

4.3 Searching the Marketplace

The main entry point for doing a search is on the upper right of the portal and from the Search section in the Matchmaking subpage. The default search form is shown in Figure 20. The drop-down menu allows restricting the search to certain entry types, e.g. on Products.
The search is started once keywords have been typed in and the Enter-key is pressed. The results are presented in a list as shown in Figure 21.
Besides simple keyword search, also an advanced search is provided when clicking on the Advanced Search link in the search form shown in Figure 20. The advanced search starts with a selection of an entry type on the tabs in the advanced search page (Figure 22).

Once the entry type is chosen, certain categories for fields become available. For instance, if Products is selected as entry type, as shown in Figure 23, several category options related to...
Products can be set to filter the search results. In addition, individual keywords can be defined in the highlighted Search form.

![Advanced Search for products](image)

Figure 23: Advanced search for products

The results are presented in the same way as the results of the simple search (see Figure 21).

### 4.4 Registration, Login and Logout

As mentioned above, the blue arrow down in the upper right can be used to activate the registration and login bar as shown in Figure 26. In addition, the new front page contains a big Join Us button (see Figure 24) for promoting the community membership. Clicking on this button results in the joins us page giving the visitor detailed information about the benefits of the membership in the WaterInnEU marketplace (see Figure 25) including contributing to the platform (provide own content, write comments for example), use the matchmaking services, sign up for alerts, and use the open forum. The registration link in the top bar is forwarding the visitor to the Join Us page, too.
The WaterInnEU Marketplace is a market led innovation platform that screens the most relevant products and services for River Basin Managers and accelerates their uptake through targeted dissemination and support services.

Figure 24: Join Us button from the landing page.

Join Us

Contribute:
Upload your own product or event, or add your organisation to our community (screened by our in-house team before going live).

Use our matchmaking service:
Find an organisation or partner that can help you implement a product, or communicate your own service offering.

Sign up for alerts:
Receive information on new or updated products, organisations, services requests, service offers or events.

Use the open forum:
Start or join a discussion on a topic of interest.

You can also:
- Browse our products and services to find and implement new products
- Take a course to help you implement a specific product
- Go to the forum to see the latest debates on river basin management
- Subscribe for alerts to get informed about the latest changes depending on your requirements

Figure 25: Join Us page promoting the membership benefits for visitors
Figure 26: Activated registration and login bar on the top of the Marketplace

Clicking the Join Us button on the Join Us page forwards the visitor to the registration form, as shown in Figure 27. The form requests a username and an e-mail address from the user. Furthermore, a time zone can be chosen. It also lists the terms of use and checks, whether the user has read and accepts them. In order to prevent spam accounts, a captcha is used. Note that during the registration process, an informed consent on the collection of personal data is included.

Figure 27: Registration Form of the Marketplace

Once the user has registered by clicking the Create new account Button, the data is transferred to the portal. In addition, the user is forwarded to the Thank you for registering page (see Figure 28) which explains in detail the next steps that will be performed until the new account is ready to use. First one admin has to accept the request. Then a confirmation email is sent to the user with the
requirement to re-set the password. The user can then use the login form (see Figure 29) to login to the portal and enter the portal with its member landing page (see Figure 30).

![Figure 28: Thank you for registering - page shown after registering a new account.](image)

![Figure 29: Login form of the Marketplace](image)

On the right side of the member landing page, the Add Content item provides the entry point for editing content as described in Section 4.5.1. Per default, users who register and subsequently log in to the portal change their role from End User to Portal Member (compare Section 2.2) and are thus able to edit entries, to comment on products or to start or contribute to discussions in the forum. Furthermore, subscribing to new entries (Section 4.8) also requires to be logged in. The My Content section lists all entries that have been created by the member.
The Logout functionality and a link to the account settings are offered in the blue top bar, if a user is logged in (Figure 31). After logging out, only the non-restricted functionality is available again.
4.5 Collaborative Content Creation

As mentioned above, the portal provides facilities for adding or updating descriptions of products, organisations, projects, and events in a collaborative manner.

4.5.1 Adding Entries

Products, organisations, projects, or events can only be created by portal members. Thus, users need to be registered and logged in before being able to create new entries. Once the users are logged in, they can follow the Add Content link in the right menu bar to choose a certain entry type that should be added.

In the following, the creation of a new product is described as an example. The creation of related projects and organisations can also be done using the products form. Events can be created in a similar manner and are not explained in detail.

![Create Product page](image-url)
The form allows the user to fill in values for all fields as defined in the product specification sheet (Annex A) and therefore provides different functionalities. In general, additional hints on how to fill a certain form field are located at the respective form field. The creation of a product starts with selecting a language as well as entering general information, such as name, owner and category. For adding a logo, a file can be chosen and uploaded as shown at the bottom of Figure 32. Mandatory fields are marked with a red star after the field name, as shown for Category field in Figure 32. For adding text values, e.g. for Product Name, and Product Owner, form inputs are provided. For the latter additional instructions are provided below the field. Here, the text format for the input field can be changed from Plain text to Filtered HTML, allowing users to enter free text using HTML tags. Furthermore, one or more links to external resources can be added at associated form sections including a title that is later displayed in the detailed view of the product description, as shown in Figure 33.

Figure 33: Adding text and links

For specifying field values with predefined terms, the user can choose from a drop-down list, as shown in Figure 34.
Depending on the chosen category, different additional fields may be shown when filling out the remaining form fields. If the Category is for example Software tools, an additional field Type of software is displayed when scrolling down, as demonstrated in Figure 35. This field would not be visible, if the Category would be Technology (hardware).

If not just one, but several terms should be selectable as field values, all possible terms are listed and can be selected by checkboxes, as shown in
For which tasks in water resources management can the product be used?
- Setting objectives
- Selecting measures
- Socio-economic analysis
- Characterization of water bodies (including mapping)
- Pressures and impacts
- Public participation
- Data processing (spatial or geographical)
- Planning process
- Financial management
- Intercalibration
- Monitoring and reporting
- Modelling and prediction
- Reference conditions
- Infrastructure planning
- Other

*Figure 36 for the field WFD Objectives.*

If none of the pre-defined terms matches the product or there is another important purpose, the user can also choose Other and then type in another term in the textbox that appears (Figure 37).
Figure 37: Defining an additional term that is not pre-defined

Additional terms can be analogously defined in drop-down boxes as shown for the field Licensing/Copyright in Figure 38.
Figure 38: Defining an additional License/Copyright item

For defining the standards, one or more categories in the Standard Category need to be chosen at first. Depending on the chosen values in Standard Category, input boxes for the standards appear as shown in Figure 39, where Data Downloading and Data Encoding are chosen as Standard Category.
Figure 39: Choosing a Standard Category

The user can then type in the standards the product is supporting. The standards that have been already defined beforehand, are provided in a drop-down list (Figure 40).

Figure 40: Selecting previously defined standards
If the standard has not been defined before, it can be added by typing the name in the box and pressing the Enter key. When typing in the name of the standard, previously defined standards matching the name are suggested in a drop-down list as shown in Figure 41.

![Figure 41: Suggesting previously defined standards](image)

If no matching standard is found, a message appears that the standard will be added and clicking the Enter key adds the standard to the list (Figure 42).

![Figure 42: Defining a new standard](image)

As a product has been developed in a certain project by a certain organisation that is already registered on the Marketplace, the product can be linked to a project or an organisation by using the Add existing project or Add existing organisation button. E.g., to link an existing organisation, click Add existing organisation, which opens a new form where existing organisations are shown in a drop-down list (see Figure 43).

![Figure 43: Selecting an existing organisation](image)

By clicking on an organisation, the organisation is selected and can be edited or removed later (see Figure 44).
In case the project and/or organisation is not yet existing in the portal, the Add new project and Add new organisation button can be used to create new entries. For example, if clicking on the Add new project button, a new form for adding information about the new project is opened, as shown in Figure 45.
After providing all necessary information about the project, the *Create project* button at the bottom of the form can be used to create the project. The new project is then displayed in the product form and can subsequently be edited or removed (Figure 46).
After finishing the information on the product, clicking the preview button generates a preview of the product description. Before finally saving a product, the user needs to preview her entries in order to do a final check. Once clicking the preview button, automated checks will be run, e.g. verifying that all mandatory fields are filled. If these fail, error messages will appear as shown in Figure 47.
After checking the preview and doing final edits, the product can be saved and the moderator needs to do a final check before publishing the product (The moderator functionality is described in Section 4.5.4). In addition, the author is able to add a comment for the revision of the product, e.g. “initial version”.

### 4.5.2 Editing Entries and Edit History

Editing existing products or other entries can be done in a similar way as creating new entries. To edit an existing product description, the user needs to be logged in and the product needs to be displayed in the detailed view as shown in Figure 48. Within the figure, the previously created product is highlighted red because it has not yet been published and remains within a pending state. Per default, the current version of the product description is displayed. Two more options are available: Edit Current and Revision operations. By clicking Edit current, the edit form for the product appears, demonstrated in Figure 49. The form is the same as for creating new products, but the values of the current product description are shown as field values.
Figure 48: Detailed product view for portal members with option to edit (highlighted red because the product is not yet published)
**Edit Product 52° North Sensor Web Client**

The submission of product specification sheets undergoes a moderation workflow. Hence, adding new content might cost some time. Get in touch with the administrator for speeding things up using the helpdesk form. Please consider the following additional instructions to some of the fields below.

Product deletion is only possible by admins. If you want to have a product deleted, please use the contact form. Get in touch with our helpdesk if your content does not fit in this form.

**Language**

- English

**Category**

What type of product is this?

- Software Products

**Product Name**

What’s the title or name of the product?

- 52° North Sensor Web Client

**Product Owner**

52° North

**Text format**

More information about text formats

- Plain text

- No HTML tags allowed.
- Freelinking helps you easily create HTML links. Links take the form of [(indicator: target)](title). By default the indicator
  - Click to view a local node.
- Webpage addresses and e-mail addresses turn into links automatically.
- Lines and paragraphs break automatically.

Who is the first or best one to contact?

**Logo**

Files must be less than 1 MB.

- Allowed file types: png, gif, jpg.
- Images must be between 100x100 and 128x128 pixels.

**Product Description**

What is the product about? Short description of the product and background information

*enter product description here*

**Photo**

Please provide an image with a minimal resolution of 475 x 200 pixels (width x height). Keep this aspect ratio for the best results.

- Files must be less than 6 MB.
- Allowed file types: png, jpg, jpeg.
- Images must be larger than 475x200 pixels.

*Choose File* No file chosen

*Upload*

---

**Figure 49: Form for editing a product description**
After editing a product, the user again needs to check the preview by clicking the *Preview* button at the bottom of the edit form (Figure 50).

![Figure 50: Previewing product description or viewing changes made when editing products](image)

The user is also able to check only the changes by clicking the *View changes* button. A comparison view appears as shown in Figure 51. The changes are shown in red colour.
Edit Product 52° North Sensor Web Client

The submission of product specification sheets underlies a moderation workflow. Hence, adding new content might cost some time. Get in touch with the administrator for speeding things up using the helpdesk form. Please consider the following additional instructions to some of the fields below.

Product deletion is only possible by admins. If you want to have a product deleted, please use the contact form. Get in touch with our helpdesk if your content does not fit in this form.

<table>
<thead>
<tr>
<th>Original</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes to Product Description</td>
<td>we really should enter an appropriate product description here</td>
</tr>
<tr>
<td>Change to Competitive Advantage</td>
<td>we really should enter information about competitive advantages here</td>
</tr>
<tr>
<td>Changes to Tour</td>
<td>Ecological or chemical status</td>
</tr>
<tr>
<td>Climate change and energy</td>
<td>Climate change and energy</td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
</tr>
</tbody>
</table>

Language

English

Category

Software Products

After viewing the preview or the changes, the user can then add a Revision log message, as shown in Figure 52. The log message will be displayed in the edit history of the product. After clicking the Save button, the new version of the product description is passed to the moderator who will check and publish the new version.

A success message is displayed as shown in Figure 53.
Figure 53: Success message after editing a product.

All portal members, who are logged in, are also able to check the edit history of a product. Therefore, they need to click on the Revision operations link in the detailed view of a product description to open the list of revisions (Figure 54). Published revisions are shown as yellow and pending revisions as red. The user can also select two revisions and use the Compare button to generate a comparison view similar to the one shown above in Figure 51.
Figure 54: Viewing the edit history of a product
4.5.3 Adding Comments

Comments can be added to all entries, i.e. products, organisations, service request and service offerings. The main entry points are the links at the bottom of detailed views of these entries, as shown in Figure 55.

![Diagram of commenting links at the end of a detailed entry view](image)

**Figure 55: Commenting links at the end of a detailed entry view**

If logged in, a new form for adding a comment is shown (Figure 56). The user needs to type in the comment and may also add a subject to the comment.
After clicking the Save button, a success message appears as shown in Figure 57 and the comment is queued for review by the moderator. The review functionality for the moderator is described in the next section. In addition, the entry owner will be informed after the publication of the comment via e-mail.
4.5.4 Moderator

All entries that have been added or changed by portal members need to be checked and published by the moderator (compare Section 2.2). If a moderator enters the portal, entries that have been edited and need to be reviewed by the moderator are shown on the right side under Pending Revisions (see Figure 58).

If the moderator clicks on an entry under Pending Revisions, the detailed revision view of this entry appears (Figure 59). The different revision operations are as follows:

- **List all revisions**: links to a list of all revisions and to compare the changes made with between two revisions.
- **View Current** (shown by default): shows the latest view of the entry.
- **Edit Current**: allows editing the latest version of the entry.
- **Publish**: allows publishing the pending entry.
- **Compare to current**: allows comparing the pending version to the current published version. This option is only visible if there are at least two distinct versions to be compared. After initial creation only one version of a new entry is available, hence the Compare To option is not available.
When choosing **List all revisions**, the revision history of the entry is shown (Figure 60). The history lists all revisions including the date, the editor and the current status of a revision, wherein pending revisions are shown in red colour.

When at least two revisions are available, the moderator is also able to select two revisions and compare the edits made to each other. A view appears as shown in Figure 61, where in this case the pending revision is compared to the published version using the **Compare to current** option.
Figure 61: Comparing a pending version to the current published version
Finally, if the moderator agrees with the changes made, he can then choose to publish the entry leading to a final check (Figure 62). Therein, the moderator may also choose a later date and time for publication. If not, the entry is directly published at the portal once the Publish button is clicked.

Afterwards, a success message is displayed that the entry has been released (Figure 64). In addition, the author of the entry is informed about the publication of the entry via e-mail.

Another way to force moderators to review the author’s content, an author can click on the Submit for Publish button (see Figure 63) or manually add the words “ready to review” to the revision log message. This will result in an email being sent to all members of the moderators group. This mail contains some basic information about the content to be reviewed including a direct link to the content.
4.6 Service Requests and Service Offerings

The Marketplace provides a common place to publish service requests and offerings. The main entry point for the service requests and offerings is the section Service Requests and Offers in the Matchmaking page. A screenshot of this section is shown in Figure 65. The latest updates of the service request and offerings are shown in the two tabs Service Requests and Service Offerings.
4.6.1 Service Requests

Selecting the Service Requests tab lists the latest updates and allows accessing all service requests by clicking the Show all Service Requests button. A list of all service requests is shown in Figure 66.
Figure 66: List of service request with filter option on category

If the user wants to read a full service request and may want to add comments (e.g. hints or a response), she needs to click the title of the service request teaser. An example of a detailed view is shown in
Figure 67: Detailed view of a service request.
Support for setting up water monitoring infrastructure needed

We're planning to set up a new Web-based infrastructure for managing our water monitoring sites and processes.

Category: Monitoring, measuring & data processing (software)


Add your Comment

Subject *

Comment *

Your name: stochastic-user

CAPTCHA
This question is for testing whether or not you are a human visitor and to prevent automated spam submissions.

Math question *

Solve this simple math problem and enter the result. E.g. for 1+3 enter 4.
3 + 3 =

Save  Preview

Figure 67: Detailed view of a service request

If there is not yet a similar service request, the user can add a new service request by clicking the Add new Service Request button from the matchmaking page. If the user is not yet logged in, the login form appears. Otherwise, the form for adding a new service request is directly shown (Figure 68).
A service may be requested for one or more products. Hence, products may be linked to the service request. The Add items button opens a pop-up where existing products can be selected (Figure 69).
**Figure 69: Selecting products for a new service request**

After selecting products, these are shown in the form and the *Preview* button can be used to have a final check before saving the service request (Figure 70).
In the preview, the user has the chance to do a final review of the service request and may still do further adjustments. Finally, she can press the Save button to save the new service request, as shown in Figure 71.
Figure 71: Saving new service requests
A success message appears as demonstrated in Figure 72. The new service request is then queued to be checked by the moderator and, if everything is fine, will be released afterwards to the public.

4.6.2 Service Offerings

For service offerings, only the option to list all offerings is given in the Service Offerings tab (Figure 73).
Under the list of latest updates, the button *Show all Service Offerings* links to the list of all service offerings. The list looks similar to the list of service requests shown, except that details about the organisation offering the service are also provided (see Figure 74).
The button for adding new service offerings is intentionally not provided at the Matchmaking page. Since service requests should be provided by existing members tied to organisations, we have decided to provide this functionality only in the Add Content section from the My actions menu located at the right of the user interface for logged in members, as described in Section 4.5.1. Once a portal member has chosen to create a new service offering, a form appears as shown in Figure 75. In addition to service requests, the user can also select an organisation that offers the service. Again, once the user has finished editing, she needs to preview and afterwards save the service offerings. It will then be checked by the moderator and released afterwards.
4.7 Using the Forum

When logged in, the forum can be reached from the landing page using the Join us submenu, as shown in Figure 5. In addition, a link to the forum is always available via the You can also boxes located on the right of each subpage. The landing page of the forum is shown below (Figure 76). The several threads are listed by Title, Category and with the number of Posts and Views and the latest update (Updated). As indicated at the bottom of the page, only logged-in members are able to add new content (threads or posts) in the forum.
Figure 76: Landing page of the forum

Users can see the posts of a thread, if clicking on the title of a particular thread. The posts of the selected thread are then listed (see Figure 77).

Figure 77: Posts of a single thread in the forum

If a user is logged in, she has also the ability to Reply or Reply as a new thread. If clicking on Reply, a new form for the reply opens, as presented in Figure 78.
4.8 Events

Upcoming events can be added and edited by portal members and are accessible from the landing page (section Upcoming Events, see Section 4.1) and the Matchmaking page (see Section 4.2.4). In both cases, the latest updates on events are shown as short links. Furthermore, the user has the ability to see all events by clicking the Show all events button or to add new events using the Add new event button which is available within the matchmaking page and in the My Actions box on the right side; shown for logged in users (see Figure 80).
The primary goal of the WaterInnEU Portal is to facilitate matchmaking between organizations offering products which are relevant to river basin management, the potential users of these products, and service providers which can support implementation (for example via adaptation of software for use in a specific river basin).

We have a range of services available that seek to enhance communication between these groups by supporting product developers in the dissemination and commercialisation of their innovative products and services, and by ensuring that end users and service providers can access and implement these products.

To join or search our automatic matchmaking service, go to Service requests and offers.

For bespoke support and advice, go to Ask the Expert.

**Figure 80: Events section in matchmaking page**

The *Show all Events* button opens a list showing all upcoming events, as shown in Figure 81. The list can be filtered by the *start date* of the event and ordered by *title*. Following the *Read more* link of each entry allows retrieving a full description of the event. On the full view, comments can also be added about the event, e.g. whether it is considered to be useful or whether a certain side-meeting will be planned. In addition, given links and the category are shown which allows browsing all events of the same category by one click.
Figure 81: List of upcoming events showing the teaser of one event with a trimmed image and event description.

For adding new events, the Add new Event button (shown in Figure 80) opens a form as displayed in Figure 82. For new events, the title, language, description, category, as well as start and end date and venue can be defined. If applicable, additional links to external resources and an optional photo of the associated event can be specified.
Figure 82: Form for creating events
After all information about the event has been entered, the user needs to Preview the entry and can then use the Save button to save the entry. The created event is then scheduled to be checked by the moderator and will later be released to the public, if everything is fine.

4.9 Alerts

As mentioned in the overview of the Matchmaking page, the user has also the option to subscribe to entries in order to be notified about updates of existing entries or when new entries are added to the marketplace. The main entry point is the Alerts section in the Matchmaking page. The form is shown in Figure 84. The user first needs to specify the content type of entries (e.g. Product or Service Offering) for which she wants to receive notifications. Depending on the selected content type, additional form fields appear allowing further filter options for the subscription. Finally, three checkboxes give additional information about the subscription process. The first checkbox is mandatory and tells the user, that she might receive multiple notifications due to the subscription. The other two are optional and ask, whether the user wants to be notified on Updates of or Comments on existing entries matching the subscription.

After clicking the Subscribe button, the subscription is stored and the user will be notified, in case a new matching entry is added or an existing one is modified (if the option has been checked by the user). As the user account is linked to a dedicated e-mail address, the notifications are automatically sent to this email address. To unsubscribe, users may follow a link in subscription emails, similar to unsubscribing from mailing lists.

In addition to the central subscribe form on the matchmaking page, the marketplace offers functionality for subscribing on each entities page (see Figure 83). This includes the option to subscribe for changes on a specific entity.
Competitive Advantages:
The guide provides a straightforward, practical approach that outlines the key activities needed to ensure successful lagoon/estuary management through the participation of all stakeholders.

Stage of Commercial Development Info:
The guide is complete and freely available from the project website.

Details
Subscribe

- Subscribe to this page
- To Product content
- To content in Public domain
- To content in For free
- To content in Setting objectives
- To content in Pressures and impacts
- To content in Public participation
- To content in Planning process

The master checkboxes in the left-most column turn the given subscription on or off. Depending on the setup of the site, you may have additional options for active subscriptions.

Save

Figure 83: Entry specific subscription form; here: a product node.
The primary goal of the WaterInnEU Portal is to facilitate matchmaking between organizations offering products which are relevant to river basin management, the potential users of these products, and service providers which can support implementation (for example via adaptation of software for use in a specific river basin).

We have a range of services available that seek to enhance communication between these groups by supporting product developers in the dissemination and commercialisation of their innovative products and services, and by ensuring that end users and service providers can access and implement these products.

To join or search our automatic matchmaking service, go to Service requests and offers.

For bespoke support and advice, go to Ask the Expert.

**4.10 Contacting Experts**

If none of the matchmaking functionalities fulfilled the needs of a user, she is also able to contact an expert panel. The experts can be contacted from the Matchmaking page as shown in Figure 85. In addition, the portal renders a Contact/Helpdesk link on the bottom of each page, which links to the same feature.
If the user clicks on the *Ask the expert* button, a contact form appears, as shown in Figure 86, where the user needs to specify his name and email address as well as a subject and a category and the description of his help request.
After clicking the *Send message* button, a success message is displayed.
5 Integration with other platforms

An integration with other platforms can be achieved by utilizing an open API that provides the underlying data of the WaterInnEU marketplace in machine-readable form. The API is described in Section 5.2. Before, an overview on an informal integration initiative with other platforms is presented in Section 5.1.

5.1 Integration with other platforms

Several options for integrating with other portals have been discussed in telephone conferences with the EIP-Water and WiDEST projects and, in addition, at the EIP Water conference in Leeuwarden in February 2016. At the moment, a loosely coupled approach appears to be the best solution. A potential solution for such a loose coupling is sketched in Figure 87. It would allow to generate new options to access the underlying data of the different portals by a main entry point relying on common vocabularies. As a first step, the WaterInnEU marketplace supports the concept by providing a well-defined API to access the data in a machine-readable way (see next Section).

As a follow up from the discussion, participants from WaterInnEU, WiDEST and EIP-Water initialized an informal initiative with the goal to draft a white paper that provides an overview on the different portals and underlying metadata\textsuperscript{10}. The paper should also specify options how to integrate the data into one common database that may serve as a common entry point and may avoid duplicate information resulting in decreased maintenance efforts. At the time of writing this report, the metadata specifications of several water-related portals have been collected and are currently analysed. It is planned to finish the white paper in early 2017.

\textsuperscript{10} https://wiki.52north.org/Projects/WaterMetadata
5.2 Marketplace API

In order to facilitate the integration with other portals and the usage of the WIEU metadata in other applications, the underlying data is provided via an open API in a machine-readable way like illustrated in Figure 88.

![Figure 88: Overview on Marketplace REST API](image)

The endpoint of the Marketplace API is

https://wie.dev.52north.org/en/api

It is also directly accessible from the marketplace following the API::JSON link at the bottom of the portal. As shown at the landing page of the API, the core resources of the portal are published, e.g. Products and Events. Only information that is publicly available at the portal is accessible via the API, i.e. user information and other private information is not accessible.
As shown in Figure 90, when clicking on a certain entry type, e.g. the organisations, the organisations metadata are provided in a JSON encoding, which is the default serialization format for JavaScript and allows easy integration with other Web applications.
In a similar way, JSON resources are available for the other entry types like products, events or organisations.

In addition, the API provides filter features for selecting a single collection entity, e.g. an organisation:

https://wie.dev.52north.org/en/api/organisations?title=Antea%20Group

Clicking on the link above results in the single entity representing the Antea Group as outlined in Figure 91. The parameter title is used to search for all organisations with “Antea Group” in the title.

```json
{
   - organisations: [  
       - {  
            title: "Antea Group",
            Description: "Antea Group is an international engineering and environmental consulting firm specializing in full-service solutions in the fields of environment, infrastructure, urban planning and water.",
            Path: "/en/organisation/antea-group",
            Class: "Large Enterprise, Consulting",
            Website: "http://www.anteagroup.com/en"
        }
   ]
}
```

*Figure 91: JSON encoding of a single organisation selected with title attribute filter provided by the API.*
### Annex A

#### Product Specification Sheet

<table>
<thead>
<tr>
<th>Field name</th>
<th>Cardinality</th>
<th>pre-defined terms for drop down selection or Text</th>
<th>Field Description (Questions are visible for all; bullet points only for suppliers)</th>
<th>Dependency on base category (also limited categories)</th>
</tr>
</thead>
</table>
| Category*                   | 1           | Policy brief
Best practice guidance
Technology (hardware)
Software tools
Dataset
Methodology
Standard
Other | What type of product is this? | Software tools subcategory activated only if Software tools is chosen. |
| Product name                | 1           | FREE TEXT | What’s the title or name of the product? | |
| Product owner               | 1           | FREE TEXT | Who is the first or best one to contact? | |
| Logo                        | 1           | IMAGE (current size constraints: 80x80 < w x h < 125*125) | | |
| Product Description*        | 1           | FREE TEXT Limit to 300 words | What is the product about?
- Short description of the product and background information | |
| Photo                       | 1           | IMAGE (bigger in size than logo) | | |
| Application & Target Markets| 1           | FREE TEXT | What the product is used for, where and by whom? | |
| Competitive Advantages*     | 1           | FREE TEXT | The unique selling point of the product | |
| Stage of commercial development* | 1       | FREE TEXT | | |

- Commercially available
- Looking for first markets
- Looking for development partners
- Awaiting product validation/certification
- Other

<p>| 0..1 | FREE TEXT | The status quo of product development, (if appropriate, please use standard TRL definitions) | | |</p>
<table>
<thead>
<tr>
<th>License / copyright*</th>
<th>1</th>
<th>Public domain</th>
<th>- Please give details of accessibility criteria in the free text box.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Free and open source</td>
<td>Details of accessibility criteria</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Proprietary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>FREE TEXT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs*</td>
<td>1</td>
<td>For free</td>
<td>- Please give cost details in the free text box</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; EUR 5000</td>
<td>- For example, licence costs, costs for implementation and development of the product.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EUR 5000-10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EUR 10,000-25,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EUR 25,000 to 50,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;EUR 50,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On request</td>
<td></td>
</tr>
<tr>
<td>FREE TEXT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Software</td>
<td>0..1</td>
<td>Monitoring and measuring</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data processing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydrological modelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GIS and remote sensing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Participation, decision making, role playing games</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Socio-economic analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other software tools</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other hardware</td>
<td>Only visible, if “Technology (hardware)” is chosen in Category.</td>
</tr>
<tr>
<td>Type of Hardware</td>
<td>0..1</td>
<td>Instrumentation &amp; control</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biological or chemical treatment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water supply and wastewater</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Irrigation and drainage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other hardware</td>
<td></td>
</tr>
<tr>
<td>Case Studies*</td>
<td>1..n</td>
<td>REFERENCE</td>
<td>Case studies, best practice examples and lessons learned from the application of the product</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Please use the TITLE to give a brief description of what each link provides (Limit 128 characters).</td>
</tr>
</tbody>
</table>

License / copyright*: 1
Costs*: 1
Type of Software: 0..1
Type of Hardware: 0..1
Case Studies*: 1..n
<table>
<thead>
<tr>
<th>e-learning, tutorials and supporting material</th>
<th>0..n</th>
<th>LINKS</th>
<th>e-learning, tutorials and/or other supporting material available for the product</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Please use the TITLE to give a brief description of what each link provides (Limit 128 characters).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Links to websites of the product or to projects where the product has been implemented.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Download material such as worksheets by the supplier of the product.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Links to e-learning content within the marketplace</td>
</tr>
</tbody>
</table>

| WFD objectives* | 1..n | Setting objectives Selecting measures Socio-economic analysis Characterization of water bodies (including mapping) Pressures and impacts Public participation Data processing (spatial or geographical) Planning process Financial management Intercalibration Monitoring and reporting Modelling and prediction Reference conditions Infrastructure planning Other | For which tasks in water resources management can the product be used? |

| Issue* | 1..n | Ecological or chemical status Floods and droughts Climate change and energy Ecosystem services Urban areas Water conservation and recycling Other | The water management subject addressed by the product |

|  |  |  | FREE TEXT |
|  |  | FREE TEXT |

FREE TEXT
| Relevant water bodies* | 1..n | Rivers  
|                        |      | Lakes  
|                        |      | Artificial and heavily modified waterbodies  
|                        |      | Coastal and transitional waters  
|                        |      | Groundwater  
|                        |      | Wetlands  
|                        |      | Protected areas  
|                        |      | Rain and precipitation  
|                        |      | Other  
|                        |      | FREE TEXT  
| Target user group*    | 1..n | Research organisation  
|                        |      | Supplier  
|                        |      | Industry consultants  
|                        |      | Utility  
|                        |      | Asset owner  
|                        |      | Trade associations  
|                        |      | Government (and associated bodies) – policy  
|                        |      | Government (and associated bodies) – practitioners  
|                        |      | Regulator  
|                        |      | Campaigning organisation or charity  
|                        |      | Funding and investment  
|                        |      | Training provider  
|                        |      | Water user representative  
|                        |      | Networking organisation  
|                        |      | Other  
|                        |      | FREE TEXT  
| Type of input requirements* | 1 | FREE TEXT  
|                        |      | What requirements does the product have regarding knowledge, data and technology?  
|                        |      | Not applicable to policy brief or best practice guidance.  
| Type of output*        | 1 | FREE TEXT  
|                        |      | The outcomes of product implementation  
|                        |      | - For example, analysed and prepared data qualitative data of stakeholder dialogues, model visualisation, alerts etc.  
|                        |      | Not applicable to policy brief or best practice guidance. |
| Potential to combine this tool with other tools* | 1 | FREE TEXT | Compatibility with other products - For example, products in support of better integration e.g. an integrated model for linkage between surface waters and groundwater or climate models; software tools etc. | Not applicable to policy brief or best practice guidance. |
| Supported legacy systems* | 1 | FREE TEXT | Existing (data-) systems the product can be used with | Not applicable to policy brief or best practice guidance. |
| Supported standards | 0..n | TERMS from user extended vocabulary for each standard category | International and/or national standards the product is compatible with | Not applicable to policy brief, best practice guidance or standard. |
| Standard Category | 0..n | Data discovery (metadata/catalogues) Data encoding Data visualization Data Downloading Sensor data Processes and models Other | What is the standard category | Only applicable, if at least one supported standard is chosen. |
| Version | 0..1 | FREE TEXT | Version or publication date of the product |  |
| Project* | 1 | REFERENCE | The project in which the product was developed |  |
| Project & promotional material about the product | 0..n | LINKS | Any leaflets, factsheet etc. associated with the product. Please use the TITLE to give a brief description of what each link provides (Limit 128 characters). |  |
| Organisation / Institution* | 1 | REFERENCE | The name of the product's developer organisation |  |
| Contact details* | 1 | FREE TEXT | How can I get in contact with product and / or service provider, river basin managers and consultants related to the products? - E-mail, telephone, country etc. |  |
### WaterInnEU

**Acronym:** WaterInnEU  
**Project title:** Applying European market leadership to river basin networks and spreading of innovation on water ICT models, tools and data  
**Theme:** WATER-4a-2014. Water Innovation: Boosting its value

**Comments**  
**FREE TEXT**  
What are the experiences users have had with the application of the product?  
- Recommendations by product supplier and users.

*Mandatory fields*

List of potential product/services categories: for the ‘Organisation’ template (ie for the matchmaking between service offerings and service requests):

<table>
<thead>
<tr>
<th>Category</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological or chemical treatment</td>
<td></td>
</tr>
<tr>
<td>Socio-economic analysis</td>
<td>Finance and funding</td>
</tr>
<tr>
<td>Electrical &amp; mechanical services</td>
<td>Irrigation &amp; drainage</td>
</tr>
<tr>
<td>Instrumentation and control (hardware)</td>
<td>Modelling and decision support</td>
</tr>
<tr>
<td>Laboratory services</td>
<td>Pipes and pipelines</td>
</tr>
<tr>
<td>Monitoring, measuring &amp; data processing (software)</td>
<td>Pumps, tanks &amp; valves</td>
</tr>
<tr>
<td>Research</td>
<td>Training</td>
</tr>
<tr>
<td>Waste water treatment</td>
<td>Waste and sludge disposal</td>
</tr>
<tr>
<td>Water conservation and recycling</td>
<td>Water supply and treatment</td>
</tr>
<tr>
<td>Ecosystem services</td>
<td>GIS and remote sensing</td>
</tr>
</tbody>
</table>
Annex B

In this annex, the important core, contributed, and developed Drupal modules that drive the WIEU Marketplace, are described.

- **52North Theme for WIEU:**
  The implementation of an own theme is improved by using the Drupal theme inheritance concept. An existing base theme is installed, and only the adjustments need to be implemented. These adjustments include styling of some elements and change of the colours. In addition, the landing page and advanced search are implemented as template suggestions. Template suggestions are template files that provide different templating instructions for specific parts of the page.

- **Chaos Tools:**
  This module provides Application Programming Interfaces (APIs) and tools for better developing with Drupal. One example is the definition of contexts. A context can be triggered by a logged-in user visiting a specified page and result in additional information being displayed, or just CSS adjustments. More information about the sub-modules and features of the Chaos Tools module can be found on its homepage.

- **Views:**
  The views module provides the user/developer of Drupal with means for displaying the content in lists, galleries or other displays. The prototypes uses views for the content inventory displays of several entries and providing the advanced search feature. In addition, the Views JSON module is used for the JSON API (see Section 5 for more details).

- **Revisioning incl. Diff:**
  The revisioning module provides the functionality for handling revisions of each content entry. This is required for fulfilling the collaborative content management approach in a manageable manner.

- **Harmony:**
  The harmony module package provides means for a forum. In addition to the Drupal default forum feature, it provides better handling and structuring of forum threads and posts.

- **reCAPTCHA:**
  The reCAPTCHA module provides means for spam protection.

- **Search API incl. Solr Search:**
  The Search API module in combination with the Solr Search module provides the means for the keyword and advanced search. By using Apache Solr the search feature is able to handle growing amounts of data in a scalable and manageable way. The module provides means for index and search server management (creation, definition, handling). Various plugins for different solutions are available: Apache Solr, elasticsearch, and database driven for example.

- **Panels:**
  The panels module is used for the landing page layout and advanced search page. It provides means for creating various layouts and overriding system layouts.

- **Strongarm**
  The Strongarm provides means to override the Drupal default settings, e.g. the landing page of the prototype.

- **Legal**
  The Legal module provides means for managing Terms & Conditions (T&C) in a documented way. It allows enforcing users to accept T&C before registration and log-in. In addition, versioning of T&C is possible including the documentation of the acceptance by

---

11 [https://www.Drupal.org/project/ctools](https://www.Drupal.org/project/ctools)

12 More information about the View module can be found at: [https://www.Drupal.org/project/views](https://www.Drupal.org/project/views)

13 More information about the Revisioning module can be found at: [https://www.Drupal.org/project/revisioning](https://www.Drupal.org/project/revisioning)
the user. This includes that users having accepted the old version are forced to accept the
new T&C version.

- **EU Cookie Compliance**
  This module provides means dealing with the EU Directive on Privacy and Electronic
  Communications.

- **TGMGT**
  This module provides means for managing translations incl. translation job managements
  with human and/or machine performed translations.

- **Print**

- **Subscriptions**

- **Features**
  The Features module allows collecting configurations of different parts of a Drupal
  installation and migrate these to another instance. The configuration is moved to code and
  allows the monitoring of changes as the code version is compared to the live in database
  version.

- **52N – Central Subscribe**
  This module provides the subscribe form on the matchmaking page (see section 4.9
  Alerts).

- **52N – Default Nodes**
  Provides the content for some default nodes:
  
  - API::JSON - landing point of the JSON API (see Section 5)
  - Cookies - page about the used cookies
  - Imprint - the imprint of the marketplace
  - Javascript Required - page about the need for activated Javascript and which
    domains to allow
  - Join Us - motivational page for new users promoting the benefits of becoming a
    member of the WaterInnEU community
  - Landing Page: About section - background information about the marketplace and project on the landing page
  - Landing Page: Action buttons section - the four big action buttons on the landing page (see 4.1 Entering the )
  - Landing Page: Intro text - introductive text on the landing page about the marketplace
  - Landing Page: Upcoming Events section - section about upcoming events on the landing page
  - Matchmaking - the matchmaking page with the services accordion (see Section 4.2.4 Matchmaking & Support Page)
  - Related Portals - a list of portals in the river basin management sector
  - Sitemap - a textual description of the page containing links to each section
  - Thank You for registering - a page shown after registering which outlines the next
    steps after registering until the user become part of the WaterInnEU community

- **52N – Dynamic Content**
  This module provides means for dynamic context display on the page like content changes.

- **52N – Feature – Alerting**
  This feature module provides all configuration options required by the alerting/subscription
  functionality of the marketplace.
  (see Section 4.9 Alerts)

- **52N – Feature – API::JSON**
  This feature module provides all configuration options required by the API functionality of
  the marketplace including the JSON views for the resource endpoints.
  (see Section 5)

- **52N – Feature – Configuration**
  This feature module provides all basic configuration options the marketplace.

- **52N – Feature – Events**
  This feature module provides all configuration options required by the events functionality of
the marketplace including the content type definition and views.

(see Section 4.8)

- **52N – Feature – Forum**
  This feature module provides all configuration options required by the forum functionality of the marketplace.
  (see Section 4.7 Using the Forum)

- **52N – Feature – Frontpage**
  This feature module provides all configuration options required by the front page functionality of the marketplace including the views and panel configuration.

- **52N – Feature – Helpdesk**
  This feature module provides all configuration options required by the helpdesk functionality of the marketplace.
  (see Section 4.10 Contacting Experts)

- **52N – Feature – i18n**
  This feature module provides all configuration options required by i18n including translations provided by the core and contributed modules.

- **52N – Feature – Menus**
  This feature module provides all configuration options required for the menus of the marketplace.

- **52N – Feature – Notifications**
  This feature module provides all configuration options required by the moderation functionality of the marketplace.
  (see Section 2.2 User Roles)

- **52N – Feature – Organisations**
  This feature module provides all configuration options required by the organisations functionality of the marketplace including the content type definition and views.
  (see Section 4.2.3 Browsing Organisations)

- **52N – Feature – Products**
  This feature module provides all configuration options required by the products functionality of the marketplace including the content type definition and views.
  (see Section 4.2.2 Browsing Products)

- **52N – Feature – Projects**
  This feature module provides all configuration options required by the projects functionality of the marketplace including the content type definition and views.

- **52N – Feature – Roles and Permissions**
  This feature module provides all configuration options regarding roles and permissions within the marketplace.
  (see Section 2.2 User Roles)

- **52N – Feature – Search**
  This feature module provides all configuration options required by the search functionality of the marketplace including the content type definition and views.
  (see Section 4.3 Searching the )

- **52N – Feature – Service Requests and Offerings**
  This feature module provides all configuration options required by the service requests and offerings functionality of the marketplace including the content type definition and views.
  (see Section 4.6 Service Requests and Service Offerings)

- **52N – Feature – Success Story**
  This feature module provides all configuration options required by the success story functionality of the marketplace including the content type definition and views.
  (see Section 4.2.5 Success Stories)

- **52N – Product of the Month**
  This feature module provides all configuration options required by the product of the month functionality of the marketplace.
  (see Section 4.2.1 Products & Services panel)
• 52N – Revisioning
  Adds an info message when saving a node about the revisioning workflow implemented in the marketplace.

• 52N – Shared PHP Functions
  This module provides PHP functions that are use by several other modules.

• 52N – Standard Label Formatter
  This module provides a field formatter required for D5.5 “Standardization label proposal” which was disabled after an internal discussion.

• 52N – Term Formatter Using Icons
  This module provides a field formatter for term field to display icons with pop-ups and not the term text.
  (see Figure 7)

The Figure 92 outlines the modules developed and created for the Marketplace and there dependencies between each other.
Figure 92: Dependency of the Drupal modules developed and created within the project.