Project Report

ID5.22: Final Evaluation of the Integrated LearnWeb and KRService

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Abstract (for dissemination): This document describes the evaluation of the final version of LearnWeb2.0, called: LearnWeb v.1.0 and KRService v.1.0. After a brief introduction, the evaluation methodology is described; a summary of the function follows, with the final outcome of the evaluation process.  
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# Version History

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## Summary of Changes

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4 Introduction (Giunti)

This document describes the evaluation of the final version of LearnWeb2.0, here on called for convenience:

- LearnWeb v.1.0
- KRService v.1.0

This document refers to the following:

- ID5.21.1 (LearnWeb2.0 v.0.4) delivered on 6-Oct-2009 [http://hdl.handle.net/1820/2044](http://hdl.handle.net/1820/2044)
- ID5.21.2 (LearnWeb2.0 v.1.0) submitted to DSpace on 12-Nov-2009.

5 Evaluation methodology (UPF)

In order to provide a complete analysis of all the LearnWeb2.0 v1.0 ([http://phpcake.it.fmi.uni-sofia.bg/](http://phpcake.it.fmi.uni-sofia.bg/)) functions we have developed a Unit and Integration tests. The Unit test searches for defects and verifies the functioning of integrated software components that are stable when operating in isolation. The test was performed by a software expert with no previous involvement in the development of this tool. The Integration test consists in verifying if the units are correctly integrated and related among them: interfaces between units, complete processing chain and relation controls within the system including several modules and /or in combination with database. We also performed a test of the function requirements established in deliverable ID5.15 and ID5.16.

This document provides a list of the errors detected which make up the main evaluation outcomes. A set of suggestions for some of the problems detected are also proposed for those evaluation outcomes that require an improvement in the tool. The details of each of the aspects evaluated are not given but have been already documented via Bugzilla to inform the main developers and speed up the implementation process. A detailed description of each of the evaluated aspects is given in D 4.1 Evaluation Plan (p. 118 and 119).

Also included in the document is a summary of a loadability test performed by a collaborator from the Sofia University. The information and evaluation outcomes of this analysis are given in section 7.

6 Functions evaluated (UPF+GIUNTI)
6.1 Entering LearnWeb from Liferay

LearnWeb 2.0 can be integrated as an iFrame in LifeRay. Once added as an iframe, if the user has the same credentials for accessing LearnWeb as s/he does for accessing the LifeRay environment, then the user is automatically logged into LearnWeb without any need for the user to provide his/her credentials again.

Recommendation
- Add an indication in the LearnWeb user manual of how to include it as an iframe in LifeRay.

6.2 User management

6.2.1 Registration

Any user can register the application correctly using the registration application.

Recommendation
- Make a revision of the of the registration process if LearnWeb is already integrated when the user accesses the LifeRay environment.
- Let the system create a welcome message after creating a new user account
- Send out a welcome and confirmation e-mail
- Reduce the time between the creation of an account and the actual possibility to use it. Or mention in a message/e-mail that it can take some time to activate the account.

6.2.2 Authentication

- Any user already registered to the application can access the system using their credentials.

Recommendation
- none.

6.2.3 Authorization

The user can authorize LearnWeb to access some of the accounts he/she already has in some Web 2.0 tools such as Flicker or YouTube. There is a special function that facilitates this authorisation process. It has been tested to authorize all the tools but in some of them it gives some errors when accessing the link to the tool.

Recommendation
- Check the authorization links for all the tools.
6.2.4 Function as not logged user
When a user is not logged into the system there are some functions that he/she can still perform without difficulty. These are:
- conduct a search
- use filters
- Help function is empty
- Advanced search works
- Installing the toolbar is possible

Recommendation
- The help function should be completed or deleted for this function.

6.3 Home page
6.3.1 Home page left panel
When the user enters for the first time a welcome message appears in the left panel of the tool.

Recommendation
- The welcome message should be extended to explain how LearnWeb can be useful.
- Add a link to a user manual in the welcome message.

6.3.2 Home page central panel
The central panel of LearnWeb shows the latest uploads.

Recommendation
- Give this panel a title; it will help the user to understand what can be found here.

6.3.3 Home page right panel
When the user accesses the home page he/she sees a tag cloud. Clicking on it forwards the user to the search section with the results for the chosen tag.

Recommendation
Give this panel a title; it will help the user to understand what can be found here.

6.3.4 Home page upper bar

In the home page, there is an upper bar that can be used for searching for resources. The user can type any word and the system will search for the list of resources associated with this word.

**Recommendation**

- Improve the design, suggestions are:
  - Use the same button design for ‘search’ and ‘advanced search’
  - Delete the ‘?’ symbol and place the mouse-over on the drop-down option
  - Make a decent button for the Firefox plug-in
  - Translate this button, and check the English language
- A help menu with manuals and user guides is missing

6.4 Search

6.4.1 Search by single keyword

The search by single keyword function works properly.

**Recommendation**

- In some cases, the system is a little bit slow. Check section 7 for loadability outcomes.

6.4.2 Search by multiple keywords

The search by multiple keywords function

**Recommendation**

- In some cases, the system is a little bit slow. Check section 7 for loadability outcomes.

6.4.3 Search by category

The user is able to search for a resource through a concrete category provided by the administrator of the system. This function works properly in most cases but fails in some cases differentiating resources in categories when a resource has been associated to more than one category. Please, check the search for “computer” and “science” categories...
Recommendation

- Include as default categories in the system at least all the categories of resource types that can be created with the TENCompetence tools and TENCompetence LifeRay portlets (e.g. Units of Learning, Competences, Competence Profile…)

6.4.4 Advanced search - multimedia

The advanced search-multimedia function allows the user to search by resource types such as videos, images… It works properly in each case.

Recommendation

- None.

6.4.5 Advanced search - date

It is possible to search a resource by the date it was created using a calendar and introducing the date by hand. The calendar date works properly but the introduction of the date by hand appears to be problematic.

Recommendation

- Check the possibility to search by introducing the date by hand.

6.4.6 Advanced search - settings

There is an option to search for resources by using some metadata stored about these resources. If the user searches by tags or by text the results listed are different. The user can also rank according to most recent but, since the date function does not work properly when the date is introduced by hand, the system does not search for these resources.

Recommendation

- The system should distinguish in the list between the most voted for resources, or the most commented on resources. This will help the user in his search.

6.4.7 Mixing advanced search with keywords and category

The user can make advanced searches with keywords and categories. This work in all cases, however, since the introduction of the date by hand does not work, in some cases, the success of this function cannot be assured.

Recommendation
- Review the search functions including dates introduced by hand.

### 6.5 Resource list

#### 6.5.1 Correctness of search results list

All the search options of the system have been checked. All cases work properly except for the mixing advanced search with keywords and category.

**Recommendation**

- Include UoLs as one of the categories that can be found in the Advanced search function.
- The search is sometimes very slow. Check the loadability tests’ results.
- Check also previous issues about category and advanced search.

#### 6.5.2 Ordering search results

A user can put the search results in order by clicking on the small arrows. Each arrow serves to locate the resource in a place on the list.

**Recommendation**

- Add a help message indicating what each arrow is for.
- Maybe a drop down box could work better here.

#### 6.5.3 Displaying sources

LearnWeb displays all types of resource included in the Web 2.0 tools which are integrated in LearnWeb the resources created with Liferay portlets and also resources stored in the Fedora external repository. In all cases, the display is performed clearly for the user.

**Recommendation**

- None.

#### 6.5.4 Clicking on a resource already added to Fedora

Works and links properly with the appropriate tool, e.g. in a case of a UoL.

**Recommendation**

- More tests should be done when the number of resources in the system have been increased
6.5.5 Clicking on a resource not yet added to Fedora

When a user clicks on a resource that has not been uploaded to Fedora, the user can visualize it correctly and also access its information.

**Recommendation**
- None.

6.5.6 Clicking on (+) symbol

Users can access the original source where a resource has been uploaded from by clicking on the + button. It works correctly in all cases.

**Recommendation**
- Make the symbol bigger and include an explanation for the user when passing the mouse over it.

6.6 Toolbars

6.6.1 Installation

A user can install a toolbar to search and store resources in LearnWeb directly from a browser. However, when using Mozilla 2.0, it fails in some cases.

**Recommendation**
- Check by installing the toolbar in different browsers and add a message in the toolbar installation package indicating recommended browsers.

6.6.2 Toolbar - resources

Users can search for resources directly from the toolbar. However some inconsistencies have been found regarding the pages shown to the user when using the search with the toolbar and when doing the same search within LearnWeb.

**Recommendation**
- Solve inconsistencies between the toolbar resources list and the Learnweb resource lists.
6.6.3 Toolbar - upload
A user can directly upload any type of resource by using the Toolbar: creating groups, pictures, audios... It works properly in all cases but gives shows error messages if the user tries to upload a resource such as a picture without being registered to Flicker. The user should be informed about this in some way.

Recommendation
- Open GroupMe! In a different tab/window. This will help prevent the user from losing the context

6.6.4 Toolbar - spreadCrumbs
Everything works properly in this function, however, there are still some inconsistencies between the toolbar and the LearnWeb application.

Recommendation
- Solve inconsistencies between LearnWeb and Toolbar.

6.6.5 Toolbar – add this!
The user can add any resource to LearnWeb from any pages using the toolbar. It has been tested for all types of resources and it works properly.

Recommendation
- Add a help button to let users know that this is one of the possibility provided by the toolbar.

6.7 Adding a resource
6.7.1 Adding a resource - metadata
A user can add metadata to any of the resources when uploading it to Fedora. The different resources have been added successfully. Some problems were experienced with the web option.
- Different resources were added.
- UoL: No problems and the last additions are shown in the home page.
- Web page: Problems found when adding a web page. The page was blocked.
- All help works properly.

Recommendation
- Solve the problems when uploading a web page.
6.7.2 Adding a resource - category
A user can add a resource to the system by locating it into a category. However, this function does not seem to work properly because the system stacks when selecting the category and it works too slowly.

Recommendation
- See loadability tests in section 7.

6.7.3 Adding a resource - groups
A user can create a group to share resources with. However, some errors have been encountered when creating a group. A final button Create group button is missing.

Recommendation
- Add a Create group button once filled the form.

6.7.4 Adding a resource – tag and comment
A user can add a tag to any resource and also comment on them. In each case, these two functions work properly.

Recommendation
- None.

6.8 MyHomePage
6.8.1 My Groups
Groups in Learn Web are managed using the Web 2.0 tool GroupMe! When a group is created with this tool, it is added as a group in LearnWeb. This function works properly but some usability problems are experienced when the user accesses My groups and he/she has not created any group in GroupMe! A message should be provided in this case.

Recommendation
- Distinguish between the two types of My groups including help messages or changing names.

6.8.2 Upload Multimedia
A user can upload any type of Multimedia resource using the integrated Web 2.0 tools. No problems have been reported. However, the audio files are too slow to upload.
Recommendation
- Change error messages by something less aggressive for the user.

6.8.3 Upload other resources
The system allows users to upload any type of resource. All types of resources including UoLs have been tested and work properly.

Recommendation
- It sometimes works too slowly. Check loadability tests in section 7.

6.8.4 My Web2.0 resources
“My Web2.0 resources” is a function for managing all the web 2.0 resources stored in LearnWeb and related to the integrated Web 2.0 services. However, the name is a little bit confusing. When clicking on this option the user expects a list of resources but it links to Search. It is a minor change that should be reviewed. The name should be redefined.

Recommendation
- Reconsider the name of the function with something clearer relating to the function that it performs: Search Web 2.0 resources or My working space 2.0.

6.8.5 My friends
LearnWeb allows users to import all their friends of the Web 2.0 services included such as Facebook. It works properly.

Recommendation
- More tests should be done with more users.

6.8.6 My bookmarks
A user can create bookmarks using del.ici.ous web 2.0 service. When a bookmark is created it is included as a bookmark in Learnweb.

Recommendation
- Include an explanation for the user explaining that this function is connected with the appropriate web 2.0 tools.
6.8.7 My LearnWeb resources
My LearnWeb function allows the user to list all the resources uploaded to the system, including those related to a web 2.0 tool.

Recommendation
- The upper bar shown when listing the resource is not active when listing the resources for a search. Make the bar active.

6.8.8 My tags
Any user can manage his/her own tags deleting and creating new ones. All functions related to tags work properly.

Recommendation
- When deleting a tag it is shown with a line over it. Maybe it would be nice to consider the idea of including another function to delete the tag forever.

6.8.9 My comments
A user can add comments to any resource and access to his/her list of comments using this function. The function is always consistent.

Recommendation
- None.

6.8.10 My rates
A user can visualize a list of rates given to his/her rated resources. It works properly.

Recommendation
- Copy the way of listing the resources in My tags in this section (clickable resources and dates shown)

6.8.11 My groups
All the groups created with the web 2.0 service GroupMe! Are listed using this function. It has been successfully tested.

Recommendation
- Include a message for the user indicating that the groups are linked to the GroupMe! Web 2.0 tool.
6.8.12 Authorizing Web2.0 services

If a user wants to use his/her web 2.0 service accounts that are included in LearnWeb, he/she must authorize LearnWeb to access these tools. This function has been successfully tested with: Flickr, YouTube, Facebook and Ipernity.

*Recommendation*

- Add a help message indicating the process for authorization.

6.8.13 Single sign on among Web2.0 services

Once the user has authorized access to all his/her integrated to web 2.0 services, he/she can directly access those tools without introducing the credentials again.

*Recommendation*

- None.

6.8.14 Authorizing other Fedoras

A user can authorize any other member to access Fedoras repository by using his/her URL access. It has been successfully tested.

*Recommendation*

- Introduce help messages for guiding the user in the process.

6.9 Excellence class

6.9.1 Computation

Some of the functions in the tool take too long to load. In section 7 we describe the main results obtained by performing loadability tests that show the most problematic pages.

*Recommendation*

- Review those pages that take more between 2 and 8 seconds to load in the loadability tests outcomes.
6.9.2 Visualization
If a user is not registered to the system, he/she can access and visualize the comments made by registered users but cannot add his/her own comments.

Recommendation
- Add a message for the user if he/she tries to publish a comment explaining that he/she must register.

6.9.3 Unfair user
When a user tries to access to one of the users declared as unfair by the administrator, the resources and comments upload by this user are hidden.

Recommendation
- None.

6.10 Admin section
6.10.1 New category
An administrator can create any category that will be visualized later by the users. Different categories have been created successfully.

Recommendation
- The Link to the Administrator section is too near to the Help link. Separate it to make it more readable.

6.10.2 Edit category
When editing a category as an administrator the system staks.

Recommendation
- Review the link of the edit function.

6.10.3 Delete category
When deleting a category as an administrator the system staks.

Recommendation
- Review the link of the delete function.
6.10.4 **Reassign category**
When deleting a category as an administrator the system staks.

*Recommendation*
- Review the link of the reassign function.

6.10.5 **Manage user’s classes**
The administrator can manage user’s classes making them fair or unfair in case of necessity.

*Recommendation*
- Add information about user category to facilitate the identification of those users that are marked as fair and those which are marked as unfair.

6.11 **Localization**

6.11.1 **English**
Some English language errors have been detected during the evaluation tasks. In the English case, they have been reported for each of the functions tested.

*Recommendation*
- Carefully follow the English bugs detected in previous sections.

6.11.2 **Spanish**
Some spelling errors have been detected in the Spanish version of the tool:
- Home Page (Página Principal)
- Help by Ayuda.
- Search by Buscar.
- My Home Page (Mi Página Principal)
- Help in upper menu should be Ayuda.
  - Search by Buscar
    - *Servicio Web 2.0 disponibles (DesAutorizar/Autorizar directamente en interweb) by Servicios Web 2.0 disponibles (Desautorizar/Autorizar directamente interweb)
    - *Available Fedora’s by Autoriza en Fedora
  - In Upload Resources (Subir Recursos)
    - *Web resource by Recurso Web*
6.12 Integration with TENCompetence Objects

6.12.1 Unit of Learning
One of the functions provided by LearnWeb is the search and management of UoLs. The following options have been successfully tested for this type of resource:
- Search: Works in the Web Version
- View: Works
- Add: Works
- Play: Works, it connects directly to the LinkTool
- The Thumbnail is correct.

Recommendation
- None.

6.12.2 Competence profiles
A user can also upload Competence profiles created with Liferay Tencompetence portlets to LearnWeb and treat them as any type of resource. All possible functions have been successfully tested for this type of resource.

Recommendation
- Test again when more Competence profiles are available.
6.12.3 Competencies
A user can also upload competences created with Liferay Tencompetence portlets to LearnWeb and treat them as any type of resource. All possible functions have been successfully tested for this type of resource.

**Recommendation**
- Test again when more competences become available.

6.12.4 Learning Activities
A learning activity can be stored as any type of resource in LearnWeb, as a UoL, an audio, a file… All functions have been successfully tested for this type of activities.

**Recommendation**
- None.

6.13 Resource view

6.13.1 Thumbnail
All resources in LearnWeb have an associated Thumbnail that improves the usability of the system. Each Thumbnail associated with each of the resources available has been successfully tested: photo, video, audio, text, html-page, slide, UoL, Learning activity, Competence and bookmark.

**Recommendation**
- A specific Thumbnail for the audio file is missing.

6.13.2 Links (url, embed)
Links and URLs are also treated as a resource in LearnWeb and are embedded in the system when accessing them. In all cases, the functions related to the url or links work properly.

**Recommendation**
- None.

6.13.3 Comments (view/insert)
All the functions related to the comments (view/insert) have been successfully tested.
6.13.4 Bookmark this
All the functions related to the bookmarks (bookmark a resource) have been successfully tested.

Recommendation
   - None.

6.13.5 Download/view
A user can download or view any of the resources in LearnWeb. All functions related to this work properly.

Recommendation
   - None.

6.13.6 Upload modified version
A user can download, change and upload a modified version of a resource already uploaded to LearnWeb. All works correctly.

Recommendation
   - None.

6.13.7 Rate
A user can rate any of the resources in LearnWeb. All functions related to this work properly.

Recommendation
   - None.

6.13.8 Tags (view/insert)
A user can manipulate tags (view/insert) for any of the resources in LearnWeb. All functions related to this work properly.
Recommendation
- None.

6.13.9 Share
A user can choose to share a resource with someone. In this case the user sharing the resource receives an e-mail with a link to the resource. This function has been checked but the link provided to the user receiving the resource does not work properly.

Recommendation
- Review the link provided to the user to which another user shares a resource.

6.13.10 Report abuse
A user can report abuse for any of the resources he/she accesses. All the functions related to reporting abuse work properly.

Recommendation
- Add a help message in the abuse reports explaining its main function and how the abuse will be treated by the system once created.

7 Loadability tests
This section presents the summary of the main results of the loadability tests. The aim of this evaluation is to determine if the system is able to fully support concurrent access of different users. The points presented here have been extracted from a document provided by Cornelia from the Sofia University and involved in TF15 included here as an appendix.

The load tests were carried out using the JMeter (http://jakarta.apache.org/jmeter/) and the LearnWeb tool installed at the following address: http://learnweb.it.fmi.uni-sofia.bg/. A ramp test was used with up to 300 simultaneous users for a duration of 10 minutes and 10 seconds between clicks. A test is set to continue when a sample error occurs. The tool measures the number of samples, the standard deviation, the throughput, the percentage of detected error, etc. The graph, aggregation and the summary results recorded by JMeter listeners were also analyzed: Graph results, Spine Visualizer, Aggregate Results, Summary results, View results in a Table and View Tree Results (see the detailed information of the problems found in the Annex).

From the JMeter analysis four main conclusions can be drawn:
Solve the links with 100% error:
- /testingchecklistmobileapplication-091023085741-phpapp02-thumbnaill-2
- /11/38/72/5013872.baa2e315.75x.jpg
- /18/00/87/180087917/180087917_200.jpg
- /1/97/41/889741.0dbfc4a5.75x.jpg
- /safebrowsing/downloads?client=navclient-auto-ffox&appver=3.0.10&pver=2.2&wrkey=AKEgNitIWE4k_UaHqURXoO12ksHtpMkbPJulp_j0Odihtlz7XRtix5fq7JFbMwd7xemn3S6zGnPTUOTSUIUqx3kLYZbEZRRw==
- /safebrowsing/rd/goog-malware-shavar_s_15761-15800.15761-15800.

Solve the links that generated request with response code 404 with 100% error:
- /css/learnweb.css
- /css/jtip.css
- /popup/popup.js
- /css/popup.css
- /css/learnweb.css
- /js/sign.js
- /js/jscrypt/utf-8.js
- /js/jscrypt/md5.js
- /js/jscrypt/aes.js
- /js/jscrypt/aesprng.js
- /js/jscrypt/entropy.js
- /js/jscrypt/armour.js
- /js/crypter.js
- /users/logouthidden
- /search
- /users/logint?loginform=1
- /search/index
- /lang/bul

The following links have an average time of more than 2 s and code should be improved:

<table>
<thead>
<tr>
<th>URL</th>
<th>Average time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/t1215300-2008-user-interface-design-3-ui-de-1226443216831536-8-thumbnai-2</td>
<td>2315</td>
</tr>
<tr>
<td>/userinterface-090628225338-phpapp02-thumbnaill-2</td>
<td>2210</td>
</tr>
<tr>
<td>/modeldriven-engineering-of-user-interfaces-2923-thumbnaill-2</td>
<td>2158</td>
</tr>
<tr>
<td>/techniquesforreviewinga-userinterfacewua2008slides-1212051111500617-9-thumbnaill-2</td>
<td>2148</td>
</tr>
<tr>
<td></td>
<td>URL</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>5.</td>
<td>balsamiq-091009233605-phpapp02-thumbnail-2</td>
</tr>
<tr>
<td>6.</td>
<td>/michotteicas2008-1207222327973158-8-thumbnail-2</td>
</tr>
<tr>
<td>7.</td>
<td>/a-mdacompliant-environment-for-developing-user-interfaces-of-information-systems-1194736647982127-1-thumbnail-2</td>
</tr>
</tbody>
</table>

Table 1 Links with an average time of more than 2 seconds that should be improved.

The following links have an average time of more than 8 s and code should be improved:

<table>
<thead>
<tr>
<th></th>
<th>URL</th>
<th>Average time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>/favicon.ico</td>
<td>17022</td>
</tr>
<tr>
<td>2.</td>
<td>/12/96/66/5979666.dd0e3aad.gif</td>
<td>26089</td>
</tr>
<tr>
<td>3.</td>
<td>/vi/iEgIeSOHUU/2.jpg</td>
<td>18691</td>
</tr>
<tr>
<td>4.</td>
<td>/3055/3102810320_1404fed124_m.jpg</td>
<td>11562</td>
</tr>
<tr>
<td>5.</td>
<td>/3161/3101971103_fe44e7d974_m.jpg</td>
<td>11509</td>
</tr>
<tr>
<td>6.</td>
<td>/3095/2890425768_7eee6d2c9a.jpg</td>
<td>42116</td>
</tr>
<tr>
<td>7.</td>
<td>/photos/14329403@N03/2890425768</td>
<td>42097</td>
</tr>
<tr>
<td>8.</td>
<td>/g/css/c_bo_selecta.css.v80386.14</td>
<td>42080</td>
</tr>
<tr>
<td>9.</td>
<td>/g/css/c_photos_people.css.v80521.14</td>
<td>42065</td>
</tr>
<tr>
<td>10.</td>
<td>/g/css/c_fold_main.css.v80608.64777.80377.14</td>
<td>42076</td>
</tr>
<tr>
<td>11.</td>
<td>/g/javascript/global.js.v79707.14</td>
<td>42115</td>
</tr>
<tr>
<td>12.</td>
<td>/g/javascript/s_output_en_us.js.f0a743b60fb928f98d52426e490f1e95</td>
<td>42063</td>
</tr>
</tbody>
</table>

Table 2 Links with an average time of more than 8 seconds that should be improved.
8 Summary of quality of release v.1.0 (UPF)

Having analyzed the main functions provided by the LearnWeb2.0 v1.0 we can conclude that most of the requirements explained in ID5.15 and ID5.20 have been successfully implemented and that most of the critical problems detected in ID5.17 have been solved. New functions added from previous versions and the new the Toolbar LearnWeb application have been tested.

Four different testers from the TF15 have been involved in the evaluation of the available functions. For each of the functions a deep analysis following the methodology described in section 2 was performed. All the problems detected during the evaluation have been reported in detail following a structure proposed by the developers. Finally, a loadability test was also performed.

The results show that LearnWeb v1.0 accomplishes the requirements described in DIP4 of the project. Different evaluations have been performed before this round of evaluations and the tool has evolved well with added functions and solved problems that make it more competitive and user friendly. The system is stable and covers the main needs required by the project. Nevertheless, minor changes should be made before solving those problems detected during the evaluation. In the following, we summarize and comment on the most critical aspects that should be treated:

Function recommendations

1. Solve the functionality problems detected in the analyzed functions, especially in relation to the Authorization functions.
2. Solve the links that do not link to the intended web page.
3. Solve the relation between the Toolbar application and the Web version of the tool. Upload the user accounts of both applications when managing a new resource.

Usability recommendations

4. Solve the coherence problems relating to the icons, typographies and menu locations on all pages.
5. Solve the coherence problems relating to the design of the pages of the Toolbar application and the Web application.
6. Add a help facility in the form of pop-up windows for the different functions to help guid the users.

Loadability tests

7. Solve the error reports in the Loadability section
8. Improve the time response of all functions.
9 Conclusions (UPF+Giunti)

This document provides information on the main outcomes of testing conducted on LearnWeb v.1.0. The results are derived from a complete Function test (sec. 6), and a loadability test (sec. 7). We have also included a summary of the more relevant results of the test and a set of recommendations for the final version.

The evaluation outcomes show that there are still some improvements that could be considered for future versions of the tool after the project termination. These improvements do not affect the scientific/technological value of the product, but deals with some engineering/production aspects.

The main recommendation arising from the results is to concentrate on the current functions and to make all of them work properly and create help messages and manuals to help users in the usage of the tool.

10 References (UPF)


Annex (TF-15)

<table>
<thead>
<tr>
<th>Loadability Tests</th>
<th>Main outcomes and suggestions regarding the loadability tests. A detailed description.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requests with average response time more than 2 s</td>
<td>Description</td>
</tr>
<tr>
<td></td>
<td>Following links have average time more than 2 s:</td>
</tr>
<tr>
<td></td>
<td>URL</td>
</tr>
<tr>
<td>/t1215300-2008-user-interface-design-3-uiide-1226443216831536-8-thumbnail-2</td>
<td>2315</td>
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<tr>
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</tr>
<tr>
<td>/modeldriven-engineering-of-user-interfaces-2923-thumbnail-2</td>
<td>2158</td>
</tr>
<tr>
<td>/techniquesforreviewinga-userinterfacewua2008slides-121205111500617-9-thumbnail-2</td>
<td>2148</td>
</tr>
</tbody>
</table>
Details:

Summary Report

Suggestion: Code could be improved.

<table>
<thead>
<tr>
<th>Requests with average response</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Following links have average time more than 8 s:</td>
<td></td>
</tr>
</tbody>
</table>
## Details:

### Average Response Time data in Summary Report

**Suggestion:** Code should be improved.

### Requests with 100 % error

**Description**

Following links generated requests with 100 % error:

```
//testingchecklistmobileapplication-091023085741-phpapp02-thumbnai1-2
```
Details:
Basic information

Request data
java.net.SocketException: Connection reset
  at sun.reflect.GeneratedConstructorAccessor36.newInstance(Unknown Source)
  at sun.reflect.DelegatingConstructorAccessorImpl.newInstance(Unknown Source)
  at java.lang.reflect.Constructor.newInstance(Unknown Source)
  at java.security.AccessController.doPrivileged(Native Method)
  at sun.net.www.protocol.http.HttpURLConnection.getChainedException(Unknown Source)
  at java.net.HttpURLConnection.getResponseCode(Unknown Source)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>at org.apache.jmeter.threads.JMeterThread.run(JMeterThread.java:290)</td>
<td>at java.lang.Thread.run(Unknown Source)</td>
</tr>
<tr>
<td>Caused by: java.net.SocketException: Connection reset</td>
<td>at java.net.SocketInputStream.read(Unknown Source)</td>
<td>at java.io.BufferedInputStream.fill(Unknown Source)</td>
</tr>
<tr>
<td></td>
<td>at java.io.BufferedInputStream.read1(Unknown Source)</td>
<td>at java.io.BufferedInputStream.read(Unknown Source)</td>
</tr>
<tr>
<td></td>
<td>at sun.net.www.protocol.http.HttpURLConnection.getHeaderFieldInt(Unknown Source)</td>
<td>at java.net.URLConnection.getHeaderFieldInt(Unknown Source)</td>
</tr>
<tr>
<td></td>
<td>at java.net.URLConnection.getContentLength(Unknown Source)</td>
<td>at java.net.URLConnection.getHeaderField(String, Unknown Source)</td>
</tr>
</tbody>
</table>
|         | at org.apache.jmeter.protocol.http.sampler.HTTPSampler.readResponse (HTTPSampler.java:203) | ...

Suggestion: Requests with error should be fixed.
### Requests with 100 % error

<table>
<thead>
<tr>
<th>Response Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>404</td>
<td>Following link generated requests with response code 404 with 100 % error:</td>
</tr>
<tr>
<td></td>
<td>/css/jtip.css</td>
</tr>
<tr>
<td></td>
<td>/popup/popup.js</td>
</tr>
<tr>
<td></td>
<td>/css/popup.css</td>
</tr>
<tr>
<td></td>
<td>/css/learnweb.css</td>
</tr>
<tr>
<td></td>
<td>/js/sign.js</td>
</tr>
<tr>
<td></td>
<td>/js/jscrypt/utf-8.js</td>
</tr>
<tr>
<td></td>
<td>/js/jscrypt/md5.js</td>
</tr>
<tr>
<td></td>
<td>/js/jscrypt/aes.js</td>
</tr>
<tr>
<td></td>
<td>/js/jscrypt/aesprng.js</td>
</tr>
<tr>
<td></td>
<td>/js/jscrypt/entropy.js</td>
</tr>
<tr>
<td></td>
<td>/js/jscrypt/armour.js</td>
</tr>
<tr>
<td></td>
<td>/js/crypter.js</td>
</tr>
<tr>
<td></td>
<td>/users/logouthidden</td>
</tr>
<tr>
<td></td>
<td>/search</td>
</tr>
<tr>
<td></td>
<td>/users/logint?loginform=1</td>
</tr>
<tr>
<td></td>
<td>/search/index</td>
</tr>
<tr>
<td></td>
<td>/lang/bul</td>
</tr>
</tbody>
</table>

### Details:

/css/jtip.css
Basic Information

Response data

Suggestion: A possible solution, proposed by JMeter is:

```
Tidy: 2 errors, 2 warnings

line 1 column 978 - Warning: unexpected <body> in <HR>
line 1 column 985 - Warning: unexpected <html> in <HR>
This document has errors that must be fixed before using HTML Tidy to generate a tidied up version.
```

OK
### Description

Following link generated requests with response code 404 with 100% error:

/Popup/popup.js

### Details:

![Screenshot of results tree](image)

**Basic data**

**Suggestion:** A possible solution, proposed by JMeter is:

This document has errors that must be fixed before using HTML Tidy to generate a tidied up version.

---

### Description

Following link generated requests with response code 404 with 100% error:

/js/sign.js

### Details:
Basic information

Suggestion: A possible solution, proposed by JMeter is:

Description
Following link generated requests with response code 404 with 100% error:

/js/jscrypt/utf-8.js

Details:
Basic information

Suggestion: A possible solution, proposed by JMeter is:

![Tidy: 2 errors, 7 warnings](image)

Description
Following link generated requests with response code 404 with 100 % error:

/js/jscrypt/md5.js

Details:
Basic information

Suggestion: A possible solution, proposed by JMeter is:

```
Tidy: 2 errors, 2 warnings
```

Description

Following link generated requests with response code 404 with 100% error:

```
/js/jscrypt/aes.js
```
Suggestion: A possible solution, proposed by JMeter is:

Description
Following link generated requests with response code 404 with 100 % error:

/js/jscrypt/aesprng.js

Details:
Suggestion: A possible solution, proposed by JMeter is:

Description
Following link generated requests with response code 404 with 100% error:

/css/learnweb.css

Details:
Suggestion: A possible solution, proposed by JMeter is:

Description
Following link generated requests with response code 404 with 100% error:

/js/jscrypt/armour.js

Details:
Suggestion: A possible solution, proposed by JMeter is:

![Tidy: 2 errors, 2 warnings]

Description
Following link generated requests with response code 404 with 100% error:

`/js/crypter.js`

Details:
Suggestion: A possible solution, proposed by JMeter is:

Description
Following link generated requests with response code 404 with 100% error:

/js/jscrypt/entropy.js

Details:
Suggestion: A possible solution, proposed by JMeter is:

This document has errors that must be fixed before using HTML Tidy to generate a tidied up version.