MOSAICA

Semantically Enhanced, Multfaceted, Collaborative Access to Cultural Heritage

Project IST-034984

D6.2 MOSAICA Validation Report

Deliverable

Editors: ORT
Contributors: ORT
Dissemination Level: **Public**
Date: 11-December-2008

Executive Summary

The aim of this deliverable is to present the validation process, organisation and results. The document is divided in two parts: The first one reminds the validation process. The second present the validation organisation and results.

CONTENTS

1 INTRODUCTION 5

2 VALIDATION PROCESS REMIND 6

2.1 Validation framework 6

2.1.1 Requirements Management Process 8

2.2 Mosaica System Validation 11

2.2.1 Use Case & User Groups 11

2.2.2 List of Components 14

3 VALIDATION ORGANISATION AND RESULTS 16

3.1 Validation organisation and results 16

3.2 Criteria for System Validation 16

3.3 Timeline of Validation 17

3.4 Users Validation Groups 17

3.5 Validation phases and process 20

3.5.1 First validation phase 20

3.5.2 Second validation phase 21

3.6 Control actions 22

3.7 Validation results 22

3.7.1 Semantic Annotator 22

3.7.2 Semantic search and Browsing 24

3.7.3 GIS/TIS 25

3.7.4 Virtual Expedition Editor 26

3.7.5 Virtual Expedition Player 28

3.7.6 Mosaica Portal 29

4 VALIDATION CONCLUSION 31

5 REFERENCES 32

6 APPENDICES 33

6.1 Appendix A – MANTIS Bug Tracking 33

6.2 Appendix B – Validation questionnaires 34

1 INTRODUCTION

The objective of creating a validation process is to carry out an effective assessment of the project outcomes. This is necessary for validating the project activity and corresponding results from several distinct perspectives such as individual technological components (verification), as well as the entire system (validation) being developed in the project, track the progress in development and research based on system requirements.

This document will remind the validation process and will present the validation organisation and results.

2 VALIDATION PROCESS REMIND

2.1 Validation framework

A significant body of knowledge (ISO 8402:1994 [1], European Commission [2], [3], IEEE [4],[5], ISO [6], et al) considers “verification” and “validation” as separate and distinct terms. Some use the terms "verification" and "validation" interchangeably, or in some cases refer to software "verification, validation, and testing (VV&T)" as if it is a single paradigm, with no distinction among the three terms. Here verification includes activities involved in verifying the feasibility and functionalities of a software deliverable through utilization of a small but sufficient sample of users in a real-life situation to yield preliminary findings on user acceptance (See European Commission 1994b, [2]).

WP7 builds on this body of knowledge (EU Commission [2], IEEE [4],[5], ISO [6], et. al) that considers verification and validation to be distinctly different activities within the development lifecycle. Verification is the provision of objective evidence that the design outputs of a particular phase of the MOSAICA system development life cycle meets all the specified requirements for that phase. Validation is considered as the confirmation by examination and provision of objective evidence that software specifications conform to user needs and its intended uses, and that the particular user requirements [7] implemented through software can be consistently fulfilled. Accordingly, verification embodies consistency, completeness, and correctness of a given MOSAICA individual component and its supporting documentation, as it is developed, and provides the input for the subsequent validation activity for same.

Consequently, all validation activities are highly dependent upon comprehensive testing, inspections, analyses, and other verification tasks performed at each stage of the MOSAIC system development life cycle as graphically illustrated in figure 1.

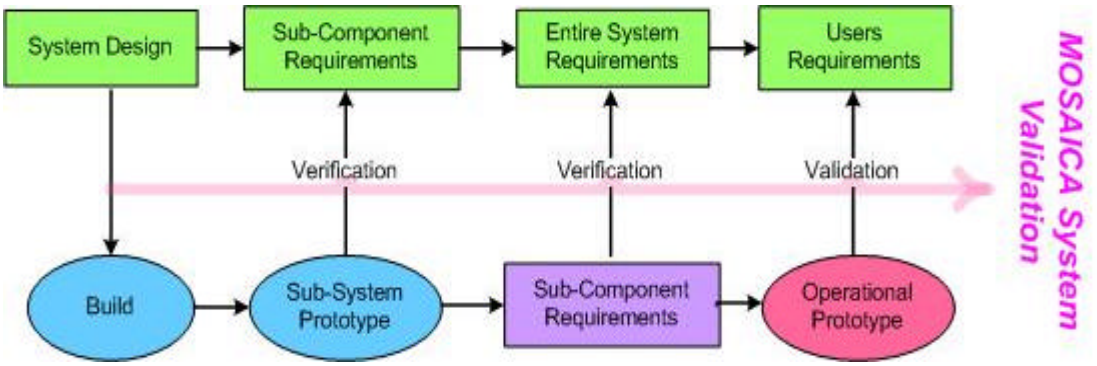


Figure 1. MOSAICA Validation Activities [8]

To this end the project validation activities have been conducted during the MOSAICA system development phases to ensure that all requirements have been fulfilled, as well as at the end of the MOSAICA development cycle which will constitute as the final evaluation.

Clearly, verification and validation activities can not be absolute since unlimited testing by the developers is simply not feasible and on the same token it is difficult to discern just how much evidence is constituted as sufficient to validate an individual component. Accordingly, the pragmatic strategy for the validation activities in large measure is a matter of developing a "level of confidence" that the MOSAICA system meets all requirements and user expectations set out in the MOSAICA Requirements Documents - Deliverable D5.1.

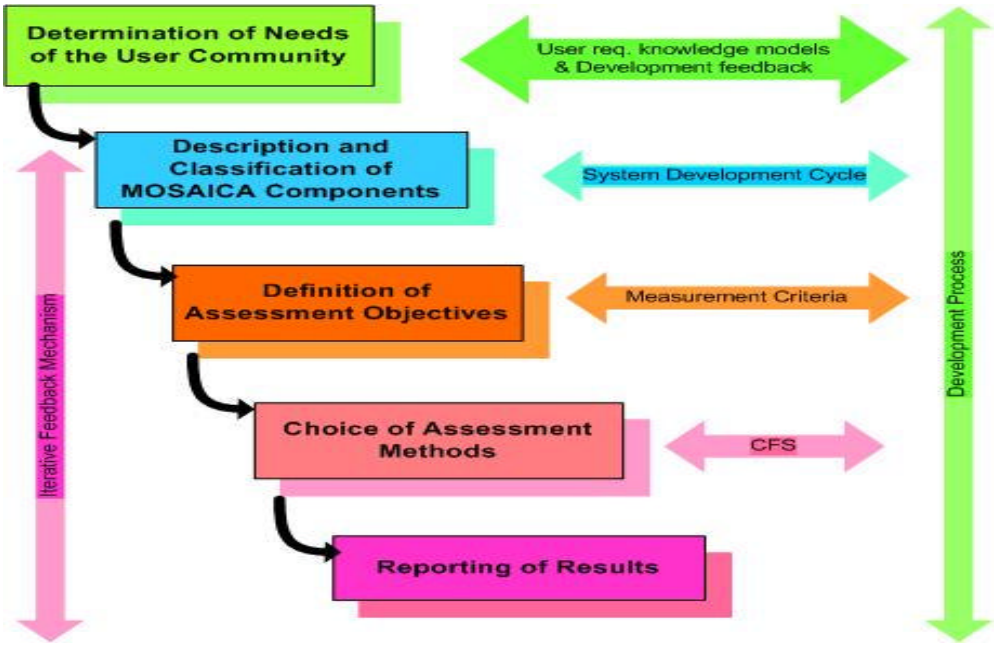


Figure 2. MOSAICA Validation Framework

Figure 2 graphically illustrates the MOSAICA validation framework that WP1, WP2, WP3, WP4, WP5 and WP6 will be engaged upon, demonstrating the logical relationship between the different stages of validation activities of MOSAICA system. It should be noted that the evaluation and validation procedures and their execution is based upon Goal Directed Project Management Methodology [9,10].

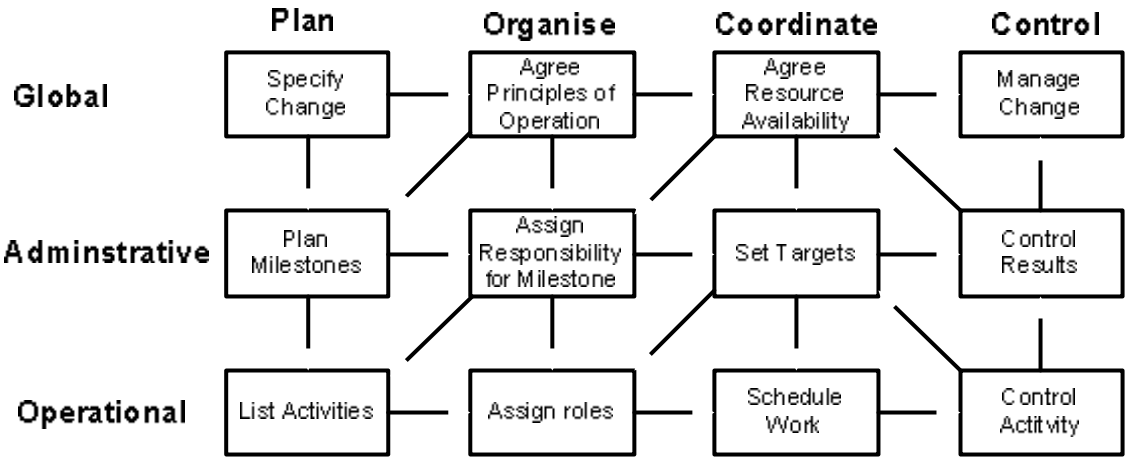
2.1.1 Requirements Management Process

The overall management processes for the conduct of the WP1, WP2, WP3, WP4 and WP5 work packages include the planning, organization, coordination, control and management in relation to ***validation and evaluation process*** (WP6). Principle methodology utilized to manage these is based on Goal Directed Project Management methodology (GDPM) [10]. The methodology encourages a team oriented approach towards planning and controlling projects.

Building on the above, the overall work package plan consists of several hierarchical levels addressing:

1. The global; that is, the management of the overall objectives of the work package and the management of the relationship between WP1 and other work packages.
2. The administrative; that is, the management of the administrative tasks within the work package including the deliverables of same.
3. The operational; that is, the management of the daily operations during the life of the work package.

Figure 3 illustrates the interrelationship between planning, organisation, co-ordination, and control and the global, administrative, and operational layers noted.


Plan
Organise
Coordinate
Control
Global
Specify Change
Agree Principles of Operation
Agree Resource Availability
Manage Change
Adminstrative
Plan Milestones
Assign Responsibility for Milestone
Set Targets
Control Results
Operational
List Activities
Assign roles
Schedule Work
Control Actitivty

To achieve this control and transparency the following high level processes have been created:

1. The user and development communities review the allocated project requirements in D5.1 before they evaluate the system.
2. The development community utilise the allocated requirements as the basis for development plans, work products, and activities in context of MOSAICA development life cycle.
3. Changes to the allocated requirements are reviewed and incorporated into the system.

Specifically in order to execute the above processes the following procedures have been put in place, to discuss issues noted above.

1. Tele-conference meetings involving the validation and verification group (every week)
2. E-mail communication
3. Joint briefing sessions with external user groups

In conduct of the procedures noted above, the following matrix is used to document and control the process:

Requirements Control	Control Actions
What is the status of each requirement?	All the requirements documented, individually controlled and assessed.
What is the rate of change for the allocated requirements?	Maintaining and logging all changes to the requirements. These changes can then be compared to a preliminary benchmark.
What is the cause of the change to the allocated requirements?	Re-visit requirement gathering process / consult user community
How will requirement changes affect the development process?	The impact of each and every change to the requirements (Requirements Integrity [RI]).
Does the MOSAICA system satisfy the requirements?	Continually determining the functionality of the system specifications and resulting software and comparing it against the RI.

Table1. Control process

The above matrix serves as an internal tracking mechanism for requirements tracking and management process of the MOSAICA project.

In order to maintain the high level of accuracy for the requirements tracking process, Savannah [11] issue tracking system has been implemented. This takes advantage of dynamic issue management strategy; committing, tracking and modifying issues. Utilizing issue management features such as:

1. **Relationships:** Tracking of relationships between issues. Dependencies between issues are flagged and tracked through either the issue entry process or while reviewing one or multiple issues.
2. **Change tracking:** All changes made along with information about the user who instigated the change, when a change is made and any comments committed along with the change are tracked with the issue.
3. **Comment viewing and editing:** All comments made to the issue are tracked. Comments allow support or other type conversations to be viewable and editable by any parties interested in the progress of an issue.

2.2 Mosaica System Validation

2.2.1 Use Case & User Groups

MOSAICA requirements outline three distinct use scenarios:

1. *Explorative usage.* – Users will be able to visit places that evoke their interest and motivation, by merely zooming-in on a particular area on MOSAICA's geographical maps of Europe, or by exploring MOSAICA semantic directory, or by submitting a query. They can conduct, and record their own pre-planed or spontaneous “expeditions”, and choose places they would like to visit. The users are free to travel the virtual Worlds, and learn about the Jewish heritage in their own time, and as often as they wish.

2. *Guided usage.* – MOSAICA will offer a variety of recommended Virtual Expeditions divided by topics and objectives. Each Virtual Expedition can start and end at a different location, have a differing time span, and include the display of selected artefacts that are considered to be a "must" within a certain location (e.g., museum, synagogue, or cemetery).
3. *Collaborative usage.* - Educational personnel and the individual users will be able to share their cultural assets and knowledge in two ways: (1) users will be able to annotate exposed cultural objects either with their free-text comments, or semantically annotate them using the MOSAICA Ontology, and to directly contribute content, including photos of artefacts owned by them, that can otherwise not be publicly exposed, and thus exhibit them online, and (2) users can design and record their own Virtual Expeditions, and suggest them to other visitors by storing them in the Repository of Educational Resources.

To complement these scenarios we identify the relevant user groups involved in using the system as stakeholders.

User groups involved in validating the MOSAICA system may be divided into two main types - “User Groups” within the Project and “User Groups” outside the Project involved in validating MOSAICA project recognizing the role and contribution of the latter in independent validation and assessment of the MOSAICA system functionalities.

Members of internal user groups will in charge of the first validation and during the second validation they will act as appraisal managers and liaise with external user groups acting as the interface to the project.

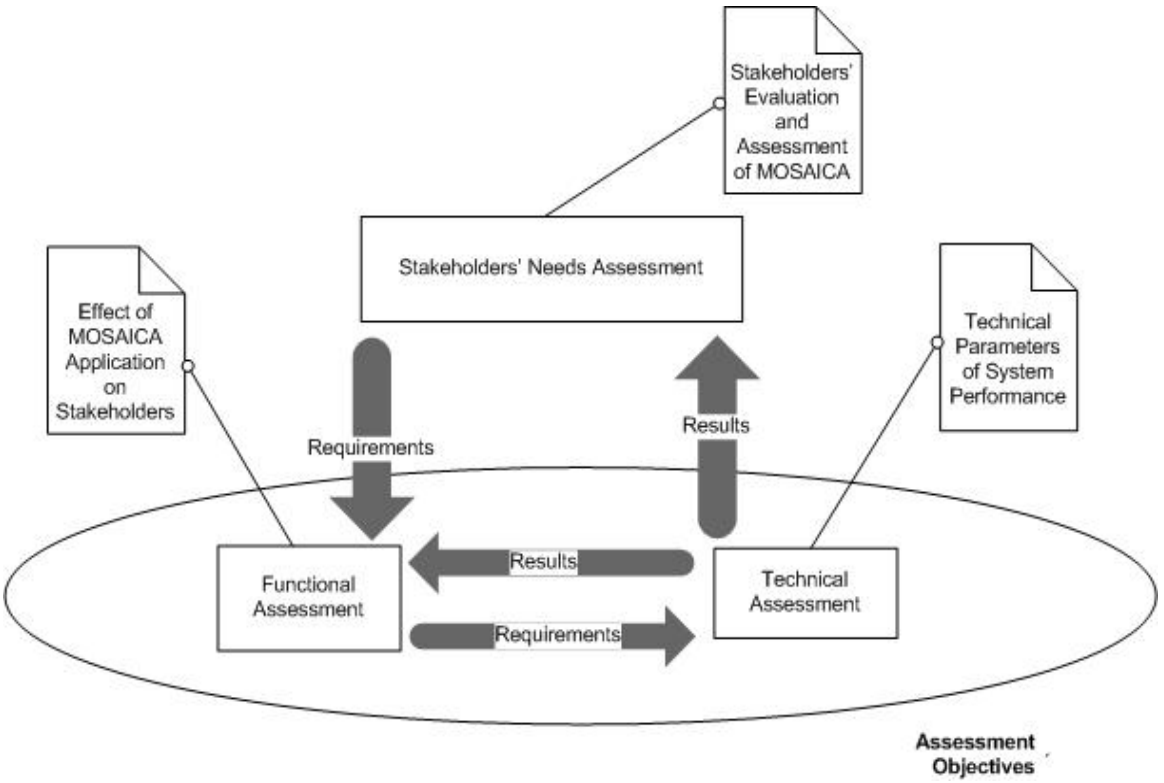


Figure 4. Use case and user groups

Figure 4, illustrates the stakeholder needs in the context of the above closely related to the implementation and use of the developed applications.

All facts and figures given in this section are the result of provisional conceptual planning based on the evaluation frameworks presented. They are subjected to change during the iterative process of evaluation.

The following external user community selections and configuration is a significant activity for the MOSAICA project. MOSAICA system should address the main aspects of promoting multiculturalism through its **explorative**, **collaborative** interfaces and through **guided** facilities. There are interrelations between each of these MOSAICA features and developing tolerant attitudes in a user as well as in the community of users

Based on these scenarios and stakeholders a set of system functionalities and system architecture was developed.

2.2.2 List of Components

MOSAICA is an advanced Web-based portal dedicated to the Jewish cultural heritage in Europe, and featuring (1) multifaceted interfaces for knowledge-based exploration and discovery, and (2) online utilities empowering users to collaboratively author and manage cultural resources in the globally distributed environment and must be evaluated by the user community to ensure that the system is successful in all of the required user functionalities.

To ensure subjective evaluation of the MOSAICA system, the presentation and hands on demonstration incorporates clear explanation of project objectives and efforts towards meeting the mandatory deliverables of the project:

- **Semantic Search and Browsing**: Semantic Search and Browsing (SSB) is the chief graphic user interface to the MOSAICA content. MOSAICA content comprises MOSAICA knowledgebase (which in turn consists of the MOSAICA ontologies and MOSAICA knowledge expressed as assertions) and MOSAICA annotations (which in turn include annotating assertions, references to external content resources, references to internal content resources, as well as the actual internal content resources).
- **Semantic Annotator**: Semantic Annotator (SA) is the system component designed to enable the end user to generate annotations, and attach them to a resource. These annotations are metadata containing references to the domain ontology.
- **GIS/TIS** (Geographical Information System) empowered map. Rather then hard-coding GIS data, it is our intention to empower the GIS with the Semantic Web technologies, and thus allow semantic references between the information displayed on the map to be created dynamically and online.
- **Virtual Expedition Player**: Virtual Expedition (VE) is a new presentation paradigm for cultural heritage. Virtual Expedition Player (VEP) is the component that enables execution of the VEs. If VE is compared to the HTML, then VEP would be the VE browser.
- **Virtual Expedition Editor**: Virtual Expedition Editor (VEE) is the utility

application designed to generate Virtual Expeditions (VE) using the semantically annotated resources. The output of the VEE is used as the input for the VEP. This is actually a set of complementary online utilities that guide users how to design their own Virtual Expeditions, record them, and enhance them with educational instructions and additional activities, such as treasure hunt, portfolio preparation, etc

- **Mosaica Portal**: Is an advanced Web bases portal dedicated to the Jewish Cultural heritage in Europe, and featuring multifaceted interfaces for knowledge based exploration and discovery. The portal gives a direct access to all components and interfaces and interconnects each component with the others. It is the Mosaica system.

3 VALIDATION ORGANISATION AND RESULTS

3.1 Validation organisation and results

The validation plan was organised according to the following principles:

- Cycle of testing sessions
- Usability testing methods
- Finding problems of the prototype
- Continuous improvement

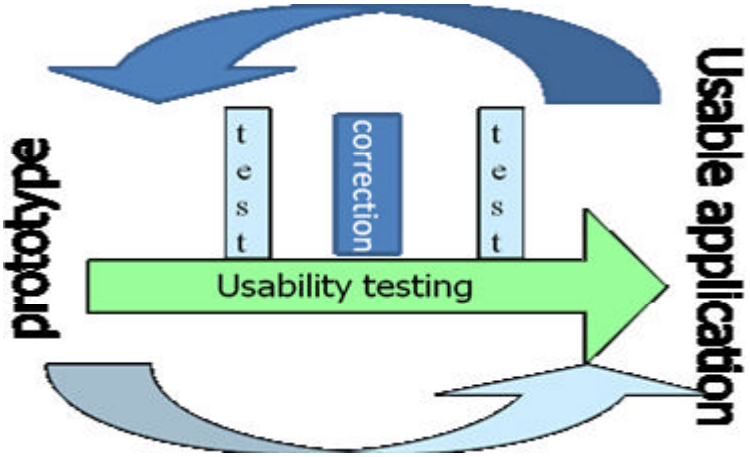


Figure 5. Validation plan overview

3.2 Criteria for System Validation

The elements taken into consideration for validating the application were as follows:

- Efficiency of application
- Effectiveness of application in supporting user-goals
- Technical robustness
- User satisfaction

3.3 Timeline of Validation

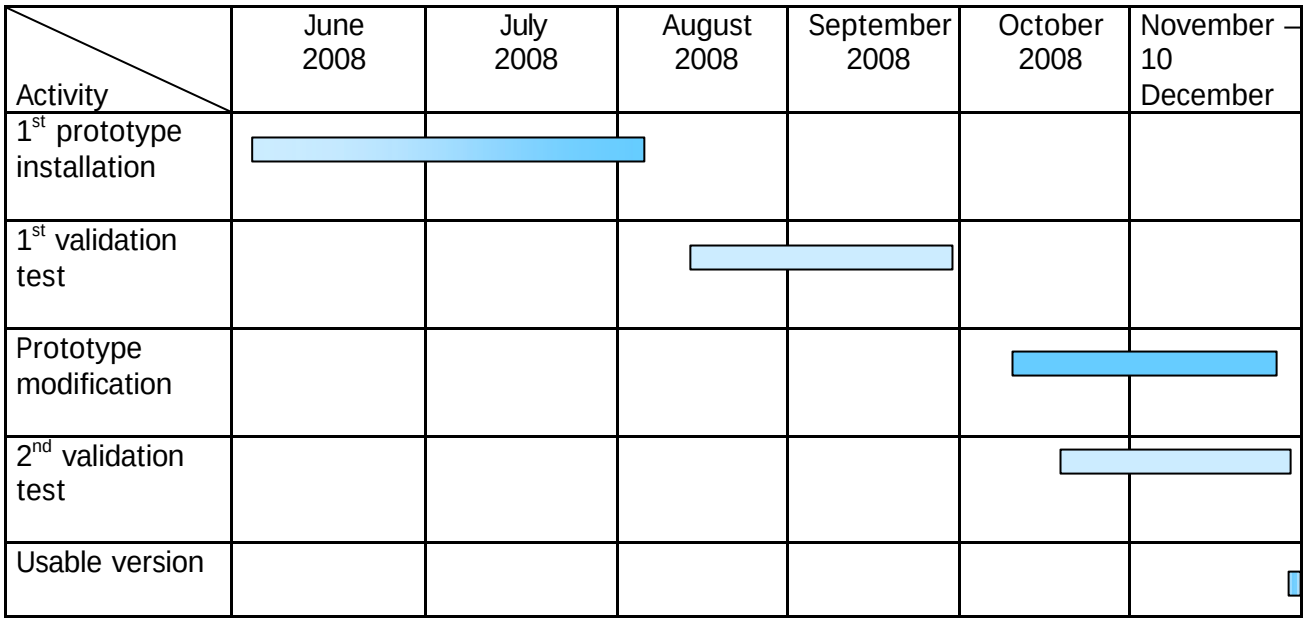


Figure 6. Validation Timeline

3.4 Users Validation Groups

Two User groups involved in validating the MOSAICA system:

"User Groups" within the project:

- Project Partner's who report bugs on the Mantis system (MantisBT is a web-based bugtracking system) when they used the Mosaica system. (appendix A). Their participation is indeed useful both to verification and validation.
- A dedicated team is in charge of the first validation and during the second validation they will act as appraisal managers and liaise with external user groups acting as the interface to the project.

No	Name	From	Profile
1	Clara Barrafranca	ORT	Senior project manager: Clara is in charge of training and pedagogical engineering in different European educational projects (R&D). She has been leading research and development in the areas of learning methodology and e-pedagogy. Clara has been leading pilot phases regarding different projects (from definition of criteria, to the implementation of the test, passing by the validation of the pilot, report results and corrective actions).
2	Olivier Tassetti	ORT	Olivier Tassetti is IT manager for Ort France Paris since 2002. He is working in NTIC department. His job is to handle e-learning systems in Ort France schools; he also works in research and development of new learning systems for Education and Training European Projects, he is in charge of technical partners' coordination and provides advice and support to the project team.
3	Francois Wagner	ORT	Mr Wagner works as consultant and a trainer for ORT France**,** he studies the projects feasibility, conceive, carry out and parameterize softwares in scientific, technical and industrial data processing, install and follow up operating systems, train the users.
4	Elio Lumbroso	ORT	ICT project co-ordination, setting up and directing distance learning systems – consulting with pedagogical teams to introduce and develop ICT for E-Learning projects – co-operative work online between local ICT managers of ORT France.
5	Raphael Attias	ORT	Raphael has taught for thirty years the Jewish history and the Jewish culture, Mathematics, business computer and new technologies of information and the communication. Aged of 57 years old, he was also director of the Moroccan Institute of the High Hebraic Studies in Rabat (Morocco).

Table2. User Groups within the project

"User Groups" outside the Project:

- Involved in validating MOSAICA project, recognizing the role and contribution of the latter in independent validation and assessment of the MOSAICA system functionalities.

No	Name	From	Profile
1	Raphaël Rouckout	Web designer – Integrator	Web designer – Integrator E-content designer. Master in Visual Communication Créapole-ESDI School management creation (design, communication, fashion, illustration, multimedia…).
2	Cecile Peysson	ORT	Cécile is in charge of coordinating different European projects for Ort France in Paris regarding the WEb sites, marketing and communication.
3	Sebastien Barrere	ORT	Technical responsible, management of the ORT network.
4	Gabriel Elkaim	ORT	Historian - Geographer Person in charge of the training of the professors of Jewish history in ORT france. Assistant editor of studies at the Aquiba School (since 2006) Graduate of the Hebraic University of Jerusalem and the University of Letters and Social sciences of Strasbourg.

Table2. User Groups outside the project

3.5 Validation phases and process

Validation is performed in two phases with two different user groups.

3.5.1 First validation phase

The first validation phase was organised as follows.

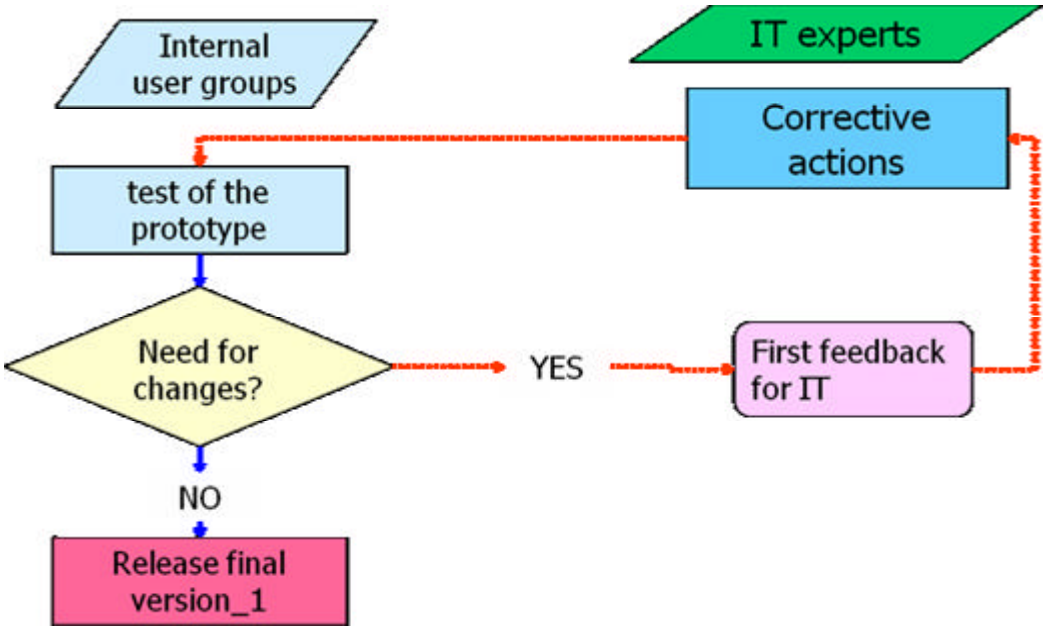


Figure 7. First validation

The process implemented during this phase for managing the validation is depicted below:

Figure 8. First validation process

3.5.2 Second validation phase

The second validation phase was organised in a slightly different way in order to also involve external user groups.

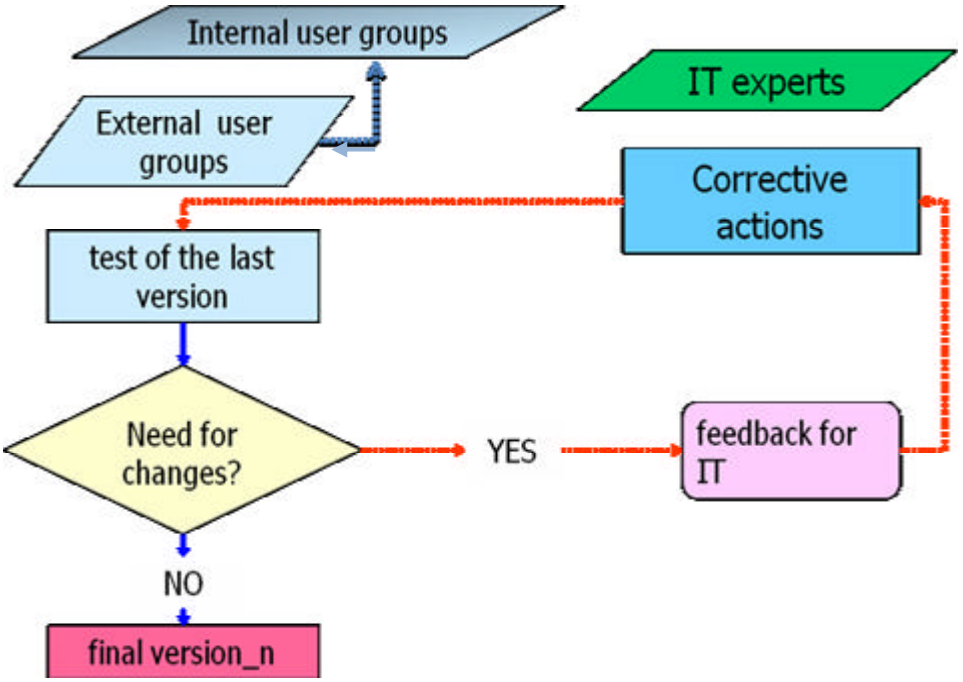


Figure 9. Second validation

The process implemented during this second phase was therefore also adapted; it is depicted below:

Figure 10. Second validation process

3.6 Control actions

Control Actions	
All the requirements documented, individually controlled and assessed.	validate
Maintaining and logging all changes to the requirements. These changes can then be compared to a preliminary benchmark.	validate
Re-visit requirement gathering process / consult user community	validate
The impact of each and every change to the requirements (Requirements Integrity [RI]).	validate
Continually determining the functionality of the system specifications and resulting software and comparing it against the RI.	validate

Table4. Control actions

3.7 Validation results

3.7.1 Semantic Annotator

First and Second validation 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Questions	First validation Results[1]	Second validation Results	Remarks	Final status
I can load the semantic annotator applet	Yes : 2/5	Yes : 3/4	Local problems Problem with the stability of the semantic annotator Problem with the java version with Internet explorer, minima requirement is java 1.6 update 11. Sometimes enable to load, or significant delay to load	1
The loading speed of the applet is correct	Yes : 2/5	Yes : 3/4		
I can annotate an url	Yes : 5/5	Yes :4/4	It is really hard to find proper resources for annotations	1

[1] Number of person who answered Yes/ Number of total person who made the validation

I can annotate a local file	Yes : 0/5	Yes :3/4	Problem with sound and video files	3
I can zoom on my resource (graphics files only)	Yes: 5/5	Yes :4/4		1
I can see my resource (graphics files only)	Yes: 4/5	Yes :4/4		1
I can preview my resource (sounds and videos only)	Yes: 1/5	Yes 3/4	Problem with the sound and video files	2
I can enter a title for my resource	Yes: 5/5	Yes:4/4		1
I can select a concept from the list	Yes: 5/5	Yes:4/4		1
I can choose the relation between my resource and the selected concept	Yes: 4/5	Yes:4/4	The concept window it does not open	1
I can add a tag to my resource	Yes: 4/5	Yes:4/4	The concept window it does not open	1
I can navigate in the concept list	Yes : 4/5	Yes:4/4	The concept window it does not open	1
I can select an existing resource	Yes: 4/5	Yes:4/4		1
I can choose the relationship between my resource and the already annotated resource	Yes :5/5	Yes:4/4		1
I can add relationship between my resource and already annotated resource	Yes :5/5	Yes:4/4		1
The various operations carried out on the resource are listed in the right pane	Yes: 5/5	Yes : 4/4		1
My annotation is correctly saved	Yes: 3/5	Yes : 4/4	Impossible to find the annotation for some persons, after the annotation phase	1
I can modify the annotation of my resource	Yes: 3/5	Yes : 4/4	Impossible to find the annotation for some persons, after the annotation phase	1

Table5. Semantic annotator validation

Validation criteria status 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Criteria	Expected results	status
Easiness of use (usability)	Annotating time measured in tens of seconds High-level of satisfaction with the usability	2

Table6. Semantic annotator criteria

3.7.2 Semantic search and Browsing

First and Second validation 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Questions	First validation Results[2]	Second validation Results	Remarks	Final status
I can load the semantic browser applet	Yes : 2/5	Yes : 3/4	Local problems Problem with the stability of the semantic search browsing Problem with the java version with Internet explorer, minima requirement is java 1.6 update 11. Sometimes enable to load, , or significant delay to load	1
The loading speed of the applet is correct	Yes : 1/5	Yes : 3/4		
I can navigate in the concept list (double click on a folder)	Yes : 5/5	Yes :4/4		1
The navigation speed between concept is correct	Yes : 3/5	Yes :3/4	Connection problems	2
For each concept I have relative concept in the knowledge box	Yes: 5/5	Yes :4/4		1
I can easily find a concept by using the shortcut bar (using autocompletion)	Yes: 0/5	Yes: 4/4		1
I can view a graphic resource by doing a double click	Yes: 5/5	Yes: 4/4		1
I can play an audio resource by doing a double click	Yes: 1/5	Yes: 4/4		1

[2] Number of person who answered Yes/ Number of total person who made the validation

I can view a map resource by doing a double click	Yes: 0/5	Yes: 4/4	Problem with the communication with GIS/TIS	1
The time to open a resource is correct (graphic, sound, map)	Yes: 2/5	Yes: 4/4	Connection problem	1
I can see information relative to the resource in the knowledge box	Yes: 5/5	Yes: 4/4		1
I can filter resource by type, use and rank	Yes :0/5	Yes: 4/4		1
I can order the resource list by title, ranking, purpose, resource type	Yes: 0/5	Yes: 4/4		1

Table7. Semantic search and browsing validation

Validation criteria status 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Criteria	Expected results	status
Precision and recall of information retrieval (usability of the high-precision search)	Approaching 100% with no false negatives (and depending on the complexity of the expected reasoning[3])	1
Ranking strategy of information retrieval (usability of both high-precision and keyword search)	High satisfaction (statistically significant high correlation between users' and system's ranking).	2
Browsing simplicity (usability of browsing facilities)	Browsing time measured in tens of seconds	3

Table8. Semantic search and browsing criteria

3.7.3 GIS/TIS

a- First and Second validation 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Questions	First validation Results[4]	Second validation Results	Remarks	Final status
I can see the map	Yes : 5/5	Yes : 4/4		1
I can navigate in the map using arrow	Yes : 5/5	Yes : 4/4		1
I can zoom in and out the map	Yes : 5/5	Yes : 4/4		1
I can navigate on the map by using the mini-map	Yes : 0/5	Yes : 4/4		1
If dick on a picture, the picture is displayed in picture box	Yes : 0/5	Yes : 4/4		1

[3] The test corpus may expect reasoning method that is in fact not implemented, which would lead to reduced precision.

[4] Number of person who answered Yes/ Number of total person who made the validation

I can see related concept to this picture in the knowledge box	Yes : 0/5	Yes : 4/4		1
I can see the title, the contributor and the subject of the map (metadata)	Yes : 0/5	Yes : 4/4		1
When I click on annotated zone on the map I see related information in the knowledge box (annotated zone are black point ex: Beth lehem)	Yes : 0/5	Yes : 4/4		1
When I select a concept in this knowledge box, I'm automatically redirect to the SSB	Yes : 0/5	Yes : 4/4		1
The SSB display information about the concept I clicked in the GIS knowledge box	Yes : 0/5	Yes : 4/4		1
When I click on the Jerusalem zone, a menu appears an it proposes link to associate concept	Yes : 3/5	Yes : 4/4	Some problems with the browser versions	1
When I click on a concept in this menu, it is display in the SSB	Yes : 0/5	Yes : 4/4		1

Table9. GIS/TIS validation

b- Validation criteria status 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Criteria	Expected results	status
Easiness of use (simple menu, better view of the resources)	Access needed information quickly	2

Table10. GIS/TIS criteria

3.7.4 Virtual Expedition Editor

a- First and Second validation 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Questions	First validation Results[5]	Second validation Results	Remarks	Final status
I can load the Ve Editor applet	Yes : 3/5	Yes : 4/4	Local and connection problems	1
The loading speed of the applet is correct	Yes : 1/5	Yes : 4/4	Problem with the stability of the ve editor.	

[5] Number of person who answered Yes/ Number of total person who made the validation

I can choose different type of story	Yes : 5/5	Yes : 4/4		1
For each different type of story, I can choose different template	Yes : 5/5	Yes : 4/4		1
I can change the background of a scene	Yes: 0/5	Yes : 4/4	Only one background and some problems	1
I can add character to the scene, move and resize it	Yes: 3/5	Yes : 4/4	Move and resize problems	1
I can add sound to a scene, a character	Yes: 0/5	Yes : 4/4		1
I can add a "Tell" scene	Yes : 5/5	Yes : 4/4		1
I can write text in a text box	Yes : 5/5	Yes : 4/4		1
I can copy/paste text from notepad, web browser to this text box	Yes : 5/5	Yes : 4/4	word document cannot be used	1
I can move and resize this text box	Yes : 3/5	Yes : 4/4	Sometimes text box doesn't appears	1
I can add an hyperlink in the text box	Yes : 0/5	Yes : 4/4		1
I can get Text from the Semantic Database (using get resource)	Yes : 5/5	Yes : 4/4		1
I can add a "Show" scene	Yes : 5/5	Yes : 4/4		1
I can select an resource from the Semantic Database	Yes : 2/5	Yes : 4/4	Some problems with the SSB and VEE communication, impossible to accede to the semantic database by the VEE.	1
I can move and resize this resource	Yes : 2/5	Yes : 4/4	some problems to resize the resource	1
I can add "Tell and Show " scene	Yes : 5/5	Yes : 4/4		1
I can select 2 resources from the Semantic Database	Yes: 0/5	4/5	Only if you begin with the picture resource.	3
I can add a "Ask" scene	Yes : 5/5	Yes : 4/4		1
I can add a question, and answers in the ask box	Yes: 3/5	Yes: 5/5	Problems with the visualisation of the ask box, and with the order of questions	1
Each answer can be link to a scene	Yes : 5/5	Yes : 4/4		1

I can delete a scene	Yes : 4/5	Yes : 4/4		1
I can create navigation scenario by using, next button and ask navigation	Yes : 3/5	Yes : 4/4	Problem with the screen resolution. Sometimes the button next not appears	1
I can edit a Virtual Expedition	Yes : 2/5	Yes : 4/4	The VE file was corrupted	1

Table11. VEE validation

b- Validation criteria status 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Criteria	Expected results	status
Easiness of use (usability)	Support for creativity	2
High-level of satisfaction with the usability	High-level of satisfaction with the usability	3

Table12. VEE criteria

3.7.5 Virtual Expedition Player

a- First and Second validation 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Questions	First validation Results[6]	Second validation Results	Remarks	Final status
I can load the Ve Editor applet	Yes : 3/5	Yes : 4/4	Local and connection problems	1
The loading speed of the applet is correct	Yes : 1/5	Yes : 4/4		
I can load a Virtual Expedition	Yes : 2/5	Yes : 4/4	The VE file was corrupted	1
Scene are displayed correctly (background, characters, position)	Yes : 3/5	Yes : 3/4	-Problem with the screen resolution. -problem with background fixation,	3
Resource are displayed correctly (Graphics, Texts, sound)	Yes: 3/5	Yes : 3/4	Problem with communication between VE and SSB	3
I can navigate between scenes	Yes: 3/5	Yes : 4/4	Problem with the screen resolution. sometimes the button next not appears,	2

Table13. VEP validation

[6] Number of person who answered Yes/ Number of total person who made the validation

b- Validation criteria status 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Criteria	Expected results	status
Design principles specified in D4.1 Virtual Expedition Methodology	principles found their implementation in the technology of choice	3

Table14. VEP criteria

3.7.6 Mosaica Portal

a- First and Second validation 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Questions	First validation Results[7]	Second validation Results	Remarks	Final status
I can access to the mosaica portal	Yes : 1/5	Yes : 4/4	-Local problems -Problem with the stability of the portal -Problem with the java version with Internet explorer, minima requirement is java 1.6 update 11. -Sometimes, impossible to have an access	1
The loading speed of portal is correct	Yes : 1/5	Yes : 3/4		
In Anonymous mode I can click on different information button and see their contents (Who are we, What is Mosaica, Benefits, Terms of services, policy ...)	Yes : 5/5	Yes : 4/4	Some spaces are empties	1
In Anonymous mode I can use the SSB by clicking investigate	Yes : 1/5	Yes : 4/4	Sometimes, impossible to have an access Problem with the java version	1
In Anonymous mode I can use the GIS by clicking explore	Yes: 1/5	Yes : 4/4	Sometimes, impossible to have an access Problem with the java version	1
In Anonymous mode I can use the VE player by clicking Virtual Expeditions	Yes: 1/5	Yes : 4/4	Sometimes, impossible to have an access Problem with the java version	1
In Anonymous mode I can register an Account	Yes: 3/5	Yes : 4/4	No confirmation message received	1
In a Registered mode I can logged to Mosaica portal using the sign in button	Yes: 5/5	Yes : 4/4		1
In a Registered I can use the SSB by clicking investigate	Yes: 1/5	Yes : 4/4	Sometimes, impossible to have an access Problem with the java version Impossible to have an access to the video	2
In a Registered I can use the GIS by clicking	Yes: 1/5	Yes : 4/4	Sometimes, impossible to have an access	1

[7] Number of person who answered Yes/ Number of total person who made the validation

explore			Problem with connection	
In a Registered I can use the ve player by clicking Virtual Expeditions	Yes: 1/5	Yes : 4/4	Sometimes, impossible to have an access	1
In a Registered I can create a VE	Yes: 2/5	Yes : 4/4	Sometimes, impossible to have an access	1
I can use the SSA by clicking resources/tag web resources	Yes: 1/5	Yes : 4/4	Problem with communication between portal, the VE and SSB	1
I can update my profile	Yes :4/5	Yes : 4/4		1
I can create a user group	Yes :0 /5	Yes : 4/4		1
I can join a user group	Yes :0/5	Yes : 4/4		1
I can set authorisation for my user group	Yes :0/5	Yes : 4/4		1
I can create account for my children	Yes :0/5	Yes : 4/4		1
I can chat with other people connected to the portal	Yes: 4/5	Yes : 3/4	Sometimes messages do not arrive to the person	1

Table15. Mosaica Portal validation

b- Validation criteria status 1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

Criteria	Expected results	status
Easiness of use (simple menu, better description of each components)	User Registering System	1
Group Management	Find desired components easily	2
High-level of satisfaction with the usability, and the easiness to register an account	High-level of satisfaction with the usability	2

Table16. Mosaica Portal criteria

4 VALIDATION CONCLUSION

Between the first and second validation phases, modifications were made regarding the different reports and validation results. But the most important modifications and bug resolutions were made during the second validation phase including the first week of December.

During the period of October to mid November the system was so instable that we were not able to finalise this validation in a good condition. The general feeling was: interesting idea, but it lacks maturity and focus.

For this reason internal user groups (in agreement with technical team) asked the external user groups to validate again the Mosaica system between mid November and beginning of December. At this stage, some new corrections and modification still had to be done, but the Mosaica system appeared to be stable.

External user groups worked in better conditions and were able to validate each component, and the communication between the different components on the Mosaica Portal.

The following table summarises the level of satisfaction achieved at the end of the validation process with respect to the validation criteria defined in §3.2.

1=completely satisfy – 2=satisfy – 3=partially satisfy – 4=not satisfy

	Validation status
• Efficiency of application	1
• Effectiveness of application in supporting user-goals	2
• Technical robustness	3
• User satisfaction	2

Table17. System functionalities conclusion

5 REFERENCES

1. Quality Management and Quality Assurance Vocabulary-ISO 8402:1994. Available online from http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=20115

2. Converge Project TR 1101 (1997) "A Proposal for a Revised Transport Telematics Functions List" EU Fourth Framework Programme (FP4) – Transport Sector Project.

3. TRACAR-CEC/TTAP Project TR1059 (1996), "TRACAR Draft Validation Plan", Deliverable Number 05/40-05/45

4. IEEE Guide for software verification and validation plans (Guide 1059)

5. IEEE standard for software verification and validation plan (standard 1012)

6. Akhgar, B, Naderi M. Siddiqi J (2003) "GRACE User Requirements Specification".

7. Software Productivity Consortium http://www.software.org/PUB/VNV/hierverification.asp#The%20V%20Model

8. Akhgar, B. and Hariri, H. (2004); "Knowledge oriented strategy and Information Systems Development" An integrated Approach, SGAMC publication Vol. 4, Issue 8.

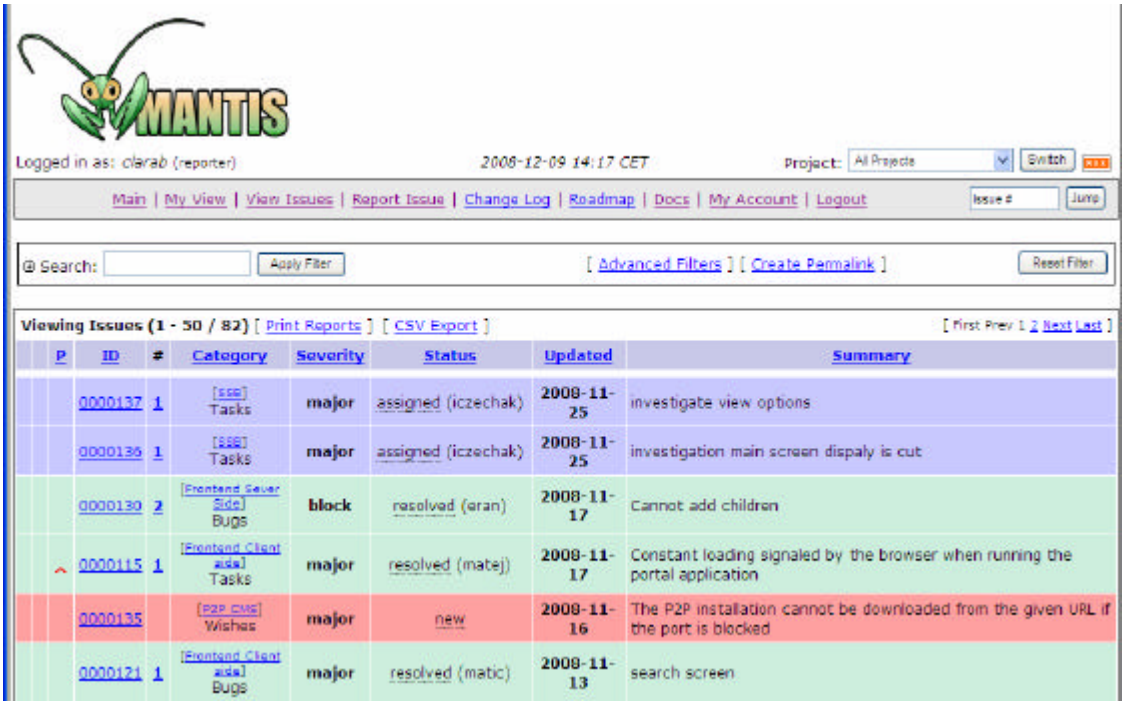
9. Akhgar, B (2001); A methodology method for Analysis and Design of complex systems. VIDA Publication company, ISBN: 964-91700-7-3.

10. GDPM Systems http://www.gdpmsystems.com/

11. Bug Tracking System http://savannah.cern.ch/projects/MATCH

6 APPENDICES

6.1 Appendix A – MANTIS Bug Tracking



P	ID	#	Category	Severity	Status	Updated	Summary
	0000137	1	[sss] Tasks	major	assigned (iczechak)	2008-11-25	investigate view options
	0000136	1	[sss] Tasks	major	assigned (iczechak)	2008-11-25	investigation main screen dispaly is cut
	0000130	2	[Frontend Sever Side] Bugs	block	resolved (aran)	2008-11-17	Cannot add children
^	0000115	1	[Frontend Client side] Tasks	major	resolved (matej)	2008-11-17	Constant loading signaled by the browser when running the portal application
	0000135		[P2P CMS] Wishes	major	new	2008-11-16	The P2P installation cannot be downloaded from the given URL if the port is blocked
	0000121	1	[Frontend Client side] Bugs	major	resolved (matic)	2008-11-13	search screen

6.2 Appendix B – Validation questionnaires

Questionnaire Validation VE tools			IE7
editor : http://qmosaica.paris.ort.asso.fr/ve/VEEditor.html player : http://qmosaica.paris.ort.asso.fr/ve/ve_player.html			
	Yes	No	Explanation
Load the Ve Editor			
I can load the Ve Editor applet	x		
The loading speed of the applet is correct	x		
New Virtual Expedition (Please select Virtual Expeditions> Create a new VE)			
I can choose different type of story	x		
For each different type of story, I can choose different template	x		
Scene In General			
I can change the background of a scene		x	only one background
I can add character to the scene, move and resize it	x		
I can add sound to a scene, a character	x		but impossible to test it on the ssb,
Tell Scene			
I can add a "Tell" scene	x		
I can write text in a text box	x		
I can copy/paste text from notepad, web browser to this text box	x		
I can move and resize this text box	x		
I can add an hyperlink in the text box	x		
I can get Text from the Semantic Database (using get resource)	x		
Show Scene			
I can add a "Show" scene	x		
I can select an resource from the Semantic Database	x		
I can move and resize this resource	x		
Ask Scene			
I can add a "Ask" scene		X	Imposssible to ask a question, the qu
I can add a question, and answers in the ask box	x		
Each answer can be link to a scene	x		
Tell and Show Scene			
I can add "Tell and Show " scene	x		
I can select 2 resources from the Semantic Database		x	Ican only add first a picture, if i inser
I can move and resize this resource	x		
Ve General			
I can delete a scene	x		
I can create navigation scenario by using, next button and ask navigation	x		

Questionnaire Validation Portal			Mozilla 5.0
url : http://212.179.43.184:8081/mosaica-test/Mosaica.html			
	Yes	No	Explanation
Load the Portal			
I can access to the mosaica portal	x		
The loading speed of portal is correct	x		
Anonymous Using (This part is relative to user that are not registered)			
I can click on different information button and see their contents (Who are we, What is	x		"Help area" no text tutorial " no
I can use the ssb by clicking investigate	x		
I can use the gis by clicking explore	x		
I can use the ve player by clicking Virtual Expeditions	x		
I can register an Account		x	i can enter all asked information but
Registered Using (This part is relative to user that are already registered)			
I can logged to mosaica portal using the sign in button	x		
I can use the ssb bly clicking investigate	x		format : image ok, sound ok, text ok
I can use the gis by clicking explore	x		
I can use the ve player by clicking Virtual Expeditions	x		
I can create a VE	x		
I can use the SSA by clicking resources/tag web resources		x	Sorry, but applet is still not loaded. click here to try again We are sorry for inconvience
I can update my profile	x		
I can create a user group	X		
I can join a user group	x		
I can set authorisation for my user group	x		
I can create account for my children	x		
I can chat with other people connected to the portal	x		

Questionnaire Validation GIS

	Yes	No	Explaination
Gis General (click on investigate)			
I can see the map			
I can navigate in the map using arrow			
I can zoom in and out the map			
I can navigate on the map by using the minimap			
If click on a picture, the picture is displayed in picture box			
I can see related concept to this picture in the knowledge box			
When my mouse move over a annotated zone/box , i can see in a popup with the concept rel			
GIS/SSB Interaction			
I can see the title, the contributor and the subject of the map (metadata)			
When i click on annotated zone on the map i see related information in the knowledge box (			
When i select a concept in this knowledge box, i'm automatically redirect to the ssb			
The ssb display information about the concept i clicked in the gis knowledge box			
When i click on the Jerusalem zone, a menu appear an it propose link to associate concept			
When i click on a concept in this menu, it is display in the ssb			

Questionnaire Validation Sa

url : http://212.179.43.184/SVG/MosaicaApplet.html

	Yes	No	Explanation
Load the Semantic Annotator			
I can load the semantic annotator applet	X		
The loading speed of the applet is correct	X		
General Annotation			
I can annotate an url	X		
I can annotate an local file	X		
I can zoom on my ressource (grahics files only)	X		
I can see my ressource (grahics files only)	X		
I can preview my ressource (sounds and videos only)	X		
Add Metadata			
I can enter a title for my ressource	X		
Le link of my ressource inside the "original location" box is correct	X		
The default ressource type is correct regarding the real type of my ressource	X		
I can add a second type to my ressource	X		
Second type proposed are correct regarding the real type of my ressource	X		
I can add an author for the annotation	X		
The default date of the annotation is correct	X		
I can modify the annotation date	X		
I can add medata to a ressource	X		
Add a Rank			
I can select how the ressource will be used	X		
The default selection of the ressource usage is correct	X		
I can choose the quality of my ressource	X		
I can Rank my ressource	X		
Add a tag			
I can navigate in the concept list	X		
I can select a concept from the list	X		
I can choose the relation between my ressource and the selected concept	X		
I can add a tag to my ressource	X		
Add Relationship			
I can navigate in the concept list	X		
I can select an existing ressource	X		
I can choose the relationship between my ressource and the already annotated ressource	X		

Questionnaire Validation SSB

url : http://212.179.43.184:8081/mosaica-test/Mosaica.html

	Yes	No	Explaination
Load the Semantic Browser			
I can load the semantic browser applet (Investigate button)			
The loading speed of the applet is correct			
Concept Navigation (concept are blue folder)			
I can navigate in the concept list (double click on a folder)			
The navigation speed between concept is correct			
I can go to the previous, parent concept i clicked (using red arrow)			
For each concept I have relative concept in the knowledge box			
I can easily find a concept by using the shorcut bar (using autocompletion)			
Ressource Navigation			
I can view a graphic ressource by doing a double click			
I can play an audio ressource by doing a double click			
I can view a map ressource by doing a double click			
The time to open a ressource is correct (graphic, sound, map)			
I can see information relative to the ressource in the knowledge box			
I can filter ressource by type, use and rank			
I can order the ressource list by title, ranking, purpose, ressource type			