



## **IMAGINATION**

*Image-based Navigation in Multimedia Archives*

FP6 - 034626

### **Deliverable**

WP 2: Requirement Analysis  
D6  
User requirements document

**BSMC**

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<b>Abstract (for dissemination)</b>	The D6 deliverable aims at providing the user requirements identified so far. To get this goal the paper illustrates how representatives of user groups (University students, publishers and Internet users) have been selected and involved to get a very first feedback. A <i>User requirements list</i> is provided to identify roles, rights and permissions of administrators, domain experts and users of IMAGINATION.
<b>Keywords</b>	User requirements, administrator, domain expert, user, University students, publishers, Internet users.

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## TABLE OF CONTENTS

<b>1</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>6</b>
<b>2</b>	<b>CONTRACTUAL OBLIGATIONS.....</b>	<b>7</b>
<b>3</b>	<b>USER GROUPS.....</b>	<b>8</b>
3.1	SELECTION OF REPRESENTATIVES OF USER GROUPS .....	9
3.1.1	<i>Selection of University students.....</i>	<i>10</i>
3.1.2	<i>Selection of publishers.....</i>	<i>11</i>
3.1.3	<i>Selection of Internet users .....</i>	<i>12</i>
3.2	PROBLEMS AND EXPECTATIONS OF USERS. A FIRST ANALYSIS.....	13
3.3	COMMUNICATION CHANNELS .....	14
<b>4</b>	<b>IDENTIFICATION OF USER REQUIREMENTS: THE USER REQUIREMENTS LIST</b>	<b>15</b>
<b>5</b>	<b>POSSIBLE FUTURE ORGANISATION OF WORK AND <i>USER REQUIREMENTS LIST</i></b>	
	<b>UPDATING.....</b>	<b>22</b>

## 1 EXECUTIVE SUMMARY

This document is aimed at examining user requirements.

Concerning its content the deliverable is divided into 5 chapters that are described below:

- Chapter 1 summarizes the objective of the deliverable and provides a short description of the other chapters of the deliverable;
- Chapter 2 illustrates contractual obligations concerning D6 *User requirements document*;
- Chapter 3 describes the users that will be involved in the activities of validation and their first contribution to the requirements list;
- Chapter 4 illustrates the *User requirements list* agreed by the consortium;
- Chapter 5 draws up a possible organization of work in this domain.

This document must be conceived as a living document, whose content may vary, even significantly, as consequence of the involvement of users and of the implementation of the application software.

## 2 CONTRACTUAL OBLIGATIONS<sup>1</sup>

This deliverable is compiled according to the contractual statements on WP2 (see Workpackage 2 description chart<sup>2</sup> ), with particular regard to *T2.2 Identifying user requirements* and *T2.4 Deriving functional requirements from user requirements*.

To fully comprehend this deliverable it is important to read D5 on legal issues and D3, containing the state-of-the-art analysis.

In fact, the D3, D5 and D6 are all necessary to reach Milestone 1 of the project.

The user requirements document, written by BSMC, collects information on the three different categories of users of IMAGINATION system identified by the contract (University students, publishing companies producing educational material in the field of history and special interest groups of Web users) and provides the *User requirements list*. This deliverable is possible thanks to the contribution of two other partners (DISY and Photo12) for chapter 3 and of all the partners for chapter 4.

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<sup>1</sup> Contractual obligations described in this chapter regard D6.

<sup>2</sup> See Annex1- Description of Work, p.38 of the contract

### 3 USER GROUPS

User groups have been identified on the basis of contract statements<sup>3</sup>:

#### *“Potential Users of IMAGINATION system*

*The following potential end-user groups of the IMAGINATION system (and its individual modules) are identified:*

- *Special interest groups of web users: There are specific interesting periods of history, which attracts lots of individuals from the general public. A good example is the online encyclopaedia Wikipedia, where special interest groups exist for specific historical periods, such as the “Imperialism and World Wars”<sup>4</sup>. These groups can highly benefit from our system, because it allows to organise available content for a specific historical period in deeper connections between persons, events and objects.*
- *University students: Our system provides will provide university students specialising in history with an overview on specific historical periods by semantically connecting images and textual documents.*
- *Publishing companies producing educational material for history: Our system will allow to explore history by browsing through images. This is especially ideal for the younger generation, especially children. Our technology can be used to construct innovative teaching material for pupils. One example is the Editis Group in France that produces electronic teaching material, and which has shown a interest in the results of our project.*

*Representatives of these user groups have been contacted by the IMAGINATION consortium, and will be actively involved in the evaluation of the IMAGINATION prototype. Most specifically, representatives of the user groups will be invited to the two validation workshops during the project, where they will be testing the system, evaluating it, and providing feedback. An external expert in usability evaluation will be also involved to assure independent and fair validation.*

*For the first group, the Wikipedia Foundation has been contacted, and they have expressed their interest to evaluate and use the project results. For the second group, BSMC will be using its network. Finally, for the last group, the Editis Group has been contacted, and they also expressed interest to evaluate and use the project results. During the course of the project, other user groups will also be identified and contacted, such as museums specialised in history, or news publishing companies.”*

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<sup>3</sup> See Annex I - Description of Work, p.23 of the contract

<sup>4</sup> [http://de.wikipedia.org/wiki/Portal:Imperialismus\\_und\\_Weltkriege](http://de.wikipedia.org/wiki/Portal:Imperialismus_und_Weltkriege)

### 3.1 Selection of representatives of user groups

Representatives of the three user groups have been contacted by BSMC, PHOTO12 and DISY and will actively be involved in the evaluation of the IMAGINATION prototype. Most specifically, representatives of the user groups will be invited to the two validation workshops during the project, where they will test the system, evaluate it, and provide feedback.

This chapter provides information on them: people are listed here through initial letters of their names in order to protect users' rights to privacy but obviously their identity is known by the partners responsible for each user group.

### **3.1.1 Selection of University students**

Users chosen for the panel:

M.A. (University Roma 3)

M.B. (University La Sapienza)

E. D.G. . (University La Sapienza)

C. D. M. . (University La Sapienza)

O.F. . (University La Sapienza)

C.F (University La Sapienza)

D.P. (University Roma 3)

M.T. (University La Sapienza )

H. V. (University La Sapienza )

BSMC, considering its institutional mission, has involved representatives of University students.

Through its well-established relationships with Universities, BSMC, has contacted professors in order to identify University students of History, in particular “Contemporary History” and “Publishing and journalism”.

The students are representatives of different ages, different Faculties, different Universities and studying at different stages (triennium and specializing ).

On the basis of selected curricula provided to BSMC, students have been chosen. The number of students is more than 6 (the number previously indicated within the project partners) because we expect a possible turnover.

### **3.1.2 Selection of publishers**

Users chosen for the panel:

G. M. from *Nathan*

V. P. from *Larousse*

M. B. from *Magnard*

N. B-L. from *Sejer-Editis*

C. L. from *Sejer-Editis*

S. F. from *Sejer-Editis*

Photo12 has selected this panel since they are all from French publishing companies in the field of education and we believe the Imagination technology could be applied on what will be called 'digital schoolbooks', that will one day replace the traditional schoolbooks.

Those companies are the largest representatives of the French publishing market in the field of education (around 80% of educational books are provided by them).

To test the Imagination technology, we selected users that have different jobs inside those companies: from the person in charge of searching images to illustrate historical texts to the one who's in charge of managing numerical educative platforms.

Brief information on companies and people involved are provided here:

#### **Sejer-Editis – N.B.-L., C. L. and S. F.**

Sejer-Editis, is the second largest publishing group in France (turnover: 776 million euros), which gathers around 30 publishing brands. The educational field represents around 30% of their activity.

N.B.-L. manages the two iconographic areas of the company that publishes around 12,000 images a year.

C. L. deals with spreading of numeric resources in French schools. He helps developing new numeric platforms for educational publishers.

S. F. manages the multimedia R&D department that creates new multimedia products for publishers.

#### **Nathan – G. M.**

This company publishes books for the young and educational ones.

G. M. manages the team of iconographers, in charge of searching images to illustrate the books.

### **Larousse – V. P.**

This publishing house is specialized in reference books (dictionaries, educational books, etc).

V. P. manages the team of iconographers.

### **Magnard – M. B.**

Magnard only publishes educational books.

M. B. manages the team of iconographers.

### **3.1.3 Selection of Internet users**

DISY is still negotiating with the Wikimedia Foundation. So at the moment this deliverable is issued, it is not possible to access to the Wikipedia volunteers.

The German Wikipedia Foundation has been asked to provide members of the German Wikipedia user group that are interested in IMAGINATION application domains: WWI and contemporary European politicians, preferably users that are interested in both. In order to get the involvement of this user group, DISY has prepared a short document describing the project goals, its open-source policy, and its requirements towards the users.

### 3.2 Problems and expectations of users. A first analysis

University students have been met in order to explain to them the main goals of the project and the possible benefits of the service and to get a first feedback from them.

Images are assuming a great importance both as documents (source for students) and as material to enrich their own texts.

Moreover Information and Communications Technology (ICT) implies new cultural sources and new tools for access to cultural heritage.

It means that University students need more and more effective instruments to retrieve iconographic material and work on it.

On the basis of the possible scenarios of use, the group would prefer an initial search box:

- For both simple and advanced search, where it is possible to write several terms in order to define the results;
- With a structure formally similar to the most common OPAC (On Line Public Access Catalogue)
- With a specific field for the source, that is a necessary information if the image is used within a degree thesis, a publication, ....
- With a specific field for the subject and the use of a controlled vocabulary to avoid synonymies and ambiguities.

An initial thematic allocation of content on the homepage (through the ontology) has been accepted as a possible guide and help, to put beside (and not to replace) the free search box.

For what concerns publishers, these are the results of their first involvement:

- The users' interface must be web-based in order to perform more intuitive searches.
- The technology should be able to detect objects and not only humans.
- The metadata shouldn't be edited by all users: the annotation tool should be available for reliable users only.
- 'Tagging' should be also available.

### 3.3 Communication channels

To ensure a full involvement of users a communication strategy should be defined.

A few tools are identified:

- a forum: established for each user group, to discuss main issues and disseminate information;
- meetings: to be organized at defined stages of the project;
- contact person: identified within the partners (BSMC, PHOTO12, DISY) to be the referee for user groups;
- Internet: to get general information on the project ([www.imagination-project.org](http://www.imagination-project.org))

#### **4 IDENTIFICATION OF USER REQUIREMENTS: THE USER REQUIREMENTS LIST**

The first version of the *User requirements list* has been analyzed, discussed and approved by all the partners during the plenary meeting that was held in Athens on 16<sup>th</sup> October 2006.

The first draft of the requirements list drawn up by the consortium has been enriched by BSMC, DYSI and Photo 12 ( the partners responsible for users groups ) on the basis of their own experiences and institutional missions and according to the first feedback of each users group.

Among the main changes to the first draft a new conceptual and terminological definition of the actors involved must be mentioned; at the end three different actors have been identified: Administrators, Domain experts and Users. Each category is characterized by different possible interaction with IMAGINATION and therefore there will be different implications for legal issues.

The list is enriched by a glossary of technical terms, to explicitly explain the meaning of some expressions, since partners come from different countries and different backgrounds.

Several comments ensure a better understanding of the requirements.

## GLOSSARY

Term or phrase	Explanation
<p><b>context based search</b></p>	<p>Let us take the classic example of the Yalta 1945 picture:  <a href="http://en.wikipedia.org/wiki/Yalta_Conference">http://en.wikipedia.org/wiki/Yalta_Conference</a></p> <p>By clicking on Stalin (for example) simple search would retrieve Stalin's biography first. While <i>Context based search</i> will retrieve results IN THE CONTEXT of THIS picture. In other words, the system will understand that there is 'Stalin', 'Yalta', '1945', 'Churchill', etc. on this picture. Altogether they constitute a context for this picture. As a result, user clicks on Stalin and gets Stalin in a similar setting (for example in Potsdam conference - also 'conference', also 'Churcill', also '1945': <a href="http://en.wikipedia.org/wiki/Potsdam_conference">http://en.wikipedia.org/wiki/Potsdam_conference</a>). Stalin' s biography is less important in this context, therefore it is not given first.</p>
<p><b>ontology instance (OI)</b></p>	<p>Information unit in ontology. Read Section 2.1 in the <i>State of the art analysis document</i> (available from the project web site:  <a href="http://imagination-project.org/upload/D3%20State%20of%20the%20art%20analysis.pdf">http://imagination-project.org/upload/D3%20State%20of%20the%20art%20analysis.pdf</a>)            Termed 'items' in the user interface (GUI).</p>
<p><b>concept or class</b></p>	<p>Termed 'Lists of items' in the GUI, e.g., lists of persons, airplanes etc.</p>
<p><b>relation</b></p>	<p>Termed the same in the GUI</p>
<p><b>content</b></p>	<p>Images and text documents</p>
<p><b>region</b></p>	<p>Part of an image that contains some item(s) from the ontology. E.g., a face of the person, or a car. It is usually a box.</p>
<p><b>annotation</b></p>	<p>A (weighted) list of relevant OIs</p>
<p><b>end users can create/delete annotation, ontology entity or image region</b></p>	<p>They can make proposals, which must then be validated by the domain experts to be accepted in the system. Until the proposals are not accepted by domain experts, the changes are only visible for the user who made the proposal.</p>

## ADMINISTRATOR

Cat.	Nr.	Requirement	Must	Should	May	Not relevant	Comments
		<b>Administration of end users</b>					
AU	1	End user registers to have additional rights, e.g. to become a domain expert.				X	End users are anonymous, all of the other types of users are not. Therefore, it is not possible to promote an end user to be a user with more rights.
AU	2	Administrator adds a new end user manually				X	End users register themselves.
AU	3	Administrator changes permissions of an end user				X	See AU 1
AU	4	Administrator removes an end user	X				
		<b>Administration of domain experts</b>					
AE	1	New domain expert applies to be accepted.			X		The decision is made by the system administrators. In the case of a positive decision, the expert is added manually to the system. (See AE 2)
AE	2	Administrator adds a new domain expert	X				
AE	3	Administrator removes a domain expert	X				
		<b>Administration of content</b>					
AC	1	Administrator adds new content (images, text)	X				
AC	2	Administrator removes existing content (images, text)	X				
AC	3	Administrator sets the option to embed annotations directly into image header fields. (I.e., image metadata is preserved outside the system)			X		
AC	4	When administrators upload an image, the system automatically annotates it	X				

## DOMAIN EXPERTS

Cat.	Nr.	Requirement	Must	Should	May	Not relevant	Comments
		Content management					
DC	1	Domain expert uploads new content				X	Only administrators can upload new content into the system.
		Validation of end user suggestions					
DV	1	Domain expert validates proposed annotations (accepts or rejects)	X				
DV	2	Domain expert validates proposed ontology entities (accepts or rejects)	X				
DV	3	Domain experts validates proposed image regions (accepts or rejects)	X				
DV	4	Domain experts provides a reason for his/her validation decision			X		
		Metadata and ontology editing					
DE	1	Domain expert adds new annotations	X				
DE	2	Domain experts edits the ontology	X				

## USERS

Cat.	Nr.	Requirement	Must	Should	May	Not relevant	Comments
		<b>Search interface</b>					
SI	1	<b>A general search box for initial is available.</b>	X				
SI	2	<b>Users browse the ontology and start search for a specific ontology item.</b>	X				
SI	3	<b>System presents images as starting points on the start page. These images are either randomized or pre-selected. Users then start search by clicking on one image or a region of a image.</b>		X			
SI	4	<b>Clicking on a marked object in an image initiates a context based search for other pictures of the selected object.</b>	X				
SI	5	<b>The system provides and advanced image search where the user can manually define a weighted list of ontology elements.</b>	X				
SI	6	<b>Technical terms (ontology, concept etc.) are avoided in the user interface and are replaced by non-technical terms, such as "list of items".</b>	X				
		<b>Search results</b>					
SR	1	<b>The system supports context based search with ranking over images.</b>	X				
SR	2	<b>Search from a general search box makes search in ontology first to find relevant instances and provides a list of them. A next click on instance will make image search for images with particular annotation.</b>			X		
SR	3	<b>Search from a general search box provides list of images at once in next screen, even if the search is ambiguous (more than one ontology entitiy matches the search term).</b>		X			<b>Search is made like SR2, all matching OIs are taken automatically.</b>

SR	4	Users can specify in their profile whether they prefer ontology or image search for the general search box as the default.			X		
SR	5	When the user navigates over an image part with the mouse (s)he sees a pop-up with brief information about the person (object) that is below the mouse pointer.	X				
SR	6	During viewing the image, users also see additional, detailed information about the actually selected entity. This information is available in some permanent place of screen (for example right top corner). The information is generated using the information that is stored in the ontology.			X		
System access							
SA	1	The system is web based.		X			
SA	2	User searches without registering to the system.		X			
SA	3	User registers himself/herself to the system.	X				
SA	4	User uploads new images.				X	Only administrators can change the content to ensure quality.
Automated annotation							
AA	1	The system suggests regions of person faces.					
AA	2	The system suggests regions for other types of predetermined objects: for example war machines – tanks, airplanes.		X			
AA	3	The system suggests annotations for image regions.					
AA	4	The system suggests annotations for the whole image.		X			
AA	5	Users automatically get suggestions for interesting image regions (areas).			X		
AA	6	Users get suggestions for interesting image regions (areas) on demand (i.e. by pressing a button).	X				
AA	7	Users automatically get suggestions for ontology instances for the actually selected image regions during the annotation.			X		
AA	8	Users get suggestions for ontology instances on demand.	X				
AA	9	Users can set in their profile whether they want automatic		X			

		suggestions.				
		Manual annotation				
MA	1	End user manually removes image regions that are not relevant, e.g. "phantom persons"	X			
MA	2	End user manually add image regions that where not automatically detected	X			
MA	3	End user manually removes OI annotation that is not relevant for an image region	X			
MA	4	End user manually adds relevant Ois to image regions that were not automatically detected.	X			
MA	5	End user manually removes OI annotation that is not relevant for the whole image	X			
MA	6	End user manually adds relevant Ois to the whole image that were not automatically detected.	X			
MA	7	During search for an ontology instance users are provided with suggestions automatically as they type (live search)		X		
MA	8	End users get a notification about the decision of the domain expert(s) about his/her annotation proposals.			X	
		Ontology editing				
OE	1	From the annotation tool users are able to create a new ontology instance.	X			
OE	2	Users can add new classes.			X	
OE	3	Users can add new relations.			X	
		Informal annotation and discussion				
IA	1	A discussion forum is provided for free discussion for the end users.		X		
IA	2	New comments on the forum are connected to a specific image.		X		
IA	3	Users see a list of forum comments for a specific image.		X		

## **5 POSSIBLE FUTURE ORGANISATION OF WORK AND *USER REQUIREMENTS LIST* UPDATING**

During the project the involvement of users will probably include:

- **Testing of the system on the basis of specific tasks**
- **Questionnaires: preparation and filling**
- **Reports**
- **Participation in project meetings**
- **Other**

It is important to highlight once again that it is expected that the user requirements will evolve, as the first prototype becomes available for user testing. Therefore, the document will not be considered as final, but will be a **living document**, which will evolve on the basis of component-specific requirements analysis, and on the results of formative user evaluation.