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6-MONTHLY ACTIVITY REPORT N°2

6-Monthly Activity report from 1st January 2007 to 30th June 2007

Acronym	TRENDS
List of participants	SERAM PERTIMM INRIA ROBOTIKER CRF (FIAT) SB (STILE BERTONE) UNIVLEEDS (UNIVERSITY OF LEEDS) CU (UNIVERSITY OF CARDIFF)
Coordinator organization	SERAM SOCIETE D'ETUDES ET DE RECHERCHES DE L 'ECOLE NATIONALE SUPERIEURE D'ARTS ET METIERS
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Project Website	www.trendsproject.org
Project Type	STREP (Specific Targeted Research Project)
Contract number	FP6-IST-27916
Start Date	1 January 2006
Duration	36 months

0. INDEX

1. INTRODUCTION

1.1 GENERAL CONTEXT: TRENDS PROJECT WP9

The objectives of TRENDS WP9 are to ensure general coordination and follow up, management, dissemination and IPR issues of the project. The task T9.1 corresponds to the *Project coordination* activities. It includes, among other sub-tasks, the contractual reporting activities with the EC, including all the TRENDS management and work progress reports (reporting period progress reports, mid-term assessment report, and final report, dissemination and exploitation reports).

1.2 ACTIVITY REPORTS

This report is the second 6-monthly activity report. Activity reports summarize the major objectives and achievements during the specific reporting period.

1.3 COMPOSITION OF THIS REPORT

This report summarizes the activity of the TRENDS project within the period from 1st January 2007 to 30th June 2007. It describes the objectives for this period and the progress actually achieved. The allocation of the personnel resources is given together with the planned allocation for the rest of the project.

This document is structured as follows: in section 3, an overview of the general objectives and then the objectives and main achievements for the reporting period are presented. Section 4 focuses on the work packages progress of the period. The deliverables completed are listed in this section. Management aspects including the actual and forecast personnel efforts per partner and per deliverable as well as a project work plan are summarized in section 5. A brief note on the exploitation and dissemination of results is provided in annex (section 9).

2. EXECUTIVE SUMMARY

Project objectives:

"The overall goal of the TRENDS project is the achievement of an interactive software for the elaboration of design trend boards dedicated to product designers in B to C markets such as for the automotive and original equipment manufacturers. This software aims to improve the early design process, especially in acting on the design watch and information process implemented by the designers." Inspirational materials play an important role in the design process. The very specific activity of searching for inspirational material corresponds to a hybrid semantic search of text and images. This activity has been formalized through the *Conjoint Trends Analysis method*. This method is very innovative, but needs some improvements, especially for the phase of information searching. The main research challenges for the TRENDS project are the identification and development of technologies that will improve the precision and efficiency with which designers can access inspirational materials and particularly images. These challenges will be met through the integration of three innovative technologies: web search agent, visual content indexing and retrieval, graphical user interface. The TRENDS system will be moulded to the information gathering process that takes place during industrial design, taking into account the task-based requirements and the cognitive and affective processing of designers. An important means of achieving this is the inclusion of end users of the TRENDS system (designers) in the developmental process. To this end, two of the project partners are companies engaged in car design (Stile Bertone and Fiat) and the views of other designers and design students are being sought.

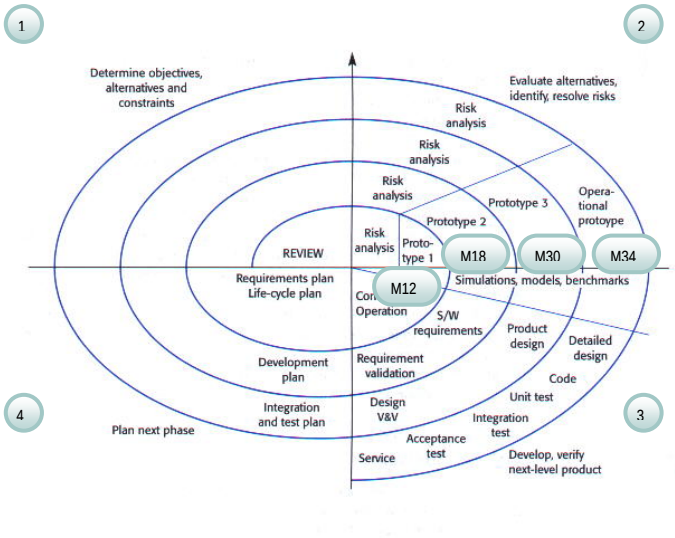

Figure 1: TRENDS successive prototypes according to the Spiral Model (Boehm, 1988)

In the TRENDS project, four different prototypes will be tested by the end-users (dates and prototypes according the new technical annex):

Prototype 1 (M12): Prototype 1 is the first interface prototype and non-interactive function. It follows the functional specification and its translation into design concepts. This prototype is a PPT version without any algorithmic development *(see TRENDS D2.4 First version of the graphic interface and its description)*. It is the first concrete expression of the end users needs and of the main functions coming from the Conjoint Trends Analysis method. This interface is not interactive and this is what distinguishes it from later prototypes.

Prototype 2 (M18): Prototype 2 is the first version of the components prototype. As components, it includes the User interface of text and image search and results and the Intelligent web agent software. It will be delivered as deliverable *D2.9 Prototype 2*.

Prototype 3 (M30): Prototype 3 is the full prototype integrating the previous components plus the User interface for ambience and pallets, the User interface for the intelligent agent search. It will be delivered as deliverable *D2.10 Final version of the software*.

Prototype 4 (M34): Prototype 4 is the operational prototype: it is the final version of the software. It will be delivered as deliverable *D2.11 Final version of the software*.

The contractors involved are the following:

8 partners from France, Spain, Italy and United Kingdom are involved in the project.

- SERAM, Coordinator, Design Methodology (*Conjoint Trends Analysis*), France
- PERtinent et IMMédiat (PERTIMM), Semantic search engines, France
- Institut National de Recherche en Informatique et Automatique (INRIA), Image search engines, France
- University of Leeds (UNIVLEEDS), Psychology, Human factors, United Kingdom
- University of Cardiff (CU), Intelligent agents, United Kingdom
- ROBOTIKER, Interface development, Spain
- Centro Ricerche Fiat (CRF), Car design and manufacturing, Italy
- Stile Bertone (SB), Car design, Italy

TRENDS project website :
www.trendsproject.org

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Work performed and results achieved so far:

The third 6-months period mainly corresponds to the elaboration of prototype 2. This prototype was built according to the first version of the GUI (see figure 2) and is wholly interactive and integrates the following functionalities: *sphere interface, search by text, search by image, search by sectors and relevance feedback*. Prototype 2 corresponds to an important stage of the project by providing the first visible elements of the future software.

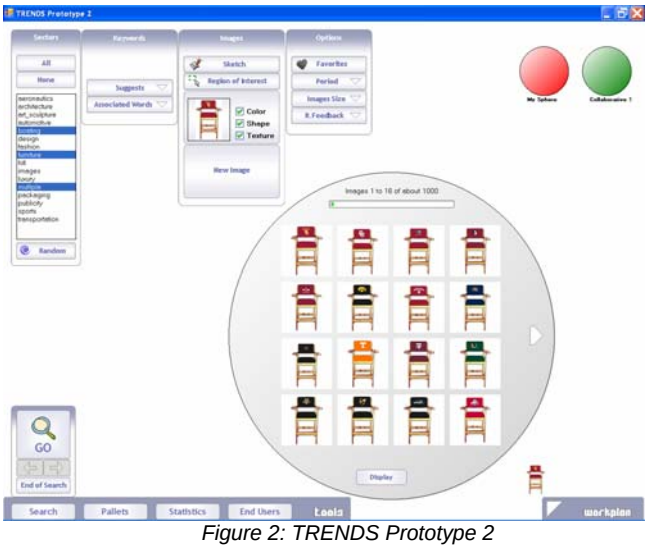


Figure 2: TRENDS Prototype 2

In this prototype, the image search engine was implemented. This version of the fusion search engine does not achieve the mixt text and image search at this stage. But it is able to receive text requests and provide images as result. The index used for FSE includes the image validation results and the ontology tags. As a result, only validated images can be retrieved and each image in the result provides he list of its associated ontologies.

The second grabbing linked to this prototype contains ~520,000 images. The global visual appearance of the images has been extracted using colour, texture and shape descriptors (signatures). The employed descriptors are the HSV histogram (colour), histogram weighted by the probability of the colour of the current pixel (colour and texture), Laplacian weighted histogram (colour and shape), Hough histogram (shape) and Fourier histogram (texture). Several internal tests have been necessary, for the dimensionality reduction by Principal Component Analysis to accelerate the search and validation of images that can be processed by the indexing module. At this stage, the integration work concerns the specification, implementation and testing of the communication protocol through an XML flux. Here the format and protocols first drawn in the 1st year were more specifically detailed and achieved. The image retrieval server implements a part of the HTTP protocol and functions using stateless asynchronous procedure. At this moment, all the details of the XML exchange format have been specified.

PROTOTYPE 2 IN DETAIL		
Available functionalities	**Features**	**Technical parameters**
Search by image sample (by colour, by shape, by texture) Search by relevance feedback Search by text (keywords + “only”, “except” and “include” options Search by random General interface functionality (drag and drop images and spheres, possibility to hide, delete, restore, change the name, zoom in / out of images and spheres, display the properties of the images) Display options (mosaic, big and small, one by one)	Image descriptors: Colour: HSV histograms (by Laplacian, by probability of colour) Texture: Spectral power density distribution Shape: hough transform SVM-based relevance feedback 510 000 image indexed and grabbed	C# for complex graphical interface C# for core functions (communications, calculations) Works in Windows (user’s platform), with 1280x1024 resolution Executable is easily installed in every computer (30KB very light in client side) .NET FrameWork installation Log file is generated for control of times and errors XML files are stored (requests, responses and relevance feedback) so that anything can be checked

Table 1: TRENDS prototype 2

In the perspective of prototype 3, semantic contents were implemented with the textual indexation (semantics and linguistics), co-ocurences, semantic adjectives and ontology. Relating the co-integration for the fusion search engine, the format unification was completed in prototype 2 and the first version of the algorithm was designed.

Expected end results

The expected end results are firstly three separate prototypes:

- User interface of text and image search
- User interface for ambience and pallets
- User interface for intelligent agent search and results

Finally these three prototypes will be integrated into the final version of TRENDS software.

Intentions for use and impact

The impact of TRENDS project for European research and development is related on one side to new concepts for design, and on the other side to advanced information search with mixed semantic image and text cross-indexing and cross-retrieval. Even if targeted market is focused towards car designers, it will be possible with the working initial prototype to show it to different partners and to develop it in other areas. All the markets linked to design activity can be considered, like fashion design (clothes, shoes, bags, perfumes), or industrial design (computers, PDA’s, mobile phones). Indeed every design process needs inspirational phase and information gathering. In addition, other general fields can be considered as targeted markets: they have a similar feature which is the need for cross-lingual and mixed semantic text and image queries. Consequently three levels of exploitation were identified: car industry, industrial design and more widely markets linked to the need for cross-lingual and mixed semantic text and image queries. The initial targeted markets are automotive builders and original equipment manufacturers. TRENDS consortium integrates car builders, while car manufacturers are represented in the Special Interest Group of TRENDS.

Publishable results

In addition a flyer and a poster are available on TRENDS website.

Also new technical deliverables were delivered that will be revised for providing a public version on the website, in addition to the previous ones:

- D2.7 - Design and innovation database, images and words database
- D2.8 - Procedure for the extraction of sociological and design trends through the web
- D3.1 - Procedure for statistics realization
- D4.1 - First version of the graphic interface and its description

At this stage of the project the following presentations were made in the framework of International Conferences:

[1] Mougenot C., Bouchard C., Aoussat A., *Fostering innovation in early design stage: a study of inspirational process in car design companies*, Wonderground 2006, Design Research Society International Conference, 1-5 November 2006, Lisbon.

[2] Kaur, S., Westerman, S.J., Mougenot, C., Sourbe, L., & Bouchard, C. (2006). *Computer-based support for creativity in industrial design.* Poster presented at the First International Symposium on Culture, Creativity, and Interaction Design., London, UK Sept. 2006.

[3] Mougenot C., Kaur S., Bouchard C., Westerman S., Aoussat A. An experimental study of designers' cognitive activity in design information phase. Abstract submitted to ICED 2007, 16th International Conference on Engineering Design, August 28-3, 2007, Paris

[4] Setchi R., Workshop of the Institute of People Centred Computation (IP-CC), Bristol UK, 2006

[5] Setchi R. , Tang Q., Concept Indexing Using Ontology and Supervised Machine Learning, XIX International Conference on Computer and Information Science and Engineering, 29-31 January 2007, Bangkok, Thailand.

[6] Setchi R., Workshop of the Institute of People Centred Computation (IP-CC), Bristol UK., 2006

[7] Setchi R., Tang Q., Concept Indexing Using Ontology and Supervised Machine Learning, XIX International Conference on Computer and Information Science and Engineering, Bangkok, Thailand, 29-31 January 2007.

[8] Setchi R., Tang Q., "Ontology-based concept indexing", I-Prom Conference, July 2007

[9] Bouchard C., Mantelet F., Ziakovic D., Setchi R. Tang Q., Aoussat A., Building a design ontology based on the Conjoint Trends Analysis, I-Prom Conference, July 2007

[10] Bouchard C., Mougenot C., Mantelet F., Setchi R., Tang Q., Aoussat A., Building an domain ontology related to car design, I-Prom Conference, July 2007

Next International Conferences planed:

[1] Bouchard C., Mougenot C., J.F.Omhover, Aoussat A., TRENDS, A Kansei based information retrieval system based on the Conjoint Trends Analysis method, International Association of Societies of Design Research, IASDR 2007, Hon-Kong, Design Research Society, 11-15 November 2007.

[2] Mougenot C., Bouchard C., Aoussat A., Creativity in design – How designers build mental images, IASDR 2007, Hon-Kong, Design Research Society, 11-15 November 2007

3. PROJECT OBJECTIVES AND MAJOR ACHIEVEMENTS DURING THE REPORTING PERIOD

3.1 OVERVIEW OF THE PROJECT OBJECTIVES, CURRENT RELATION TO THE STATE OF THE ART

Large amounts of multimedia data are becoming available today, touching more and more aspects of human activity: from TV channels storing their productions, stock photograph sellers and resellers, online stores, to museums and Internet search engines, etc. There is an increasing demand for methods and technologies for mining and organizing quickly and reliably these visual contents [BOU04] [LEW06][DAT07a]. In this context, the TRENDS project proposes to build an information retrieval system that can index and keep up to date a list of web sites and other related visual material specific to the automotive industry in particular, but also to fashion and art in general. The main objective is entirely visual, e.g. the purpose of a search session is to find images illustrating the query subject. From this perspective, TRENDS project register itself into the mainstream research direction but also respond to real necessities coming from a well-defined category of users.

For years, the usual method to query multimedia databases has been to attach keywords or labels to each item and then to perform searches based in on these annotations. This method works well on small databases where the price and the time necessary to annotate the items is reasonably low, but for nowadays databases it becomes increasingly difficult to use. Indeed, it is not rare to see image databases of several tens or even hundreds of thousands of images. Recent keyword based image search engines (e.g. Google) rely on web pages or documents where the images are used to gather the necessary information to describe the images. While this approach works to some extent for a generic search engine, indexing by *text only* has its own drawbacks for more specialized queries: the association between text and images unreliable; semantic difficulties: different words may have similar meanings (synonymy) and same word may have different meaning (polysemy); text associated with images comes from the citing context and may not reflect reliably the visual content. In this context, Content Based Image Retrieval (CBIR) have matured over the last ten years as an active research field that focuses on methods and technologies for searching image databases based on their visual content [BIM99][SME00][LEW06][DAT07a]. Moreover, we expect mixed search methods based simultaneously on visual descriptors and text to perform better compared to methods based on image signatures or text alone [DAT07b], especially for query target that are very semantic.

The size of the final TRENDS image repositories, after the harvesting done in WP5 will be completed is estimated to be more than 500,000 images. Thus, the TRENDS data repository can be considered a very large image database and the choice of visual descriptors should reflect this reality:

- The system should provide answers in real-time, thus the descriptors should be compact (small size) while compressing as much information as possible. Our choice of descriptors have been guided by the fact that we cannot afford to build expensive computing facilities designed to deal with large indexes on disk, cache systems or parallel computing environments. At this size of the database it is still conceivable to keep the generic visual indexes into the main memory, fact that will accelerate considerably the query [DAT07a].
- The semantic gap is more visible for large databases than for small ones [HUI03] [HUI05] [SEB03]. As it resulted from the WP1 activity, the targets of the TRENDS system users (designers) are very semantic and can be situated at the border between diversity in terms of image samples and representativity in terms of the intended subject. In this context, relevance feedback [], a recent modern powerful method based on online learning has been implemented to provide efficient solutions to the problem of semantic gap.

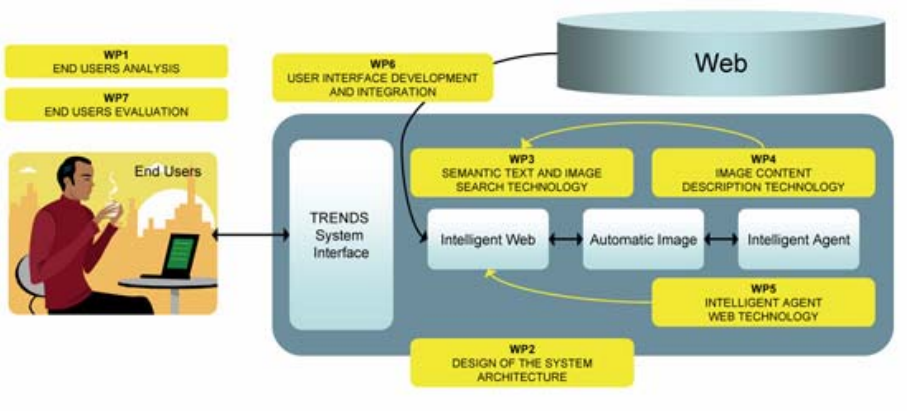
At month M18, the TRENDS software Prototype 2 includes the following CBIR services:

- Indexing of images: description of the global visual appearance of images using several colour, texture and shape signatures
- Query by visual similarity using any combination of characteristic descriptors (colour, texture and shape)
- Semantic queries using relevance feedback based on Support Vector Machines

A detailed description of these functions as well as a state of the art and motivation is provided in deliverable D4.1.

3.2 OBJECTIVES FOR THE REPORTING PERIOD, WORK PERFORMED, CONTRACTORS INVOLVED AND MAIN ACHIEVEMENTS IN THE PERIOD

3.2.1 A project divided into 9 operational work packages



	JA	FE	MA	AP	MA	JU	JUI	AU	SE	OC	NO	DE	JA	FE	MA	AP	MA	JU	JUI	AU	SE	OC	NO	DE	JA	FE	MA	AP	MA	JU	JUI	AU	SE	OC	NO	DE
WP1	M1					M6																														
T11																																				
T12																																				
T13																																				
T14																																				
T15																																				
WP2			M3									M12																								
T21																																				
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WP3								M8				M12												M24						M30						
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WP5							M7					M12												M24						M30						
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T81																																				
T82																																				
T83																																				
WP9												M12												M24						M30						

Figure 3: TRENDS Work packages

For the third reporting period, the objectives were the development of prototype 2 (it includes the user interface of text and image search and results and the Intelligent web agent software). To this end, the initial technical integration was done by achieving the communication protocol, and providing the specification of XML formats.

3.2.2 Main objectives from month 13 to month 18

- Develop prototype 2 (components prototype)
- Develop the user interface of text and image search
- Develop the user interface for ambiences and pallets
- Develop the user interface for the intelligent agent search
- Develop the user interface for intelligent web agent software
- Define FSE specifications for Prototype 3
- Provide a new version of the GUI according to the end-users feedback
- Prepare the protocol for the test related to prototype 2

3.2.3 Work performed during the period

During the first year of TRENDS project, the analysis of the end-users needs results and the integration of the Conjoint Trends Analysis method provided the main functionalities of TRENDS future software that were translated into the first version of the GUI (non interactive). In the last 6 months period, final refinements and the validation of the design and ergonomics specifications and system architecture were done.
This period correspond to the technical development of the system until the production of the second prototype which is the components prototype. This prototype is wholly interactive and integrates the fusion search engine which does not integrate yet the mixed text and image search. Prototype 2 integrates main functions like the search by text, the search by image with relevance feedback and the search by sectors. These main functions all are provided through a single interface following the concept Galaxy chosen by the end-users during the first year. This concept displays spheres which represent the various sets of images. Prototype 2 runs with about 520,000 images from which global visual appearance has been extracted using histograms for colour (HSV), texture (Fourier), shape (Hough) and colour and shape (Laplacian). The whole communication protocol working through an XML flux was detailed, implemented and tested. Image retrieval server implements a part of the HTTP protocol and functions using stateless asynchronous procedure. It is able to receive text requests and provide images as result. The index used for FSE includes the image validation results and the ontology tags. As a result, only validated images can be retrieved and each image in the result provides he list of its associated ontologies.
This technical development was accompanied by working out a state of the art about technologies related to TRENDS. More specifically the current solutions for visual and textual similarity search were summarized. In addition, in the perspective of the third prototype, the Fusion Search Engine algorithm was developed.
In parallel of the technical development, the planning and specification for the testing sessions along the whole development process was worked out and validated by the consortium. A draft version of the protocol for prototype 2 testing was prepared. The technical coordination and the technical integration were supported by the introduction and use of new specific *living* documents available on the private part of the website (customised spiral, detailed planning and iterative roadmap).
The management task was continuously improved, reinforcing the collaborative approach in terms of reporting and decision making. This improvement was highly supported by the new version of the website, the use of specific workflows and the massive introduction of call conferences for project management board meetings and in complement to the face to face technical meetings. Also the rewriting of the meta-deliverables started during this period, but no technical deliverable was submitted. After a follow-up meeting by the Commission in May 2007, a reorganization of the work plan of the project was initiated in June. This encompassed a revision of the technical annex and also the rewriting of three main meta-deliverables giving more clarity to the project outputs provided by the consortium during year 1.
The dissemination task included mainly the achievement of the third version of the website and the preparation of I*Proms conference. SERAM got an additional grant for the continuation of this task until the end of the project.

3.2.4 Main achievements in the period

- Development of prototype 2
- Co-integration: format unification completed in Prototype 2
- XML interconnection module

- Technical translation of the interface information needs
- Design and implement tagging algorithm
- PERTIMM textual indexation (semantics and linguistics (co-occurences, semantic adjectives, ontology)
- First version of FSE algorithm designed
- Implementation, test and choice of a set of state of the art global image descriptors, results on the test databases
- SVM-based relevance feedback implemented
- Implementation of the ISE server (providing functions like queries by visual similarity with colour, texture, shape and combinations
- Indexing and validation of the 3rd grabbing (510,000 images)
- Third list filtering (87% of text has been filtered, resulting in a much faster index (factor of 10) and only 26 % of the images are filtered : keep wealth of the database)
- Definition of FSE specifications for Prototype 3
- Finalization of living tools for supporting the technical management (customised spiral, detailed planning and iterative roadmap)
- Third version of the website developed
- Workflows established for technical and management deliverables with corresponding templates
- Organization of a TRENDS session at I*PROMS conference
- Start the project re-organization: writing the new management report, the new meta-deliverables, and the new technical annex.
- An association of lawyers located in Paris was mandated by SERAM for images related IPR.
- A risk analysis was initiated by SERAM

The *user interface for ambience and pallets* and for *intelligent agent search* were not wholly achieved at this stage, and the *development of the user interface for the mono-sector mappings* could not start during the reporting period.

Deliverable No	Deliverable title	Original delivery date	Actual delivery date
D2.7	**List of design and ergonomics specification**	M12=Dec 2006	13 Feb 2007
D2.8	Validation results, report	M12=Dec 2006	16 Feb 2007
D3.1	**Intermediate report on Textual similarity search (+ XML description)**	M12=Dec 2006	15 Feb 2007
D4.1	**Intermediate report on visual description**	M12=Dec 2006	5 Feb 2007
D8.1	Internal and external reports on project assessment	M12=Dec 2006	9 Feb 2007
D9.9.1	Yearly Management report n°1 (including Forms C)	M12=Dec 2006	27 Feb 2007
D9.6.1	Project dissemination and public participation and awareness raising report	M12=Dec 2006	15 Feb 2007
D9.3.2	Revised plan for using and disseminating knowledge	M12=Dec 2006	15 Feb 2007
D9.13.2	Annual activity report n°1	M12=Dec 2006	15 Feb 2007
D9.4.6	2-monthly management report N°6	M14=Feb 2007	13 Apr 2007
D9.4.7	2-monthly management report N°7	M16=Apr 2007	15 June 2007

Table 2: Deliverables from M13 to M18

4. WORK PACKAGES PROGRESS OF THE PERIOD

This section describes work package by work package the progress towards objectives and the advancement as far as the deliverables are concerned. This section deals with WP 1, 2, 3, 4, 5, 6, 7, 8. Management activities (WP9) are globally addressed in the next section. Dissemination activity is also partly addressed in the annex "Use and dissemination".

4.1 WORKPACKAGE 1: END USER NEEDS ANALYSIS

Objectives:

- To define the user needs, and the methodology of interviewing, benchmarking, etc. ✓
- To make a world wide state of the art and a benchmarking data base on design information systems. ✓
- To define functional specifications for TRENDS system. ✓
- To validate result data with end-users. ✓

WP1 objectives have been reached during the first year.

4.2 WORKPACKAGE 2: DESIGN OF THE SYSTEM ARCHITECTURE

WORK PACKAGE DESCRIPTION	
Starting date: 3 **Duration:** 10	**Total Effort (man/month):** 60.5
Partners involved:	**Effort (man/month):**
SERAM **(WP Leader)**	23
PERTIMM	5
INRIA	3
ROBOTIKER	7
CU	4
CRF	8
UNIVLEEDS	5.5
SB	5

Table 3: WP2 Description

4.2.1 WP2 objectives

The objective of WP2 was to design the overall architecture of the system, starting from the CTA methodology and WP1 results to implement and mix the three technologies into one homogeneous system able to adapt to each designer in any market (automotive, furniture, cosmetic, textile…).

Detailed list of objectives:

- To specify and validate the end users needs for the future TRENDS system and software. ✓
- To elaborate an initial sociological and design trends database. ✓
- To define a procedure for the identification of the sectors of influence and the websites for the extraction of sociological and design trends. ✓
- To define a procedure for the mono-sector mappings realization, the ambience, pallets and statistics realizations. ✓
- To define interface graphic design specifications. ✓
- To design the software architecture of the TRENDS system software presenting sociological and styling trends. ✓
- To validate the software architecture with end users. ✓
- To define the user test protocols. ✓
- To define the choice of the communications protocols and data transfer functions. ✓
- To define elements that will be used: computer, processors, programming language. ✓

WP2 objectives have been totally reached during the period.

4.2.2 WP2 main meetings

No meeting during the period.

4.2.3 Participants role and main contributions

The table below gives an overview of the main contributions:

WP2				
Partner	**Role**	**Main contribution**	**Man month foreseen**	**Man month declared**
SERAM **(WP Leader)**	Sectors of influence, procedure for the identification of the websites, procedure for the mono-sector mappings, ambiences and pallets, elements for the GUI, software architecture, validation of software components, validation of design and ergonomics specifications	Sectors of influence, procedure for the identification of the websites, for the mono-sector mappings, ambiences and pallets, design of the first TRENDS prototype (first version of the GUI), definition of software architecture, definition of the user test protocol, application of the user test protocol to the first TRENDS prototype	23	24.1
PERTIMM	Procedure for the identification of the websites, procedure for the mono-sector mappings, ambiences and pallets, elements for the GUI, software architecture, validation of software components	Procedure for the identification of the websites, elements for the GUI, definition of software architecture	5	5
INRIA	Procedure for the mono-sector mappings, ambiences and pallets, elements for the GUI, software architecture	Procedure for the mono-sector mappings, ambiences and pallets, elements for the GUI, definition of software architecture	3	3
ROBOTIKER	Elements for the GUI, software architecture	Elements for the GUI, contribution to the design of the first TRENDS prototype, definition of software architecture	7	7
CU	Procedure for the identification of the websites, elements for the GUI, software architecture, validation of software components	Procedure for the identification of the websites, elements for the GUI, definition of software architecture	4	7
CRF	Validation of software components, validation of design and ergonomics specifications	Sectors of influence, procedure for the identification of the websites, elements for the GUI, evaluation and validation of the GUI and TRENDS functions usefulness	8	8
UNIVLEEDS	Validation of design and ergonomics specifications	Elements for the GUI, definition of the user test protocol, application of the user test protocol to the first TRENDS prototype	5.5	4.27
SB	Validation of design and ergonomics specifications	Elements for the GUI, evaluation and validation of the GUI and TRENDS functions usefulness	5	4.40

Table 4: WP2 Participants role

4.2.4 Work package progress of the period

- ***T2.1: Definition of the sectors of influence from an initial sociological and design trends database***

This task was achieved during the previous period.

- ***T2.2: Definition of a procedure for the identification of the websites.***

This task was achieved during the previous period.

- ***T2.3: Definition of a procedure for the mono-sector mappings, ambiences and pallets definition and statistics module and user test protocols***

This task was achieved during the previous period.

- ***T2.4 : Definition of the first design elements for the graphic interface***

This task was achieved during the previous period.

- ***T2.5: Definition of the software architecture of TRENDS system***

Final refinements and the validation of the design and ergonomics specifications and system architecture were achieved.

- ***T2.6: Validation of the design and system architecture***

A validation procedure has been led at the end of 2006 which led to the production of validation results in January 2007. A list of validations points including the network requirements of the system, the compatibility of the interface, the standards used for request formatting, the software connectivity with other professional software has been established and been submitted to the end-users. In addition, first validation loop was made by SERAM in order to check the content of the database according to the needs involved by the CTA application. In addition, the last deliverables of the validation of the design and system architecture were approved by all the partners.

4.2.5 Deliverables and milestones

Deliverable No	Deliverable title	WP N°	Lead contractor	Date due	Actual delivery date
D2.7	**List of design and ergonomics specification**	**2**	**SERAM**	**M12=Dec 2006**	**13 Feb 2007**
D2.8	Validation results, report	2	SERAM	M12=Dec 2006	16 Feb 2007

Table 5: WP2 Deliverables so far

Milestone No	Milestone title	WP N°	Lead contractor	Date due	Actual date
M2.3	**End of work package, End of interface specifications and software architecture validated.**	**2**	**SERAM**	**M12=Dec 2006**	**28 Feb 2007**

Table 6: WP2 Milestones so far

4.2.6 Difficulties encountered

No difficulties have been encountered during the period.

4.2.7 Conclusion

The achievement of these remaining tasks closed the second workpackage.

4.3 WORKPACKAGE 3: IMAGE CONTENT DESCRIPTION TECHNOLOGY

WORK PACKAGE DESCRIPTION	
Starting date: 8 **Duration:** 23	**Total Effort (Man month): 63**
Partners involved:	**Effort (Man month):**
PERTIMM **(WP Leader)**	16.5
INRIA	13
ROBOTIKER	15
SERAM	8
CU	3.5
CRF	2.5
UNIVLEEDS	4
SB	0.5

Table 7: WP3 Presentation

4.3.1 WP3 objectives

In WP3, the aim is to develop a semantic text and image search engine that will help designers to find images related to their needs using a mix of text and image signatures. The main idea is to find the best method to mix the INRIA image search technology with the PERTIMM text search technology. And this method will have to adapt itself to the designer's, helping them to find the right words, semantic adjectives and expressions that will be linked to the images he/she is looking for.

Detailed list of objectives:

- To find images from text search into PERTIMM search engine (PERTIMM).
- To link the expressions extracted from each text document by PERTIMM to the images belonging to it (PERTIMM).
- To separate a request coming from the user interface into two requests: to the Text search engine and the Image search engine (PERTIMM, INRIA).
- To mix the image pertinence algorithm with the text pertinence algorithm (PERTIMM, INRIA).
- To send the results to the user interface (PERTIMM, INRIA).
- To develop the user interface for the mixed text and image search (ROBOTIKER, PERTIMM, INRIA).
- Integration tests and validation (ALL).

4.3.2 WP3 main meetings

Date	Place	Nature of the meeting	Participants	Subject
3rd April, 2007	Conference call	Technical meeting	University of Cardiff ; INRIA; PERTIMM, ROBOTIKER; SERAM	Work progress
24th April, 2007	PERTIMM, Asnières, France	Technical meeting	UNIVLEEDS; INRIA; PERTIMM, ROBOTIKER; SERAM	Work progress

Table 8: WP3 main meetings

4.3.3 Participants role and main contributions

The table below gives an overview of the main contributions:

WP3				
Partner	**Role**	**Main contribution**	**Man month foreseen for the whole WP**	**Man month declared so far**
PERTIMM **(WP Leader)**	Mixed text and image search algorithm, interface for the mixed text and image search, Tests and validation	FSE specifications and development. Indexation integrating ontologies and image validation. Integration and tests for prototype 2	16.5	10.25
INRIA	Mixed text and image search algorithm, interface for the mixed text and image search, Tests and validation	FSE specifications, tests on re ranking algorithms, image validation. Integration and tests for prototype 2	13	4.5
ROBOTIKER	Technical user interface, interface for the mixed text and image search, Tests and validation	Provided the user interface for prototype 2 thus including a user interface for the fusion search engine. Integration of all modules and tests for prototype 2;	15	8.5
SERAM	Tests and validation	Pilot tests	8	1
CU	Tests and validation	-	3.5	0
CRF	Tests and validation	-	2.5	0
UNIVLEEDS	Tests and validation	Tests and validation	4	0.67
SB	Tests and validation	-	0.5	0

Table 9: WP3 Participants role

4.3.4 Work package progress of the period

- ***T3.1 : Development of the mixed text and image search algorithm***

The main objective of WP3 is to develop a mixed text and image search algorithm that will combine as much as possible the benefits of using multiple document signatures (e.g. text and image). WP3 builds on the existing search algorithms based in visual signatures (developed in WP4) and text descriptions (developed in WP5).

PERTIMM achieved D3.1 deliverable “Intermediate report on textual similarity search (+XML description)”, focusing on the state of the art on textual search and including some modifications and implementations proposed by SERAM in order to improve it.

INRIA started WP3 by building a state of the art concerning the multi-modal search by image and text of multimedia repositories. An in depth state of the art will be presented in detail in the next meta-deliverable (Month 21).

PERTIMM worked with INRIA on the fusion search engine specifications through several discussions. An analysis of the state of the art including the semi-automatic annotation of images with keywords and in extension [ADA03], [DUY02], [LU00, [KHE04], [ZHA05], the indexing and retrieval relying on keywords and visual features [CAS98], [LU00], [SMI01], [ZHO02], obtaining a feature vector representation based on keywords annotating an image [ZHO02], [KHE04] or hard representation [LU00], latent semantic indexing [CAS98], [ZHA02] and finally the link with relevance feedback [LU00], [ZHO02], [KHE04] was achieved. Results show that multi-modal search methods, e.g. search using several types of document description, can be divided in two main categories:

- Early fusion of description spaces: the combined descriptor lives in the product space of the mixed representation. Typical search sessions (Query by Example, …) can be performed without any further distinction. The main advantage is that the early binding of description spaces allows the re-use of the search algorithms without further modification or adaptation. However, the contribution of each descriptor in the final result is fixed and cannot be modified.
- Late fusion of results: the final result of a query is obtained as a fusion with re-ranking of the results obtained on each description separately. This schema allows the dynamic weighting of the importance of each component at the query time and is more adapted to interactive generic systems like TRENDS system.

From this analysis it follows that late fusion of results with re-ranking is a better adapted method for TRENDS system, since it allows the user to modify at any time the importance of each query component (visual or/and text). This method is also better adapted to the general architecture of TRENDS system. Since the system already deploy search methods for text and image separately, the late binding with re- ranking is more natural and preserves the integrity of each search module, making the system more easy to maintain and upgrade.

INRIA interacted continuously with PERTIMM to identify the technical details involved in the mixed use of text and image technologies. Finally, INRIA performed experiments involving fusion of results by re-ranking. These will help in defining the most fitted internal architecture for the Fusion Search Engine.

A technical meeting was organised by PERTIMM in early April in order to gather all the technical partners involved in the software development process. A document presenting the modules and their links has been provided to all partners in order to illustrate the whole project architecture.
All partners involved in the development of any module have contributed to the internal document “System links formats & modules description” for the whole system integration. Regular and continuous exchanges have been performed between the partners. Two main schemas now represent the core of the system where interactions between modules are clearly identified. The common technical document gathers all data from each partner and fully describes every module and every exchange protocol in terms of software characteristics, hardware pre-requisites, innovation, and usage within the whole process.
The version of the fusion search engine implemented and integrated in prototype 2 does not achieve the mixt text and image search at this stage. This first version of the FSE is able to receive text requests and provide images as result.

The index used for FSE includes the image validation results (INRIA image analyser) and the ontology tags (CU ontology tagger). As a result:

- only validated images can be retrieved,
- each image in the result provides the list of its associated ontologies.

This version has been validated (T3.3) for Prototype 2.

Then, PERTIMM’s main contribution has been the management of the technical description of the links, modules and protocols for prototype 2. Now the system architecture is well defined as well as the relations between the constitutive modules: exchange XML formats are fully specified. The first version of the fusion search engine was implemented, where mixed text and image search is not yet wholly achieved, but from which it is possible to receive text requests and provide image results. The index used for FSE includes the image validation results and the ontology tags.

T3.2 : User interface for the mixed text and image search

The definition of the detailed XML format for data exchange between the interface and the mixed text and search engine has been accomplished. Continuous conversations between PERTIMM and INRIA have been carried out to achieve a common format suitable for all the modules, trying to fit the necessities of the interface and the requirements of the data retrieval servers.
This work enriched a technical document gathering all exchanges and protocols formats between modules.
The resulting implementation has been validated (T3.3) in Prototype 2.

T3.3 : Integration tests and validation

Prototype 2 is the deliverable result of this integration and validation process.
This version of FSE as well as its user interface have enabled to:

- consolidate the module,
- validate the integration of the FSE in the whole architecture,
- validate the communication with the user interface in both directions : launch a request to the FSE and receive results from the FSE

It is possible for end users to test the module via the user interface provided by ROBOTIKER.

4.3.5 Deliverables and milestones

D3.1 “Intermediate report on textual similarity search” has been elaborated by PERTIMM. This report consists in the state of the art on the text search.

Deliverable No	Deliverable title	WP N°	Lead contractor	Date due	Actual delivery date
D3.1	**Intermediate report on textual similarity search**	3	PERTIMM	M12=Dec 2006	15 Feb 2007

Table 10: WP3 Deliverables so far

No milestone was defined for this period.

4.3.6 Difficulties encountered

The only difficulties encountered were in the integration of the two search engines for text and image, into the user interface. They have been solved by the spiral method used, exchanging mails and performing trials.

4.3.7 Conclusion/What still has to be done

The fusion search engine will be fully implemented for next prototype and the module will be delivered in month 26. It will then be able to merge and rank the results from both the text and the image search engines. The user interface also called the request manager server will certainly evolve since then but the very final version is not planned before month 30.

4.4 WORKPACKAGE 4: IMAGE CONTENT DESCRIPTION TECHNOLOGY

WORK PACKAGE DESCRIPTION	
Starting date: 3 **Duration:** 26	**Total Effort (man/month): 64,5**
Partners involved:	**Effort (man/month):**
INRIA **(WP Leader)**	25.5
PERTIMM	6.5
ROBOTIKER	14
SERAM	8
CU	3
CRF	2.5
UNIVLEEDS	4
SB	1

Table 11: WP4 Presentation

4.4.1 WP4 objectives

In WP4, the image analysis and visual appearance modelling methods will be used to design new appropriate algorithms and signatures for the visual search in the context of the project data tendency. Besides, the colour, shape and texture information descriptions for visual ambiance description, more powerful methods for online interactive query, e.g. relevance feedback, will be provided. Object recognition algorithms will be investigated with regards to invariance properties constraint for the designers and geometric spatial configuration modelling of visual features.

Detailed list of objectives:

- Development of the signature extraction algorithm for mono-sector and ambience.
- Interface between PERTIMM repository and INRIA image search engine.
- Development of the pallets extractions from selected images.
- User interface development for the pallets and ambience.
- Integration tests and validation.

4.4.2 WP4 main meetings

No meeting during the period.

4.4.3 Participants role and main contributions

WP4			
Partner	**Role**	**Man month foreseen for the whole WP**	**Man month declared so far**
INRIA **(WP Leader)**	Signature extraction algorithm for mono-sector and ambience, Interface with PERTIMM repository, pallets extractions, interface for pallets and ambience, tests and validation	25.5	10.19
PERTIMM	Interface with INRIA image signatures, tests and validation	6.5	3.4
ROBOTIKER	Signature extraction algorithm for mono-sector and ambience, interface development for the pallets and ambience, tests and validation	14	0
SERAM	Tests and validation	8	1.65
CU	Tests and validation	3	4.5
CRF	Tests and validation	2.5	0
UNIVLEEDS	Tests and validation	4	0.93
SB	Tests and validation	1	1

Table 12: WP4 Participants role

4.4.4 Work package progress of the period

T4.1 Development of the signature extraction algorithm for mono-sector and ambience

Work performed in T4.1 during the last six months can be divided in three categories, as follows.

1. Database indexing and validation. Two successive grabbings of the TRENDS database, obtained from the list of representative sites by sectors of influence, have been provided by WP5. The first grabbing contained ~320,000 images and the size of the image was limited to greater than 50KB. The second grabbing, made available for the TRENDS software prototype 2, contains ~520,000 images, limited at size larger than 10KB. The global visual appearance of the images has been extracted using colour, texture and shape descriptors (signatures). The employed descriptors are the HSV histogram (colour), histogram weighted by the probability of the colour of the current pixel (colour and texture), Laplacian weighted histogram (colour and shape), Hough histogram (shape) and Fourier histogram (texture). These descriptors have been extensively tested and are described in detail in deliverable D4.1 (also including a state of the art concerning image signatures).

To maintain a reasonable search time (under 1 second) on such a large image database, a reduction of dimension have been performed using Principal Component Analysis (PCA) and the most first 60 principal components have been retained after several tests. This provides a good compromise between the size of the descriptors, speed of the search engine and the quality of the results. This step is of paramount importance, especially for the relevance feedback component, which evaluates several times the kernel function for every image in the database.

2. Image Search Engine Implementation. A second group of works performed in this task concerns the implementation of the Image Search Engine (ISE) server that is included in the TRENDS software Prototype 2 (delivered at month 18). Both Query by Example and Relevance Feedback search paradigms are available (**Figure 4:** *Functional diagram of the Image Search Engine*
).

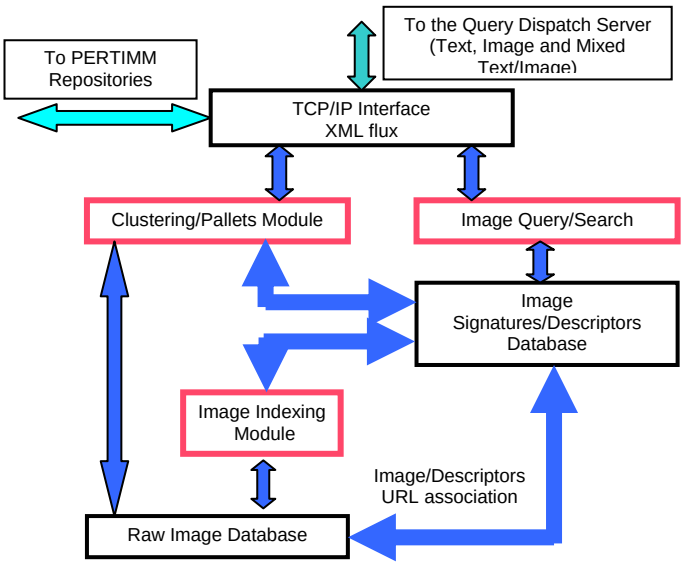

Figure 4: Functional diagram of the Image Search Engine

The software modules that have been implemented are:

- Image Query/Search module
- Image Indexing module

The Clustering/Pallets module will be available for Prototype 3. The Query/Search module offers the possibility to perform queries by image similarity (colour, texture and shape) and semantic queries by relevance feedback.

The server interfaces with the TRENDS system through a TCP/IP interface: queries and answers are formulated using an XML flux.

3. Integration of the Image Search Engine into the Prototype 2. The Image Search Engine has been integrated into Prototype 2. The integration work concerns the specification, implementation and testing of the communication protocol through an XML flux. The image retrieval server implements a part of the HTTP protocol and functions using stateless asynchronous procedure.

T4.2 Interface between PERTIMM repository and INRIA image search engine

In task T4.2, work has been performed with PERTIMM on the interface specification for the communication between the TRENDS repositories and image search engines. The TRENDS software use a reference list of images that are employed by all the sub-components (list build in WP1). WP5 will provide a module that regularly checks and updates the list of web sites indexed by the system. Also, the module will be able to add new web sites to the TRENDS repositories or remove web sites considered by the users as non relevant. Task 4.2 specifies the interface between the TRENDS database and the Image Search Engine: the interface is used to upgrade the list of images that are indexed with visual descriptors and to update the reference image list with images that have been found valid by the image indexing module. This is the pool of images available for the users of system to perform queries.
At this moment, all the details of the XML exchange format have been specified. PERTIMM exploits the results of INRIA image analyser to validate images. Only images validated by the analyser can be retrieved by a request on the database, the other are flagged invalid. The database used for prototype 2 includes these characteristics.

Work continues with the implementation of the interface for the local queries: images available locally on the user's computer may be made available for indexing and may be used as query inputs.

T4.3 Development of the pallets extractions from selected images

In Task T4.3 work has started by the study of different case studies, feasibility and different algorithmic options for pallets extraction. The objective is to find and implement the algorithms that are most adapted to the extraction of low level characteristics for the creation of visual summaries of a set of images. SERAM and INRIA will collaborate closely during this task to establish the requirements for the pallets extraction module (CTA method) and to study the feasibility of different approaches. We started by investigating the state of the art in image segmentation, classification and clustering of parts of images. We envision an interactive interface where the user may supervise the automatic work done by the system.
Also, since the image retrieval server implementation has started and the pallets module will be a part of it, work has been done to assure that it will seamlessly integrate.

T4.4 User interface development for the pallets and ambience

This task has not started yet.

T4.5 Integration tests and validation

Several internal tests for the Prototype 2 repository (~520,000 images) have been necessary. These concerns mainly dimensionality reduction by Principal Component Analysis to accelerate the search and validation of images that can be processed by the indexing module.

4.4.5 Deliverables and milestones

D4.1 “Intermediate report on visual description” has been elaborated by INRIA. It contains a state of the art for image visual descriptors and query methods, illustrated by examples extracted from the work done within WP4.

Deliverable No	Deliverable title	WP N°	Lead contractor	Date due	Actual delivery date
D4.1	Intermediate report on visual description	4	INRIA	M12= Dec 2006	5 Feb 2007

Table 13: WP4 Deliverables so far

Milestone No	Milestone title	WP N°	Lead contractor	Date due	Actual date
M4.1	Visual content database filtering methods and Clustering methods for pallets extraction	**4**	INRIA	M12= Dec 2006	5 Feb 2007
M4.2	Interconnection specification with textual search methods	**4**	INRIA	M12= Dec 2006	5 Feb 2007
M4.3	Object retrieval methods with geometrical configuration modelling	**4**	INRIA	M18= June 2007	/

Table 14: WP4 Milestones so far

4.4.6 Difficulties encountered

A new range of problems, specific for the large image databases grabbed directly from the Internet, have been discovered:

- Many images are cited in the web pages although they do not exist anymore on the web site (we encountered more than 30000 images in this situation, which is non negligible since it represents around 5% of the database)
- Many images are saved on the disk but the files contain only text equivalent of a HTTP error or a mis-configuration of the server. At this time we are discussing with PERTIMM the best method to detect this kind of errors.

These errors are expected in this situation and do not constitute an element of surprise. Measures have been taken to render the indexing software tolerant to this type of faults.

4.4.7 Conclusion/What still has to be done

To sum up, the main achievements of WP during the period are:

- Indexing and validation of the TRENDS database for the Prototype 2 (~520,000 images)
- Implementation of the Image Retrieval Engine (Server). It includes the possibility to formulate queries by visual similarity using any combination of colour, texture and shape signatures as criteria. It includes also the possibility to use relevance feedback based in Support Vector Machines to perform semantic queries
- Integration of the Image Retrieval Engine into the TRENDS Prototype 2

The results of the tests with the real users (designers) will be integrated into the system to prepare the final version of the query by image similarity and relevance feedback modules.

Work will continue with the extraction of the pallets from sets of images selected by the user. Also, work is under way to implement clustering of images using different visual criteria. Clustering methods will be also needed for the pallets extraction algorithms.

4.5 WORKPACKAGE 5: INTELLIGENT AGENT WEB TECHNOLOGY

WORK PACKAGE DESCRIPTION	
Starting date: 4 **Duration:** 27	**Total Effort (man/month):** 78
Partners involved:	**Effort (man/month):**
PERTIMM **(WP Leader)**	23
SERAM	7
INRIA	6
ROBOTIKER	11.5
CU	21.5
CRF	5
UNIVLEEDS	3.5
SB	0.5

Table 15: WP5 Presentation

4.5.1 WP5 objectives

The objective of WP5 is to develop an intelligent Web agent to find documents containing images related to a semantic description given by designers, mixing text and images signatures.

Detailed list of objectives:

- To elaborate a list of sites to harvest on internet, belonging to the needs of the users. ✓
- To elaborate a unique database of contents (texts and images) for all TRENDS members.
- To continuously adapt the content of the database to the needs.
- To elaborate semantic contents for the intelligent agent.
- To develop the intelligent agent to find on internet new contents absent from the database.
- To develop a user interface for the intelligent agent.
- To test and validate the overall WP contents and developments.

4.5.2 WP5 main meetings

Date	Place	Nature of the meeting	Participants	Subject
13-Feb-2007	SERAM	Technical meeting	PERTIMM, SERAM	Data Base Content Review

Table 16: WP5 main meetings

4.5.3 Participants role and main contributions

The table below gives an overview of the main contributions:

WP5				
Partner	**Role**	**Main contribution during the months 13-18**	**Man month Foreseen for the whole WP**	**Man month declared for the period**
PERTIMM (WP Leader)	Elaborate list of sites, Harvesting the internet, delivering the database of web resource	Improved the grabber to achieve the objectives of the period. Built the database content for Prototype 2, integrating the image validation data from INRIA and the ontology tags from CU.	23	14.35
SERAM	Elaborate list of sites	List of sites covering 15 sectors	7	3.9
INRIA	Indexing the images	Image indexation and validation	6	3.25
ROBOTIKER	User Interface for the meta search engine and the database management	User interface for prototype 2	11.5	4
CU	Ontology	Ontology tags for each document	21.5	14.15
CRF	-	-	5	0
UNIVLEEDS	-	-	3.5	0
SB	-	-	0.5	0

Table 17: WP5 Participants role

4.5.4 Work package progress of the period

T5.1 : Elaborate a list of sites for the database

This task ended at the end of August 2006.

T5.2: Harvesting and indexing

PERTIMM worked on the last web site list to harvest the texts and images, focusing on new sectors.

SERAM tested 13 starting addresses of *image* sector. These websites are protected against crawler, and the crawling is poor (no interesting images). HTTrack has been tested; it has the same problem as PERTIMM crawler. It was decided to produce another starting addresses list for image sector (cinema, nature, urban, music, animals, travel, SF and VR.). 1500 websites were added to the initial list to describe these 8 sectors.
The crawling of these websites (for image sector) is now available.

The list of sites provided by SERAM (before April 11th, 2007) was fully grabbed. It represents: 368 GB (6 234 661 files) of data including 245 GB (5 248 754 files) of indexable text, 47 GB (817 456 files) of indexable images.
This total amount of data (text and images) grabbed was filtered so that some sites are now invalidated and added in a "black list". In fact, some grabbed websites have far more text files than images (or far more weight of text data than image data): the pollution created this way makes all the process slower for a few of images, so we have blacklisted these websites. Moreover some websites use server technology making the images impossible to download. The main filtering issue is the ratio between images and text number and weight.
The final amount of data, resulting from the valid sites after the filter process has been run, is: 56 GB (1 465 517 files) of data including 17 GB (859 788 files) of indexable text, 34 GB (563 882 files) of indexable images.
This filtering has many advantages:

- A major part of the image pool grabbed was successfully kept (~ 70%)
- Only the meaningful texts linked to these files has been kept (~ 10%)
- The amount of text data is drastically reduced, so the search time will be really improved.
- The communication of less data takes less time.

T5.3: Elaborate semantic contents (PERTIMMizers) to find other sources

PERTIMM worked on the semantic adjectives to be used as PERTIMMizers, and to be sent to CU for integration in OntoRo.

CU worked on:

- Development of ontology descriptors
- Coding for outputting intermediate calculation results such as TFIDF and ontology descriptors for a whole document for evaluation and debugging purpose.
- Integrate ontologies: create CTA ontology, contribute its related part for an IPROMS paper Within the ontology navigation field
- Study the initial approach of methods for ontology navigation, Design ontology navigation protocol
- Study the approach to improve the tagging accuracy by adding part-of-speech information

Forty three (43) PERTIMMizers were tuned by SERAM from the semantic adjectives (excel file). The tuning of this type of PERTIMMizers (abstract concepts) is much harder than in the physical world. The validity of the PERTIMMizers was tested on the second version database. The validity on the third database will be tested in July.
Further development of the indexing procedure (POS tagging, automatic detection of the language, improving the HTML parsing component) has been carried on in the last months. The last version of the database has been tagged for ontologies.

T5.4: Develop an intelligent agent

After the first tests, PERTIMM started to modify its Meta Search Engine to take into account the specific need of Trends system, to collect images with the associated texts that have been found by the “classical” search engines used for the Meta search. PERTIMM also improved grabber development so as it becomes more easily reloaded in case of errors. This goal has been successfully achieved and PERTIMM is confident in the stability of its grabber. The grabbing process is now able to provide enough data about the site so that it is possible to filter the sites afterwards. PERTIMM worked on the basic processes needed for the automatisation of the grabbing / filtering / indexing process. The generation of the correct flow for indexation that should come out from the grabbing step is operational. Webpages without a link to an image validated by INRIA has been removed from the flow of indexation. Crawler and the meta-search engine specifications were added by SERAM to the general specifications. CU realized the state of the art review in recent approaches to indexing, annotating and topic identification related to Ontologies.

T5.5: User interface development

Prototype v2 has been studied by ROBOTIKER and the development has been achieved in C# for Prototype 2. Preliminary tests have been made before choosing C#. Semantic navigation possibilities have been evaluated. ROBOTIKER started to specify with PERTIMM the HMI that will interface the user and the data base grabbing process, the intelligent agent, by means of specific queries to the web. The document “System links formats & modules description” contains the preliminary description of this interface. Functional and detailed specifications for the exchange format have been performed to integrate the ontology tags and PERTIMM indexer. PERTIMM worked on the needs of the user interface for the management of the database. PERTIMM ensured that it is possible to extract the ontologies references from the results of a request.

T5.6: Integration test and validation

Image search engine architecture refinement has been done to prepare the network protocol for the exchange of information with the text search engine. Tests have been run to validate the functionalities implemented in prototype 2.

5.5.5 Deliverables and milestones

Deliverable No	Deliverable title	WP N°	Lead contractor	Date due	Actual delivery date
D5.2	**Report on semantic methodology used by PERTIMM and CU**	5	PERTIMM	M18= June 2007	/

Table 18: WP5 Deliverables so far

Milestone No	Milestone title	WP N°	Lead contractor	Date due	Actual date
M5.1	First milestone at the end of the first site list harvesting and indexing	**5**	PERTIMM	M12= Dec 2006	/
M5.2	Second milestone after validation of the first user interface prototype	**5**	PERTIMM	M18= June 2007	/

Table 19: WP5 Milestones so far

4.5.6 Difficulties encountered

The main difficulties encountered concerns the complexity of internet, and specifically of image grabbing because of the protection that has been put on them by many sites. To respect these protections, we need to avoid these sites by putting them in the blacklist.

4.5.7 Conclusion/What still has to be done

We have still to continue the process of harvesting and indexing to find interesting images which are not protected by software traps.

4.6 WORKPACKAGE 6: USER INTERFACE DEVELOPMENT AND INTEGRATION

WORK PACKAGE DESCRIPTION	
Starting date: 13 **Duration:** 21	**Total Effort (man/month):** 41.5
Partners involved:	**Effort (man/month):**
ROBOTIKER **(WP Leader)**	19.5
SERAM	7
PERTIMM	4
INRIA	1
CU	3.5
CRF	3
UNIVLEEDS	2.5
SB	1

Table 20: WP6 Presentation

4.6.1 WP6 objectives

The objective of WP6 is to elaborate the whole interface of TRENDS system. This interface is a collection of different interfaces that present different functionalities, such as the mixed image and text search, pallets generation, ambience boards' generation, mapping, chronological and sectorial clustering.

4.6.2 WP6 main meetings

No specific meeting for WP6 during the period. However, the issue has been dealt in meeting in PERTIMM of 24.04.07 when the general roadmap of Prototype 2 and 3 has been established.

4.6.3 Participants role and main contributions

The table below gives an overview of the main contributions:

WP6			
Partner	**Role**	**Man month Foreseen for the whole WP**	**Man month declared so far**
ROBOTIKER (WP Leader)	Integration of all users interfaces, user interface for the mono-sector mappings, user interface for the ambience mappings, statistics interface, validation and tests	19.5	7.94
SERAM	Validation and tests	7	3.6
PERTIMM	Validation and tests	4	0.5
INRIA	Validation and tests	1	0
CU	Validation and tests	3.5	0
CRF	Validation and tests	3	0
UNIVLEEDS	Validation and tests	2.5	0
SB	Validation and tests	1	0

Table 21: WP6 Participants role

4.6.4 Work package progress of the period

- ***T6.1 : Integration of all user interface developments into a reusable API***

The development of the user interface for the prototype 2 has been carried out during this period.
The D2.4 first graphical interface (ppt non interactive preliminary version) was the main input for the development of the user interface of the prototype. After minor comments from the users, in January 2007 this task started.

Initially, it was necessary to identify the most suitable software to develop the user interface. Fast responses with the user and with the server communication were required. At the same time, it was needed to develop graphically advanced elements, and for further exploitation modules, the possibility of building a multi platform system was really appealing.

These preliminary considerations led to the decision that Prototype 2 was developed in C# for graphical elements and C/C++ for core functions. The basic functionalities available for initial tests with users will be the searches with text and image (separately) and basic functionalities with the UI, such as spheres and image management and display modalities. Prototype 3 and final software will be developed in wxWidgets (more complex), since this allows the system being multiplatform. Prototype 3 will take into account the feedbacks of the users over the prototype 2.

Once the data exchange protocols for communication (sending and receiving of XML file with query/responses) have been defined, it has been necessary to implement them in C++. The main problems found have been related to the big amount of information to manage at the same time. Threading and programming optimization techniques are applied. The UI aims at being fast (regarding interaction with the user) and robust. Every error is notified to the user. For the pilot tests and test with the end users a log file is also automatically generated. This way, times of connection and reception of responses from the servers and interface management are registered, in order to identify the weaker points. The final executable for the tests is easily installed in every computer and needs only 300 KB for running.

During this period, the User Manual of prototype 2 was also written in order to provide the basic information for the users to test. It gathers all the information about the available functionality, the steps to proceed, and the required actions for the installation of the UI in every computer.

- ***T6.2 : Development of the user interface for the mono-sector mappings***

This task has not started.

- ***T6.3 : Development of the user interface for the ambience mappings***

This task has not started.

- ***T6.4 : Development of the statistics interface***

This task has not started.

- ***T6.5 : Integration tests and validation***

Integration activities have started at the beginning of June. Under T3.2, it has been specified a common communication protocol (HTTP POST method for XML file exchange) for UI, TSE and ISE, and the XML files for queries and responses. Once the 3 partners implied (PERTIMM, INRIA and ROBOTIKER) have developed the code for their corresponding communication and exchange of data, the integration has started.

Separate integration sessions have been planned between the user interface and the separate search engines. First, ISE and UI were integrated. For that, two days were planned where debugging actions were performed in both companies (ROBOTIKER and INRIA) at the same time and the steps were followed by phone till the final results were achieved. After this integration with the image server, the integration with the text server was carried out in other three days' session and finished. The preliminary version of the prototype 2 was prepared. Exhaustive tests were made by the separate developers in the following weeks. The detected bugs were communicated and properly solved. The robustness of the system, installation issues and speed of interaction and connection was also tested. ROBOTIKER made many improvements to guarantee the robustness of the system. The final version of the user interface for the tests with the end users is available for all the partners in order to test it. It is really easy to install and only requires 300 Kb. All the detected errors and proposed improvements will be taken into account for further versions of the user interface.

4.6.5 Deliverables and milestones

The D6.1 has not been provided since we are waiting for the new Technical Annex to be approved and concentrated on meta-deliverables.

Deliverable No	Deliverable title	WP N°	Lead contractor	Date due	Actual delivery date
D6.1	**User interface description**	6	ROBOTIKER	M18= June 2007	/

Table 22: WP6 Deliverables so far

No milestone was defined for this period.

4.6.6 Difficulties encountered

The main difficulty in this period (prototype 2) was due to the management of such a big amount of images to handle at the same time. It was needed to create parallel process in the computer to manage the display of hundreds of images and to allow the possibility of launching several queries simultaneously, which is already possible in prototype 2.

Other difficulty the ROBOTIKER team found is the complexity in the graphical elements proposed by the end users in the WP1 and WP2. They are not standard elements that can be found in every development environment, but they have to be created one by one, carefully to adapt the dimensions and functionality. This was a big effort.

4.6.7 Conclusion/What still has to be done

Prototype 2 has been developed in C# and it has an inherent middle-high difficulty, but anyway, it is a Microsoft platform and there are already existing developments and well documented information. On the contrary, the prototype 3 was decided to be developed In CodeBlocks IDE (Integration Development Environment), which is the best one for wxWidgets development. The main reason for that is the possibility of building distributions for different platforms (Windows, Mac, Unix) with the same compiled code. This platform allows selecting different options and linking possibilities for that. This open source environment is promising but presents a high difficulty, since the working environment is complex, and the documentation is poor and not properly ordered, but linked to forums. The researcher is doing a big effort in finding the best solution.

After the test of the end users on prototype 2, their feedbacks will have to be inserted in the next versions of the software.

4.7 WORKPACKAGE 7: END-USER EVALUATION

WORK PACKAGE DESCRIPTION	
Starting date: 13 **Duration:** 24	**Total Effort (man/month):** 51.5
Partners involved:	**Effort (man/month):**
CRF **(WP Leader)**	19
SERAM	9
UNIVLEEDS	13
PERTIMM	3.5
INRIA	1
SB	6

Table 23: WP7 Presentation

4.7.1 WP7 objectives

The objective of WP7 is to show the practical applicability of TRENDS concepts within an industrial environment with a sufficient complexity to show all general advantages of the architecture. A verification of the results is important in order to ensure the practical relevance of the test cases. Beside technological aspects, possible limitations coming from implementation costs within real industrial constraints should be investigated.
To do that, a pilot testing phase is foreseen with the aim of analyzing the impact and the benefits of the TRENDS concept and solution, providing an intensive "in-house" testing of the overall solution, evaluating its performance, and identifying possible refinements. The pilot phase will be carried out through the implementation of 2 test cases, which will be followed by the evaluation of the achieved performances and the analysis of the requirements for the generalization of the results. The test cases will be designed according to specific needs of industrial partner.

4.7.2 WP7 main meetings

A detailed planning of WP7 was prepared by CRF with UNIVLEEDS. During the first year meeting in Paris, this description of WP7 was shared with the whole consortium. This was followed by a bilateral meeting between SERAM and UNIVLEEDS in March 2007, where the user testing approach was specified and more detailed.

4.7.3 Participants role and main contributions

The table below gives an overview of the main contributions:

WP7			
Partner	**Role (during the third 6months period)**	**Man month Foreseen for the whole WP**	**Man month declared so far**
CRF (WP Leader)		19	2
SERAM		9	3.7
UNIVLEEDS		13	3.86
PERTIMM		3.5	0
INRIA		1	0
SB		6	0.87

Table 24: WP7 Participants role

4.7.4 Work package progress of the period

The work conducted for the period is in line with the expectations. The work is in progress and there are not critical issues to be highlighted.

T7.1 : Analysis of the activity of the end-users

The way to approach the work package has been defined in order to detail the WP planning. As end users, CRF and SB contribution within the reporting period consisted in:

- end-users tests on LABELS (sorting and labelling exercise);
- evaluation of the icons (labelling and association);
- icons evaluation (metaphor by the end-users).

To this end, the usability test protocol of TRENDS interface that was prepared in the previous period was applied by SERAM. These tests started in April and were intended to end in July.

UNIVLEEDS worked on recruiting designers for planned tests; preparing for testing.

- ***T7.2 : Final validation of the design and ergonomics with end-users***

This task has not started yet.

4.7.5 Deliverables and milestones

No deliverable and milestone were defined for the period.

4.7.6 Difficulties encountered

No difficulties have been encountered during the period.

4.7.7 Conclusion/What still has to be done

First round of tests and validation on Prototype 2 will be conducted in September. Test and validation phase for Prototype 3 will follow.

4.8 WORKPACKAGE 8: CONTINUOUS ASSESSMENT

WORK PACKAGE DESCRIPTION	
Starting date: 1 **Duration:** 36	**Total Effort (Man month):** 7
Partners involved:	**Effort (Man month):**
SERAM **(WP Leader)**	2.5
PERTIMM	1.5
INRIA	1
ROBOTIKER	1
CRF	1

Table 25 : WP8 Presentation

4.8.1 WP8 objectives

To proceed with continuous assessment in each Work package of the technological research activities and dissemination activities against specified criteria and obligations foreseen in the Appendix X. This is centralised by SERAM and mainly done by each Work package Leader.

4.8.2 WP8 main meetings

Internal assessment was implemented during the one year project review meeting. Apart from that no specific meeting related to WP8 was held during the period.

4.8.3 Participants role and main contributions

The table below gives an overview of the main contributions:

WP8				
Partner	**Role**	**Main contribution**	**Man month Foreseen for the whole WP**	**Man month declared for the period**
SERAM **(WP Leader)**	Centralisation of assessment data, WP1 and WP2 assessment	Management of the internal and external assessment	2.5	2.05
PERTIMM	WP3 and WP5 assessment	Overall assessment of year 1 project and outputs	1.5	0.8
INRIA	WP4 assessment		1	0.24
ROBOTIKER	WP6 assessment		1	0.43
CRF	WP7 assessment		1	0.1

Table 26 : WP8 Participants role

4.8.4 Work package progress of the period

WP2 was internally assessed by the consortium members through a questionnaire distributed during the project review in January, and through the reading of WP2 reports. Besides WP2 outputs were assessed by two external experts: Claudia Eckert and Nathalie Bonnardel. In the related period, a new expert was included in the scientific board of TRENDS after the request of the Commission: Nadia Bianchi-Berthouze who was invited to the next project review meeting of July (11-12).

The internal assessment reports and the report from C. Eckert were included in the previous activity report. The report from N. Bonnardel figures in Annex 10.

	Technological Research criteria	- -	-	0	+	++
WP2	Number of reference sites					
	Relevance of reference sites					
	Integrated professions					
	Stimulation power (randomness)					
	Precision and detail of information					++
	Intelligibility					++
	Ease of use					
	Usefulness					++
	Number of users tested					++
	Relevance of information					++
	Freshness of information					++
	Quality of images					++
	Automatic updating capacity					

	Reports criteria	- -	-	0	+	++
WP2	User-friendly appearance					++
	Clearness					++
	Readability				+	
	Definition of concepts				+	
	Structure					++
	Concision					++
	Consistency					++
	Technical content					++
	Scientific content					++
	Completeness					++
	Verifiability of contents					++

Table 27 : WP2 Assessment by Nathalie Bonnardel: Technological research and reports

4.8.5 Deliverables and milestones

Deliverable No	Deliverable title	WP N°	Lead contractor	Date due	Actual delivery date
D8.1	Internal and external report on project assessment	8	SERAM	M12=Dec 2006	9 Feb 2007

Table 28: *WP8 Deliverables so far*

No milestone was defined for this WP.

4.8.6 Conclusion/What still has to be done

The scientific board currently involves three experts representing several points of views which are crucial for the project: design science and artificial intelligence, cognitive psychology (understanding of the cognitive process involved into design process), and Kansei based image retrieval. This scientific board will be completed with two other experts in image retrieval (A. Del Bimbo, or H. Burkhart) and textual search (M. Shackelford or J. Holt).

4.9 WORKPACKAGE 9: MANAGEMENT AND COORDINATION

WORK PACKAGE DESCRIPTION	
Starting date: 1 **Duration:** 36	**Total Effort (Man month):** 17.5
Partners involved:	**Effort (Man month):**
SERAM **(WP Leader)**	14
All partners	3.5

Table 29: WP9 Description

4.9.1 WP9 objectives

The overall goal of WP9 is to ensure TRENDS general coordination and follow up, management, dissemination and IPR issues.

- Project coordination activities:
  - The administrative, financial and technical day-to-day follow-up of the project.
  - The contractual reporting activities with the EC, including all TRENDS management and work progress reports.
  - Preparation of the project meetings and related data and deliverables, for those convened in the Project Management Board and the Project Support Team. The agenda of each meeting has to be proposed in advance (reasonable notice given), amended and approved by all the partners concerned.

- Project management activities:
  - The control and transmission of any documents and information connected with the Project to and between the partners.
  - The implementation of TRENDS dedicated communication tools such as a specific web site and forum.
  - The monitoring of the Project Quality Assurance Plan and Risk Management Plan.

- Coordination activities related to the Project dissemination, exploitation and IPR issues:
  - The preparation of a dissemination and exploitation plan.
  - A contribution to raise public awareness of TRENDS related matters (Dissemination strategies).
  - The monitoring of the Project IPR Plan as foreseen in TRENDS Consortium Agreement.
  - The following and revision of the plans for using and disseminating knowledge based on the Consortium Agreement.

4.9.2 WP9 main meetings

The following meetings were organized:

Date	Place	Nature of the meeting	Participants	Subject
9-10Jan-2007	SERAM	One year meeting	All partners	Current state and next steps of the project, Dissemination and IPR issues.
19-Jan-2007	SERAM	Technical meeting	PERTIMM, SERAM	First review meeting's preparation
9-Feb-2007	SERAM	Technical meeting	INRIA, PERTIMM, SERAM	First review meeting's preparation
20-Feb-2007	SERAM	Technical meeting	INRIA, PERTIMM, SERAM	First review meeting's preparation
26-Feb-2007	SERAM	First review meeting	Reviewers: H. Krömker, J. C. Rodriguez Commission officer: R. Klar All partners	Pre-review recommendations and related actions and results, Updated state of the art, Achievements since the pre-review, Quality implementation, Dissemination implementation.
9th May, 2007	Audio conference	Consortium audio conference	All partners	Management & technical issues
25th May, 2007	Audio conference	WP leaders concertion meeting	SERAM, PERTIMM, INRIA, UNIVLEEDS,	Preparation of the 30th follow-up meeting in

			ROBOTIKER	Luxemburg
30th May, 2007	Luxembourg	Follow-up meeting	SERAM, INRIA, PERTIMM, ROBOTIKER, UNIVLEEDS	Specification of the new organisation of work in TRENDS
4th June, 2007	Audio conference	Follow-up meeting	All partners	Debriefing of follow-up meeting in Luxembourg
11th June, 2007	Audio conference	Follow-up meeting	All partners	Consortium follow-up meeting

Table 30: *TRENDS WP9 main meetings*

4.9.3 Participants role and main contributions

The table below gives an overview of the main contributions:

WP9				
Partner	**Role**	**Main contribution**	**Man month Foreseen for the whole WP**	**Man month declared so far**
SERAM **(WP Leader)**	Management, coordination and dissemination (MCD)	Management, coordination and dissemination (MCD)	14	11.9
INRIA	MC	MC	0.5	0.36
SB	MC	MC	0.5	0,57
PERTIMM	MC	MC	0.5	0.3
CU	MCD	MCD	0.5	1.2
CRF	MC	MC	0.5	0.4
UNIVLEEDS	MCD	MCD	0.5	3.23
ROBOTIKER	MC	MC	0.5	0.235

Table 31: *WP9 Participants role*

4.9.4 Work package progress for the period

- ***Administrative and financial follow-up***

Two major meetings took place during the first six months of year 2. Indeed, on the 26th of February, 2007, TRENDS first year review took place at ENSAM in Paris. Following this meeting and the evaluation of the first year project by the European Commission, the project was red-flagged.
Another important meeting followed on the 30th May in Luxembourg with a delegate representation of TRENDS consortium. It was decided that the consortium would submit again some deliverables under the form of meta-deliverables. The draft versions of these documents were sent to Mr. Van Der Eecken on the 7th of June and uploaded on the private part of TRENDS website.

Technical management

A roadmap has been setup in order to coordinate the development efforts between the technical partners. This roadmap includes a checklist of every component or functionality developed within the project. It has been updated several times in the May-June period, more particularly during the technical meetings. Several distant meetings have been setup to coordinate the technical development of the prototype 2. These meetings have been prepared by SERAM, with the help of the technical partners, to ensure the pursuing of the overall goal of the project and to assure a constant effort on each component of the prototype2.

Risk analysis

An AMDEC Risk management was started, including the implementation of the failure mode, causes, solution, a severity index by function in Excel files. The result is composed of two parts:

1. TRENDS PROJECT RISKS MANAGEMENT (PRM) which contains the main risks for all Work Packages,
2. TRENDS PRODUCT RISKS MANAGEMENT (AMDEC) which contains the technical risks (from WP2 to WP7).

A detailed description of this system is available in BMR 8. This risk analysis still needs to be discussed and approved and validated by the whole Consortium.

Quality assurance plan

Following the European Commission requirements during the pre-review meeting in Luxembourg on the 23rd of October, 2006, a European programs manager has been hired by the coordinator. In the same time, an assurance quality plan was thought and progressively set up, implementing some corrective actions for the improvement of management.

- After the completion of the first year of activity on TRENDS project, the coordination team implemented an organization involving all partners in one or several work-packages.
- An organization for the administrative and scientific coordination was defined to increase the quality of documents delivered to the Commission.
- An assessment system was defined with the evaluation from external experts and auto-evaluation of the partners of the project themselves.

These quality procedures were presented during the review meeting on the 26th February, 2007.

Dissemination / Exploitation

A revision of the 'plans for using and disseminating knowledge' was done in relation with the elaboration of deliverables D9.3.2 *Plan for using and disseminating knowledge* and D9.6.1 *Project dissemination and public participation and awareness raising report*. The dissemination strategy was implemented and several actions and outputs were achieved: TRENDS Special Session at I*PROMS Conference has been initiated by CU and SERAM. The event is supported by SERAM, CU and LEEDS.
3000 flyers were printed for TRENDS partners.
At the beginning of the year, a poster was prepared by SERAM and presented at the information days intituled “FP7 in Motion: Cognitive Systems, Interaction, Robotics, Digital Libraries and Content” held in Luxembourg on 24-25 January 2007. Finally, CU presented a research paper at the International Conference on Computer, Information and Systems Science, and Engineering (CISE 2007), Bangkok, Thailand, 29-31 January 2007.
The dissemination activity in WP9 included the improvement of TRENDS website especially by refining the meetings documents presentation on the private part of the website.
TRENDS poster was presented to the CHORUS presentation by INRIA.
Moreover, 6 Papers were written by the consortium for the special TRENDS session at I-PROM conference.
An article about TRENDS project was written and published in ROBOTIKER’s technological magazine.
UNIVLEEDS worked on the preparation of papers (including data analysis, etc.), for I*PROMS (Innovative Production Machines and Systems Conference) 2007, ACII 2007 (Affective Computing and Intelligent Interaction), and ECCE 2007 (European Conference on Cognitive Ergonomics). All of these were accepted (3 papers).

SERAM also worked on the preparation of I*PROMS 2007, IASDR (Conference of the International Association of Societies of Design Research: Emerging Trends in Design Research). All these papers were accepted (2 for I*PROMS, 2 for IASDR).

- ***IPR***

In order to deal with the issue of intellectual property rights linked to the use of public images, LA BOETIE AVOCATS, an association of lawyers located in Paris was mandated by SERAM. Mr. Marc-Olivier Deblanc a lawyer specialized in intellectual property rights has been working on TRENDS case.
He confirmed his first recommendations not to ask for the web-sites proprietors authorizations but use a "Robot Exclusion Protocol' accompanied with the drafting of extremely specific and detailed clauses on the software.
The final report of the lawyer was received by SERAM on the 11th of July and enclosed to BMR 8.

- ***Web-site***

After having received more recommendations from the EC during the project review which took place in Paris in February, SERAM has been working on a new version of the website (version 3).
The initial version of the Website was improved with a more playful aspect and professional appearance.
A new technological support has been found: a content-management system has been chosen because it is evolutive, maintained by a large community and open source. An appropriation of this new platform has been done by the webmaster of TRENDS project.
A list of new and useful functionalities has been established by SERAM and correspondent software components have been found in order to implement them on the website.
The website has been re-developed in order to support even better dissemination and collaboration within the project. The public layout of the website has been redesigned, and more simple pages oriented for a professional interest have been written. Also, the private part of the website has been entirely changed in order to support better collaboration tools: a forum for exchanging within the work packages, a calendar in order to support meetings and work plans, and a file sharing tool in order to exchange files (big files).

Also, the website supports a newsletter letting the managers contact every partner in the project instantly.

4.9.5 Deliverables and milestones

Deliverable No	Deliverable title	Original delivery date	Actual delivery date
D9.9.1	Yearly Management report (Form C…)	M12=Dec 2006	27 Feb 2007
D9.6.1	Project dissemination and public participation and awareness raising report	M12=Dec 2006	15 Feb 2007
D9.3.2	Revised plan for using and disseminating knowledge	M12=Dec 2006	28 Feb 2007
D9.13.2	Annual activity report	M12=Dec 2006	28 Feb 2007
D9.4.6	2-monthly management report N°6	M14=Feb 2007	13 Apr 2007
D9.4.7	2-monthly management report N°7	M16=Apr 2007	15 June 2007

Table 32: *WP9 Deliverables so far*

Milestone No	Milestone title	WP N°	Lead contractor	Date due	Actual date
M9.1	End of the first reporting period	9	SERAM	M12=Dec 2006	**15 Feb 2007**
M9.2	Mid-term assessment	9	SERAM	M18=June 2007	**/**

Table 33: *WP9 Milestones so far*

4.9.6 Difficulties encountered

Some important efforts have been orientated on the general management of the project.

This is a crucial aspect on which the European Commission had insisted on during the pre-review meeting in Luxembourg in October 2006.
Following this meeting, SERAM had recruited a European Programs Manager in order to help in the management of TRENDS. An organization had been thought and progressively implemented in order to mainly improve the communication within the consortium and the quality of reports submitted to the European Commission:
- A new template for bi-monthly reports has been defined for an easier use for the partners and more practicality for the coordinator.
- Some workflows for the drafting of technical and management reports have been implemented, involving more responsibilities for work-packages leaders.
- A system of audio conferences has been set up by the coordinator to cope with the improvement of communication between partners.
- Parallel to these improvements, the web-site has been redefined and strongly thought to be a supporting tool for the management team. For instance, a collaborative zone has been implemented and a specific zone is dedicated to the documents on the way to be validated by partners.
All these efforts aimed at trying and succeeding to overcome the difficulties encountered during the first year of the project.
In the recent months and following the 30th May meeting in Luxembourg, important efforts were mobilized by the consortium in order to draft meta-deliverables and reorganize the technical annex. This new technical annex will allow the consortium to carry on with the project on solid bases avoiding inconsistencies and therefore misunderstandings within the consortium noticed during the first year of activity.

4.9.7 Conclusion/What still has to be done

- The workflows for the drafting of technical and management reports have been implemented, involving more responsibilities for work-packages leaders. These workflows have been sent to the consortium for validation. Once agreed by all, they will be sent to Mr. Van der Eecken for validation. This action should be done by September.
- SERAM won a regional grant of 30000€ that will be mainly used for dissemination activities. The decided actions should begin by October.
- Following the 30th May meeting in Luxembourg, TRENDS consortium committed itself to deliver the following documents to the European Commission in September:
  - An augmented and repackaged version of the year-1 deliverables related to:
    * Meta-deliverable 1.
      State of the art, in particular an analysis of most popular products, tools and methods;
    * Meta-deliverable 2.
      User factors, including functional requirements; ergonomic and interface/interaction related aspects; design, planning and assessment of field tests, their impact on subsequent prototypes;
    * Meta-deliverable 3.
      Intended system architecture and specifications.

    The proposition for the plans of those meta-deliverables has been sent to the European Commission on the 7th of June, 2007 by SERAM.
  - A revised version of the Technical Annex. This should be done by the 15th of September, 2007.

5. CONSORTIUM MANAGEMENT

This section provides general information about the consortium management by describing the management structure, procedures, and the consortium meetings and contributions. Finally, TRENDS website implementation is briefly explained.

5.1 CONSORTIUM MANAGEMENT TASKS AND THEIR ACHIEVEMENT

5.1.1 TRENDS technical Management structure

The core management team of TRENDS project consists of 2 persons for the scientific and technical part of TRENDS:

Carole Bouchard: TRENDS project coordinator

Xavier Mignon: TRENDS technical manager

They both participated from the beginning to TRENDS proposal preparation and to the project launch.

Carole Bouchard is specifically responsible for the overall coordination, for the *Conjoint Trends Analysis* integration and for the continuous feedback of the end-users.

She is supported by two persons for the administrative, legal and financial aspects: Isabelle Cadéac and Eugénie Cazor.

Xavier Mignon is in charge of the technical coordination for the achievement of the three independent technologies (semantic text/images search technology, image content description technology, intelligent agent technology) and their integration.

WP leaders who were involved are: SERAM (WP1, WP2), PERTIMM (WP3, WP5), INRIA (WP4), ROBOTIKER (WP6), and CRF (WP7).

The dissemination manager and IPR manager is SERAM.

The exploitation manager is ROBOTIKER.

5.1.2 TRENDS Management tasks and their achievement

No major change occurred within the partnership during the first six months of year 2.

A minor change occurred by CRF since the 1st of May, 2007. Indeed, Mrs. Francesca Di LUCCHIO has been replaced by Mrs. Carlotta VITALE.

During the first six months of 2007, the management tasks consisted in the day-to-day administrative and financial follow-up.

Assurance quality procedures were implemented and applied to management reports mainly. An increase of internal meetings occured by the coordinator, especially when some documents had to be submitted to the European Commission.

SERAM also implemented a system of audio-conferences to improve the communication within the consortium. This allows a non-virtual and spontaneous communication between partners and a dialogue and decision process speeded up. This allows to ensure all the partners share the same vision of the project goals and next steps.

Finally, a workflow for both technical and management reports has been implemented. This workflow is available on TRENDS website in the validation zone. Once validated by the whole consortium, these documents will be sent to Mr. Van der Eecken for approval.

The management team requested some additional funds for the dissemination activities to an organisation of the region of Paris. A grant of 30000€ was offered to SERAM who should print some advertising materials and organise a conference around TRENDS by the end of the year. The public would be designers.

Following the meeting held in Luxembourg on 30th May, 2007, the main issue for the consortium was to carry on with the project activities but also to dedicate some time to the project reorganisation with the drafting of meta-deliverables and the update of the Technical Annex for the 18 remaining months.

5.1.3 Consortium meetings

Date	Place	Nature of the meeting	Participants	Subject
9-10-Jan-2007	SERAM	One year meeting	All partners	Current state and next steps of the project, Dissemination and IPR issues.
19-Jan-2007	SERAM	Technical meeting	PERTIMM, SERAM	First review meeting's preparation
9-Feb-2007	SERAM	Technical meeting	INRIA, PERTIMM, SERAM	First review meeting's preparation
13-Feb-2007	SERAM	Technical meeting	PERTIMM, SERAM	Data Base Content Review
20-Feb-2007	SERAM	Technical meeting	INRIA, PERTIMM, SERAM	First review meeting's preparation
26-Feb-2007	SERAM	First review meeting	Reviewers: H. Krömker, J. C. Rodriguez Commission officer: R. Klar All partners	Pre-review recommendations and related actions and results, Updated state of the art, Achievements since the pre-review, Quality implementation, Dissemination implementation.
6th March, 2007	Roissy CDG, France	Technical Meeting	UNIVLEEDS, SERAM	User testing approach specification
3rd April, 2007	Conference call	Technical meeting	University of Cardiff ; INRIA; PERTIMM, ROBOTIKER; SERAM	Work progress
24th April, 2007	PERTIMM, Asnières, France	Technical meeting	UNIVLEEDS; INRIA; PERTIMM, ROBOTIKER; SERAM	Work progress
9th May, 2007	Audio conference	Consortium audio conference	All partners	Management & technical issues
25th May, 2007	Audio conference	WP leaders concertion meeting	SERAM, PERTIMM, INRIA, UNIVLEEDS, ROBOTIKER	Preparation of the 30th follow-up meeting in Luxemburg
30th May, 2007	Luxembourg	Follow-up meeting	SERAM, INRIA, PERTIMM, ROBOTIKER, UNIVLEEDS	Specification of the new organisation of work in TRENDS
4th June, 2007	Audio conference	Follow-up meeting	All partners	Debriefing of follow-up meeting in Luxembourg
5th June, 2007	Audio conference	Technical meeting	SERAM, PERTIMM, CARDIFF, INRIA, ROBOTIKER	Sequencing and planification of the integration of P2
7th June, 2007	Paris	Technical meeting	SERAM, UNIVLEEDS	Preparation of the user tests protocol for P2.
11th June, 2007	Audio conference	Follow-up meeting	All partners	Consortium follow-up meeting

Table 34: *List of meetings*

5.2 JUSTIFICATION OF DEVIATIONS FROM WORKPLAN

During the first six months of this year, the major deviations were linked to the reorganization of the project following the 30th May meeting in Luxembourg. Indeed, each partner mobilized great efforts in the drafting and validation of numerous documents, might it be technical ones or management ones, the main one being the Technical Annex.

Indeed, the workplan for the next 18 months is currently being reviewed.

The new technical annex, on progress will allow the consortium to carry on with the project on solid bases avoiding inconsistencies and therefore misunderstandings within the consortium as previously noticed. Any deviations from workplan on the bases of this updated document would be reported in the bi-monthly reports.

5.3 PROJECT TIMETABLE AND STATUS

This period corresponds to a transitional period of great activity on documents templates and technical annex review.

Deliverable No	Deliverable title	Original delivery date	Actual delivery date
ID9.1*	**Project Management and references documents**	Internal	-
D9.2.1	Project Fact sheet	M01=Jan 2006	31 Jan 2006
D9.3.M	Initial Plan for using and disseminating knowledge	M01=Jan 2006	16 June 2006
D9.4.1	2-monthly management report N°1	M02=Feb 2006	21 Apr 2006
D9.5**	**Project Web site**	M03=Mar 2006	31 Mar 2006
D9.7**	Project PPT/HTML Presentation	M03=Mar 2006	15 June 2006
D9.4.2	2-monthly management report N°2	M04=Apr 2006	23 June 2006
D1.1	**List of users specifications**	M04=Apr 2006	20 May 2006
D1.2	List of usage issues with current design systems	M04=Apr 2006	20 May 2006
D1.3	Market analysis for new design software	M04=Apr 2006	20 May 2006
D1.4	**List of functional specifications**	M06=Jun 2006	27 July 2006
D1.5	Specification validation results	M06=Jun 2006	27 July 2006
D2.1	Design and innovation database, images and words database	M05=Mai 2006	13 July 2006
D2.2	Procedure for the extraction of sociological/design trends	M05=Mai 2006	13 July 2006
D9.4.3	2-monthly management report N°3	M06=Jun 2006	16 Oct. 2006 17 Nov 2006
D9.13.1	6-monthly activity report	M06=Jun 2006	18 Oct. 2006 2 Nov 2006
D9.4.4	2-monthly management report N°4	M08=Aug 2006	17 Nov 2006
D2.3	Procedure for statistics realization	M08=Aug 2006	13 Oct 2006
D5.1	Initial list of sites and free access databases	M08=Aug 2006	29 Sep 2006
D2.4	**First version of the graphic interface … PPT**	M09=Sep 2006	13 Nov 2006
D9.2.2	Project brochure	M09=Sep 2006	8 Nov 2006
D9.4.5	2-monthly management report N°5	M10=Oct 2006	30 Nov 2006
D2.5	**System infrastructure**	M10=Oct 2006	13 Dec 2006
D2.6	**User test protocol**	M10=Oct 2006	5 Dec 2006
D9.10.1	Project Annual public report	M11=Nov 2006	16 Dec 2006
D2.7	**List of design and ergonomics specification**	M12=Dec 2006	9 Feb 2007
D2.8	Validation results, report	M12=Dec 2006	28 Feb 2007
D3.1	**Intermediate report on Textual similarity search (+ XML description)**	M12=Dec 2006	15 Feb 2007
D4.1	**Intermediate report on visual description**	M12=Dec 2006	5 Feb 2007
D8.1	Internal and external reports on project assessment	M12=Dec 2006	9 Feb 2007
D9.9.1	Yearly management report (Form C…)	M12=Dec 2006	27 Feb 2007
D9.6.1	Project dissemination and public participation and awareness raising report	M12=Dec 2006	15 Feb 2007
D9.13.2	Annual activity report	M12=Dec 2006	28 Feb 2007
D9.4.6	2-monthly management report N°6	M14=Feb 2007	13 Apr 2007
D9.4.7	2-monthly management report N°7	M16=Apr 2007	15 June 2007

Table 35: Global list of deliverables so far

5.4 TRENDS WEBSITE: AN EFFICIENT TOOL SUPPORTING GENERAL MANAGEMENT

During the first half of the second year, TRENDS website has been entirely re-implemented due to the recommendations of the EC. After having received more recommendations from the EC during the project review which took place in Paris in February, SERAM has been working on a new version of the website (version 3). A new technological support has been found: a content-management system has been chosen because it is evolutive, maintained by a large community and open source. An appropriation of this new platform has been done by the webmaster of TRENDS project.

A list of new and useful functionalities has been established by SERAM and correspondent software components have been found in order to implement them on the website.
The website has then been re-developed in order to support even better dissemination and collaboration within the project. The public layout of the website has been redesigned, and more simple pages oriented for a professional interest have been written. Also, the private part of the website has been entirely changed in order to support better collaboration tools: a forum for exchanging within the work packages, a calendar in order to support meetings and work plans, and a file sharing tool in order to exchange files (big files).

Also, the website supports a newsletter letting the managers contact every partner in the project instantly. See the following captures for an appreciation of the work that has been done on this new version.

Figure 5: TRENDS website v3 welcome page

Figure 6: TRENDS new presentation pages
(from left to right and up to down : "trends for the industry", "trends for research", "trends team" and "what trends is for?")

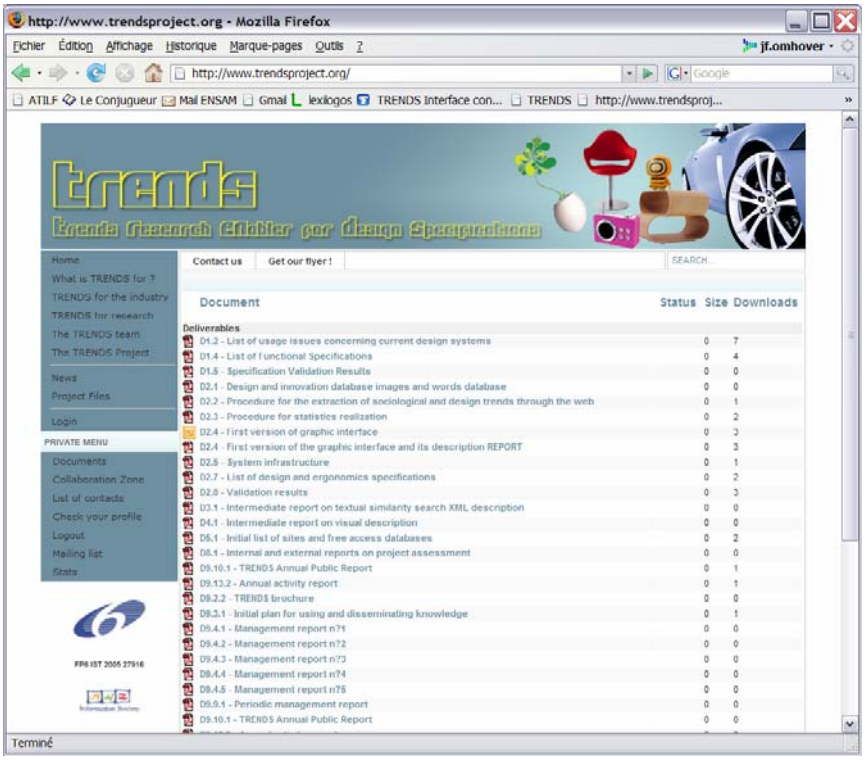

Figure 7: TRENDS internal list of documents

Figure 8: TRENDS website internal file sharing zone

Figure 9: TRENDS website internal forum

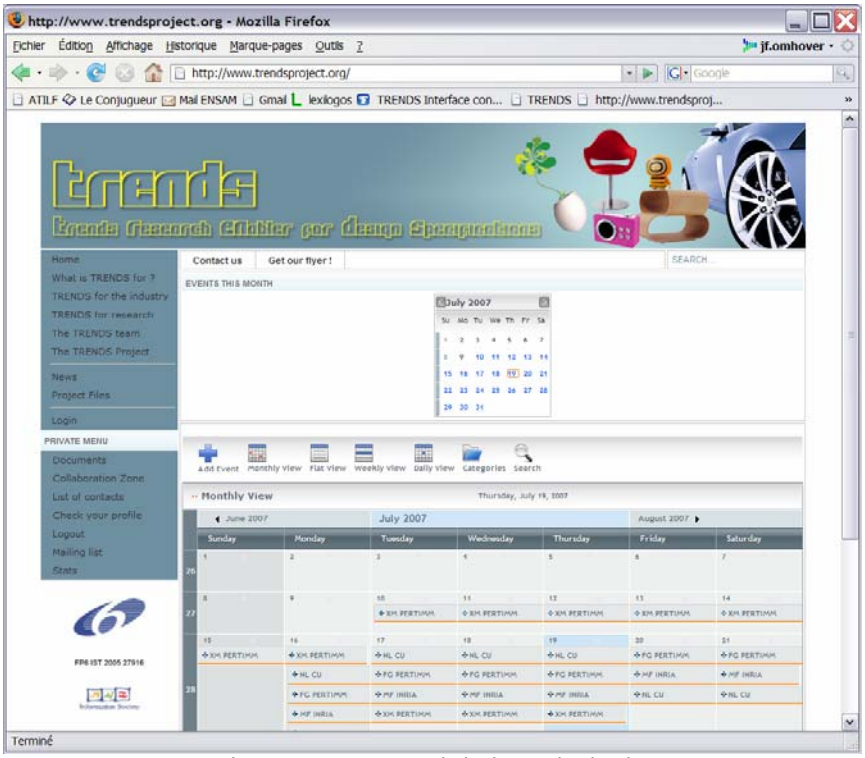

Figure 10: TRENDS website internal calendar

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7. REFERENCES

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8. GLOSSARY

Content Based Image Retrieval (CBIR)
Content-based image retrieval (CBIR), also known as query by image content (QBIC) and content-based visual information retrieval (CBVIR) is the application of computer vision to the image retrieval problem, that is, the problem of searching for digital images in large databases. "Content-based" means that the search makes use of the contents of the images themselves, rather than relying on human-inputted metadata such as captions or keywords.

Conjoint Trends Analysis
The Conjoint Trends Analysis is a recent method based on the externalization and formalization of the cognitive activity of the designers in the earliest phases of design. What is most original in this approach is the identification and use of various domains of influence (nature, arts, industrial sectors, sociological end values) in order to enrich the design solution space. Finally it enables the identification of formal trends attributes (shape, colour, textures) linked to particular environments in order to use them in the early design of new products. It makes it possible to enrich and to inspire the designers and the design team when designing product. It is positioned in the earliest phases of the design process.

Crawler
Web *crawler* (also known as a web spider or web robot) is a program or automated script which browses the World Wide Web in a methodical, automated manner. Other less frequently used names for web *crawlers* are ants, automatic indexers, bots, and worms (Kobayashi and Takeda, 2000). The related process is called *web crawling* or *spidering*. Many legitimate sites, in particular search engines, use spidering as a means of providing up to date data. Web *crawlers* are mainly used to create a copy of all the visited pages for later processing by a search engine that will index the downloaded pages to provide fast searches. *Crawlers* can also be used for automating maintenance tasks on a web site, such as checking links or validating HTML code. Also, *crawlers* can be used to gather specific types of information from Web pages, such as harvesting e-mail addresses (usually for spam).

Data Mining
Data mining (DM), also called Knowledge-Discovery in Databases (KDD) or Knowledge-Discovery and Data Mining, is the process of automatically searching large volumes of data for patterns using tools such as classification, association rule mining, clustering, etc. Data mining is a complex topic and has links with multiple core fields such as computer science and adds value to rich seminal computational techniques from statistics, information retrieval, machine learning and pattern recognition.

Design Trendboards
The Trend boards are iconic compositions that enable to communicate a homogeneous atmosphere both in terms of style and consumers' sociological values. *Design Trendboards* aim to generate exhaustive pallets used in the design phase. These representations include an exhaustive number of sectors.

Iterative approach
The iterative approach used in TRENDS project is based on the Spiral model from Boehm (1988). In this model, each loop is a development stage, and the progressive approach enables to reduce risks for software development. A key advantage in approaching a complex project in this way is that the major risks are resolved at an early stage, before significant costs are accrued.

Latent Semantic Analysis
Latent semantic analysis (LSA) is a technique in natural language processing, in particular in vectorial semantics, patented in 1988 by Scott Deerwester, Susan Dumais, George Furnas, Richard Harshman, Thomas Landauer, Karen Lochbaum and Lynn Streeter. In the context of its application to information retrieval, it is sometimes called latent semantic indexing (LSI).

Ontology
In both computer science and information science, an ontology is a data model that represents a set of concepts within a domain and the relationships between those concepts. It is used to reason about the objects within that domain.

Pallets
Pallets are composed of the most significant discrete elements extracted from the ambience and enabling to recognize a specific trend in terms of colours, textures, forms.

Participatory design
Such an approach requires the 'active participation of end-users rather than simply using end-users as a source of data' (Muller, Haslwanter, & Dayton, 1997).

Trend
Technical / technological and formal evolution led by a transverse inter-sector current which gives to a product its position in the obsolescence cycle.

User-centred approach
Design method involving detailed examination of the nature of the individuals who will be using the system (e.g., abilities and preferences), the nature of the tasks that they will be performing (e.g., task components and performance sequences), and the contexts in which those tasks will be performed (e.g., organisational requirements, norms, or practices). Tests have to be performed, throughout the development process, to provide detailed assessment of the performance of the system and its acceptance by end-users (see ISO 13407).

Sectors:areas of influence
Sector of influence are all the industrial, artistic or natural sectors that are used for the transfer of some formal and functional attributes into the reference sector. For instance the *biomorphism* is a key sector of influence for car design.

Term Frequency Inverse Document Frequency
The tf–idf weight (term frequency–inverse document frequency) is a weight often used in information retrieval and text mining. This weight is a statistical measure used to evaluate how important a word is to a document in a collection or corpus. The importance increases proportionally to the number of times a word appears in the document but is offset by the frequency of the word in the corpus. Variations of the tf–idf weighting scheme are often used by search engines to score and rank a document's relevance given a user query.

Word sense disambiguation
In computational linguistics, word sense disambiguation (WSD) is the problem of determining in which sense a word having a number of distinct senses is used in a given sentence. For example, consider the word *bass*, two distinct senses of which are:

1. a type of fish
2. tones of low frequency

and the sentences *The bass part of the song is very moving* and *I went fishing for some sea bass*. To a human it is obvious the first sentence is using the word *bass* in sense 2 above, and in the second sentence it is being used in sense 1. But although this seems obvious to a human, developing algorithms to replicate this human ability is a difficult task.

9. ANNEX: PLAN FOR USING AND DISSEMINATING THE KNOWLEDGE

9.1 SECTION 1 - EXPLOITABLE KNOWLEDGE AND ITS USE

The exploitable results that have been produced during the period include two State of the art reports on Textual similarity search (D3.1) and on visual description (D4.1).

The exploitable product achieved is the TRENDS components prototype, including functionalities such as Sphere interface, Search by text, Search by image, Relevance feedback, and Search by sectors.

Exploitable knowledge	Exploitable product (s) or measure (s)	Sectors of application	Timetable for commercial use	Patent or other IPR protection	Owner & Other partners involved
TRENDS List of users specifications WP1		1.Auto 2.Fashion Design 3.Industrial Design	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS List of functional specifications WP1		1.Auto 2.Fashion Design 3.Industrial Design	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS Database WP2	Database content (Set of images and files)	1.Auto 2.Fashion Design 3.Industrial Design	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS Procedure for extraction of sociological and design trends through the web WP2		1.Auto 2.Fashion Design 3.Industrial Design 4. Architecture 5. Sport goods 6.Marketing 7.Advertising 8.Packaging 9.Domestic appliances	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS User test protocol WP2		1.Auto 2.Fashion Design 3.Industrial Design 4. Architecture 5. Sport goods 6.Marketing 7.Advertising 8.Packaging 9.Domestic appliances	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS List of design and ergonomics specification WP2		1.Auto 2.Fashion Design 3.Industrial Design 4. Architecture 5. Sport goods 6.Marketing 7.Advertising 8.Packaging 9.Domestic appliances	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS Database V2 WP2	Database content (Set of images and files)	1.Auto 2.Fashion Design 3.Industrial Design	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS First version of the GUI and non interactive functions WP2		1.Auto 2.Fashion Design 3.Industrial Design 4. Architecture 5. Sport goods 6.Marketing 7.Advertising 8.Packaging 9.Domestic appliances	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS Software architecture WP2		1.Auto 2.Fashion Design 3.Industrial Design 4. Architecture 5. Sport goods 6.Marketing 7.Advertising 8.Packaging 9.Domestic appliances	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS Ontologies Excel tables WP2		1.Auto 2.Shoes design 3.Fashion Design 4.Industrial Design 5. Architecture 6. Sport goods 7.Marketing 8.Advertising 9.Packaging 10.Domestic appliances	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS Intermediate Report on Textual Similarity Search © WP3		1. Car design and manufaturing 2.Design and related sectors 3.Information search	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG
TRENDS Intermediate report on		1. Car design and manufacturing	2008	Internal rules for owners planned + Condition of	TRENDS + SIG

Visual description © WP4		2.Design and related sectors 3.Information search		use published when tool available	
TRENDS Prototype 2 : components prototype	Prototype : Available functions are Sphere interface, Search by text, Search by image, Relevance feedback, and Search by sectors.	1.Auto 2.Shoes design 3.Fashion Design 4.Industrial Design 5. Architecture 6. Sport goods 7.Marketing 8.Advertising 9.Packaging 10.Domestic appliances	2008	Internal rules for owners planned + Condition of use published when tool available	TRENDS + SIG

Table 1: Exploitable results and their use.

10.2 SECTION 2 - DISSEMINATION OF KNOWLEDGE

TRENDS Fact sheet

TRENDS fact sheet can be found at the following address:
http://cordis.europa.eu/ist/kct/trends synopsis.htm

TRENDS Website

TRENDS website can be found at the following address:
http://www.trendsproject.org/

TRENDS Flyer

TRENDS flyer can be found at the following address:
http://www.trendsproject.org/project files
3000 flyers were printed for TRENDS partners.

TRENDS Poster

TRENDS poster, for internal use, can be found at the following address:
http://www.trendsproject.org/documents/projectdocuments

TRENDS Video demonstration of prototype 2

TRENDS video presentation will be soon available on the public part of the website. It is currently in validation process by the TRENDS consortium (validation zone of the website). This demonstration shows the main functionalities of TRENDS prototype 2 in use.
http://www.trendsproject.org/private part/file sharing/validation zone

TRENDS consortium's companies internal and external communication

TRENDS projects appears in the ROBOTIKER's Annual Report 2005 and 2006 and in all the company presentations the salesmen can spread in every commercial visit.

TRENDS consortium's companies internal and external communication

TRENDS poster was presented was presented by CU at the information days held in Luxembourg on 24-25 January 2007. The event called "FP7 in Motion: Cognitive Systems, Interaction, Robotics, Digital Libraries and Content" was attended by more than 300 researchers from academia and industry working in the area of semantic based systems, cognitive systems, digital libraries and e-learning.

Special session of the I*PROMS Conference 2007 (see http://conference.iproms.org/)

The Special Session of I*PROMS Conference 2007 will be co-chaired by Dr. Setchi from CU and Dr. Bouchard from SERAM (LCPI). TRENDS partners and researchers outside the TRENDS consortium have been invited to submit their papers. The Special session called "Innovation and Design" will be held within the 2007 I*PROMS Conference on Innovative Production Machines and Systems, that will take place on the Internet between 2 and 13 July 2007. The conference seeks to provide a platform for presenting, discussing and disseminating research results contributed by scientists and industrial practitioners active in the area of innovative production and manufacturing systems. IPROMS 2007, the 3rd Virtual Conference, of the EU-funded FP6 I*PROMS Network of Excellence will build on the outstanding success of its predecessors, IPROMS 2005 and IPROMS 2006 which attracted authors from some 30 countries across five continents and some 4000 registered delegates and guests from 71 countries, making IPROMS conferences truly global phenomena.

10.2 SECTION 2 – PUBLISHABLE RESULTS

At this stage of the project the following presentations were made in the framework of International Conferences:

[1] Mougenot C., Bouchard C., Aoussat A., *Fostering innovation in early design stage : a study of inspirational process in car design companies*, Wonderground 2006, Design Research Society International Conference, 1-5 November 2006, Lisbon.

[2] Kaur, S., Westerman, S.J., Mougenot, C., Sourbe, L., & Bouchard, C. (2006). *Computer-based support for creativity in industrial design.* Poster presented at the First International Symposium on Culture, Creativity, and Interaction Design., London, UK Sept. 2006.

[3] Mougenot C., Kaur S., Bouchard C., Westerman S., Aoussat A. An experimental study of designers' cognitive activity in design information phase. Abstract submitted to ICED 2007, 16th International Conference on Engineering Design, August 28-3, 2007, Paris

[4] Setchi R. , Tang Q., Concept Indexing Using Ontology and Supervised Machine Learning, XIX International Conference on Computer and Information Science and Engineering, 29-31 January 2007, Bangkok, Thailand.

[5] Setchi R., Tang Q., "Ontology-based concept indexing", I-Prom Conference, July 2007

[6] Bouchard C., Mantelet F., Ziakovic D., Setchi R. Tang Q., Aoussat A., Building a design ontology based on the Conjoint Trends Analysis, I-Prom Conference, July 2007

[7] Bouchard C., Mougenot C., Mantelet F., Setchi R., Tang Q., Aoussat A., Building an domain ontology related to car design, I-Prom Conference, July 2007

Next International Conferences planed:

[1] Bouchard C., Mougenot C., J.F.Omhover, Aoussat A., TRENDS, A Kansei based information retrieval system based on the Conjoint Trends Analysis method, International Association of Societies of Design Research, IASDR 2007, Hon-Kong, Design Research Society, 11-15 November 2007.

[2] Mougenot C., Bouchard C., Aoussat A., Creativity in design – How designers build mental images, IASDR 2007, Hon-Kong, Design Research Society, 11-15 November 2007.

10. ANNEX: ASSESSMENT REPORT OF N. BONNARDEL

WP2 Assessment by Nathalie Bonnardel

	Technological Research criteria	- -	-	0	+	++
WP2	Number of reference sites					
	Relevance of reference sites					
	Integrated professions					
	Stimulation power (randomness)					
	Precision and detail of information					++
	Intelligibility					++
	Ease of use					
	Usefulness					++
	Number of users tested					++
	Relevance of information					++
	Freshness of information					++
	Quality of images					++
	Automatic updating capacity					

WP2 Assessment by Nathalie Bonnardel: Technological research criteria

Note: answers are only provided for criteria that are meaningful with regard to my field of expertise.

	Reports criteria	- -	-	0	+	++
WP2	User-friendly appearance					++
	Clearness					++
	Readability				+	
	Definition of concepts				+	
	Structure					++
	Concision					++
	Consistency					++
	Technical content					++
	Scientific content					++
	Completeness					++
	Verifiability of contents					++

WP2 Assessment by Nathalie Bonnardel: Reports criteria

- In accordance with my field of expertise, my comments are related to cognitive ergonomics and cognitive psychology approaches.
- First, the objectives of the TRENDS project sound particularly interesting since design activities are ubiquitous and are going to increase in the years ahead.
- Secondly, research I previously conducted with both professional designers and students showed that it is necessary to support designers' cognitive processes in order to reach creative design solutions (Bonnardel & Marmèche, 2004, 2005).
- Therefore, the TRENDS system should be useful in various design areas (automotive, furniture, etc.) and for designers of different levels of expertise.
- The main objectives of WP2 are crucial: to specify an initial sociological and design trends database, to define graphical interface design specifications, to validate the software architecture with end-users, to define the user test protocols...
- Since the TRENDS system will be innovative (only one system, developed at the University of Tokyo presents, to such an extent, similarities with it), the iterative process, called "Spiral Model", adopted by participants in the research project is very well chosen. It ensures end-users' contribution all along the system development as well as an iteration of prototype testing. The Spiral Model also leads to an identification of areas of uncertainty and, on this basis, an expression of risks to be resolved at various stages of the project. These risks are related to crucial aspects: the usefulness and usability of the system as well as designers' pleasure when using this system.
- I appreciated that researchers involved in this project designed three interface concepts and conducted an evaluation on them. This evaluation aimed at identifying users' perception of the graphic style as well as their preferences in order to develop the TRENDS system. This evaluation was based on two complementary methods:
  - an online questionnaire, proposed to 30 end-users, which allowed participants to choose one interface concept (the "Galaxy");

-a user test, conducted with 12 designers, which aimed at evaluating an improved version of the graphical interface chosen in the previous stage. It was completed by a series of semi-structured interviews.

- These methods were focused on both a semantic and emotional evaluation. The use of these methods was rigorous and adapted to the objectives to reach.
- The obtained results are well presented (tables and graphics) and the comments are relevant.
- Researchers adopted an innovative approach for evaluating an improved version of the interface concept, called "NewGalaxy", since they compared its characteristics with the ones of an "ideal" interface.
- They also conducted usability evaluation, which allows them to obtain and present precise results related to the system's functionalities: "searching", "statistics", "displaying and background support". These functions are assessed with regard to important criteria, such as usefulness, unusualness, ease of understanding and perceived ease of use.
- Statistical analyses were conducted on the data and they show significant results. These findings are completed by results of semi-structured interviews, which point out both positive and negative comments and underlie suggestions for improving the TRENDS system.
- Moreover, results of the "Conjoint Trends Analysis" method and of previous user-tests (based on associations of words and pictures) were also exploited for developing the TRENDS system.
- To summarize, this research has been very well conducted and it leads to useful results. Especially, it allowed the researchers to define important design and ergonomics specifications for the TRENDS system (*i.e.,* the interface and its sub-components).