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FIRST VERSION OF THE GRAPHIC INTERFACE AND ITS DESCRIPTION Workpackage 2 - Task 2.4

This document presents the first element of graphic interface proposed by all TRENDS partners, for the TRENDS system.

Acronym	TRENDS
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1. GENERAL INTRODUCTION

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 document presents the deliverable D2.4 *First version of the graphic interface and its description, document and folder PPT*.

1.1 WORK PACKAGE 2 OBJECTIVES: DESIGN OF THE SYSTEM ARCHITECTURE

The objective of WP2 is to design the overall architecture of the TRENDS system, starting from the Conjoint Trends Analysis (CTA) methodology and the WP1 results to implement and mix the three technologies into one homogeneous system able to adapt to each designer in every market (automotive, furniture, cosmetic, textile...). The first tasks (from T2.1 to T2.3) aimed to develop procedures related to the Conjoint Trends Analysis. The work was developed along a panel of tasks to set up procedures and techniques required obtaining the sectors of influence, the ambience, the pallets and statistics.

In a second time, the integration of the Conjoint Trends Analysis functions in addition to the end users requirements list will allow to identify general outlines of the interface design elements (T2.4). On the other side, the key elements and links for the software architecture definition will be proposed in this work package (Task T2.5) in coherence with the needs analysis results and the integration of the CTA method.

The second work package concerns the methodology development phase of the project and its results are a prerequisite of the prototype WP3, WP4, WP5 and WP6 and will deliver inputs for WP7

1.2 TASK T2.4: DESIGN OF THE FIRST DESIGN ELEMENTS FOR THE GRAPHIC INTERFACE

This report is related to the task T2.4. After the elaboration of the initial sociological and design trends database (T2.1), the definition of a procedure for the identification of the sectors of influence and the websites for the extraction of sociological and design trends (T2.2), and the definition of a procedure for the mono-sector mappings, ambiances, pallets definition and statistics module (T2.3), the current task consists in the definition of the first design elements for the graphic interface (T2.4). The resulting deliverable D2.4 is headlined *First version of the graphic interface and its description, document and folder PPT*.

1.3 STRUCTURE OF THE REPORT

Based on the *D1.5 – Specification validation results*, and on the *D2.2 – Procedure for the extraction of sociological and design trends through the Web* and *D2.3 - Procedure for statistics realization*, TRENDS partners generated interface graphic design specifications.

This document describes the methodology that was used for generating the first elements of interface graphic design, i.e. a process of joining functional requirements from the needs analysis and the integration of the CTA method, and fresh ideas about interfaces in general, coming from a creativity session.

This document presents the results, i.e. 3 proposals for TRENDS graphic interface concepts in the form of still pictures that will be submitted to evaluation by end-users in a further step, and a more detailed concept (concept “tree”) aiming to show more concretely all the functionalities expressed during the creativity session.

2 METHODOLOGY

The methodology followed the three following steps:

- 1 – The creativity session
- 2 – The synthesis and refinement session
- 3 – The early design of interface elements

Each of them will be detailed in this report.

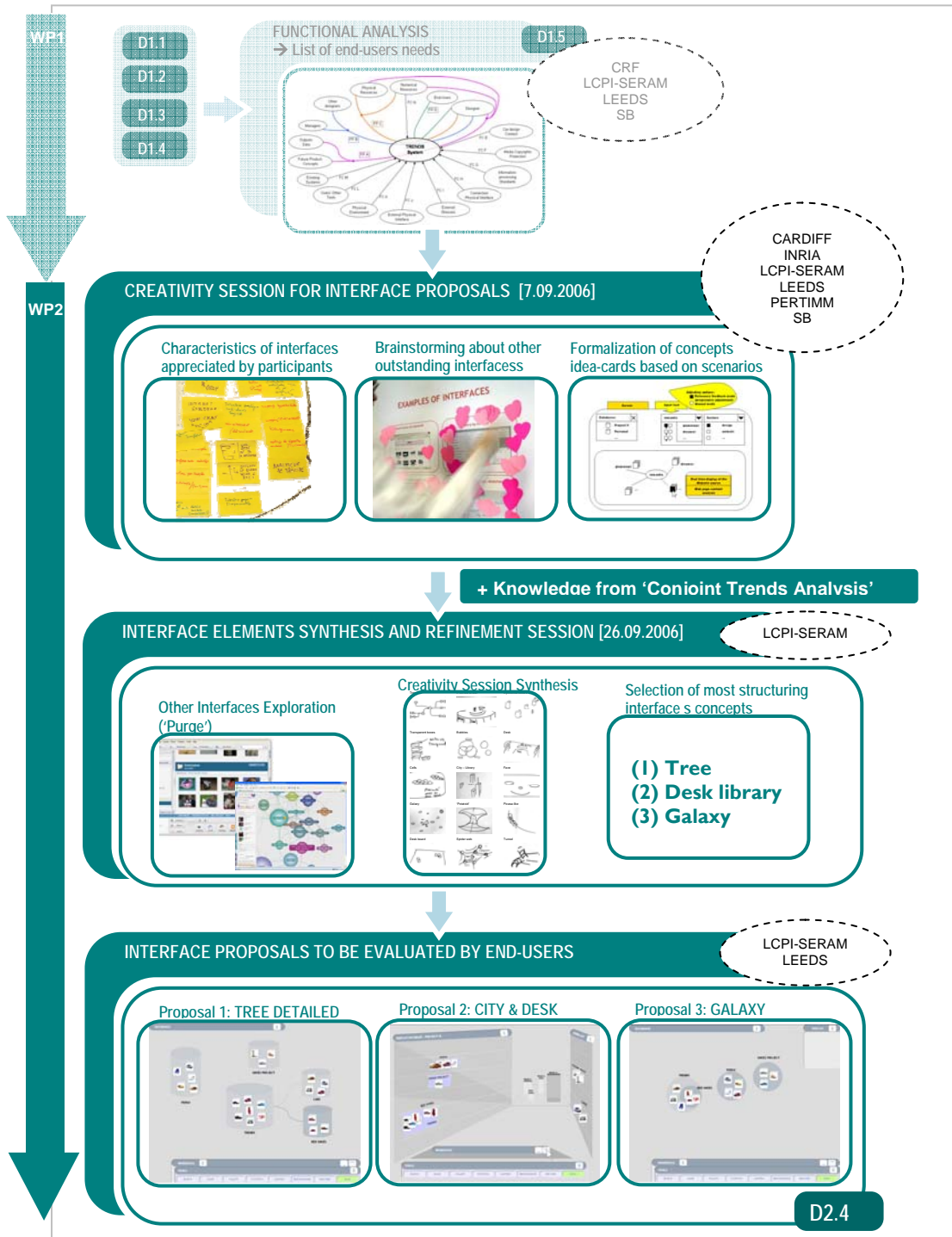


Fig. 1: Overview of T2.4 process

2.1 CREATIVITY SESSION

2.1.1 Introduction

The previous results *D1.5 – Specification validation results*, *D2.2 – Procedure for the extraction of sociological and design trends through the Web* and *D2.3 - Procedure for statistics realization* were used for the elaboration of a common list of functions. This list was the main input for the creativity session. As decided at last project-review meeting in Turin (June 27-28, 2006), TRENDS team-members met for a creativity session focused on finding fresh ideas for the TRENDS graphic interface design. The session took place in Paris, on September 7, 2006.

The advantages of using applied creativity methods were to bring all the partners to the same level of knowledge on the previous results, before the generation of ideas for the future TRENDS interface. This approach gave the opportunity for all the partners to express themselves on the new interface elements of the future TRENDS system. Applied creativity methods offer a relevant framework for the expression of ideas in a multi-disciplinary context.

2.1.2 Preparation of inputs for the creativity session

The initial list of functions produced and validated in WP1 was completed by functions coming from the CTA method: three experts of the CTA method extracted a common list of functions from the previous studies done by LCPI SERAM and from the previous deliverables *D2.2 – Procedure for the extraction of sociological and design trends through the Web* and *D2.3 - Procedure for statistics realization*. The final list is of 113 functions is the following:

INTERACTION	
1	Having an attractive display
2	Having an intuitive interface (visual exploitation method)
3	...
SEARCH	
11	Being able to choose between a precise search (ex: by specific color, volume, material...) or a vague search
12	...
19	Be able to use subjective data as search inputs (aggressive, comfortable...)
20	Having different types of input: product/no-product, tangible/conceptual, color, form; feelings...
21	Controlling semantic inputs/outputs through specific criteria (car of 70's, Italian style...)
22	Possible input data: texture, colors
23	...
25	Integrating constraints from other departments while remaining creative
26	Involving design department in prospective studies
27	...
29	To be able to extract structural, emotional and aesthetic information about products
30	...
RESOURCES	
42	Integrating recently updated web pages
43	...
49	Showing contextual data (context of product use, trends of other sectors, small scenarios, specific activities...)
50	...
58	Being provided with genealogy of competitors' products
59	...
STORE	
67	Having a private space for a personal collection
68	...
USE	
76	Being able to distinguish plenty of visual details
80	...
95	Support to making moodboards and categorization that can be modified
96	...

Tab. 1: Examples of input data for the creativity session

The resulting list of functions was used in order to define fictive scenarios aiming to stimulate the idea generation. Each scenario represented here by a specific color corresponds to a particular set of functions (cf. table

1 and table 2). The detail of each can be found in annex 7.1. The goal was to cover as many functions as possible during the idea generation, in order to transform them into a more tangible form before their evaluation by the end users.

Scenario 1
Scenario 2
Scenario 3
Scenario 4
Scenario 5
Scenario 6
Scenario 7
Scenario 8

Tab. 2: List of scenarios and their correspondence with functions

The method of scenarios in the context of applied creativity is based on the description of a fun ideal imaginary situation without to think about its realism. This method is used in sub-groups of about 4 people working each around a specific scenario. There were 4 sub-groups of 4 people, so that 8 scenarios were applied.

Scenario 8: The metaphor's mixer

I am a Japanese designer who found a brilliant tool that is not yet available on the market.

For instance in order to take inspiration when I have to design a new domestic vacuum cleaner, if I want to give it an aggressive touch I enter the word *aggressive* and the tool shows automatically images of vacuum cleaners near images of animals like a howling lion, or a cobra, ...

...

Fig. 2: Example of a scenario built with the functional specifications list

The scenario is one of the numerous tools used in applied creativity. Its particularity is that it gives efficient results with a good creative distance. This tool is very useful in multidisciplinary contexts because of its playful character, enabling to work in a constructive way in spite of the different expert visions of the attendees. The latter enter in an idea generation process related to the ideal interface the end user should use in this specific context. The various ideas are quoted and sketched on idea cards which constitute the output of the creativity session. If we consider the scenario above (scenario 8 cf. figure 2), we can recognize the functions of the table underlined in purple (for example *receiving support to make analogies between products, ideas, associations and metaphors, or being able to distinguish plenty of visual details ...*).

2.1.3 TRENDS creativity session

The objective of this session was to generate fresh ideas for the TRENDS interface to be developed, based on the observation and analyses previously shown in the official deliverables, i.e. the list of functional requirements for the final TRENDS system¹ and specific functionalities coming from the CTA method.

18 members of the TRENDS consortium from various expertise fields were divided into two teams, English-speaking and French-speaking, as shown in table 3. The sessions were conducted by two session leaders, professionally-skilled in conducting creativity session.



Fig. 3: Partial TRENDS team at creativity session

English-speaking Team	French-speaking Team
INRIA	ENSAM
Robotiker	INRIA
Leeds	ENSAM
Stile Bertone	ENSAM
Cardiff	Pertimm
ENSAM	Stile Bertone
Stile Bertone	ENSAM
Cardiff	ENSAM
Leeds	

KAOS Consulting	ENSAM
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Tab. 3: Creativity Session Participants List (7.09.2006)

A collective session at the end of the day allowed sharing the ideas generated by both groups. The collected ideas were completed by e-mail sent by the creativity session participants afterwards.

Participants were invited to focus on interface only, without bothering with functionalities. Besides, they should have explored all kinds of possibilities, without thinking of any technical constraints. The creativity session lasted one whole day, divided into 4 workshops (cf. figure 4).

The first workshop was dedicated to a brainstorming about interfaces in general; the participants were invited to explain why they appreciated such or such interfaces used in their daily life. The second workshop was an

¹ "D1.4 List of Functional Specifications" – "D2.3 Procedure for statistics realization" These deliverables is available on TRENDS

extension of the previous step, more focused on existing interfaces that were benchmarked by the session organizers; these interfaces were mainly interfaces of software related to pictures-management. Keeping in mind their observations about existing interfaces for workshop 3, the participants worked in team of 4, providing ideas for blocks of interface; they generated these ideas using input usage scenario built by the session organizers. Finally, in workshop 4, the participants had to try to join all their pieces of idea, in order to generate formalized concepts for TRENDS graphical interface.

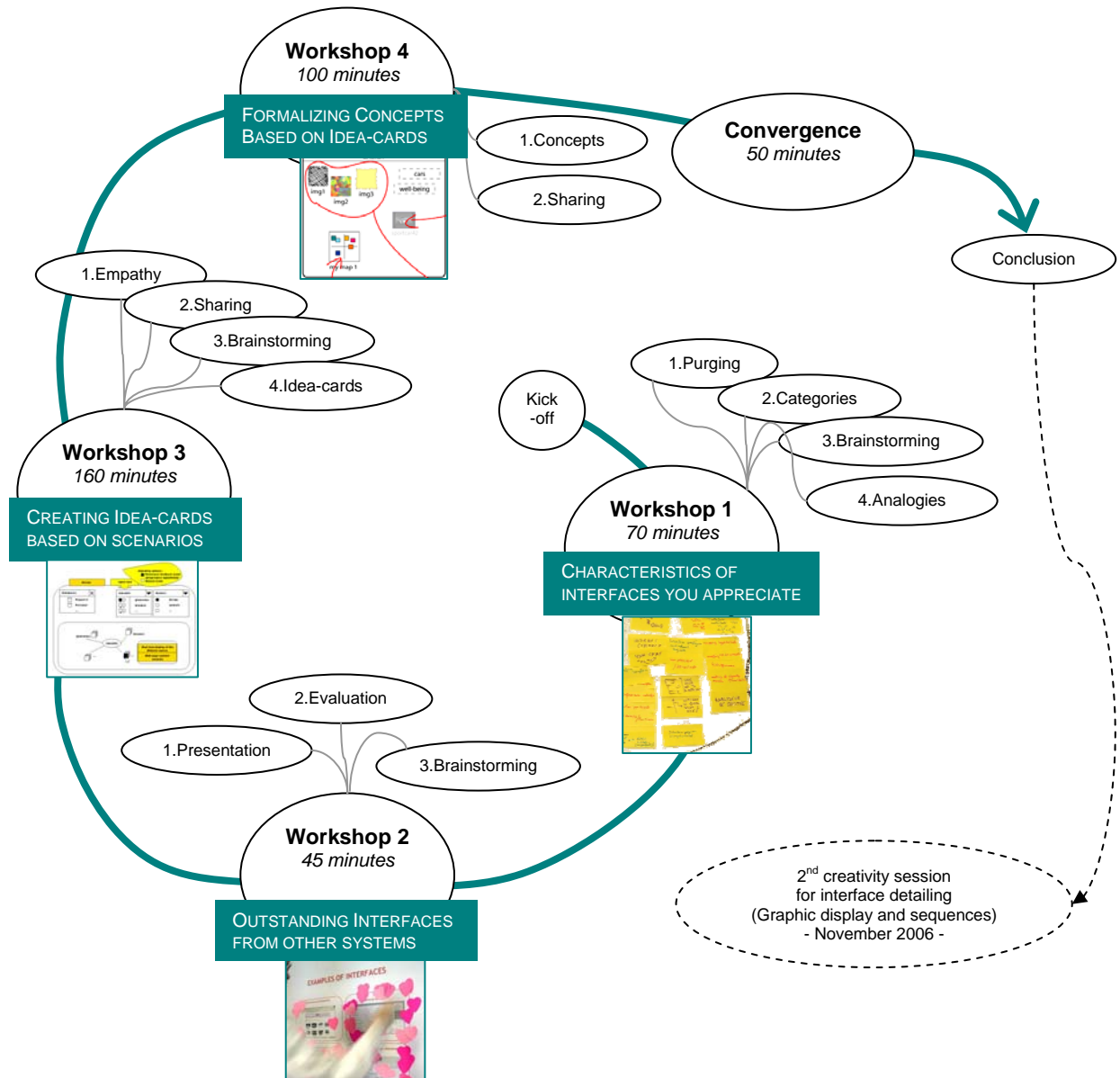


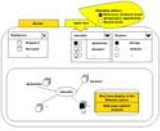



Fig. 4: Creativity session - Overview of the workshops

The workshops are more detailed in the following table, with some schedules indications and more details about the content of the workshop subtasks.

	Kick-Off	5'
	Workshop 1 – Characteristics of Interfaces You Appreciate → General interfaces idea-cards to be reused for functions	
	« Purging »	Each participant wrote down the names of favourite interfaces (numerical interfaces and others) from a wide point of view. 10'
	Sticky notes	Each participant gave explanations about the selected interfaces. 10'
	Categories	Collectively, sticky notes were joined into thematic categories. 5'
	Brainstorming	We generated ideas about the themes and we found distinguishing names for them. 15'
	Analogies	We made analogies between the themes and TRENDS system 30'
		Workshop 2 - Outstanding Interfaces from Other Systems → Interfaces idea-cards based on shown interfaces evaluations
	Presentation	LCPI showed 10 noticeable existing interfaces 10'
	Evaluation	Each participant rated the interfaces with sticky papers. 5'
	Brainstorming	Collectively, evaluations were generated about favourite interfaces and about rejected interfaces 30'
	Break	10'
	Workshop 3 - Creating Idea-Cards Based on Scenarios → Idea-cards based on scenarios	80'
	Empathic team work	Four 4-people teams wrote down short text to illustrate their view of proposed scenarios (which integrated 10 functions coming from the functional analysis – cf. official deliverable 1.4). 20'
	Sharing	Each team explained its view to the other teams. 5'
	Brainstorming	Collective work to give more details about the scenarios 10'
	Idea-cards	The whole team wrote down final idea-cards. 15'
		Same steps with other scenario, integrating other functions taken from the functional analysis. 30'
	Break	75'
	End of workshop 3	80'
	Workshop 4 - Formalizing Concepts Based on Idea-Cards → Formalized concepts based on idea-cards	100'
	Concepts	4-people teams worked on finalizing concepts. 50'
	Break	10'
	Sharing	Both teams shared their concepts. 4x10'
	Convergence	Each participant wrote down the name of his/her favourite concept. Each participant motivated his/her choice. 15'
	Conclusion	5'

Tab. 4 : Creativity session - Details of the workshops' methodological content

2.2 SYNTHESIS SESSION

At this end of the creativity session, several unsorted ideas and concepts proposals for the graphic interface were worked out. A step of synthesis was necessary. The synthesis work was done by four members of LCPI-SERAM who attended the creativity session in both English-speaking and French-speaking groups.

A divergence-convergence procedure was followed. Once again, several interface concepts existing in various systems were explored. Each member produced ideas for graphic interface. All interfaces proposals from the creativity session and from this second working session were joined; the most structuring and representative ideas were selected.

3 RESULTS: GRAPHIC INTERFACE

The following parts summarize how the concepts were produced from the creativity session. Three main steps are described: 1/ the idea generation related to the graphic interface elements, with the production of ideas about new interfaces and the appreciation of the existing ones, 2/ the refinement and synthesis of these ideas in order to generate concepts, and 3/ the elaboration of final proposals for graphic interface concepts.

3.1 ELEMENTS OF GRAPHIC INTERFACE

In creativity session, both teams provided results for each of the four workshops (raw results are detailed in Annex 7.2 and 7.3), each workshop being a step towards the definition of graphic interface elements.

3.1.1 Workshop 1 – Characteristics of interfaces you appreciate

→ The outputs of this workshop are idea-cards about existing interfaces to be reused for functions

3.1.2 Workshop 2 – Outstanding Interfaces from Other Systems

→ Interfaces idea-cards based on shown interfaces evaluations

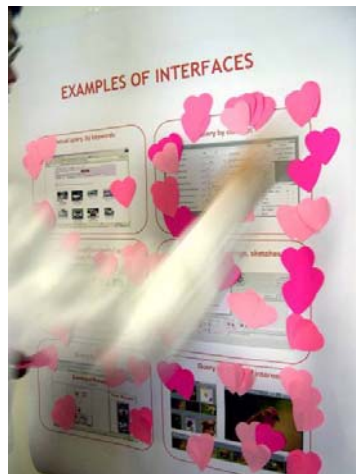

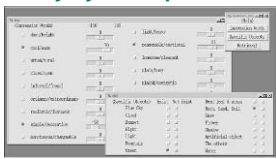






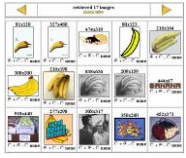



Fig. 5: TRENDS member rating existing interfaces


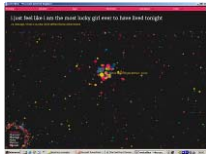

The participants were invited to evaluate 13 interfaces (cf. table 5) presented on a large-format poster, by locating sticky notes on their favourite-interfaces figures.

Each participant allocated a total amount of 24 sticky notes onto the poster.

The table below shows the results of this ranking, where the highest numbers mean that the corresponding interfaces were highly appreciated.

		<i>Evaluations by English-speaking Team</i>		<i>Evaluations by French-speaking Team</i>	
		Rating	Comments	Rating	Comments
1	Textual query by keywords 	7	The classic one: it works	9	
2	Query by concept 	21	Graduate: it's not just "yes" or "no" but "a little" or "a lot" BUT: boring graphics Should replace -100 + 1°° by less and more Pop up window: to add criteria you want to use; your list of criteria	10	Preset concepts Adjustments / precision Weighting

3	Query by visual similarity 	13	8
4	Query by drawing / sketch 	16	The pallet of colors as it's well known 11 Interactivity Approach designer (approach trade) Game-like BUT: Blur / not clear Not controlled results
5	Query by icon 	9	2 Presented tool: Too much limited First age Ugly / not professional.
6	Query by area of interest 	18	The possibility to select with the mouse 16 To focus / target the request To select after zoom To select and see the results To keep an eye on: Data Requests Results
7	Query by relevance feedback 	21	Cf. query by concept allow you to concentrate, to be more precise, to eliminate what you don't like: the no is very useful 9
8	Visual similarity and textual searching 	11	11 Interactivity Approach designer (approach trade) Game-like, Text / images BUT: Blur / not clear Not controlled results Trivial, unappealing
9	Images browser (Picasa) 	6	13 Exhaustiveness Multiple choices Multi-criteria Icons around the image (finely contextual) 3d
10	Images 3D-representation 	14	Intuitive lasso close, similar to graphics some appreciate it, some don't: 3D can be disturbing 13 Same as for "9"

11	Mosaic results display	8		4
				
12	"Mad" interface	13	Funny, different can give you different ideas exploring unknown world too messy colors mapping to zoom in and zoom out	7
				
13	Clustering display	2	Not interesting to have the same things Should put one image and the others behind	12
				

Tab. 5: Workshop2 outputs (outstanding interfaces from other systems)

After each interface has been rated, the participants had to express the advantages and the drawbacks they found in the interfaces. An overall rating was calculated (cf. figure 6), which allows us to evaluate the preferences for some of the interfaces: 1. Query by area of interest 2- Query by concept 3- Query by relevance feedback.

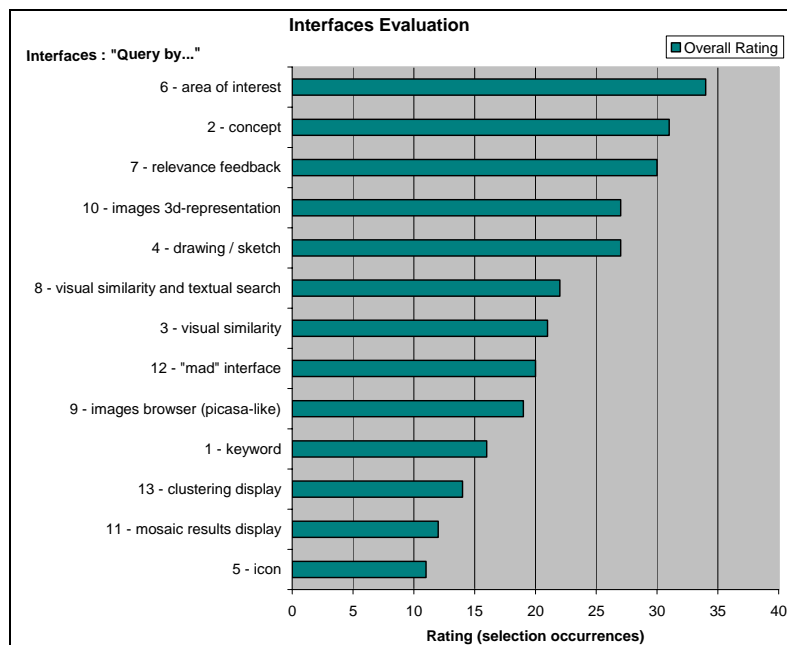


Fig. 6 : Ratings for the existing interfaces that were presented to the participants

3.1.3 Workshop 3 – Creating Idea-Cards Based on Scenarios

→ Idea-cards based on scenarios

The idea-cards generated in the creativity session (cf. figure 7) are details of the global interface to be designed. They express sub-parts of the interface. Therefore, they will not all be useful, but they can eventually be reused after the definitive interface graphics will be selected.

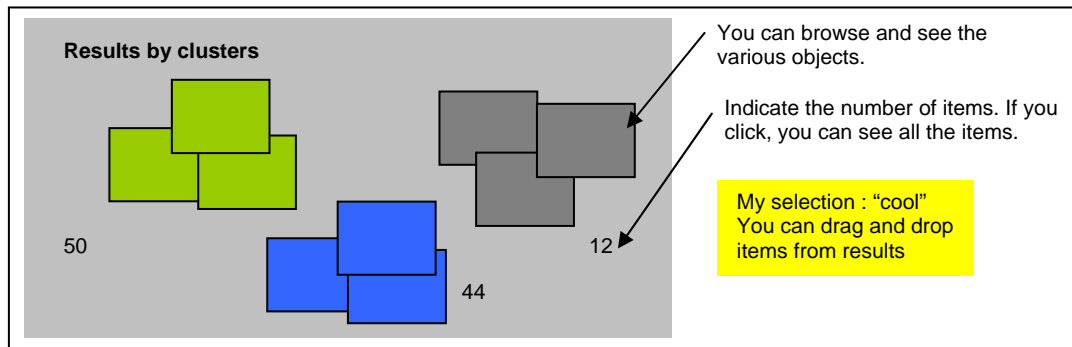


Fig. 7 : Example of an idea-card - "Results by clusters" idea-card

3.1.4 Workshop 4 – Formalizing Concepts Based on Idea-Cards

→ Formalized concepts based on idea-cards (cf. table 6)

The idea-cards generated in the fourth workshop are the final deliverables for the creativity session. They synthesized TRENDS members' work on the graphic interface.

Galaxy-like 	Abstract, without gravity 	3D-Mindmap
Concrete, with gravity, like a city 	Human Face 	Abstract City
Octopus 	Atom-like 	Progressive regulation

Tab. 6 : Creativity session outputs: formalized concepts of graphic interface

3.2 RESULTS OF REFINEMENT-SYNTHESIS SESSION

After the creativity session with all TRENDS members, a refinement and synthesis session took place at LCPI. This session involved four members from LCPI, who were part of both groups in the creativity session; the participants explained and synthesized the creativity session outputs to the other-group's members.

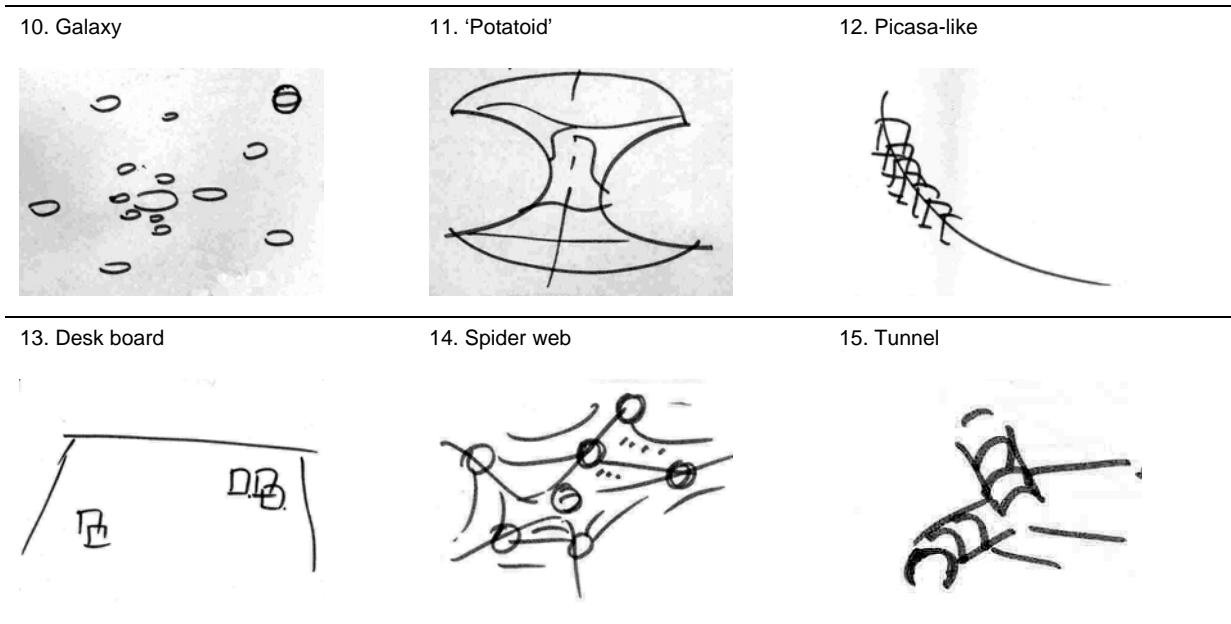
A shorter creativity session was carried out, with a review of the existing interfaces that were shown in the initial creativity session, and a review of additional interfaces examples (cf. figure 8 for some examples).



Fig. 8: Example of other existing interfaces (for music browsing), observed in the synthesis session

After the review of the 18 existing interfaces and of the creativity session outputs (idea-cards), graphic interface results were generated. The task was focusing only the interface graphics. Each member was invited to draw spontaneously rough graphic concepts; some of the proposals were similar or very close to each other. The 15 resulting proposals are presented in table 7.

1. Tree	2. iPod-like wheel	3. Cylindrical Boxes
4. Transparent boxes	5. Bubbles	6. Desk
7. Cells	8. City – Library	9. Face



Tab. 7 : Proposals for interface graphics, after creativity session synthesis.

3.3 FINAL PROPOSALS FOR GRAPHIC INTERFACE CONCEPTS

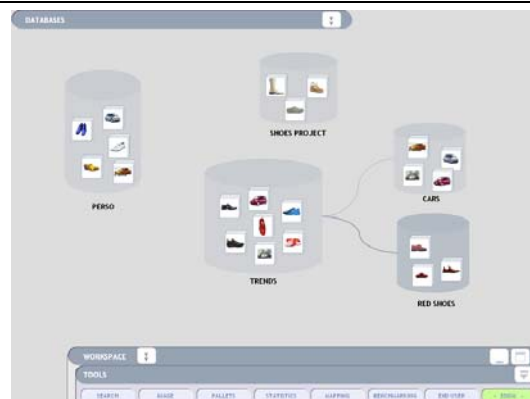
The previous synthesis session ended up with 15 proposals for graphic interfaces. For an evaluation by the end-users, we needed to keep only 3 interfaces. The most structuring and representative interfaces were kept:

- "1. Tree", "3. Cylindrical boxes" and "7. Cells" were joined into the "Tree" concept (cf. table 8)
- "6. Desk", "8. City – Library" and "13. Deskboard" were joined into the "Desk Library" concept (cf. table 8)
- "5. Bubbles", "10. Galaxy" were joined into "Galaxy" concept (cf. table 8)

Thanks to a precise methodology, the final concepts we ended up with are representative of the ideas that were proposed by TRENDS members in the creativity session and they exhaustively reflect the strongest concepts.

For larger view of the three interface proposals, please refer to the annexes 7.4 and 7.5.

Tree



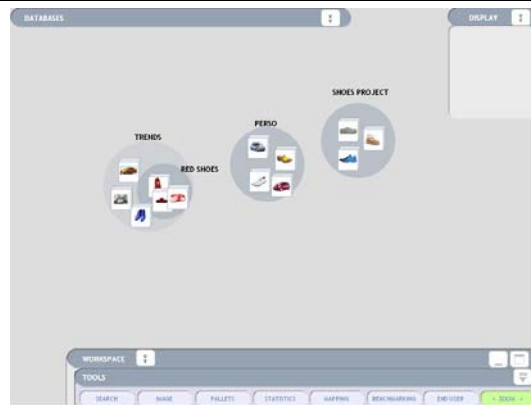
In this concept, the databases are cylindrical boxes linked to each other like tree branches. The first window illustrates an overview of all of the existing databases. On zooming in, the user can get a more detailed view of the database content. This concept is best illustrated in the "Google Earth" tool, whereby the user is required to zoom in to get a more detailed view.

Desk Library



The user navigates around a pictures database. This concept is similar to a person navigating through a city. Once the user gets closer to the building, he/she will gain a more detailed view of the building and its contents. On 'entering' the building, one stands in an office surrounded by 'libraries', these 'libraries' contain pictures that are clearly visible. Directly in front of the user stands a 'desk' (workspace) where one can place pictures to use with imaging tools.

Galaxy



The system content is represented like a galaxy, where planets are specific pictures databases. This gives an overview over all the existing databases; by zooming in, the user can get a more detailed view of the databases content, like zooming in with 'Google Earth' tool.

Tab. 8 : Final proposals for TRENDS graphic interface

3.4 FINAL PROPOSAL FOR GRAPHIC INTERFACE

In order to progress in parallel of the test with the end-users, the concept tree was firstly selected for further design with the whole integration of the functionalities expressed during the creativity session.

The creativity session enabled to collect many ideas for the TRENDS software. We gathered them and created an interface mock-up. It is a PowerPoint animated mock-up where the mouse cursor moves automatically on the screen through the different pages of a coherent sequence. This formalisation uses the tree graphic concept where pictures are gathered by cylinder-shaped bases. Then it will be declined on others graphic concepts, depending on end-users preferences. Most of the ideas already incorporated are presented and commented in annexes 7.2 and 7.3. The four screen shots below show a part of this interface representation.

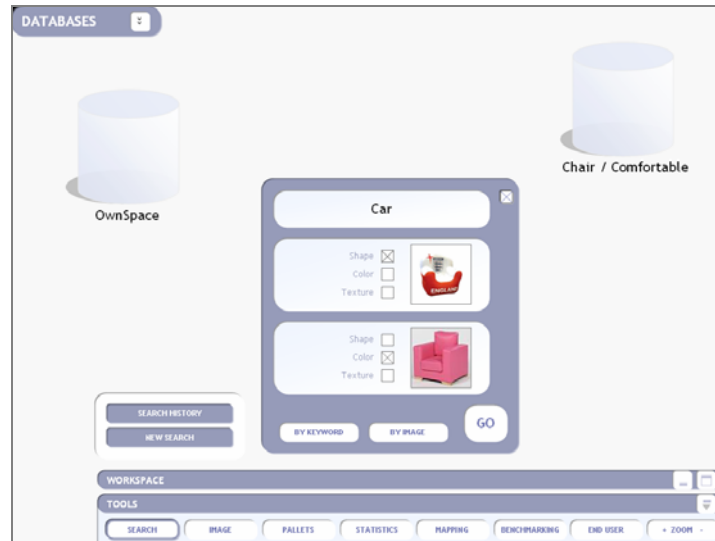


Fig. 9 : Search by keyword and images

The aim of this animated interface representation is to show, in a coherent sequence, TRENDS possibilities through a credible software environment. By simulating real software, we have a realistic representation which offers a first view of the TRENDS interface. For example the sequence illustrates an application of the CTA method, with images search from an ambience keyword, pallets generation from a base of images, and trend board creation from image cuttings. With this dynamic mock-up, we will collect the first comments and reactions from the end-users and will continuously and iteratively modify the interface to improve it.

4 CONCLUSION

This creativity session allowed TRENDS end-users and project members to integrate their needs and opinions into the definition of the TRENDS-tool interface, through a precise methodology based on creativity tools.

This document presents the raw outputs of the creativity session, i.e. a list of ideas and concepts that might be integrated in further interface developments; ENSAM-LCPI laboratory will use this material to prepare the evaluation phase of interface-concepts by the end-users at Stile Bertone and Centro Ricerche FIAT.

In connection with the here-described session, a second work meeting (November 2006) will focus on detailing the TRENDS interface, i.e. delimiting the graphical interface and the functional sequences behind the latter. Creativity sessions are essential for bringing fresh ideas and concepts into the development of an innovative system. The results mentioned in this report serve as input data for WP3, WP4, WP5 and WP6.

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6 GLOSSARY

Conjoint Trends Analysis (CTA)

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.

Applied creativity methods

Applied creativity methods enable to increase the ability to generate some ideas in big quantity in a multidisciplinary context. They are based on specific tools, programs and rules enabling to avoid the early censure of potentially interesting ideas. Different tools are available, allowing a more or less important creative gap to the persons taking part.

Divergence-convergence procedure

The divergence-convergence procedure is the procedure which is carried out when creativity methods are applied in interface design or more generally in design. The first phase is the generation phase where the process has to be as much open as possible. This phase is called the divergent phase. After that an evaluation has to be done in order to reduce the current number of possible solutions, keeping the best candidates for further refinement. This is the convergent phase where the wide set of ideas is reduced and structured according to the initial brief.