



Diogene

D7.2 Evaluation Results

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1. INTRODUCTION

This report forms **deliverable D7.2** of the DIOGENE project.

The aim of the report is to both provide feedback on the **final DIOGENE system**, and to reflect on the work that the DIOGENE project team has produced for the community. This will include consideration of the processes undertaken by the project, lessons learnt and potential outcomes that may be of use to the community. We also include suggestions for improvement that shall be of use for system improvement based on the findings of the evaluation.

This report uses the following form for explanation of evaluation results: inputs, processes, data, outputs, outcomes and impacts.

It was felt that these headings encompassed the variety of factors in which evaluation could best be presented to the project consortium and the commission, and was already used to present and explain the results of the preceding DIOGENE experimentation phase (see deliverable 7.2 'Experimentation Report').

2. INPUTS

A number of deliverables that were produced during the project have had an impact on the work and results of the DIOGENE evaluation phase. The most important of those are outlined here:

THE DELIVERABLES

D1.1 - Specifications of the Training Environment

As well as seeking consortium-wide input into the initial conceptual process, the DIOGENE project dedicated a significant amount of time to involve all partners and stakeholders in the evaluation to define to what extent the defined requirements had been met. Stakeholder requirements and specifications remained a priority for the DIOGENE project throughout evaluation.

The full list of requirements is documented on the DIOGENE deliverable D1.1. This deliverable was an input for evaluation planning and had an impact on evaluation and its results.

D1.2 – Evaluation Plan

The evaluation phase was based on the evaluation plan that was provided in deliverable D1.2. The main evaluation methods that were planned for this evaluation process. As they were planned they formed part in this summative evaluation.

D7.1 – Experimentation Report

The evaluation process was based on the findings of the experimentation phase and redesigned an evaluation environment that was adjusted to the outcomes of DIOGENE experimentation. All material that was created in the experimentation phase supported the evaluation of the DIOGENE system, such as is

- **a set of key requirements on that the quality and requirements of DIOGENE is being evaluated**
- **some key test users that contributed to DIOGENE evaluation as experienced users**
- **a set of evaluation material, findings, and lessons learnt that could be reused for evaluation after a redesign**
- **the creation of online system help materials that was very supportive for evaluation and will be of any later commercial DIOGENE system**

THE RESULTS OF THE EXPERIMENTATION PHASE

The formative evaluation during DIOGENE experimentation phase revealed a number of issues that helped to upgrade the DIOGENE system towards a stable system and related to stakeholders requirements.

282 issues that were identified by the test users and related to priorities of importance towards DIOGENE system requirements by means of a check list. The responsible partners were asked to work through this check list and to discuss the comments and suggestions that they received with this list within their implementation team and/or – if necessary – with the coordinating partners of the project. Solutions to improve DIOGENE according to the suggestions and comments were to be found

and incorporated in the final DIOGENE system.

Priority to the comments and suggestions in this list was given by the responsible partners according to their ranking in the list of suggestions that was presented in the deliverable D7.1. The priority ranking was mainly based on the impact of the single suggestion and/or improvement to a better and more requirements related DIOGENE system as well as the number of related comments that came from test users during the experimentation phase.

THE FINAL SYSTEM OF DIOGENE

This evaluation is based on the final DIOGENE system that the project produced based on the findings of the experimentation phase. This final system involved all major organisations and applied all functions that were originally defined in the work plan and infrastructure design.

The following set of organisations, which define the organisational framework of DIOGENE, were involved in this process.

DIOGENE System Component	DIOGENE System Component
Abstract Organisation – the DIOGENE network to support the DIOGENE process and web services	Authentication Agency - User authentication and authorisation service
DIOGENE Network Reception – Web Portal and entry point for DIOGENE users	Tutor Agency - Management of freelance tutors for Training Agency
DIOGENE Service Registry – Registration and Administration of services to DIOGENE	Skill Agency - Skills retrieval service and Curriculum Vitae search engine for skill managers
Training Agency – Access point for students of DIOGENE network to request for personalised training offers	Web Catcher Agency - Retrieval of free ICT content in the semantic web
Knowledge Agency – Knowledge representation and the provision of learning concepts and paths	Bank - The DIOGENE payment service and monetary transaction services
Brokerage Office – The course brokerage service	Café – Collaboration and communication services for learners and tutors
Publishing House – Publishing service for content providers	

3. PROCESSES

EVALUATION PROCESS

Evaluation as a process had been ongoing throughout the lifetime of the project, and addressed the specific needs of DIOGENE stakeholders. As far as possible, methodologies and practices were adopted to allow for full comparative evaluation. This was achieved by the project team members meeting and agreeing a series of methods that were suited to the evaluation task and enabling a DIOGENE system working in a real environment.

The evaluation of DIOGENE has been extensive, and ongoing throughout the evaluation period (August 2004 – October 2004) in the following steps:

- Installing and setting up the DIOGENE final system environment.
- Inputting a series of existing and representative data.
- Import of user data and registration for test users (evaluators) in the network reception.
- Development of various evaluation scenarios for different user roles.
- Development of evaluation material, including task lists, system documentation (online help system), feedback reports, handbooks for different user roles and stakeholders.
- System documentation to support evaluation tasks.
- Introduction of tasks to evaluators and support in use of the DIOGENE final system throughout evaluation.
- Allowing supported evaluators to interact with the DIOGENE final system in order to be able to comment on the system.
- Holding direct contact with evaluators and keep them updated on the proceedings and milestones of evaluation.
- Gathering and analyzing feedback from evaluators.
- Reporting the evaluation results to the project coordinator and project partners.
- Analyzing and interpretation of the results.

This process of evaluation was ongoing after implementation work of DIOGENE had been completed, and addressed the functional and usability needs of all organizations involved in the DIOGENE network. It is important to note, however, that these processes were limited to the extent and interactivity level users have been integrated into the whole DIOGENE network by their roles and scenarios.

Constant Communication

A key element of this work was constant communication between implementation team members and evaluation work teams, working groups at all involved partner organisations. Running across all of these evaluation tasks was a strong focus on continued communication between all stakeholders in a timely manner. This included the implementation partners directly involved in, or connected to the evaluation phase, test users involved in the peer groups, and the whole partner consortium, through meetings and offline discussions.

Time Scale and Deadlines

The narrow timescale of the evaluation phase and the summer period made evaluation and time management a high priority for this work package. It was essential that all test groups and partners were fully informed and aware of the deadlines and evaluation requirements in order to meet the deadlines laid out by the project plan and generate relevant and in-time feedback for implementation teams. Any slippages or lost time would have had a significant negative impact on project development and success.

SUMMATIVE EVALUATION

An evaluation as a set of summative evaluation tasks was undertaken throughout this process. The major aim of this process was to collect and to present information needed for summary statements and judgements about DIOGENE as a functioning system and its value to its stakeholders. The summary statement contains the strengths and weakness of DIOGENE as a conclusion of controlled and planned interactivity.

The evaluation D1.2 defined the main purpose of the summative evaluation as to prove the added value of DIOGENE in terms of its user-friendliness, learning efficiency, flexibility in space and time and cost effectiveness. In order to evaluate and prove this added value, it was necessary to understand how well the system succeeded in supporting its objectives and stakeholders' requirements.

After this evaluation process, the project team shall be able to draw conclusions from the evaluators' feedback and shall be able to compare the final DIOGENE system against the requirements of the various stakeholders. As a consequence, an estimation of the system performance and market correspondence can be made and comments and suggestions for further development could be incorporated into any future version of the DIOGENE system.

METHODS

The following evaluation methods formed part of the whole process.

Evaluation Methods
<ul style="list-style-type: none">▪ Scenario Based Evaluation▪ Performance Recordings▪ Questionnaires▪ Interviews▪ Document Analysis

They were chosen in the evaluation plan to be best suited to evaluate and compare the DIOGENE final system against the requirements that had originally been set. This mix of various evaluation methods was very supportive, also in respect to the aspects of the distributed evaluation team.

Formal feedback was gained in different ways:

1. A **Feedback Report** filled in by test users working through scenarios and evaluation tasks.
2. Other feedback has been generated from **direct discussions** with evaluators and/or partners and considered in the list of recommendations.
3. Formal feedback was gained through an **Online questionnaire**. It was elaborated for the

- three main user roles – learners – tutors – skills searchers – and generated very specific answers and feedback based on the work experience of the evaluators.
4. **Online Interviews** that were held with a number of specially appointed evaluators helped to go into details with evaluators' answers and comments and to understand the ideas behind.
 5. **Document analysis** based on system reports and log information supported the monitoring of evaluators' work progress and results.

SCENARIOS

The evaluation was based on several scenarios that were prepared and distributed among the evaluators. The various scenarios defined tasks to undergo all system processes and to evaluate these processes from the various viewpoints and needs of different system users / stakeholders.

Each scenario was described in detail, starting with role and context description, and a set of tasks on which the scenario was built. Each scenario defined a different set of tasks, processes and logic. It was felt that this would test the capabilities of DIOGENE to represent the various requirements of all stakeholders as well as the different logic behind the system, and the various components of its technical translation.

Here is a short description (an excerpt from instructions that were provided to evaluators) of the scenarios provided for the most important stakeholders.

Learners
<p><i>In this system evaluation you will act as a DIOGENE learner. As a learner, you attend courses that are designed on your individual learning requirements and your learner objectives.</i></p> <p>The Training Agency works as entry point for you. Here you search for and access online learning material, and you define your learner profile where all information about you is stored (for example: your personal data, your acquired knowledge, your learning preferences and your competences). Your competences will be published so that skills managers (enterprises) can search for people with appropriate skills. The Training Agency also provides tutoring activities, so you can choose an appropriate tutor for your course. You can communicate with him/her and other learners using the Café.</p> <p><i>In the following pages you will find a list of 23 tasks - please read the task descriptions carefully and complete all 23 tasks.</i></p>

Tutors
<p><i>In this system evaluation you will act as a DIOGENE tutor. As a tutor, you support the learners during their learning process, if they have problems and questions related to the learning material. You register yourself within DIOGENE and sell your learning support services by support of the system.</i></p> <p>The Tutor Agency works as entry point for you. Here you can register your tutorial support services as well as administrate your details and contact data ("Tutor Info"). You define your fields of competence for which you offer tutorial support to DIOGENE learners and organise any related skills ("Tutor Model"). Additionally, DIOGENE organises and allocates your tutorial jobs based on learners' requests and provides an</p>

overview of your tutorial tasks ("Tutor Job").

In the following pages you will find a list of 17 tasks - please read the task descriptions carefully and complete all 17 tasks.

Skill Searchers

In this system evaluation you will act as a DIOGENE skill searcher. As a skill searcher, you use DIOGENE to find and recruit skilled people among the DIOGENE Learner Network professionals. You can perform a search in order to retrieve learners with desired specific skills.

The Skills Agency works as entry point for you. Here you can define and manage search profiles requesting for skills a learner should have. Starting the search will lead to a research in the internal skills repository and return a list of DIOGENE users (learners) who have the required skills. You will receive contact information of the users.

In the following pages you will find a list of 18 tasks - please read the task descriptions carefully and complete all 18 tasks.

Domain Experts (Expert Users)

In this evaluation you will act as a DIOGENE domain expert. As such expert, you have the task to identify free web material that corresponds with the requirements and knowledge of a domain concept and add this free web material to the concept.

You identify the list of concepts from the DIOGENE ontology for which you are responsible to locate and add free web material. In the Web Catcher Agency administrate the web resources for the identified concepts. There will be two Web Catcher Agencies available for such services, both of which shall be used from you according to the below task list.

In the following pages you will find a list of 7 tasks - please read the task descriptions carefully and complete all 7 tasks.

As far as possible, this collaborative evaluation process that integrated all different user roles was to be supported by the scenarios and tasks so as to allow for full functional and interactive evaluation. This was achieved by the project team members, with the responsible partners for conceptualising and implementation, agreeing a series of tasks and functions that were suited to fulfil the evaluation task.

The results clearly indicate that evaluation can be carried out successfully and synchronously, as was necessary to rebuild a real environment, provided regular and clear discussions and agreements on evaluation scenarios occurred beforehand.

The partners involved in the project were asked to appoint a group of evaluators. From these, users were allocated to the different groups of DIOGENE stakeholders and provided with work material and scenarios.

4. DATA

ON-GOING PROCESS

The evaluation has taken many phases and involved many different stakeholder groups. All work was split into two blocks: Phase I and Phase II.

Block I involved a limited number of experienced users and new users and evaluated DIOGENE on the final system, including learners and tutors. **Block II** involved more experienced users and also new users and evaluated DIOGENE on the final system, including learners, tutors, skills searchers, and domain experts.

Evaluation Block I Aug 18 – Sep 17, 2004	Evaluation Block II Sep 3 – Oct 4, 2004
Preparation & Internal Evaluation: until Aug 18 Experimenting: Aug 18 – Sep 3 Feedback: Sep 6 – Sep 17	Preparation: Sep 3 – Sep 8 Experimenting: Sep 8 – Sep 17 Feedback: Sep 20 – Oct 6

Analysis	End of Evaluation
starting Oct 6	Oct 31, 2004

PEER GROUPS

A consideration of the different stakeholders and working practises of the various organisations and user roles involved in DIOGENE network was essential. These differences provided a range of user viewpoints of the DIOGENE system, and also posed a series of various aspects for usability and system use and involvement. This meant that any system component had to be used and evaluated among a wide number of evaluators and generated valuable results for various system components within the consortium.

The evaluation initiated after implementation work for system improvement had been completed based on the findings of the experimentation results, and continued based on the advanced system considering issues that resulted from previous experimentation feedback.

In total, the formal evaluation peer group consisted of at least the following registered users:

Evaluators
<p>Primary group of evaluators have been</p> <ul style="list-style-type: none"> ▪ 137 users who interacted with the system as a 'LEARNER' ▪ 21 users who interacted with the system as a 'TUTORS' and/or 'DOMAIN EXPERTS' ▪ 11 users who interacted with the system as a 'SKILLS SEARCHERS'

A secondary group of users

- came from the evaluation and project team members who were advanced users and interacted with the system in different roles as administrators, maintenance and/or support people. Opinions from these groups have been sought and recorded informally, through face-to-face and/or e-mail conversations, and formally through feedback reports and questionnaires.

Users from the primary group came from Spanish, French, Bulgarian, Austrian, Greece and Italian project partners. Additional users – those of the secondary group - supported the process of evaluation also from the remaining project partners, these including implementation and work teams and local experts and/or key users.

A mixture of unskilled users and experienced users were integrated into the evaluation phase process.

Unskilled users were provided documentation and simulation material to better understand their tasks and the DIOGENE system.

Experienced users had already been involved in the preceding experimentation phase and had better experience with the system and better possibilities to compare the advanced DIOGENE system against the prototype.

The defined DIOGENE stakeholders were given chance in this evaluation to restate their ideas and opinions, notably through tasks and feedback channels. Specific care was taken to gather feedback on the learners' experience and interaction systems, and for this information to be integrated into an evaluation report. A clear example of this can be seen in the 'evaluation results' of the various DIOGENE stakeholders as part of the complete evaluation report.

5. OUTPUTS

The evaluation phase has focused on a detailed evaluation of DIOGENE as a complete system with different roles and organizations interacting with each other and has helped compare outputs in line with community requirements.

The evaluation process produced the following results:

An Improved DIOGENE System
<p>Feedback collected from evaluators could be translated into a number of comments and recommendations and defines the key requirements for any future version of the DIOGENE system. The knowledge of those success factors and conscious selective integration of all evaluation results increases the potential of DIOGENE in a real business environment and generates</p> <p>recommendations for further system development and improvement based on the findings from evaluation and, as a pre-stage, the preceding experimentation phase.</p>
<p>Methods: All evaluation methods / Partner Discussions</p>

Improved Online Support System / Supportive Material
<p>As it had already been very supportive for the experimentation phase, the project made again use of ViewletBuilder technology¹ – an online presentation and system documentation tool for software simulation and documentation – to provide support to its evaluators during the process of interaction. This product was appropriate in terms of scenario description and system introduction to test users and enabled effective documentation and supportive direction of evaluation tasks, and was easily accessible for all involved partner institutions and test users. It has been generally successful, and would be recommended to other projects.</p> <p>The DIOGENE Online Help system builds up on the final DIOGENE system and can be used as a support tool together with the application of DIOGENE and be beneficial to a real commercial environment.</p>
<p>Methods: Direct Communication / Evaluators Feedback / Partner Discussions</p>

Lists of Comments & Suggestions
<p>Evaluators were asked to keep a diary of issues as they worked with the DIOGENE system, and this information was collected by B&P in cooperation with the responsible partners for summary and analysis.</p> <p>For performance recording users were asked to record their comments based on their interactions with the DIOGENE system that were mainly based on the provided system</p>

¹ [ViewletBuilder Technology <www.viewletbuilder.com>](http://www.viewletbuilder.com).

evaluation tasks. Such resulting protocols provided clear overview on visited pages, learning paths, dwell times, accomplished interactions, used tools (eg. search functions) and so on.

Here is an excerpt of the instructions that were given to evaluators related to their work.

Please give, after every task, a feedback. Your feedback will be very important for evaluation results. So please allow for enough time to answer the provided questions. Describe in detail which problems you had when you worked through the tasks and which recommendations you have for DIOGENE as a system. Your comments can be related to technical difficulties, missing information, comments and suggestions.

Based on these guidelines a great number of issues were tackled and discussed by users and could be reported to the evaluation team members.

Methods: Feedback Reports / Direct Discussions

FAQ Lists / Problem Request Lists / Support Information

We created a DIOGENE support desk that could be addressed by e-mail if problems occurred during work with the system and/or additional information was required by the evaluators to complete their tasks. Several issues, information deficits, technical problems, or comments and suggestions for improvement could be discussed in a two way conversation, mostly based on email communication and document transfers. This completed list included issues that drew most attention of the users or needed most support, issues that were unclear or diverged from users' expectations.

The resulting FAQ lists and problem lists help our analysts identify some problem issues of DIOGENE and focus their evaluation on specific fields of interest.

Methods: Direct Discussions / User Support

Usability Evaluation / Quantitative and Qualitative Assessment / Statistics

Our Online Questionnaire is one of the most important resource for analysts to prepare the qualitative aspects of evaluation results.

After evaluators had completed their evaluation work and returned feedback reports they had to complete an online questionnaire, different between the different roles, that related to their work experience. The questionnaire consisted of four different parts

- Part I: General questions related to the individual work experience
- Part II: Role specific assessment (separated by different DIOGENE user roles)
- Part III: Role specific questions (separated by different DIOGENE user roles)
- Part IV: Concluding questions

It took an average of 35 to 45 minutes to complete the full questionnaire. All data could be collected in a database and used to generate statistics of the kind that was needed. The questionnaire also helped identify key aspects of system usability and performance.

Methods: Online Questionnaire / Online Interview

Recordings of Online Interviews / Additional User Feedback

Online interviews with a limited number of evaluators from different groups of stakeholders were held to conclude the generation of user feedback. These online meetings had two purposes.

- To harvest any further comments of the system and possibly provide answers to any unresolved issues.
- To discuss aspects with users in a mere informal way and to generate information that could not be addressed by use of the preceding evaluation methods.

As a preparation for these online interviews, the individual feedback data was and is currently being compared against data retrieved from the DIOGENE databases. This enables us to verify adequacy and better comprehension of the feedback as a preparation for the individual online interviews, and helps us interpreting users' comments and feedback issues to the most relevant extent and assisted in formulating questions that were specifically addressed to the interviewees.

The online meetings were very productive in most cases and they raised a number of valuable issues.

Results: Online Interviews / Recordings

System Data Sheets / Log Information

Drawing information about the actual performance of the users from the technical system supports the retrieval of additional data and information that enables the analysts to trace back processes and/or work that must have a special focus to verify the systems' performance. Results from these system recordings can then be compared to the actual answers of the evaluators whose performance will be observed and will give useful information to the analysts.

Results: Document Analysing / Feedback Reports

6. OUTCOMES AND IMPACTS

FINDINGS

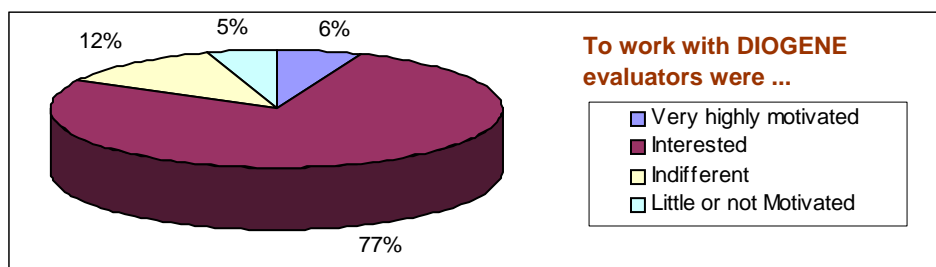
The specific outcomes will not, and cannot, be measured until an extensive analysis of DIOGENE evaluation has been completed. Therefore the following information is an interim outline of mere general findings that can be summed up from a fractional analysis of evaluators' feedback. It is much too early to assess the true impact of this evaluation, but some trends can be described.

GENERAL

The feedback clearly indicates that it was possible for users, after only a short period of time, to understand the basic idea of DIOGENE and to learn the interaction of the system. 96 % of evaluators state that understanding the system was easy or did not cause any difficulties and about the same percentage of evaluators found that understanding their roles, tasks, and work environments in the context of the system was rather not difficult.

However, it was felt that almost all users needed and benefited from the available support system (interactive online help) in which they could gain an overview of the most important functional and contextual features of DIOGENE. About 58 % of the users stated that, in at least some cases, they had problems understanding the context of the system and/or their work, and they would have required more information by the system to complete their tasks reasonably.

According to users' motives and motivation to use the system, it was found that the work attitude of users increased during interaction with the system, so that evaluators assessed their motivation as a system user higher in the end of their evaluation work than in the beginning. Only some users (1 %) claimed they did not like the system at all.



According to the innovative aspects that can be associated with DIOGENE, evaluators appointed DIOGENE to be a highly innovative (63 % of evaluators) and highly useful (94 % of evaluators) system that provides easy to use and good quality (91 % of evaluators) services of which they would want to make use again if DIOGENE will be available as a commercial service (87 % of evaluators).

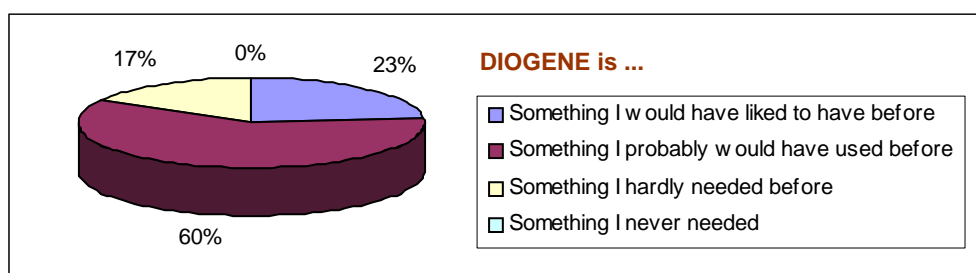
Here is some excerpts from interviews in which evaluators try to put the innovation of DIOGENE, how they see it, into words:

'The material search option is one of the best things, and maybe the way the content is presented.'
'After doing the course you can pass a test online and you can follow your improvements.'

A majority of evaluators (63 %) think DIOGENE as it is now is usable but needs further improvement to be applied in a wider context. Potential for improved system performance and, sometimes, technical problems that occurred during interaction with the system were reported by about 60 % to 65 % of evaluators, of which some reported to have used technology (internet technology) that deviates from typical standards in the internet. In that sense, DIOGENE could be improved in terms of better adaptability to alternative systems to support a wider group of stakeholders in any future environment.

The great majority of evaluators (68 %) thinks that DIOGENE is near to business needs and even more of those (78 %) state that DIOGENE services should be recommended to other users. Regarding this, a high potential for further improvement of the system and for application in a commercial environment can be assessed.

Finally, quite a big number of users confirm that DIOGENE offered services to them that they would have wished to have before. Drawing from this, it can be assumed that those users would use the services in a later application.



FEEDBACK FROM LEARNERS

Course Allocation

The overall impression of the learner centered services is extremely favorable: Most of the learners identified DIOGENE by the appropriate allocation of courses to learners according to their individual requirements. In this sense, most of the learners reported positive experience in the allocation of courses.

Learners basically had no problems finding available course offers but ideally needed to make use of the online course catalogue in order to find courses among the highly complex structure of the ICT ontology that the project developed. This would be true of an advanced DIOGENE system that integrates many courses to different areas of the whole ICT ontology. Generally, the results demonstrate that DIOGENE has a good level of utility for providing learning resources of various aspects and domains, but complexity of knowledge domains is still an issue that needs to be translated to users.

About 70 % of the learners felt that their user profile provided good support to define their learning behaviors, of which the definition of their learning language was ranked highest and most useful amongst all options. Other options, especially related to learning attitudes, were used comparatively less. And they showed highly satisfied with the allocation of courses they achieved by use of their profile definitions (72 %) and the adequacy of the courses that were suggested by the system to their lack of knowledge (78 %).

One of the major benefits that DIOGENE enables, as many users pointed out, is providing the available courses on a resource list directly to concepts of a knowledge domain. However, the benefits of this linkage are only truly realized when search or other functionality allows transparent course / concept search within the complex structure of the ICT ontology. Only this can ensure that all registered courses and available subjects can be traded by DIOGENE and consequently be

consumed by learners. As evaluation proves, more flexible search options for courses and/or the integration of a course catalogue, as an additional resource or integrated into DIOGENE, could be a beneficial add-on to the system in the current state and make full use of all available resources.

So, owing to this fact, it is expected that when enough transparency in the presentation of the ICT ontology is achieved, in order for the list of concepts to be as understandable and comprehensive as possible, DIOGENE does and will achieve good results in the allocation of courses to different and non-expert users.

Tutorial Support

An interesting aspect could be identified related to the user of the tutorial service in DIOGENE. Whereas many of the evaluators (learners) requested a need for tutorial support, only some of them actually made use of this support. Whereas some of the users proved and confirmed by their online questionnaire that they were allocated tutors for their courses, others claimed they did not achieve positive results on their tutor requests. Technical checks, however, proved that the allocation of tutors in the tests of the evaluation team corresponded well to the requests of learners. So it must be assumed that there are following reasons for this problem.

One reason may be the limited number of tutors who were available during evaluation compared to the higher number of learners and personalized courses. This situation, however, reflects a real business environment where there will be concepts and courses available in the DIOGENE ontology which may not have an experienced user as a mentor or knowledge expert as a tutor allocated.

The other reason may be the limited transparency of availability of tutors in DIOGENE. Learners only receive tutor lists on available courses. However, it seems they want some more flexibility of tutor requests. If there are no tutors available via course request they may want to search the system for available tutorial service that is related to the requested subject. This flexibility is not provided to this extent by DIOGENE and should be supported by a future DIOGENE. The same accounts for mentors.

Better transparency of availability of tutors could lead to better performance on tutor brokerage, as many users (65 % of learners) pointed out by stating that they were not sure about whether or not tutors existed for their courses and consequently showed uncertainty about the resulting offers for tutorial requests. About 25 % of learners appointed a need for more information around availability of tutorial services and about 18 % addressed a specific need for better tutor search possibilities. Embedding tutor lists in DIOGENE to allow direct access to the information that supports tutorial services and/or contact points for tutorial services could be an easy-to-implement and highly user oriented solution to this issue.

Communication

Part of DIOGENE was to realize communication channels between the learners and tutors and/or to create learning communities between the learners.

We have been in conversation with the evaluators (by direct contacts and/or online interviews) and found out that using the many different communities well supported by the available tables in DIOGENE did not fully meet the users' expectations to their complete satisfaction. We assessed very different aspects of the various types of users related to online communication and collaboration and found out that individual preferences can be much of an obstacle to collaborative learning and related technical solutions.

Conclusion

The evaluation work and outcomes of DIOGENE learners has helped demonstrate the benefits of an inclusive approach to providing learning resources to learners.

Owing to the difficulties that test users had to find tutors and the different preferences and/or experiences evaluators had concerning direct communication, 'Communication and Tutoring' were the least positive aspects that were associated with DIOGENE (rating 1 out of 4). 'Course Delivery' and 'Navigation and Interaction' (rating 2 / 3 out of 4) however resulted to be the very positive aspects that DIOGENE presented to the evaluators.

FEEDBACK FROM TUTORS

Tutorial Services

Most of the tutors (56 %) who evaluated DIOGENE see DIOGENE as a useful service for the support of their services. Most of them requested for additional support from DIOGENE to define their tutorial services whereas none of them were unable to offer their tutorial services to DIOGENE learners by use of the system. 92 % of the tutors think DIOGENE offers services that can be of use for them in a real business environment.

Whereas most of the tutors stated no problems with the registration as a tutor and definition of tutorial service (80 %), the difficulty lies in the transparency of tutor jobs and tasks. Only a minority of tutors (25 %) think they understood well the way DIOGENE supports their tutorial services and tasks – which goes well along with the 58% of evaluators who confirmed to have had at least sometimes problems to understand the context, which – according to them – was a bit confusing sometimes (62 %).

About 77 % of the tutors felt that the 'learner model' was very useful to define their experience and tutorial services, whereas the 'job list' which presents the tutor requests from learners to the tutors, was most confusing to them (70 %).

Allocation of Learners

Nearly half of the tutors stated that with the selection of learners who sent tutorial requests and consumed tutorial support they were satisfied, but a more progressive model of learner requests was expected by evaluators.

In some cases tutors had problems understanding when and whether learners contacted them. This highlights the fact that some tutors were not making themselves aware of the requests going in from learners to use their tutorial services. Regarding their high motivation to co-operate in this evaluation and the reported lack of information, it can be assumed that a more transparent DIOGENE tutorial environment can address this lack of information. Embedding learner lists in DIOGENE to allow direct access to learner related information for a tutor would support the process of teaching.

An interesting aspect could be identified related to the user of the tutorial service in DIOGENE. Whereas many of the evaluators (learners) requested a need for tutorial support, only some of them actually made use of this support. It was already explained in this report.

Learning Progress

Whereas many tutors who provided tutorial support to learners regularly checked the learning progress of their learners (70%), only some of them (30%) made use of the learners' learning history. Better and more exhaustive information on learners (31 %) and direct contact with learners (19%) was counted among the most important issues that shall be treated in any future version of the system.

Communication

Part of DIOGENE was to use the provided communication channels to create communities for communication with the learners.

Some but not all of the tutors and/or mentors have been in constant communication with learners throughout the evaluation process. This is partly due to the time constraints and limited availability of evaluators during the summer period, as some of them stated in the interviews.

Free Web Material

DIOGENE deals effectively with learning resources that have been translated to the DIOGENE ontology. Tutors addressed their interests in adding alternative resources to their lists. This issue is being treated by DIOGENE free web material that can be used to add complementary material. It is recommended from tutors that DIOGENE allows a mechanism that enables tutors to register free web material.

The complexity and exhaustion of the available ICT ontology leads to limited numbers of positive search results but shall increase with the increasing number of users and materials incorporated in the system. This can be assumed from tendencies that could be detected in the interaction of the evaluators (drawn back from various evaluation methods).

Conclusion

The evaluation work and outcomes of DIOGENE tutors has addressed some issues that will have a positive impact on the provision of tutorial support to learners. The two most difficult tasks were the 'Understanding of tutor jobs' and the 'Viewing learners and learner details'.

So, owing to this fact, it is expected that when more transparency towards learners is achieved, in order for tutors to better understand the purpose of the 'jobs concept' and have any form of notification system on learner requests in DIOGENE, DIOGENE does and can achieve good results in the allocation of tutors to learners. Embedding tutor lists in DIOGENE to allow direct access and/or contact points for tutorial requests, a need that has already been addressed by learners, could be an easy-to-implement and highly user friendly solution to both learners and tutors.

Despite the difficulties that some tutors had in finding learners, the evaluators emphasized the very positive aspects of DIOGENE as a practical, innovative and very useful tool.

FEEDBACK FROM SKILLS SEARCHERS

Feedback from skills searchers addresses mainly one interesting aspect that has not been previously mentioned:

Allocation of Skilled People

Mainly all services related to skills searches, eg. 'Adding new search profiles' and 'Finding specific skills' in the skill searchers environment, were easy going according to evaluators feedback detected by various evaluation methods (up to 90 % of skills searcher evaluators).

However, accessing the details of learners was rated as the most restricting factor that might prevent skills searchers from direct contacts to experienced learners – about 70 % of evaluators did not find satisfying ways to view learner details and consequently had difficulties contacting learners (about 50 %).

The flexibility and adaptability of available search options according to individual needs of skills searchers and/or search request was proved by a balance in the use of the various search options DIOGENE provides to skills searchers and confirms the statement of most users that DIOGENE provides 'excellent or good support for skills searches'. None of the available search options was clearly evaluated as useless. Flexibility in skills searches could be achieved in the definition of a set of skills.

FEEDBACK SUMMARY

The feedback can be summarized as follows:

Related to stakeholders ...

Stake Holders
<ul style="list-style-type: none">▪ got rapidly familiar with the system▪ were highly motivated to use DIOGENE▪ sometimes had difficulties to understand the context and, as they needed more information about the work context, used the info sites and online repeatedly▪ think DIOGENE is useful and practical, innovative, reasonable in complexity but slightly confusing, easy and reliable, and a good service that they would recommend to other users▪ see potential in further improvement of the system
Learners <ul style="list-style-type: none">▪ request for more and better information concerning available tutorial services▪ think that more flexible collaboration and communication tools would be beneficial to their learning process▪ hardly used free web search but reported positive results in several cases
Tutors / Domain Experts <ul style="list-style-type: none">▪ queries were answered to learners in a timely and helpful manner▪ have demonstrated a willingness to understand and develop their tasks and skills list.▪ request for more and better information concerning available tutorial services▪ rate the quality of available courses and free web material as high▪ think that more integrative collaboration tools would better support the learner though some of them demonstrated a willingness to engage with the community at large
Skills Searchers <ul style="list-style-type: none">▪ requested more detailed information concerning learners▪ confirm the quality of the system and search results but demand for more flexible search processes

Related to services ...

User Registration

- there were no reported problems with user registration
- the e-mail notification service on the registration process was confirmed by evaluators to be very important; some users reported long delay times which might be due to system settings
- some users suggested to reflect on the various services that are available to all users and suggest a simplification of the registration service in favour of better clearness right from the start

Brokerage / Allocation

- DIOGENE does and can achieve good results in the allocation process if the processes are understandable for users
- most of the learners are highly satisfied with the allocation of courses, but made additional use of the online course catalogue
- The complexity and exhaustion of the available ICT ontology leads to limited numbers of positive search results
- many of the evaluators (learners) requested a need for tutorial support services, but only some of them actually made use of this support

Communication

- communication tools were used only from a limited number of users
- individual preferences can be much of an obstacle to collaborative learning
- accessing the details of learners was rated as the most restricting factor in direct contacts between stakeholders
- many of the evaluators (learners) requested a need for tutorial support

Quality of Services

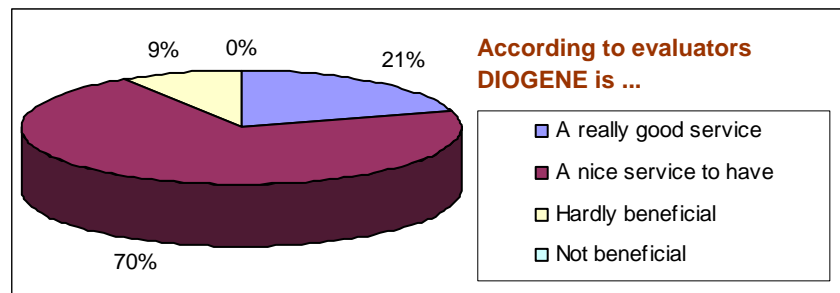
- DIOGENE deals effectively with learning resources that have been translated to the DIOGENE ontology
- learners' user profiles provided good support to define individual learning behaviors
- the limited number of evaluators did not allow to achieve the effects as compared to a commercial system
- learners appointed a need for more information around availability of tutorial services which could be addressed by additional tutor lists
- only some of the tutors made use of the learners' learning history
- Mainly all services related to skills searches were easy going
- DIOGENE provides 'excellent or good support for skills searches'

Innovation

- DIOGENE has a good level of utility for providing learning resources of various aspects and domains but complexity of knowledge domains is still an issue that needs to be translated to users
- a huge benefit of DIOGENE is that available courses exist and are related to concepts of a structured knowledge domain
- evaluators emphasized the very positive aspects of DIOGENE as a practical, innovative and very useful system

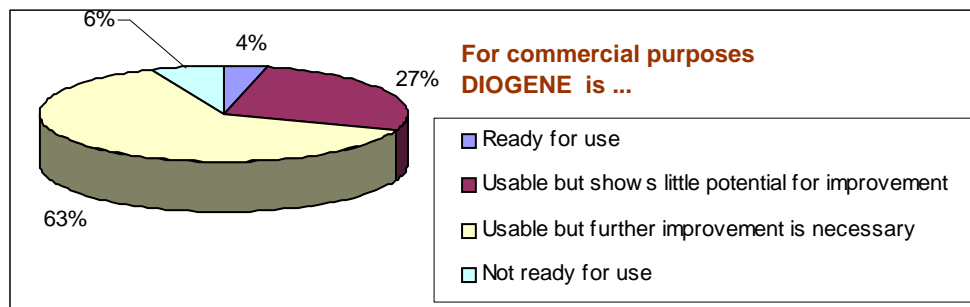
CONCLUDING INFORMATION

Evaluation proved that DIOGENE has had a significant impact on the brokerage of ICT courses. This can mainly be seen in the comments drawn from evaluators and the reliability of the DIOGENE system in bringing together learning content and learners in an automatic and needs oriented way.



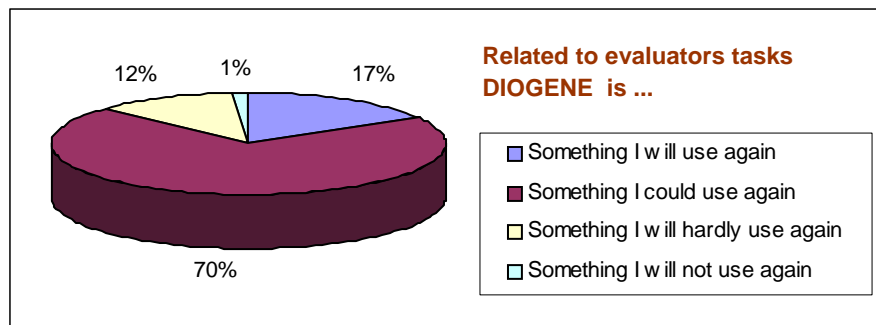
Evaluators have demonstrated a willingness to interact with the system and claimed correspondence with the requirements identified by stakeholders in the initial phase of the DIOGENE project in most cases.

In the evaluation feedback the importance of further system development, and subsequently the improvement of DIOGENE services, was highlighted by many test evaluators. The major impact of the work of the DIOGENE project will be on the current partners of the consortium as they look at taking forward the results and lessons learnt by the project. This will involve a reflection and decision-making process, using results produced by the evaluators, and recommendations made.



The current state of the evaluation results however suggests that work provided by DIOGENE shall be driven forward by further activities as there is a high chance DIOGENE will be accepted as a service among the wider community.

It shall also be addressed that many of the evaluators thanked the DIOGENE project team for keeping them involved in this evaluation process and informed about the development of DIOGENE as a service that may be available in the near future. Increased motivation of users during their evaluation work as well as their acknowledgement of the innovative character of DIOGENE have been approved in that sense.



This shall encourage the whole project team to work for the availability of DIOGENE services after the project. Therefore we would recommend that any future organization that shows potential use or promote DIOGENE as a service will be keeping staff and interest groups aware of the availability of such services.

7. COMPARING TO EXPERIMENTATION

This category of evaluators' feedback provides a set of suggestions and comments that have been collected from evaluators' experience to improve the DIOGENE system in aspects of

- **Technical / Functional Correctness**
- **Usability**
- **Service / System Upgrades**

We now compare those aspects to the key requirements that have been put into three categories in the experimentation:

- **Technical Difficulties (TD)**
- **Missing Information (MI)**
- **Comments and Suggestions (CS)**

TECHNICAL / FUNCTIONAL CORRECTNESS

This category of user feedback identifies the technical correctness of the system and evaluates issues that were detected by evaluators during their interaction with the DIOGENE system. The final DIOGENE system assured that a high percentage of such problems that existed in the evaluation prototype do not anymore exist in the final system. Consideration in implementation work after experimentation had been high priority in this category.

Some additional issues have been addressed due to the fact that experimentation was based on a scenario that excluded some DIOGENE organisations. They are listed below and have been explained in details before.

Here is a list of evaluators' outcomes that are related to issues that improve the technical stability of the DIOGENE system.

	No. of related issues that were generated from evaluation / experiment.
TECHNICAL DIFFICULTIES (TD)	257 / 126
System runtime errors - This category of comments concerns temporary or constant instability and/or unavailability of the system or parts of the system (single DIOGENE organisations). It also identifies issues where the provided functionality of the system did not provide positive or no results due to technical difficulties.	47 / 50
Unreliability of Messaging service - This category of comments concerns temporary or constant unavailability of the DIOGENE messaging service and/or identifies use cases in which test users did not achieve the suggested results or were partly unable to continue work due to technical difficulties.	11 / 9
Problems with Data Retrieval - This category of comments relates to problems and/or suggestions identified concerning the retrieval and/or display of DIOGENE data from the database and their listings in the user interfaces, this relating to fields with no or wrong data content.	5 / 8

System Performance - This category of comments relates to obvious performance problems such as is slow data retrieval and/or navigation between pages and/or various parts of the DIOGENE system, heavy load times on data requests, etc.	47 / 9
Login and access control problems - This category of comments reports potential errors that had been identified on user registration, authorisations and/or authentication services.	4 / 15
Listings contain errors - This category handles various issues concerning technical difficulties related to listings, including display, retrieval, and/or sorting mechanisms.	5 / 14
User sessions – This category provides feedback on technical correspondence of user sessions with the DIOGENE requirement – it also reports timeout problems.	2 / 3

Additional issues from evaluation phase:

Course Allocation – as explained above	27 / 0
Tutorial Support – as explained above	49 / 0
Communication – as explained above	45 / 0
Online Help Problems – as explained above	15 / 0

Feedback is based on the results from 66 experimenting users (experimentation) / 169 evaluating users (evaluation). This returns a ratio of 2.56 times more evaluating users than experimenting users. Drawing from this it could be assessed that :

**The technical stability of the DIOGENE system
could be increased by at least 20 %.**

USABILITY

This category of user feedback describes in what way and context the usability of the system in terms of information and/or guidance could be improved in order to better understand and/or interact with the system.

Here is a list of evaluators' outcomes that are related to better usability of the DIOGENE system.

	No. of related issues that were generated from evaluation / experiment.
MISSING INFORMATION (MI)	127 / 68
Fields - Missing information concerning user interface field descriptions and explanation.	26 / 33
Concept Structure - Missing information concerning DIOGENE concepts and knowledge structure was detected.	10 / 10
User feedback – Users request clear information on the processes that are going on, when they are finished, and what the results are. System feedback to the users is important for better transparency.	5 / 8
DIOGENE Organisations – A better understanding of DIOGENE organisations	4 / 4

must be created for users and support must be given to understand their different functions. Descriptions will be beneficial.	
Usability Problems – User request for a better understanding of the diverse contexts of user interfaces and processes. User instructions that are incorporated directly into the various screens of the DIOGENE system are vital to any commercial DIOGENE system especially in complex tasks such as is the selection of DIOGENE domain concepts.	15 / 10
DIOGENE Elements and Architecture – Users request for more detailed information on DIOGENE elements and concepts that they are offered – this concerns courses, tutors, concepts, etc. Better description of the DIOGENE elements and concepts will lead to better results.	10 / 1
Others (rated minor problems)	57 / 0

Feedback is based on the results from 66 experimenting users (experimentation) / 169 evaluating users (evaluation Drawing from this it could be assessed that :

Usability could be increased by at least 27 %.

SERVICE / SYSTEM UPGRADES

All comments and suggestions for further system development that could be identified by evaluators as relevant have been formulated in a list of basic recommendations for DIOGENE system improvement. Solutions to improve DIOGENE according to the suggestions and comments should be found and incorporated in the final DIOGENE final system.

SUGGESTIONS

In total, the evaluation team generated

- **recommendations for further system development and improvement based on the findings from experimentation and evaluation**

that can be used for further system improvement in order to achieve a system that evaluators claim would suit business needs and produce a sustainable DIOGENE service on the market.

A detailed list of related comments and suggestions that came from the evaluators was produced and serves as a basis for further system development. They can be summarized by the following:

1. **Find better ways to translate the complexity of knowledge domains (concepts) to users. Therefore, improve the concept search within the complex structure of the ICT ontology.**
2. **Add more flexible search options for courses.**
3. **Allow direct requests to tutors independent of course requests.**
4. **Improve transparency of available tutorial services and allow better tutor search possibilities.**
5. **Improve on the tutor job and task model and create a more transparent DIOGENE work environment for tutors.**
6. **Reflect on the current communication channels and make them more supportive as well as integrated into the learning process.**
7. **Integrate better and more exhaustive information on learners, and direct contacts, both for tutors and skills searchers.**
8. **Improve on usability by incorporation of more information on relevant items and processes.**
9. **Improve system performance and avoid technical problems.**
10. **Include additional exhaustive functionality.**

Additionally,

- **26 suggestions for further DIOGENE functionality**

were made from evaluators and would possibly lead to a successful, needs related and commercial DIOGENE system. The evaluation therefore also revealed a number of issues that could help upgrade the DIOGENE system with additional functionality to make it even more adjusted to stakeholders requirements. Further implementation based on these findings and more in depth optimization of this system will add to that aim.

FINAL REMARKS

DIOGENE answers the majority of the user needs identified in the evaluation process undertaken by the DIOGENE project, and has stood up to the demands of the full evaluation undertaken by the project team. Where the product does not meet identified requirements, solutions and suggestions for improvement have been found and addressed by evaluators or are being pursued and are identified within this report. However, it can be assumed from the first analysis results of DIOGENE evaluation that the implemented system seems to have successfully met the majority of aims and objectives as laid out in the initial specifications of the system requirements.

Drawn from the list of suggestions and comments towards an advanced system, it can be assumed that the project period allowed for enough time and possibilities to both extensively reflect on highly innovative scientific issues and results that DIOGENE addresses, as evaluators confirmed and project members proved by their many work results and deliverables, and develop and implement a commercial system which is ready for business and provides advanced services which can be applied in a commercial environment with no further development.

This report lays out areas where ongoing work is required by the project team members. The evaluators feel that adoption of DIOGENE is advisable and realistic subject to the development and recommendations outlined in this report.

The evaluation results seem to prove that the DIOGENE system has responded to the identified requirements in the possible extent, and that joint effort of interactions between the partners has had positive outcomes for the community.

The partners of the consortium are currently investigating ways in which they can work together to provide advanced services for the community based on the current DIOGENE system and the many comments and suggestions that had been generated from the experimentation and evaluation phase.

ADDITIONAL DOCUMENTS

Additional internal reports and reusable material has been produced for communication of evaluation results between the project consortium. They are listed in the following.

DETAILED REPORT

Report	Document
Details from DIOGENE Evaluation results a detailed report that reflects the tutors' evaluation experience, comments and suggestions based on their interaction with the DIOGENE framework. All collected data was generated from DIOGENE evaluation phase.	Evaluation_ReportReport_Details.doc final version: Dec 21, 2004

INTERNAL REPORTS

Report	Document
Learners' Feedback & Recommendations a summary report that reflects the tutors' evaluation experience, comments and suggestions based on their interaction with the DIOGENE framework, with special reflection on the DIOGENE Network Reception, Training Agency, Brokerage Office, Authentication Agency, Chat and the whole framework. All collected data was generated from DIOGENE evaluation phase.	ExpReport_Learner.doc final version: Dec 18, 2004
Skills Searchers' Feedback & Recommendations a summary report that reflects the skill searchers' experience, comments and suggestions based on their interaction with the DIOGENE framework, with special reflection on the Skill Agency, Chat, and Network Reception. All collected data was generated from DIOGENE evaluation phase.	ExpReport_SkillManager.doc final version: Dec 12, 2004
Tutors' Feedback & Recommendations a summary report that reflects the tutors' experience, comments and suggestions based on their interaction with the DIOGENE framework, with special reflection on the Tutors' tools and Knowledge Agency, Chat, and Network Reception. All collected data was generated from DIOGENE evaluation phase.	ExpReport_Tutor.doc final version: Dec 12, 2004

MATERIAL

Work Sheets / Task Lists	Document
Task List (Learner) a list of tasks test users 'learner' were asked to complete in the evaluation phase.	WorkSheet_Learner.pdf final version: Aug 19, 2004
Task List (Tutor)	WorkSheet_Tutor_Sheet1.pdf

a list of tasks test users 'tutor' were asked to complete in the evaluation phase.	WorkSheet_Tutor_Sheet2.pdf final version: Aug 19, 2004
Task List (Skill Manager) a list of tasks test users 'skills manager' were asked to complete in the evaluation phase.	WorkSheet_SkillsFinder.pdf final version: Sep 10, 2004
Task List (Web Catcher) a list of tasks test users 'web catcher' were asked to complete in the evaluation phase.	WorkSheet_WebCatcher_Sheet1.pdf WorkSheet_WebCatcher_Sheet2.pdf final version: Aug 19, 2004

DIOGENE Course Catalogue	Document
Course Catalogue a list of concepts and courses that were supported by the DIOGENE final system. It was used - by learners to choose among their learning requests - by tutors / trainers to register their skills and tutorial services with respect to the available courses - by skills searchers to search experienced learners among the available courses - by web catcher administrators to select and add free web material to the available courses	DIOGENE_AvailableCourses.pdf final version: Aug 18, 2004

Feedback Reports	Document
Feedback Report (Learner) a feedback report and commentary sheet for test users 'learner'.	FB_Learner.xls final version: Dec 12, 2004
Feedback Report (Tutor) a feedback report and commentary sheet for test users 'tutor'.	FB_Tutor.xls final version: Dec 12, 2004
Feedback Report (Skill Searcher) a feedback report and commentary sheet for test users 'skills manager'.	FB_SkillManager.xls final version: Dec 12, 2004
Feedback Report (Domain Expert) a feedback report and commentary sheet for test users 'domain expert'.	FB_DomainExpert.xls final version: Dec 12, 2004

Online Documentation & Help Material	Document
DIOGENE Handbooks diverse handbooks for DIOGENE system components and/or organisations to provide offline user guidance	diverse documents (in Word and/or HTML format)
DIOGENE Online Help an animated online help system with various simulations of DIOGENE processes and organisations to provide online user guidance and a reference list for user.	diverse documents (in HTML and SWF format based on Viewlet Technology) final version: Sep 14, 2004

DIOGENE List of Questions for Online Interview	Document
List of Questions a list of standard questions provided for each role plus a set of	DIOGENE_OnlineQuestions.ppt final version: Sep 21, 2004

individual questions generated from feedback material and online questionnaires coming from the interviewees' evaluation work.	
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DIOGENE Online Questionnaire	Document
Online Questionnaire (Learner) a set of questions that evaluators with user role 'learner' were asked to complete in an online questionnaire after their evaluation work.	Tasks_Learner.pdf final version: Aug 18, 2004
Online Questionnaire (Tutor) a set of questions that evaluators with user role 'tutor' were asked to complete in an online questionnaire after their evaluation work..	Tasks_Tutor.pdf final version: Aug 18, 2004
Online Questionnaire (Skill Searcher) a set of questions that evaluators with user role 'skill searcher' were asked to complete in an online questionnaire after their evaluation work.	Tasks_SkillManager.pdf final final version: Aug 18, 2004

DIOGENE Online Questionnaire Answer Sheets	Document
Individual Response Sheets a set of all individual response sheets coming from the questionnaire (as a study material to be used for later online interviews and/or detailed evaluation analysis).	DIOGENE_IndividualInterviewRe ports.zip final version: Dec 12, 2004

DIOGENE Questionnaire Summary Sheet	Document
Summary Response Sheet summing up all responses to the questions answered by all evaluators in the online questionnaire (a material that has been produced for later evaluation analysis). <i>consisting of: Summary Response Sheet Learner, Summary Response Sheet Skills Searcher, Summary Response Sheet Tutor & Domain Expert</i>	DIOGENE_SummarySheet.xls final version: Dec 12, 2004 DIOGENE_SummarySheetLearner.xls DIOGENE_SummarySheetTutor&DE.xls DIOGENE_SummarySheetSkillsSearcher.xls