



*European digital content for the global networks*

**EDC-22071 KOM2002/27938**

## **Groupware for Distributed Content Production**

**KOM2002**

### **Final Evaluation Report**

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| <b>Other contributors</b>                 |  |
| <b>Author(s)</b>                          | Evagelia Gerasi; Petros Skapinakis; Venetsanos Mavreas   |
| <b>EC Project Officer</b>                 | Kimmo Rossi  |
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| <b>Abstract (for dissemination)</b>       | This report, last part of the seventh work package, aims to show the final results of the ongoing evaluation which has started after the site became public and will end now with the termination of the project. It is a report of the progress achieved in each separate domain discussed in deliverable D7.1 (Evaluation Plan). |

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## 2. Executive summary

This report, which is part of the seventh work package, aims to show the final results of the ongoing evaluation which has started after the site became public and will end now with the termination of the project. It is a report of the progress achieved in each separate domain discussed in deliverable D7.1 (Evaluation Plan).

The main domains of the evaluation to be presented in this deliverable are an external peer-review, the evaluation of the usage and the results from the questionnaire we had inserted into the site for the users to fill in. An external evaluation from an independent expert and an evaluation of the groupware used from a post-graduate student working in Sweden with our technical experts will also be presented. The evaluation of the groupware from the users participating in the project was presented in the previous deliverable (D7.2, First Evaluation Report).

From what we gather of the usage statistics, our site seems to have far more visitors than expected. The impression we get from the same statistics is that a main reason for this activity must be the good quality of answers our site provides to common human problems (most popular pages were those about sexual disorders, depression, sleeping problems etc).

The results of the groupware evaluation (made from the student mentioned above) showed that the groupware might have caused some practical problems, mostly to new users, but at the end it proved valuable to the progress of the project.

The remarks made of the external peer-reviewer show us that our site provides a large amount of mental health information, but it should probably change a little its profile and be more user-friendly.

However the most important is the real users' opinion, which can be seen from the answers on the questionnaire inserted. Most of the users who answered this questionnaire, gave our site a rating from 3 to 5 (with 5 being very good in its overall quality). This is very hopeful for us because we see that we have created a site which helps if not all at least a large proportion of the people who visit it. This ensures us that we have reached the most important goal of this project which was to help those who need it.

### **3. Introduction – Background**

It is a common knowledge that the use of Internet has grown wide within the last years, especially in the European countries and the so-called western world. People of all ages and especially young children and adolescents appear to be searching for health information through the Internet daily.

Quite relevant in this subject are problems of mental health. It has been reported, for example, that more Internet users search the Web for information on depression than any other health condition. Furthermore a search in the “google” ([www.google.com](http://www.google.com)), one of the most popular search engines, has shown that the term depression yields 5.160.000 different pages, far more than other common conditions such as heart disease (2.910.000 pages), cholesterol (2.370.000 pages), headache (1.780.000) or influenza (870.000 pages). This is not surprising given the high level of disability associated with depression in the community and the fact that the Web provides a convenient and anonymous means of obtaining information about mental health problems, which is very important considering the stigma mental illness carries in our society.

Given this information, in the KOM2002 project we aimed to develop a website providing high quality information on various mental health problems. In particular, we aimed to produce information with the following characteristics:

- It should be accurate and evidence-based.
- It should be easily accessible from citizens across Europe and in particular should be available in several languages.
- It should be easily searchable and relevant.
- It should give the user the opportunity to interact with specialists speaking his or her own language.

We have now reached a point, where our site has been created and gone public, filled

with a lot of information on mental health subjects. So an evaluation was demanded.

Evaluation is a systematic investigation, a process (not a single act, but an ongoing procedure) which aims to help us estimate the usefulness of the project. Information was gathered to determine what is working and why, and whether the project is meeting its goals and objectives according to the proposed time plan. This information mainly aims in constantly developing and improving the site. Evaluation in our case is important not only to the developers of this site but also and above all to the public which is in need of our services. Patients tend to seek for current and well-provided information and our aim is to fulfill these expectations.

Furthermore this project gave the opportunity to people from different countries and with different computer skills to work together on a specific groupware. Given that most of the partners were medical experts, with no previous knowledge of the groupware, an evaluation of the groupware and its usefulness helped us determine whether this or a similar software could be used in projects of this kind.

This report, which is part of the seventh work package, aims to show the final results of the ongoing evaluation which has started after the site became public and will end now with the termination of the project. It is a report of the progress achieved in each separate domain discussed in deliverable D7.1 (Evaluation Plan).

## **4. Evaluation of the quality**

According to the Deliverable D7.1, evaluating the project results requires acting in two different directions: First, to evaluate the usefulness and convenience of the groupware used in order to develop the site and second, to evaluate the quality and value of the web site developed.

### **4.1 EVALUATION OF THE GROUPWARE**

The groupware evaluation was discussed in Deliverable D7.2 (First Evaluation Report). There were presented the answers to a questionnaire applied to the groupware users and the conclusions made out of them.

However an evaluation of the groupware was written as a part of a Master thesis performed from a post-graduate student working for our technicians at KTH. The part of this work concerning Kom2002 is attached below in Appendix I.

In this evaluation the whole concept of KOM2002 is explained and the detailed work needed to create this groupware is made obvious. The student makes a remark on the difficulty of having to use HTML to create FAQs (something that proven difficult for almost all users of the groupware, as was mentioned in Deliverable D7.2) , but she also notes that with a little practice one can easily learn to handle the groupware (which was also mentioned by the majority of the users).

## **4.2 EVALUATION OF THE WEB CONTENT**

### **a. External evaluation :**

As was discussed in the Evaluation Plan the site was presented to an expert in Sweden who was asked to comment on the site's content and usability and was paid for this task. This external peer-review is written and presented in Appendix II.

As stated in the report, the external expert made some comments on the content of the information provided. The 20 items he mentions, were selected to be presented in web4health, because, according to the medical experts' opinion these are the most common psychological and psychiatric problems in most parts of Europe nowadays. Of course it is understandable that we were not able to cover all psychiatric problems and questions that might exist, but this is not a work to be done inside a project in a specific time-schedule but something that should be ongoing so that it would be more complete every day. Information about the writers , their experience and studies is given of course inside the site.

Concerning the high amount of information in the "category specific sites": this was done with the purpose to provide users with all the possible options on the topic they are searching. As one can see later on (at the next part of the Deliverable concerning the real users) most of the users found the site quite easy to use and navigate.

## **b. Evaluation with the help of real users :**

It is understandable that an evaluation based only on the opinion of one expert is not adequate to estimate whether the site has achieved its original goal of providing medical information to those who really need it. For this purpose we decided collect data from the real users.

We have created a questionnaire for evaluation purposes and inserted it into our website so that users can fill it when they access the online information. This was implemented in early September and is still running.

In the tables below we report the questionnaire as well as the answers provided by the first 100 users After each question we wrote a comment concerning the answers given by the users.

Was the content of the site useful to you? Please rate on a scale from 1 to 5:

|   |                     |
|---|---------------------|
| 1 | 6 not at all useful |
| 2 | 5                   |
| 3 | 31                  |
| 4 | 21                  |
| 5 | 37 very useful      |

It is important to notice that 37 out of 100 found the site very useful, in contrast to only 6 who found it not at all useful. Furthermore the majority of users benefited from the consultation of the site (89 out of 102 rated the usefulness from 3 to 5).

Please rate the information you obtained.

|   |   |
|---|---|
| 1 | 8 very badly written - not understandable     |
| 2 | 6   |
| 3 | 14  |
| 4 | 31  |
| 5 | 41 very well written - totally understandable |

As we can see 86 out of 102 found the site information well-written and understandable (ratings from 3 to 5).



On a scale from 1 to 5 please rate to which point the site made clear what sources of information were used to compile the content:

|   |  |
|---|--|
| 1 | 6 no sources of evidence for the information are mentioned |
| 2 | 13   |
| 3 | 32   |
| 4 | 28   |
| 5 | 21 the sources of evidence are very clear                  |

21 out of 100 found the sources of evidence very clear. 81 out of 100 gave a positive rating from 3 to 5, in contrast to 19 who gave a negative rating from 1 to 2.

On a scale from 1 to 5 please rate whether it was clear when the information was produced:

|   |   |
|---|---|
| 1 | 8 No, no dates existed on any text or answer or source of information           |
| 2 | 14  |
| 3 | 32  |
| 4 | 23  |
| 5 | 23 yes, there were dates on every text of information I was given from the site |

Again the majority of the users (78 out of 100) gave a good rating (from 3 to 5) concerning the reference on the time of production of the information.

Please rate to what point you thought the information was balanced and unbiased?

|   |  |
|---|--|
| 1 | 5 the information is completely unbalanced or biased   |
| 2 | 13   |
| 3 | 27   |
| 4 | 25   |
| 5 | 30 the information is completely balanced and unbiased |

82 out of 100 users found the information objective (ratings from 3 to 5). One can easily understand the importance of this result for a site whose goal is to provide medical information.

Please rate to what point you thought the information covered your questions in depth:

|   |  |
|---|--|
| 1 | 15 no, I was left with many questions unanswered |
| 2 | 19   |
| 3 | 21   |
| 4 | 25   |
| 5 | 20 yes, it had all the necessary details         |

More than half of the users (66/100) were enough satisfied with the information they obtained from our site.

Did you think the site satisfactorily provided links for additional information?

|   |   |
|---|---|
| 1 | 7 no, it provided no links at all or no links were useful |
| 2 | 11  |
| 3 | 29  |
| 4 | 24  |
| 5 | 29 yes, it provided many useful links                     |

Again a big percentage of the users (82 out of 100) gave a rating from 3 to 5 to this question, this meaning that the site provides an adequate amount of useful links.

Were the aims of the site clear to you? Please rate on a scale from 1 to 5

|   |  |
|---|--|
| 1 | 6 no, the site does not include any indication of its aims |
| 2 | 4  |
| 3 | 24   |
| 4 | 24   |
| 5 | 42 yes, the site has clear aims                            |

90/100 users were able to understand to an adequate point the aims of the site.

Do you think the site achieves its aims? Please rate on a scale from 1 to 5:

|   |  |
|---|--|
| 1 | 7 none of the information you were expecting from the aims has been provided       |
| 2 | 5  |
| 3 | 26   |
| 4 | 35   |
| 5 | 27 all the information expected from the description of the aims has been provided |

87 out of 100 users think the site fulfills its aims to a satisfactory degree (rating from 3 to 5).

Please rate how easy/difficult to navigate the site was (navigation=finding your way on the web site):

|   |                  |
|---|------------------|
| 1 | 5 Very difficult |
| 2 | 2                |
| 3 | 16               |
| 4 | 27               |
| 5 | 50 Very easy     |

93/100 users rated the navigation of the site from 3 to 5. This is also very important because it means that almost all users find the site quite easy to use.

Please rate the mechanism of feedback (interactivity) of this site:

|   |  |
|---|--|
| 1 | 7 not at all satisfactory-very difficult to ask questions and obtain extra information |
| 2 | 10   |
| 3 | 30   |
| 4 | 29   |
| 5 | 24 very satisfactory-very easy to ask questions and obtain extra information           |

A large majority of the users (83/100) were quite satisfied with the feedback mechanism of web4health. This means that it was easy for them to ask questions and obtain extra information.

Based on the answers to all of the above questions, rate the overall quality of the site as a source of information about mental health:

|   |              |
|---|--------------|
| 1 | 4 Very bad   |
| 2 | 1            |
| 3 | 33           |
| 4 | 27           |
| 5 | 34 very good |

As expected from the previous answers, 95 out of 100 users rated the overall quality of the site from 3 to 5, 5 being very good. This means that the majority of the users (at least of those who answered the questionnaire) were satisfied with the site.

Out of those 100 users the majority think that the most important issues when searching into internet are quick, detailed and understandable information. 74 of them were aged above 20, 51 were employed (full time and part time), while the rest do not currently work (14 unemployed, 8 on pension, 10 disabled and 17 economically inactive). The majority (71/100) visited the site for the first time.

### **c. Evaluation with real users (ongoing):**

Inside web4health we have recently installed together with the questionnaire an interview, the CISR interview, which is specifically created to provide information on the mental health of the subject. This was done in an effort to continue the evaluation not just

inside a project, but to have an ongoing idea of what is wanted from our visitors and to provide them more valuable information and advice, taking into account their mental status.

This interview is answered from each individual who wants to obtain some information on their mental health after they have completed the questionnaire. When the interview is completed we get a mail which provide us with a result on the interviewed's mental condition. If asked this information can also be delivered to the interviewed. That way we have a questionnaire completed and an interview answered which can be connected to each other and provide us with very interesting information on our visitors and the way they use our site.

To see this interview together with the questionnaire one can enter the <http://195.251.195.75/iatriki/proqsy3/index.aspx> web-adress.

### 4.3 EVALUATION OF THE SITE IN OTHER LANGUAGES

The site has now gone public in the following languages: English, Swedish, Italian, Greek and German. Below one can see a table with all FAQs created in all languages (the figures of this table are based on Deliverable D3.2, delivered recently from KTH).

| <b>Language</b>  | <b>Greek</b> | <b>German</b> | <b>English</b> | <b>Italian</b> | <b>Swedish</b> |
|--|--------------|---------------|----------------|----------------|----------------|
| <i>Number of written (and translated if originally in another language) FAQ's</i>  | 317          | 612           | 899            | 479            | 756            |
| <i>FAQ's which do not have text yet</i>  | 1            | 1             | 2              | 0              | 2              |
| <i>Number of searchable FAQ's using the Natural Language Question Answering System</i>                                       | 28           | 577           | 852            | 121            | 703            |
| <i>Number of FAQ's written but not yet searchable</i>  | 288          | 34            | 45             | 358            | 51             |
| <i>Number of FAQ's written and in the subject tree</i>   | 271          | 120           | 831            | 0              | 691            |
| <i>Number of FAQ's written and not in the subject tree</i>   | 45           | 491           | 66             | 479            | 63             |
| <i>Number of FAQ's in the subject tree but not available in this language (users will be shown the English text instead)</i> | 209          | 105           | 6              | 0              | 0              |

The table shows that a large amount of information is offered in all languages.

## 5. Evaluation of the usage

### 5.1 Methodology

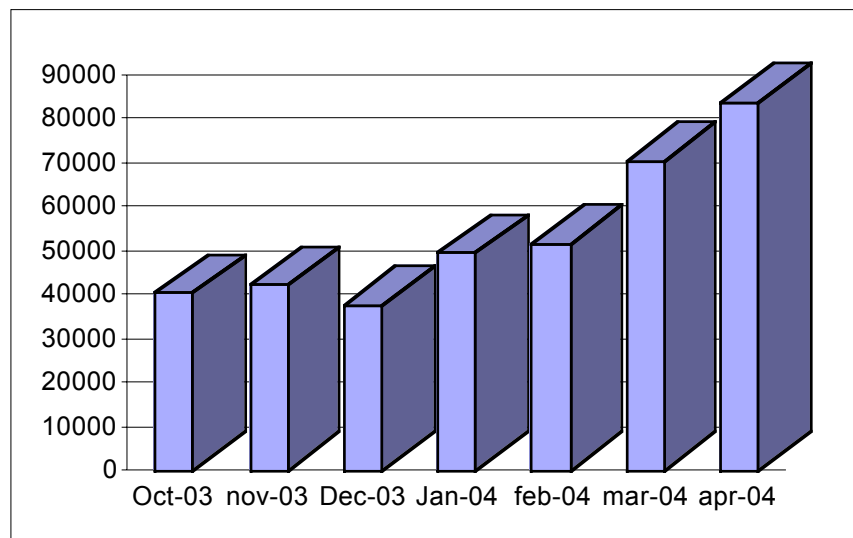
Through an external tool we can have the usage statistics of the site, that is how many users visit the site, from how many different computers, how often and from which country. These data can be collected every two or three months and compared in order to draw important conclusions about the usability and popularity of the web4health site.

Furthermore we can also use the ratings provided to us from the various Internet search engines, the position given in their list and how it varies with different search words. These data can also be collected , compared and analysed every few months. In this way we will be able to see if the site has achieved its goal of attracting patients and people in need of its services.

A statistics report was created for deliverable D3.2 (Report of second stage) from Omega and KTH and is presented below:

In April 2004, the Project web site had 84.059 visitors, 24.714 page downloads, 1.431.267 hits. Since the opening of the site, it had more than 7 million hits. The following table and graph show the monthly number of visitors since last October 2003 (included):

|                       |        |
|-----------------------|--------|
| <i>August 2003</i>    | 17 277 |
| <i>September 2003</i> | 42 663 |
| <i>October 2003</i>   | 40 307 |
| <i>November 2003</i>  | 42 285 |
| <i>December 2003</i>  | 37 383 |
| <i>January 2004</i>   | 49 360 |
| <i>February 2004</i>  | 51 760 |
| <i>March 2004</i>     | 70 382 |
| <i>April 2004</i>     | 84 059 |



In April 2004, national sites have been accessed according to the following share:

|                |        |        |
|----------------|--------|--------|
| <i>English</i> | 62 449 | 78,40% |
| <i>German</i>  | 3 617  | 4,50%  |
| <i>Greek</i>   | 46     | 0,10%  |
| <i>Italian</i> | 3 617  | 4,50%  |
| <i>Swedish</i> | 9 940  | 12,50% |

The number of total hits is slightly different from the figure given above. This most likely derives from the fact that some pages which do not belong to any specific language area, and which should not be found by users (as, e.g., <http://web4health.info/test/>), are retrieved anyway. However these figures are not completely correct given the fact that in some languages we have sites co-working with web4health (like for example the

[www.stress.gr](http://www.stress.gr) in Greek). The low number for the Greek site in the table above is because the ROBOTS.TXT file still excluded this branch of the web site at the time when the data was collected.



## 6. Conclusions

a. Finishing now the project we are ready to present the results of an evaluation which was ongoing since the site became public and was based on the opinion of the site constructors (as far as the groupware is concerned), external experts and real internet users.

b. The results of the groupware evaluation (presented in a previous deliverable) showed that the groupware might have caused some practical problems, mostly to new users, but at the end it proved valuable to the progress of the project.

This was also the opinion of a post-graduate student working in KTH, who as part of her Master thesis wrote a description and evaluation on this groupware.

c. The usage statistics show that the number of hits we get is far bigger than the one expected and this is due (at least to the extent we can trust the machine evaluation) to successful answers in common problems (most popular pages were those about sexual disorders, depression, sleeping problems etc). A difference in hits in different languages is probably due to the difference on the number of Internet users in different countries (less in Greece for example) and on the fact that in some countries there are already existing, well-known sites created before this project began.

- d. The remarks made of the external peer-reviewer show that our site provides a large amount of mental health information, but it should probably change a little its profile and be more user-friendly.
  
- e. However the most important parameter is the real users' opinion, which can be seen from the answers from the questionnaire. As mentioned above, most of the users who answered this questionnaire, gave our site a rating from 3 to 5 (with 5 being very good in its overall quality). This is very hopeful for us because we see that we have created a site which helps if not all at least a large proportion of the people who visit it. This ensures us that we have reached the most important goal of this project, i.e. to help those who need it.

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**Medcircle** [www.medcircle.org](http://www.medcircle.org)

## Appendix I: KOM2002 Evaluation

*By Camilla Settergren*

### *3.1 Tool 1: KOM 2002*



#### **3.1.1 Developer**

Developers of **KOM2002** are Torgny Tholerus & Lars Enderin, both teachers at DSV, Stockholm University, together with Jacob Palme, also at DSV (as well as examiner of this Master's thesis). KOM2002 is a EU-funded eContent research project that as one part develops a CMS and as a second part with that CMS will develop a website called Web4Health (<http://www.web4health.info/>). Web4Health is a website with questions and answers, discussion groups, chat, etc. focused on the areas of psychology and life style. The medical and psychological experts that will provide the content and information at the Web4Health website are located in several different countries in the European Union.

#### **3.1.2 Background & Similar Products**

KOM 2002 has functions for private, open and protected groups, personal messages, support for several languages and support for distance-education. KOM 2002 is used in the environment of a web-browser. It is a CMS that is very focused on the FAQ (Frequently Asked Questions) function and also discussion forums connected to a certain FAQ. This tool is specially developed for these functions and can be extended with templates that has other functions as well, but as of now it is not “marketed” in the same way as most CMS-es.

To be able to use the FAQ-database over and over without a medical expert having to answer every similar question, KOM 2002 has a natural-language question-answering system developed especially for the FAQ-part of Web4health. It is based on manually specifying question-matching templates for each FAQ, and matching them against the questions asked by users. In that way a question already asked and answered can be pulled out of the database, and the answer can be produced again when another visitor of Web4Health visits the website. This puts high demands on the templates designed for this purpose, and the natural-language question-answering system provides the foundation to make this possible.

The previous version of KOM 2002– KOM 2000 – had support for education and was therefore also an e-learning system and categorized as a Learning Management System (LMS). And since it also it was (or is, it still exists) a combination of both LMS and CMS, it

could be said to be a Learning Content Management System (see glossary). This e-learning system has not been supported in KOM2002 version of KOM.

### **3.1.3 Architecture**

KOM 2002 is entirely written as Java servlets under the Apache web server, and has only been tested with Apache, but is likely to work with any webserver handling servlets. The database is based on the Unix file system, with many small Unix-files. This makes it faster than a traditional database when the database is small, but slower if the database is large. The natural-language question-answering-part is a separate system that is connected with "the rest of the CMS" through HTTP.

### **3.1.4 Technical Overview & System requirements**

Certain optional functions of KOM2002 require that you have Dreamweaver MX installed.

### **3.1.5 My Evaluation**

As already mentioned KOM2002 is a content management software system, especially developed to assist a group in different countries to develop multi-lingual informational FAQ's. Functions of this software are for example:

- Storage of a large set of informational FAQ's.
- Each informational FAQ can be provided in multiple languages.
- A forum discussion can be associated with each informational FAQ.
- Check-in/out function when editing FAQ's.
- E-mail notifications of changes in a discussion item, FAQ-item, etc.

As for most Open-source systems the documentation is incomplete, and no complete user manual is available. Also the editor is for only HTML and it does not look like your normal text-editor, which makes it harder to understand it and get started. At the beginning it is not a very intuitive system. The create/edit page is full of details that make it hard for an untrained eye to see what needs to be done. However the editing in HTML is very simple and it does not take long to learn those few easy strings of code. If you do not want to learn any HTML at all you can edit your content in FrontPage or similar and cut-and-paste it into KOM 2002. Sometimes all the different colours to highlight things that can be edited, etc. can give a messy impression.

## **Appendix II: Review of the site <http://web4health.com>**

*By Håkan Källmén*

The purpose of the web4health was to give understandable and practical information about psychological problems to people having such problems themselves or have relatives or friends having psychological problems. The aim also was to give advices that are useable to mitigate the problems.

This website gives people a quick and cheap access to information about some common mental health and psychological problems. Web4health contains questions of others and responses of an expert panel to these questions. A reader of the site, who has elected a specific problem area, may get some information about the own problem from the responses to questions made by others. By reading the site people will become aware of the fact that some problems are common to people in different countries. However, the representativeness of those 20 items discussed at web4health.com can be discussed. It can be questioned why these problem areas and not others were selected. No information about how representative the persons that wrote the questions were is presented. If the problem areas discussed are assumed to mirror the problems of common people in Europe, information about the sample of questioners should be given.

The opening site lists 20 different areas about psychology, mental health and relationships to be discussed. It is printed that web4health is not aimed to discuss somatic and medical problems. It seems to me, as somatic and medical problems are associated to psychological problems and therefore difficult to avoid.

By the presumption that the questions are from a representative sample of European population, those 20 items seem intuitively to be a comprehensive list of everyday problems of the non-clinical population in European countries. If you have a specific question and do not find it unambiguously related to one of the listed problem areas, you have the possibility to write the question and make a search of other similar questions. You will automatically be directed to a related question written by another person and be able to read an answer to that question and get an advice how to get along with such a problem. The design of the opening page is rather well performed and it is easy to get a quick overview of the content.

When selecting one of the categories listed you will arrive in another “category specific” site. All category specific sites are overcrowded with alternatives on which you can click to get information about the selected topic. Due to the high density of the text on those pages, they are rather difficult if you want to get a quick overview of the content. When selecting different items from the list, you will find out that the quality of each area vary. Trying the category item “workplace” you will find very little information about a large problem in Sweden; namely the problem of exhaustion and depression connected to stress. Sick leave from work has grown very fast since 1997 that motivate a discussion about this topic. The non-availability of such a topic makes me to wonder if this phenomenon is due to cultural differences making this problem specific to Sweden.

Trying another item on the list, “addiction”, give rather good description of dependence of medical drugs, problems with other drugs are not attended at all. However, the site was not ready yet at the moment for review. Selection of “child care”, “anorexia”, “healthy living” or “psychiatric drugs” all leads to rather comprehensive sites giving a lot of information.

It is easy to get overloaded with information if you are not an experienced reader especially at the intermediate site between the presentation of the 20 problem areas and the questions. However, the main impression of the website is that it fulfil the aims stated above, but the design of the site can be made little “friendlier” to a non-experienced reader.



## **Appendix III: Psychological Counseling on the Web: an empirical study of Web4health**

*By Minna Forsell and Andrea Andrenucci*

### **ABSTRACT**

In this paper, we describe an empirical study of Web4health, a Question-Answering system created as a part of a groupware for psychological counseling on the Web. A group of twenty-two test users, 12 psychotherapy patients plus 10 persons who had never had any contact with psychotherapy, tested the site submitting questions in natural language about psychological problems. Since our goal was to evaluate Web4health from a user perspective, we chose to apply qualitative research methods based on in-depth interviews and user observation in order to collect data. The results collected provide indications about how users experience computer-based counseling on the Web and how the online content should be presented.

### **INTRODUCTION**

The World Wide Web has become, since its creation, the most popular tool for accessing and distributing cultural, scientific, commercial and personal information. According to [Eysenbach, G., Diepgen T.L], medical content is one of the most retrieved types of information on the WWW, which creates new opportunities to treat huge segments of the global population through Internet based therapies. Mental health is one of the medical areas where online therapy has already been successfully tested in projects aiming at treating diseases such as post-traumatic stress [Lange et al.[14]]. In comparison with ordinary treatment, psychological counselling online is more flexible and more cost effective. People with physical handicaps, or living in remote locations, may benefit from treatments otherwise available only in specialist centres at scheduled hours. In some cases it has been proved that patients, interacting with computers, suffer from less social anxiety and disclose much more information about themselves [Erdman et al. [8]]. This implies that a computer-based psychological assessment can reveal more personal information than a face-to-face session and therefore provide a better picture of the personality of the patient.

The purpose of this paper is to present an empirical study of a Q&A system for psychological counseling (Web4health). It is part of a groupware developed within a EU-financed project called KOM 2002, whose goal is to provide a website with high quality multilingual medical information to improve the mental health of European citizens.

Doctors, psychiatrists and psychotherapists from five different European countries (Italy, Sweden, Holland, Greece and Germany) use the KOM 2002 system to jointly develop a set of semantically classified web pages to answer specific questions regarding the following categories of psychological and psychotherapeutic advice: (1) eating disorders and obesity, (2) psychological obstacles to achieving healthy living habits such as unhealthy eating and substance abuse (e.g. drugs and alcohol), (3) psychological problems causing a lower quality of life through despair and inability to work, (4) life problems such as marital and interpersonal relationship problems. The information is available for consultation on-line at the following URL: <http://web4health.info/> and it is aimed at helping people who normally do not seek professional help from psychiatrists or

psychotherapists, but who can be aided in achieving a better and more productive life by psychological advice. Users consult the knowledge base submitting questions in natural language (or writing keywords related to the domain of interest), which are then matched against pre-stored FAQ-files consisting of question/answer pairs, where the question part has a template created to match many different variations of the same question (Template-Based Question Answering, [Sneiders 02]).

## THE EMPIRICAL STUDY

### Methodology

Two categories of test users were included in the study. A group of 12 patients (three men and nine women between 17 and 60 years of age), undergoing psychotherapy, and a group of ten people (four men and six women between 17 and 45), who saw themselves as healthy and had not been in contact with psychotherapy before. The subjects were asked to test Web4health by first thinking of a psychological problem and then submitting queries in order to retrieve information about it. Since our goal was to evaluate Web4health from a user perspective, we chose to apply qualitative research methods based on in-depth interviews and user observation in order to collect data. Each user session lasted 20 minutes and users were encouraged to think aloud [Long D. I. and Bourg, T. 1996] while using the system, since studies covering individual differences often utilize this method [Griffiths J., Jillian R. Griffiths, R.J. Hartley and Jonathan P. Willson 2002] in order to follow the user behaviour with the interface. The interviews focused on exploring three issues (1) how the user experienced the website, (2) how the subject used the Q&A system and (3) how relevant the retrieved information was for the subjects' information needs.

### Results of the study

The subjects used three metaphors in describing their experience with the site; the "healthy" group described it as a mental health *encyclopedia*, that can be consulted instead of a doctor or a medical book, whereas group-therapy patients mainly referred to the site as a *magazine* containing articles useful both for information and entertainment, or they regarded it as a *friend* – someone they responded emotionally to. Most users utilized the Q&A system with a "jig-saw puzzle method", treating each answer as a piece of information necessary to form a whole picture which answers their information needs. Several of them appreciated the possibility to find related entries at the bottom of each answer and to navigate easily back and forth between the list with answer headings and their bodies.

The group-therapy patients posed questions mainly related to their own problems and lives, while the "healthy" group was most interested in getting *general information* rather than seeking advice applicable to their own situation. All users agreed about the great usefulness of the anonymity factor, which allows users of being more honest in intimate matters. The *style and presentation* of the information was considered by all subjects more important than the content. If the information sounded professional and trustworthy, it was considered believable; when information was complex or too abstract it was rejected. Those who sought answers to their own problems valued *popular language*, *comprehensible analysis and empathy* as the most important parameters. The ones who

searched for information in general prioritized *detailed information from an expert of good repute*.

The quality of the retrieved information was consistently estimated as good and useful by 18 test-users, however a commonly held attitude towards the system and the Internet in general was that no *direct* help could be provided. Web4health could help the users to *find information*, but it could not motivate them to make radical changes in their lives, because it missed “the eye-contact and the human warmth” that only another human being can give. This attitude was particularly emphasized among the group therapy patients, who saw the retrieved information as a tool to confirm their own knowledge about the subject, rather than a solution to their psychological problems.

Entries that did not answer the user information needs caused negative emotions in only one of the subjects, but in most cases it was the pieces of information apparently delivered by mistake by the system, i.e. answers which were not directly related to the subjects’ question, that provoked their imagination the most, and which gave rise to new ideas about their situation. This was a common behavior among the group therapy patients: subjects, who had suffered for a long time from a particular problem, had become cognitively and emotionally resistant to conventional solutions and were more open to unexpected responses.

## DISCUSSION AND CONCLUSIONS

The results of this study provide indications about how users experience computer-based counseling on the Web and how the online content should be presented.

Information and advice about mental health received on the Internet has not the same impact on the patients as a verbal session with the therapist. Users tend to be more skeptical towards the suggestions received and value them according to how well it fits into their personal understanding of their own state of health. This implies that the information retrieved is valuable to the degree that it is *accepted* by the users.

Furthermore users with different backgrounds and search goals require different types of information and language styles. A system dealing with psychological counseling should adapt its content selection and presentation to the characteristics of the users.

Information that corresponds to the users’ earlier knowledge is accepted more easily, but when it concerns something that goes beyond the user expectation, it gives rise to a more sophisticated reflective process, stimulating the subject to get more involved in her situation in order to find new solutions to her problems. This kind of process can be compared to the effects of provocative interventions in cross-cultural computerized conversations [Isbister et al]: computer agents intervene posing awkward questions stimulating the creative thinking of the dialoguing parts and enhancing the quality of the conversation.

Our study has shown that information with unsympathetic attitude and a higher grade of technicality is easily rejected. Empathy is an important factor to reach the more personal sphere of an individual. The answers that provide most effective help to psychological problems are those that allow users to *mentally step into* the person and the problem described in the text of the FAQs. A comparison can be done with computer games where the success of an avatar depends on how much a player is able to assume the identity of the avatar. Likewise the optimal Q&A pairs would make the user feel that “the person in question *could definitely* be me, but fortunately it is *not* me”, thereby allowing the user to

*identify* her situation and her problems with those ones of the described individual, but without having to give up her anonymity.

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