

**Grant Agreement Number: 257528**

**KHRESMOI**

**[www.khresmoi.eu](http://www.khresmoi.eu)**

## Prototype of a second search system based on feedback

<b>Deliverable number</b>	<i>D8.5.2</i>
<b>Dissemination level</b>	<i>Public</i>
<b>Delivery date</b>	<i>18th of December 2013</i>
<b>Status</b>	<i>Final</i>
<b>Author(s)</b>	<i>Natalia Pletneva, Sascha Kriewel, Marlene Kritz</i>



*This project is supported by the European Commission under the Information and Communication Technologies (ICT) Theme of the 7th Framework Programme for Research and Technological Development.*

## Abstract

This deliverable provides a brief description and an update on the two prototypes developed in a framework of the Khresmoi project. These prototypes are Khresmoi for Everyone and Khresmoi Professional. This is a follow up deliverable of the Deliverable 8.3 (delivered August 2012) and Deliverable 8.5.1 (delivered August 2013). Unlike D8.3 and D8.5.1, this deliverable is of public nature; hence it provides a more general description of the prototypes. The deliverable summarises the updated features for both prototypes, provides links to access them and outlines the progress towards user requirements satisfaction.

## Table of Contents

<b>1</b>	<b>Executive summary .....</b>	<b>3</b>
<b>2</b>	<b>Introduction .....</b>	<b>4</b>
<b>3</b>	<b>Khresmoi for Everyone.....</b>	<b>4</b>
3.1	Update of user requirements .....	4
3.2	Current state of the prototype Khresmoi for Everyone.....	8
3.3	Search lite and search pro .....	9
3.4	Query autocompletion / MeSH Autosuggestions .....	11
3.4.1	Definition service .....	11
3.4.2	Preview .....	11
3.4.3	Advanced search functionalities .....	12
3.4.3.1	Images .....	12
3.4.3.2	Translated pages .....	12
3.4.3.3	Disease section filter.....	13
3.4.3.4	Keyword filter .....	14
3.4.3.5	Additional filters.....	14
3.4.3.6	Readability judgments and trustability score of search results .....	15
3.5	Access to the Prototype .....	16
3.6	Use case requirements satisfaction.....	16
<b>4</b>	<b>Khresmoi Professional .....</b>	<b>17</b>
4.1	Update of user requirements .....	17
4.2	Changes to the Khresmoi Professional prototype .....	21
4.2.1	General system and user interface feedback.....	21
4.2.2	Multilingual features .....	22
4.2.3	Query support features .....	22
4.2.4	Data sources .....	22
4.2.5	Classification and filtering of results.....	22
4.2.6	Result presentation and preview.....	23
4.2.7	Usability and labels .....	23
4.3	Access to the Prototype .....	24

<b>5 Conclusion.....</b>	<b>24</b>
<b>6 References .....</b>	<b>24</b>

## Table of Figures

Figure 1 First page of the prototype .....	8
Figure 2 Simple interface .....	9
Figure 3 Advanced search interface .....	9
Figure 4 Search Lite and Search Pro search bar .....	10
Figure 5 Search Pro bar with a query formulating hint .....	10
Figure 6 Search pro bar – entering a query .....	10
Figure 7 Mesh Autosuggestions .....	11
Figure 8 Definition service.....	11
Figure 9 A preview icon.....	12
Figure 10 Advanced search is on .....	12
Figure 11 Images corresponding to a search query .....	12
Figure 12 Translation service menu .....	13
Figure 13 A search result translation from French to English.....	13
Figure 14 A search results translation from English to French .....	13
Figure 15 Disease section.....	14
Figure 16 Keyword filter.....	14
Figure 17 Filters based on the labels assigned to HONcode certified web sites .....	15
Figure 18 Readability judgement (vertical red bar) and trustability score (horizontal red to green bar) of a search result.....	16
Figure 19 Screenshot of the updated prototype .....	21
Figure 20 Screenshot of the new advanced query form .....	22
Figure 21 Screenshot of the categories in query specification and facet browsing .....	23
Figure 22 Screenshot of the multi filters .....	23

## 1 Executive summary

The Deliverable 8.5.2 “Prototype of a second search system based on feedback” is a follow up document after internal deliverables 8.3 and 8.5.1 presenting the first and intermediate versions of the prototypes developed within the framework of the EU project Khresmoi. Two of the prototypes developed are Khresmoi for Everyone, designed for the general public use and Khresmoi Professional, designed for the physicians use. This document provides an update on the prototypes development and largely describes their final versions. Some changes still to be made towards the end of the project, i.e. ranking to be improved and some resources to be added for both prototypes. These and other improvements to be still made have been motivated by the results of the user tests conducted in Year three and consequently revised user requirements also presented in this document.

## 2 Introduction

This deliverable provides an update on two prototypes developed in a framework of the Khresmoi project. In a course of the project, it became clear that the needs and requirements of the general public and medical practitioners vary significantly (1); hence a specific product should be developed for each audience. During year 3 user tests were conducted to collect and analyse users' perception of both search systems (detailed in (2)). These findings led to revision of the user requirements presented in this document. Further on, the current state of the two prototypes is described and links to access them are provided.

As it is the first public deliverable describing the prototypes, it provides an overall description of the tools available and document the progress made since August 2013 (described in (3) not publicly available).

## 3 Khresmoi for Everyone

Khresmoi for Everyone aims at meeting the requirements of the general public searching for trustworthy online health information. In this section the update of user requirements is presented along with the prototype description.

### 3.1 Update of user requirements

The following table presents the update of the user requirements defined in (1) based on the results of the survey conducted during the first year of the project (4). Update of user requirements was motivated by the results of the user evaluations conducted during the third year of the project (2). Consequently, some of the requirements turned out to be of more or less importance. There is also a significant group of requirements which could not be evaluated during the third year as certain specific tools corresponding to some of the requirements had not been developed by then.

User requirements vary depending on the type of search – basic or advanced. These types of search tasks depend on the user's health/disease experience. For example, advanced search would be more typical for an experienced chronic patient, so-called « expert patient ». Basic search would rather be performed by a generally healthy person or someone who has just been diagnosed with an acute or chronic disease.

The user tests conducted during the third year of the project confirmed this hypothesis; hence we maintained the same types of users and searches.

	General Public Tasks		
<i>Functions \ Search Tasks</i>	Basic Search	Advanced Search	Comment for Year 4
<b>Resources</b>			
Primary resources		more important	increased importance for advanced search users
Secondary resources			
Certified Web Pages			
Specialised Web Pages (Medical societies,			

### D8.5.2 Prototype of a second search system based on feedback

hospitals)			
Drug information			
Further product information beyond drugs (glucometers, syringes, lenses)			
News			
Forums			depends on specific user, there is no clear preference whether they are stronger preferred by a basic search user or advanced search user.
Physician Directory			
Local healthcare information (patients/physician associations, health insurance, social security)			
Events (conferences)		ex: MOOC <sup>1</sup>	
<b>Classification/Filtering (Default value shown)</b>			
Primary/secondary resources	Don't show	Secondary	
Physician/general public resources	General Public	General Public	
Level of detail (overview->very specific)	Overview	Specific	
Type of resource (see list above)	less important		
Type of content (diagnosis, treatment, ...)			
Country of Origin of Resource	Local	Local (in some cases international)	
Date Range	less important		however the content should not be "old"
Trustability	Trustable	Trustable	
Readability	Readable	Readable	
Language	Mother tongue	Mother tongue (in some cases English)	
Target general public	less important		very few cases when it was demanded

<sup>1</sup> MOOC – massive online open course

### D8.5.2 Prototype of a second search system based on feedback

group (gender, age, ...)			(for ex, exclude the results about pregnant women)
Media type (video, audio, image, ppt, ...)	less important		there was no specific task to evaluate this requirement, and overall images were of less importance
<b>Ranking by</b>			
Relevance			
Language	Mother tongue	Mother tongue	
Location (independent of language)	Local	Local	
Physician Social Ratings	not clear		this feature was not implemented by the user tests in Y3
General Public Social Ratings	not clear		this feature was not implemented by the user tests in Y3
<b>Interface Layout</b>			
Simple			
<b>Link Description</b>			
Physician quality description	not clear		this feature was not implemented by the user tests in Y3
General Public Social Ratings	not clear		this feature was not implemented by the user tests in Y3
Page name			
URL			
Snippet			
<b>Translation Tools</b>			
Query translation (entered language -> English)		more important	Translation tools are especially important when there is a lack of resources in a mother tongue or while doing a research
Document translation (English->chosen language)		more important	
Medical thesaurus (medical->layman translation)	more important		Basic terminology and concepts simple explanation is especially important for basic search users
Abbreviations/Medical dictionary?	more important		
Original/Translated Side-by-side	less important		
<b>Query Completion/Support</b>			
Suggested query completion/expansion	less important		Probably was perceived as less important as speed was not sufficient

### D8.5.2 Prototype of a second search system based on feedback

			to make this feature useful and attractive for users
Search history	not clear		This feature was not implemented by the user tests in Y3
Spelling correction			
Suggestion of Scientific/Medical Synonym	not clear		This feature was not implemented by the user tests in Y3
Term definition shown below search bar	more important	more important	Although available only in Eng. during user tests, it was regarded important to have such feature in their mother tongues by participants
Query categorisation (content type)	not clear		This feature was not implemented by the user tests in Y3
Tools			
List of favourites	not clear		This feature was not implemented by the user tests in Y3
Share result with physician/peer	not clear		This feature was not implemented by the user tests in Y3
Accessibility options			
Result preview	not clear		contradicting opinions about this feature
3D body visualisation	not clear		This feature was not implemented by the user tests in Y3
Collaborative/Social Aspects			
Physician quality rating	Sees	Sees	This feature was not implemented by the user tests in Y3
General public quality rating	Uses and rates	Uses and rates	This feature was not implemented by the user tests in Y3
Suggested Links/Topics			
Pages/topics related to the one viewed (drug contraindications, lifestyle changes)	not clear		This feature was not implemented by the user tests in Y3
Latest News	not clear		This feature was not implemented by the user tests in Y3
Forums and Blogs			It remains important to have a possibility to filter in/out forums
Interactive Tools (Calculators)	not clear		This feature was not implemented by the user tests in Y3
Patient Groups	not clear		This feature was not implemented by the user tests in Y3
Simulation Tools	not clear		This feature was not implemented by the user tests in Y3

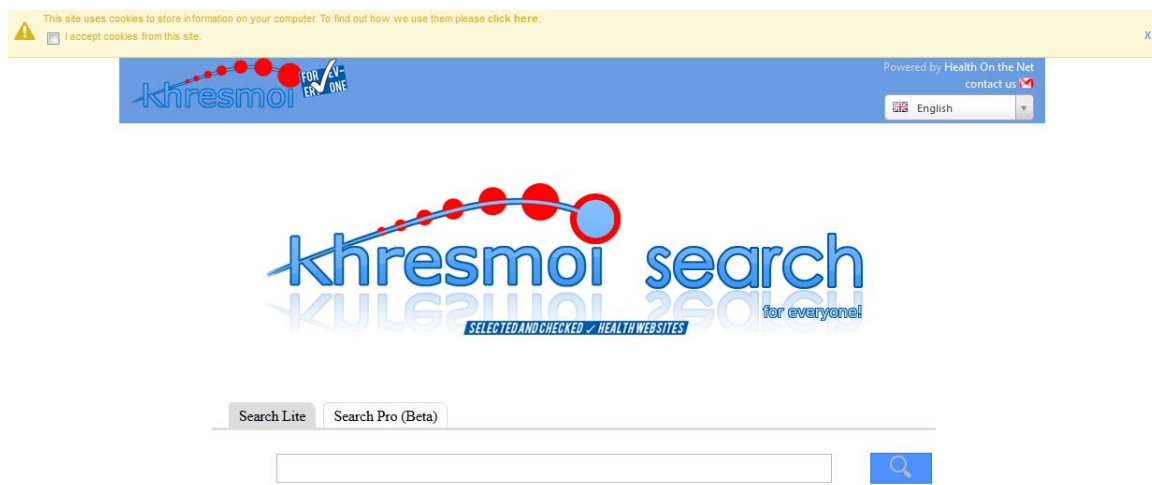
### D8.5.2 Prototype of a second search system based on feedback

Colour scheme	
	this requirement was defined in Year 2 and remains important
less important	this requirement turned out to be less important after user tests in Year 3
more important	this requirement turned out to be more important after user tests in Year 3
not clear	this requirement could not be evaluated during Year 3 evaluation tests

**Table 1 Update of user requirements for Year 4**

## 3.2 Current state of the prototype Khresmoi for Everyone

This section describes Khresmoi face addressed to the general public, i.e. non-medical professional user, searching for online health information. As various studies confirmed, this group of users prefer simple, Google-like, not overloaded interface, hence the first page was designed to meet this requirement (Fig.1). According to EU legislation, users are informed about use of cookies on the web site. They can also change the language of the interface. Further on, they can directly start typing the query. In case users have not ticked the box regarding cookies, nor changed the language, they can still fully use the prototype.

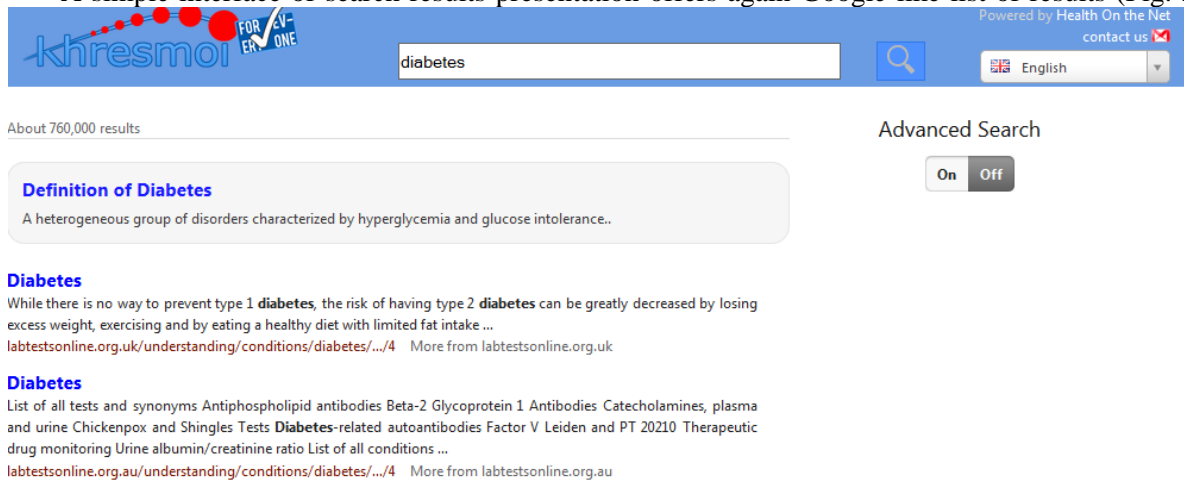


**Figure 1 First page of the prototype**



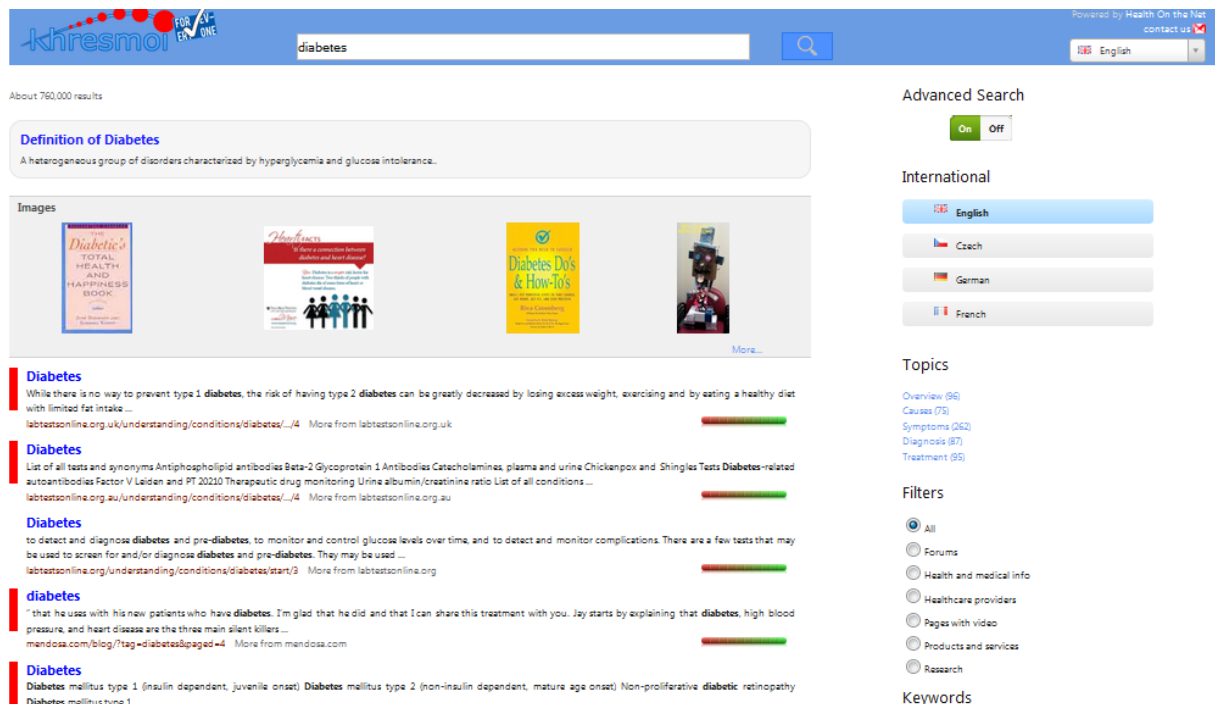
### D8.5.2 Prototype of a second search system based on feedback

A simple interface of search results presentation offers again Google-like list of results (Fig. 2).



**Figure 2 Simple interface**

Once comfortable with the simple interface, user can activate the advanced search mode (Fig. 3); its functionalities are detailed in 3.2.5).



**Figure 3 Advanced search interface**

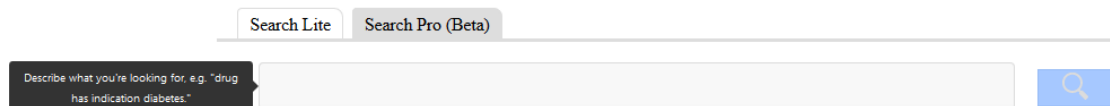
## 3.3 Search lite and search pro

The interface of Khresmoi for Everyone is available in all official EU languages. The user's chosen language is saved using cookies. When users access the first page they are capable of searching «lite» by default which offers a «Google»-like search interface with a search bar (Fig. 4).

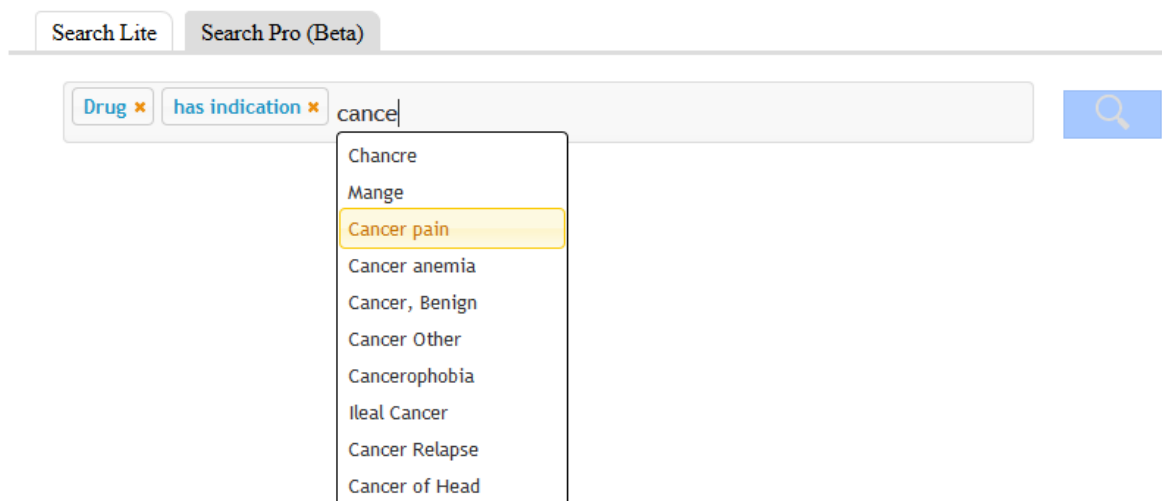


**Figure 4 Search Lite and Search Pro search bar**

Users can also enable «Search Pro (Beta) » which is still available in Beta-version and offers users to make use of semantic capabilities of Khresmoi for Everyone, i.e. formulate a semantic query (Fig. 5, Fig. 6).



**Figure 5 Search Pro bar with a query formulating hint**



**Figure 6 Search pro bar – entering a query**

### 3.4 Query autocompletion / MeSH Autosuggestions

Once a user starts typing a query in a search lite interface, a list of autosuggestions pops up. Supported languages are English, French, German, Czech and Spanish. Autosuggestions are based on MeSH<sup>1</sup> terms interleaved with the normal autosuggestions from Solr.



Figure 7 Mesh Autosuggestions

#### 3.4.1 Definition service

A box below a search bar displays a definition of a medical term provided by Ontotext's disambiguation service (5). Currently only English text is shown (Fig. 8). The presentation of this functionality has been changed comparing with August 2013 (background colour, location of the box – see Fig 2 at (3)).

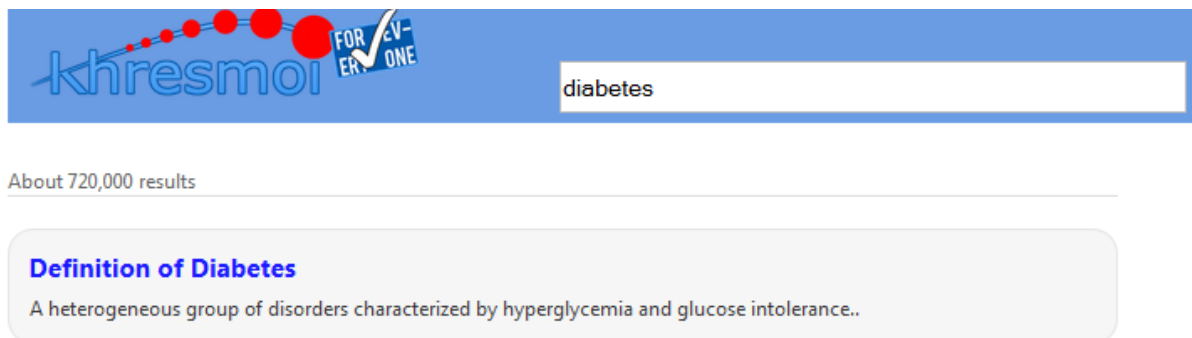


Figure 8 Definition service

#### 3.4.2 Preview

Users have a possibility to preview a search results by hovering over an icon which pops up next to each search results while scrolling over (indicated by a red arrow at Fig. 9).

<sup>1</sup> MeSh – Medical Subject Heading

## D8.5.2 Prototype of a second search system based on feedback

### Nausea

Nausea is a sick feeling in your stomach that makes you feel like you have to vomit. Mild nausea can cause loss of appetite. Moderate to severe nausea usually causes some degree of vomiting ...

[breastcancer.org/treatment/side\\_effects/nausea](http://breastcancer.org/treatment/side_effects/nausea) More from breastcancer.org



Figure 9 A preview icon

## 3.4.3 Advanced search functionalities

This section details advanced search functionalities, first mentioned in the beginning of 3.2. Largely advanced search functionalities provide users with possibility to filter in/out the results and have their search results translated. Users may enable various advanced search functionalities by clicking on a relevant button (Fig.10).

### Advanced Search



Figure 10 Advanced search is on

### 3.4.3.1 Images

Between a search bar and results display users can see images relevant to the query. More information about image ranking can be found at (6).

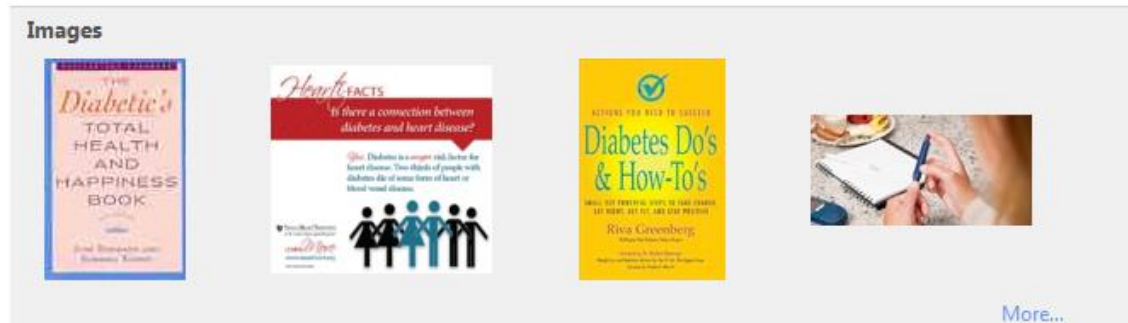


Figure 11 Images corresponding to a search query

### 3.4.3.2 Translated pages

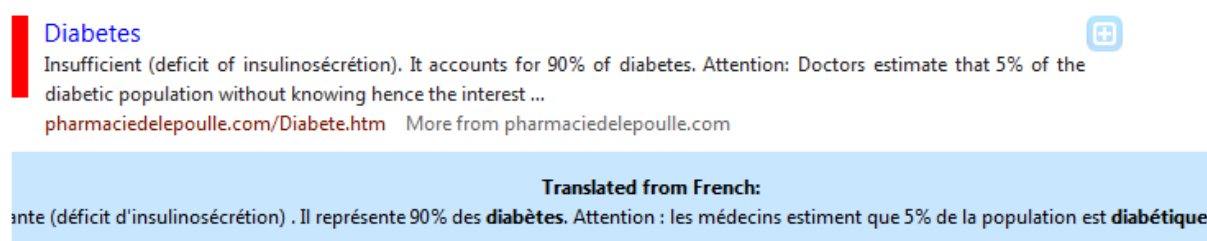
Depending on the language of interface, a user can benefit from an automatic translation provided by the CUNI translation service which will be described in detail in D4.6 due to February 2014. In case the language of the interface is set to English, upon clicking on the relevant buttons (Fig. 12), pages in Czech, German or French are dynamically translated.

## International



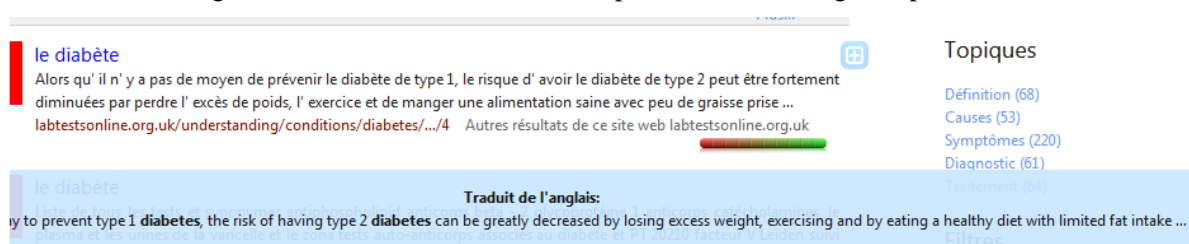
**Figure 12 Translation service menu**

Both a title and a snippet are translated into English, for example, from French. Hovering over a translated snippet allows reading an original text (Fig. 13).



**Figure 13 A search result translation from French to English**

If the language of the interface is set to Czech, German or French, English results can be translated to the respective languages (Fig. 14). Due to the fact that the majority of the resources available are in English, this feature showed to be important for non-English speakers.



**Figure 14 A search results translation from English to French**

### 3.4.3.3 Disease section filter

This advanced functionality allows users to filter in/out specific type of information about a disease, i.e. causes or symptoms (Fig. 15). This tool had been initially available in English, now a French version has been added.

## Topics

Overview (68)  
Causes (53)  
Symptoms (220)  
Diagnosis (61)  
Treatment (64)

**Figure 15 Disease section**

### 3.4.3.4 Keyword filter

The functionality called “Keywords” serves the same idea, but employs different approach: each result returned by the search engine is attributed one or more health topics out of 36 topics available based on a number of specific keywords contained in it. A health topics attributed to larger number of results appear in bigger letters. Hence, it is possible to refine search results by clicking on a health topic, thus keeping only the search results attributed chosen topic.

## Keywords

At Work Babies and Children Cancer  
Cardiovascular diseases Carers  
Medicines and Treatment Men  
Mental Health Nutrition  
Other  
Non-Communicable  
Diseases  
Patient Safety People with Disabilities  
Prevention and promotion Programmes  
Quality Assurance Research Sex  
Social Environment Vaccinations Women

**Figure 16 Keyword filter**

### 3.4.3.5 Additional filters

Filters based on HON labels which are assigned to all HONcode certified web sites have been added (Fig. 17), in this way users can filter out certain types of results, i.e. forums, or research information. HONlabels are the categories assigned to all HONcode certified web sites for the certification purposes and are based on the content of the web site. As their typology is unnecessarily complex for search engine end user, they were grouped in the following 6 categories: Forums, Health and medical info, Healthcare providers, Pages with video, Products and services, and Research.

## Filters

- ☒ All
- ☐ Forums
- ☐ Health and medical info
- ☐ Healthcare providers
- ☐ Pages with video
- ☐ Products and services
- ☐ Research

**Figure 17 Filters based on the labels assigned to HONcode certified web sites**

### 3.4.3.6 Readability judgments and trustability score of search results

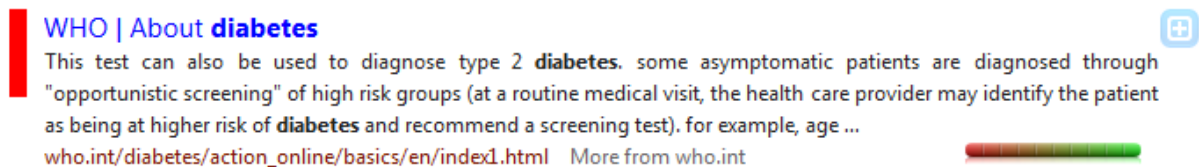
Readability of each search result has been judged as easy to read (marked by a green vertical bar) and difficult to read (marked by a red vertical bar). The method used is more than 90% reliable, as detailed in (7).

Trustability in a Khresmoi for Everyone is defined as automatic detection of web page compliance to the HONcode principles. The system backend identify whether eight HONcode principles are being respected on a certain page. As a process is automatic, sometimes there can be a difference between an estimated by the system level of trust and the real one (determined by a person conducting certification). The reliability of the estimation for each of the HONcode principles is given in the table below.

HONcode principle	Criteria	Precision
Principle 1 - Information must be authoritative	Authors' names are provided	70%
Principle 2 - Purpose of the website	Statement that the information is designed to support, not replace, the relationship between a patients and his/her physician is provided	90%
Principle 3 - Confidentiality	Privacy policy is present	96%
Principle 4 - Information must be documented: Referenced and dated	References are provided	62%
Principle 4 - Information must be documented: Referenced and dated	A date of last review or page modification is provided	95%
Principle 5 - Justification of claims	Information is presented in a balanced way.	51%
Principle 6 - Website contact details	Contact details are provided	94%
Principle 7 - Disclosure of funding sources	Web site's funding is explained	79%
Principle 8 - Advertising policy	Advertising policy is provided	74%

**Table 2 Reliability of each principle**

When a trustability level is below 100%, missing principles are identified and specified by the system. As mentioned above all the resources indexed in the Khresmoi for Everyone were manually selected and reviewed and hence, already have a certain degree of trustworthiness. Automatically measured trustability provides an additional tool to determine web site compliance to the HONcode principles.



**Figure 18 Readability judgement (vertical red bar) and trustability score (horizontal red to green bar) of a search result**

Readability and trustability methods are described in detail in the D1.6 (7).

### 3.5 Access to the Prototype

The production version of the prototype is: <http://everyone.khresmoi.eu/hon-search/>

This site offers the mobile version of the app (detailed in (8) if visited using a mobile device.

### 3.6 Use case requirements satisfaction

In Section 3.1, a list of use case requirements for the general public has been updated. Table 2 below describes which of these requirements are met by a current version of a prototype Khresmoi for Everyone.

Use case requirement	Year 4 (current state)
Resources	All the resources come from HONcode certified web pages and additional sources crawled by HES, which were manually selected specifically for general public and physicians. Out of all resources identified, the current version of Khresmoi for Everyone proposes the resources for the general public and the ones of interest both physicians and the general public. Availability of primarily sources due to their importance for the advanced search users should be clarified.
Classification/Filtering	The following filters have been implemented: language of result via interface language, disease section, keyword filter, additional filter based on HON labels.
Ranking	Documents are currently ranked by relevance to the input query and general relevance to the medical domain. Social ratings have not been implemented and there is no certainty whether they should be.
Interface layout	Currently the development version of the prototype has both “simple” and “advanced” modes.
Link description	At present the link description in the result list contains the document title, snippet, parent domain, and URL, as well as preview functionality. In the advance mode, readability judgement and trustability score are available.
Translation tools	Translation of query and search results is implemented in English, French, German and Czech.



### D8.5.2 Prototype of a second search system based on feedback

Query completion/support	Query autocompletion and spelling correction are implemented. MeSH definitions corresponding to a query term now available below the search bar (in English).
Collaborative aspects	Collaborative search aspects are not available and unlikely to be further developed based on user test results.
Tools	Only result preview was implemented which received contradictory feedback.
Suggested links	These features are not yet implemented.

**Table 3 Use case requirements satisfaction by Khresmoi for Everyone**

## 4 Khresmoi Professional

Khresmoi Professional aims at meeting the requirements of the physicians (both general practitioners and specialists) searching for trustworthy online health information. In this section update of user requirements is presented along with prototype description.

### 4.1 Update of user requirements

In this section a table summarizes an update of user requirements for medical professionals based on the results of the user tests (Tab. 4, colour scheme is the same as for the Tab.1). User evaluations proved that the types of tasks defined in (1) remain valid, i.e. typical tasks various groups of physicians would do on the Internet are: wide, or definitional search, narrow search for a very specific information, research search implying scientific, primary sources search, and finally, CME – continuous medical education – search conducted in order to find both online and offline courses regarding a specific subject.

	Physician Tasks				
<b>Functions \ Search Tasks</b>	<b>Wide Search</b>	<b>Narrow Search</b>	<b>Research Search</b>	<b>CME Search</b>	<b>Comment for year 4</b>
<b>Resources</b>					
Primary resources		Partly			Remains important
Secondary resources			For background		Remains very important
Guidelines					Remains important
Specialised Web Pages (Medical societies, hospitals)					Remains important
Drug information					Remains important
Further product information beyond drugs (glucometers, syringes, lenses)					Less important
News					Has gained importance- see new classification

### D8.5.2 Prototype of a second search system based on feedback

Forums					Not integrated in Y3, raised importance for narrow search
CME courses					Not integrated in Y3
Wikipedia					Remains important
Local career websites					Not integrated in Y3
Physician Directory					Not integrated in Y3
Events (conferences)					Remains important
<b>Classification/Filtering (Default value shown)</b>					
Primary/secondary resources	Secondary	Secondary	Primary	Secondary	Remains important-see new classification
Physician/general public resources	Physician	Physician	Physician	Physician	Remains important
Level of detail (overview->very specific)	Overview	Specific	Specific	Overview	Remains important-see new classification
Type of resource (see list above)					Remains important - See new classification
Type of content (diagnosis, treatment, ...)	Overview (definition, abbreviation etc.) Diagnosis, Treatment	Diagnosis, Treatment	Scientific literature	Overview, all contents	Remains important-see new classification
Country of Origin of Resource	Local	Local	International	Local	Remains important
Date Range		Recent	Recent	Recent	Remains important-but as a ranking criterion not classification- most recent should come first
Trustability	Trustable	Trustable	Trustable	Trustable	Remains important
Readability	Readable			Readable	Remains important
Language	Mother tongue	Mother tongue	English	Mother tongue	Remains important
Physician speciality		Own field	Own field		Remains important, for mobile requirements pre-categorization according to medical speciality is essential
Media type (video, audio, image, ppt, ...)					Remains important
<b>Ranking by</b>					

### D8.5.2 Prototype of a second search system based on feedback

Relevance					Remains important
Language	Mother tongue	Mother tongue	English	Mother tongue	Remains important
Location (independent of language)	Local	Local	International	Local	Remains important
Physician Social Ratings					Feature not implemented in Y3
General Public Social Ratings					Feature not implemented in Y3
Level of accessibility					Increased importance, although implementation of this feature is not planned
Date of publication					Remains important
<b>Interface Layout</b>					
Simple					More important for a general search
Comprehensive					Remains important for scientific search
<b>Link Description</b>					
Type of Content					Remains important
Author					Remains important (second name and first author sufficient)
Publisher					Remains important (second name and first author sufficient)
Target Audience					Remains important (second name and first author sufficient)
Quality accreditation marks					implementation of this feature is not planned
Physician quality description					Remains important
Time of last update					Remains important
Indication whether free access					Remains important, although implementation of this feature is not planned
Type of media					Less importance
URL					Remains important
<b>Translation Tools</b>					
Query translation (entered language ->)					Remains important

### D8.5.2 Prototype of a second search system based on feedback

English)					
Document translation (English->chosen language)					Remains important
Abbreviations/Medical dictionary?					Remains important
Original/Translated Side-by-side					Less important for scientific search
<b>Query Completion/Support</b>					
Suggested query completion/expansion					More important if quicker and more accurate
Integration of patient data					Implementation of this feature is not planned
Search history					Remains important
Spelling correction					More important
<b>Tools</b>					
Self-made compendium					Remains important (personal library)
Image search					Remains important
List of favourites					Replaced by personal library
Share result with physician/peer					This feature was not implemented in Y3
Result preview					Remains important
3D body visualisation					Implementation of this feature is not planned
<b>Collaborative/Social Aspects</b>					
Physician quality rating	Mostly uses	Uses and rates	Uses and rates	Uses and rates	Remains important
General public quality rating	Sees				Implementation of this feature is not planned
Forums					Remains important
<b>Suggested Links/Topics</b>					
Pages/topics related to the one viewed (drug contraindications, lifestyle changes)					This feature was not implemented in Y3
Recent publications					This feature was not implemented in Y3
Websites that users with similar queries					This feature was not implemented in Y3

### D8.5.2 Prototype of a second search system based on feedback

have visited					
Educational/Career Websites					This feature was not implemented in Y3
Latest News					This feature was not implemented in Y3
Similar search queries					Essential feature for all groups of physicians

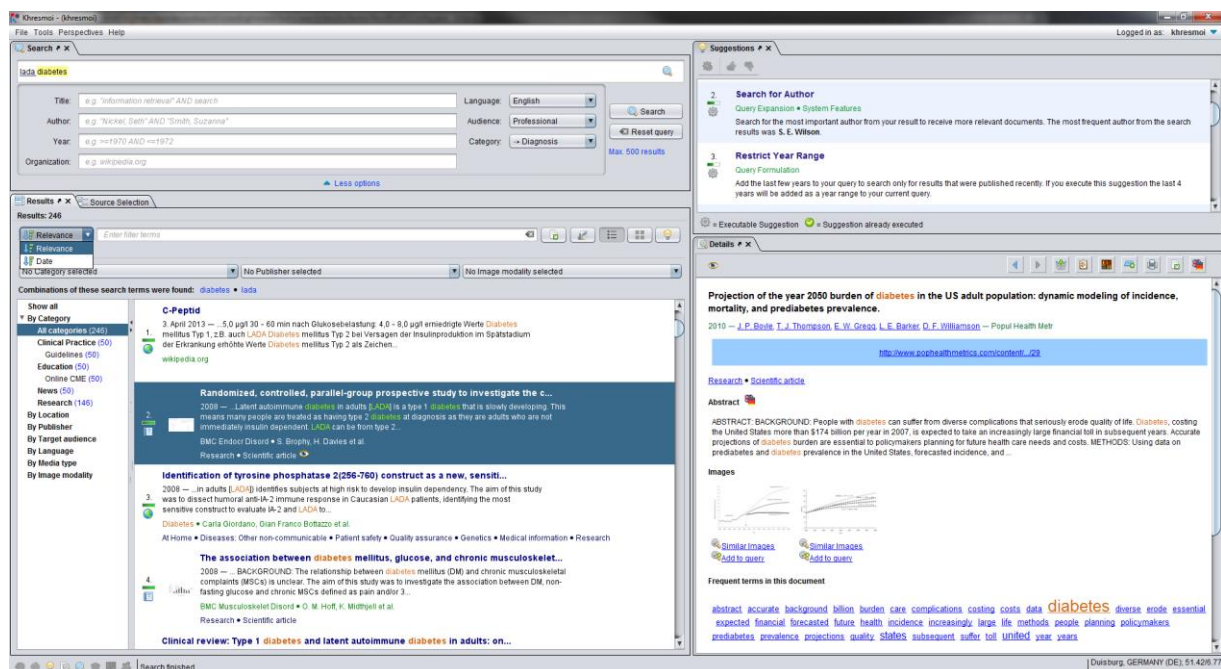
**Table 4 Update of medical professionals' requirements**

## 4.2 Changes to the Khresmoi Professional prototype

The Khresmoi Professional prototype has been extended and adapted based on the feedback from the user evaluations. The feedback had been collected and reported in Section 3.3.3 of deliverable D10.1 (2). Additional feedback was provided as result of pilot tests and formative evaluations with intermediate versions of the system.

### 4.2.1 General system and user interface feedback

Many parts of both frontend and backend services were improved with regards to speed and response time (D10.1, Sections 3.3.3.1 and 3.3.3.11). In particular, the Swing client has been made more responsive to mouse and keyboard inputs by reworking the proactive framework and introducing a caching mechanism for the faceted browsing of results. The changes to the proactive framework also removed the problems reported with deleting parts of the query (D10.1, Section 3.3.3.2) (Fig. 19).



**Figure 19 Screenshot of the updated prototype**

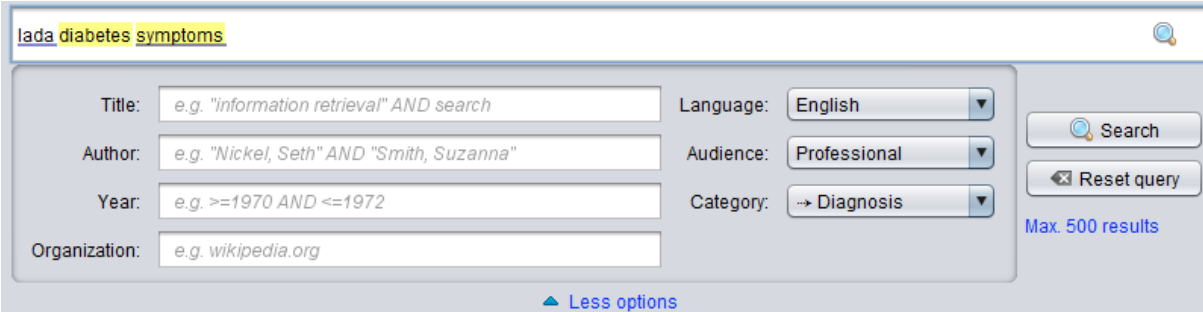
The current Swing frontend allows for hiding features that are currently unused (such as views, the expanded query form or specific parts of result details (D10.1 Section 3.3.3.2, Fig. 19).

## 4.2.2 Multilingual features

Automatic translation of queries has been added, so that queries can now be formulated in e.g. German, with German results preferred and English results (for the translated query) included but ranked lower (D10.1 Section 3.3.3.5). In addition translation is available at more points of the interface.

## 4.2.3 Query support features

Query support and query formulation have been significantly expanded. For query support, tactical search continuation suggestions using case-based reasoning are offered. This should help users that “struggled with finding the best balance between more general and more specific queries” (D10.1 Section 3.3.3.8). For query specification, the advanced query form provides the option to search by title, authors, publisher/website and restrict by year range, language, target audience or page category, such as “news”, “medical education” or “definitions” (Fig.20).



The screenshot shows a search interface with a search bar at the top containing the text "lada diabetes symptoms". Below the search bar is a form with several input fields and dropdown menus. The fields are labeled: Title (with example "e.g. 'information retrieval' AND search"), Author (with example "e.g. 'Nickel, Seth' AND 'Smith, Suzanna'"), Year (with example "e.g. >=1970 AND <=1972"), and Organization (with example "e.g. wikipedia.org"). To the right of these fields are dropdown menus for Language (set to English), Audience (set to Professional), and Category (set to Diagnosis). At the bottom right of the form are buttons for "Search" and "Reset query", and a text label "Max. 500 results". A link "Less options" is visible at the bottom center of the form.

Figure 20 Screenshot of the new advanced query form

## 4.2.4 Data sources

All data sources are now categorised as “for patients”, “for professionals” or both, and the user interface allows for restriction by audience either at query time or while using the result facets (D10.1 Section 3.3.3.9). A large number of new data sources (websites) has been crawled and integrated into the search index, based on a priority list. For images, descriptions are now provided in the short result surrogates as well as the full size detail view.

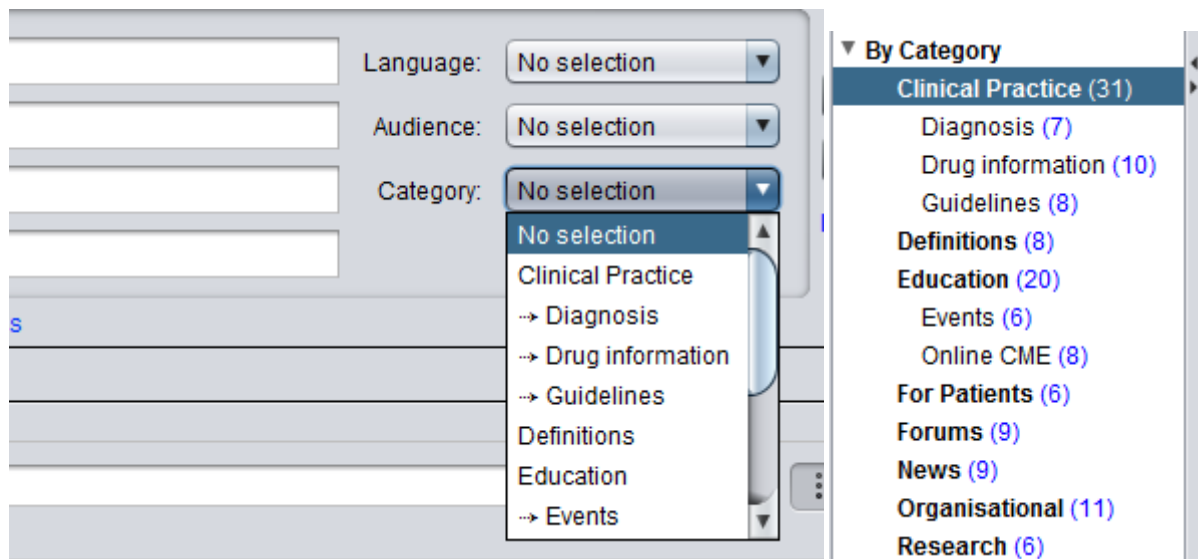
For the three backend indexes (Medsearch, Mimir textual search and Paradise Image search) descriptive text was added to the front end, making it clearer what type of documents they contain (D10.1 Section 3.3.3.9). Paging of result sets will be integrated into the workflow for the final prototype, but is currently not available. Therefore currently the number of results shown is limited to a fixed number which can be set by the user.

## 4.2.5 Classification and filtering of results

The fine grained classification for patients was replaced by a classification better suited to the needs of practitioners. Results can be in one or more of these categories (Fig. 21): Clinical Practice, Definition, Medical Education, Medical Forum, News, Organisational, Patient, and Scientific. The categories can be used at query time or while facet browsing a result.

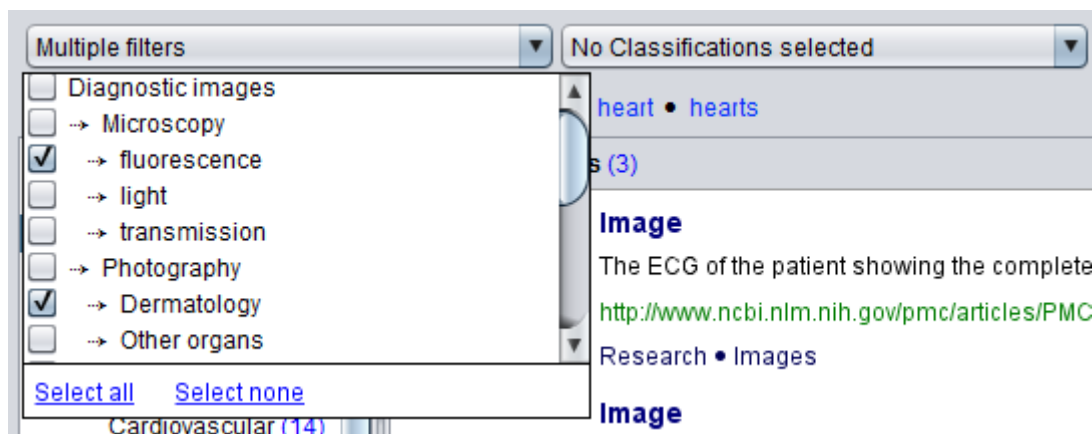
Where possible, the facets can not only be used to filter the currently shown results, but a double click will re-run the previous query with the facet value as an additional restriction (fetching a new ranked list of results).

#### D8.5.2 Prototype of a second search system based on feedback



**Figure 21 Screenshot of the categories in query specification and facet browsing**

A negative filtering option has been added (“-Term”). Combinations of positive and negative filter terms are possible within the free-text filter box (“term1 term2 -term3”). Additionally a multi-filter for categorical data was provided in form of dropdown menus (Fig. 22).



**Figure 22 Screenshot of the multi filters**

### 4.2.6 Result presentation and preview

The result preview has been adapted based on the user comments. In particular, dates were available are shown prominently. An effort is made to include last-update-dates for all indexed documents at crawl time. The summarizer has been extended for French documents, and will be provided for German documents in the future. To improve the quality and pertinence of the summaries, during indexing the main body of the document text will be marked.

### 4.2.7 Usability and labels

Many labels have been reworded to improve usability and to make the interface clearer. All icons have been replaced by icons from a common icon set.



## 4.3 Access to the Prototype

The production version of the prototype (browser based version) is available at <http://professional.khresmoi.eu>

A Java Swing version of the current prototype can be accessed from <http://professional.khresmoi.eu/index.html>

A mobile version of Khresmoi Professional is available from the Google Play Store<sup>1</sup>.

## 5 Conclusion

In this deliverable an update for Khresmoi for Everyone and Khresmoi Professional is provided reflecting their states as of December 2013. Updated user requirements for two groups of users motivate further modifications to be made till the end of the project in August 2014.

The following changes still to be made for Khresmoi for Everyone will be largely focused on the certain aspects:

- Improved ranking
- Increased resources coverage, i.e. adding Czech resources
- Improved accessibility for impaired users
- More user-friendly interface for translation service

The main changes to the Khresmoi Professional prototype still to be made are improved ranking and autocomplete suggestions, as well as paginated results and further improvements on facet browsing. The ranking will take into account recency (possibly using dates extracted from the content of indexed pages) as well as locality and language of the users and other features. Adding website suggestions based on popular queries and click-through data is being investigated. Initially these suggestions would be based on the data gathered during the user tests.

## 6 References

1. Celia Boyer, Manfred Gschwandtner, Allan Hanbury, Marlene Kritz, Natalia Pletneva, Matthias Samwald, Alejandro Vargas. *D8.2 Use case definition including concrete data*. 2012.
2. Frederic Baroz, Celia Boyer, Manfred Gschwandtner, Lorraine Goeuriot, Jan Hajic, Allan Hanbury, Marlene Kritz, João Palotti, Natalia Pletneva, Rafael Ruiz de Castañeda, Alexander Sachs, Matthias Samwald, Priscille Schneller, Veronika Stefanov, Zdenka Ures. *D10.1 Report on user tests with initial search system*. 2013.
3. Natalia Pletneva, Sascha Kriewel, Nolan Lawson. *D8.5.1 Intermediate prototype of a second search system*. 2013.
4. Natalia Pletneva, Alejandro Vargas. *D8.1.1 Requirements for the general public health search*. 2011.

---

<sup>1</sup> <https://play.google.com/store/apps/details?id=de.unidue.inf.is.ezdl.androidfrontendkhresmoi>



**D8.5.2 Prototype of a second search system based on feedback**

---

5. **Konstantin Pentchev.** *D5.2 Large Scale Biomedical Knowledge Server.* 2012.
6. **Allan Hanbury, William Belle, Nolan Lawson, Ljiljana Dolamic, Natalia Pletneva, Matthias Samwald, Célia Boyer.** *D8.3 Prototype of a first search system for intensive tests.* 2012.
7. **Allan Hanbury, Celia Boyer, Ljiljana Dolamic, Joao Palotti.** *D1.6 Report on automatic document categorization, trustability and readability.* 2013.
8. **Celia Boyer, Natalia Pletneva, Nolan Lawson, Sascha Kriewel, Thomas Beckers, Marlene Kritz, Manfred Gschwandtner.** *D8.4 Report on and prototype of mobile information access system.* 2013.
9. **Manfred Gschwandtner, Marlene Kritz, Celia Boyer.** *D8.1.2: Requirements of the health professional search.* 2011.