NEWSLETTER

What is KHRESMOI?

A project with the goal to develop a multi-lingual, multi-modal search and access system for biomedical information and documents. The system will allow access to biomedical data:
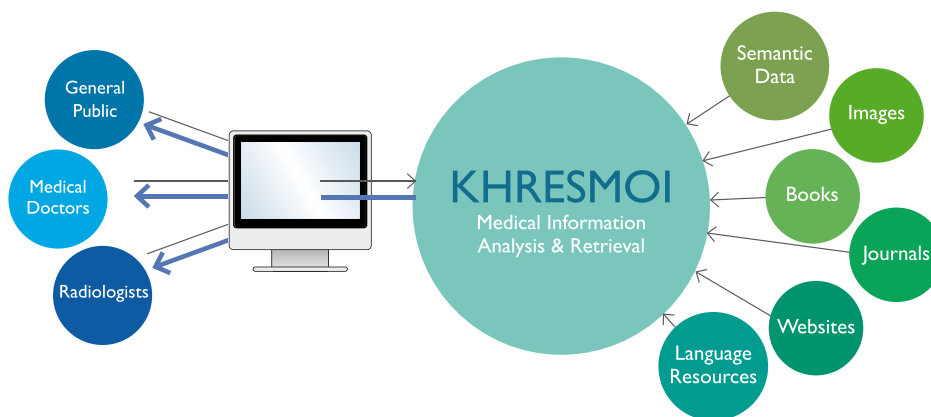
- from **many sources,**
- analyzing and indexing **multi-dimensional (2D, 3D, 4D) medical images,**
- with **improved search capabilities** due to the integration of technologies to **link the texts and images to facts in a knowledge base,**
- in a **multi-lingual** environment,
- providing **trustable results** at a **level of understandability adapted to the users.**

KHRESMOI will combine **multiple data sources** and knowledge derived from **various heterogeneous knowledge sources.** This includes **text sources** such as online journals and books, and trusted websites; and **image sources**, including images from journals and images from **Picture Archiving and Communication Systems (PACS)** at radiology departments.

Why?

Members of the general public frequently seek medical information online. This process is currently inefficient, unreliable and potentially dangerous. It is thus important that they are provided with reliable and understandable medical information in their own language.

Medical doctors need rapid and accurate answers – a search of MEDLINE takes on average 30 minutes, while doctors have on average 5 minutes available for such a search. Furthermore, over 40% of searches do not yield the information required.

Radiologists are drowning in images – at larger hospitals around 100GB of new images are created each day.

How?

Foundational Research: Effective extraction of information from text; automated 2D, 3D, 4D medical image analysis; linking structured information and unstructured text; support of multi-lingual search and adaptive user interfaces.

Component Level research: Results of foundational research will flow directly into new and existing components. Existing open source or free software components for which consortium members are maintainers or contributors include: GATE, ezDL, KIM, OwLIM, GIFT, and MOSES.

Integration: The components will be integrated into a robust, efficient and scalable test-bed for biomedical information search. At three milestones, integrated system prototypes are planned to be complete during the project, with an initial architecture to be ready by the end of the first year. Continuing foundational research incorporated into improved components will enhance the system.

khresmoi
MEDICAL INFORMATION ANALYSIS & RETRIEVAL

Project Kick-Off Meeting, 12-13 October 2010, Vienna

The Society of Physicians in Vienna welcomed the project partners in the Billroth house, which has a long standing tradition as meeting place and knowledge provider in the medical field in Austria. The public part of the kick-off meeting included presentations by the project coordinators Henning Müller and Allan Hanbury, the project officer Werner Janusch, radiologist Philipp Peloschek, Celia Boyer of the Health on the Net foundation and Najeeb Al-Shorbaji, member of the project advisory board and representative of the WHO (World Health Organization). Henning Müller then moderated a discussion with the speakers and Franz Kainberger (Department of Diagnostic Radiology, Medical University of Vienna, Austria), Georg Langs (Medical Vision Group, Massachusetts Institute of Technology (MIT, USA) and Hamish Cunningham (Computer Science Department, University of Sheffield, UK). The remaining one and a half days were devoted to defining the roles and responsibilities necessary to reach the project goals and to clarify the further course of action.

The public presentations can be downloaded at: http://www.khresmoi.eu/resources/kick-off-meeting-documentation/

Celia Boyer (HON) | View into lecture hall | Panel Discussion: Hamish Cunningham (University of Sheffield), Najeeb Al-Shorbaji (WHO), Celia Boyer (HON) and Georg Langs (MIT) | Werner Janusch (EC), Karl Heinz Tragl (Society of Physicians in Vienna)

Khresmoi: Meeting scientific and technological challenges
Henning Müller and Allan Hanbury (Khresmoi Project Coordinators)

Such an ambitious project faces a large number of scientific and technological challenges. KHRESMOI includes partners working on text analysis and search, image analysis and search, user interfaces, multi-lingual aspects and knowledge bases. Each partner faces the scientific challenge to advance the state-of-the-art in these areas and the technological challenge of incorporating the advances into a software framework adapted to biomedical information. Most of the technologies that are to be integrated have already been used and evaluated, but only in very closed and specific environments. In such specific areas they have proven to work well, except maybe the 3D and 4D medical image analysis, which is in an earlier stage of development than the other technologies. Semantic technologies, machine translation, and information retrieval are established research fields that have already produced applications, but mostly on closed corpora and very specific problems. What we target within Khresmoi is much larger. We have specialists in the consortium who can integrate all these technologies, and this is the challenge, because the experts now have to work together to combine these tools like text retrieval with semantic analysis, or semantic analysis with images, and they have to identify the complementary parts of these areas for a successful combination.

A further challenge is to ensure that whatever will be developed meets the needs of the end users: The physicians and the general public. Questionnaires and interviews with these end users are planned for the beginning of 2011 to elicit the necessary information. These end user groups will also contribute to the project at a later stage by testing/evaluating the prototypes. Interface design and human computer interaction are therefore also important cornerstones of the project.

Large Data: A problem or an opportunity?
Werner Janusch (European Commission, Technologies for Information Management)

We are aware of two things: First, solutions developed for small data do not necessarily also work for large data; they are not scalable. Second, we are facing an immense accumulation of data everywhere, and especially in data intensive scientific and medical practice, as we see e.g. in radiology. And we estimate that by now less than 50% of digital info will be authored documents, the rest comes from automated experiments, logs and other sources.

We see the exponential data growth and the resulting issue of Large Data as a main challenge for a knowledge based society and innovative economies. Storage is one, analysis, interpretation and evaluation is another topic. This is the reason why the Commission is funding projects like Khresmoi dealing with Knowledge Management and hopefully resulting in applications to handle and make available such large data.

Another interesting aspect of Khresmoi for us is its integration of heterogeneous data sources. So it will need to evaluate different types of content and bring it together in one system. The trend is towards open access.

Multilingualism as efficient localization strategy
Najeeb Al-Shorbaji (World Health Organization, Knowledge Management and Sharing)

We – the WHO being a knowledge based organization – believe that the health of the people can be improved with access to information. Enabling access to information will empower people, decision – and policy makers. Of course access is just one step. The translation of information into knowledge and furthermore into action, meaning policies or decisions is equally important. To enable access to information we provide open access to all our digital resources, we distribute publications free of charge and we disseminate our own data also free of charge. We also help countries to improve their capacity to create knowledge, to disseminate and to use it. We continuously try and improve our global knowledge repository. It needs to be globally and locally relevant at the same time. Without the localization and the adaptation of all materials to a local context, people will not use it, and there will be no translation into action or policies.

One of the major issues in this effort is multilingualism. Encouraging production of knowledge in local languages is therefore a vital

objective of the WHO. It is very important for the cultural identity to be able to contextualize, research and present knowledge in your own language. You can describe and act upon your experiences in a much more versatile way. In regard to the Khresmoi project this is of the most interesting aspects for the WHO: its multilingual approach, the language support and computer-assisted translation. We would like to make our multi-lingual products available for the project, like the World Health Report. Some of our flagship publications are available in 6, even 7 languages. We would like to create access to all our information resources for the project, so that people coming to the HON search engine will be able to see WHO publications and products, including the Global Health Library, including the Global Institutional Repository. Furthermore, we will be happy to share with the Khresmoi project development teams our experience, in terms of what kind of terminology people use, what kind of questions they pose, what range of interests and needs of the medical and the health communities, compared to the public in general arise.

The WHO is also very interested in improving the quality of health information on the internet. Hopefully at some point we will have a World Health Resolution on quality of health information. So, I see many areas of common interest for the WHO and Khresmoi, and I am looking forward to the collaboration.

Keeping it simple
Michela Spagnuolo (Khresmoi Advisory Board)

I think Khresmoi has many important impacts not only for the scientific, respectively the technical field, but also for the public. It will help us to understand how health related information in the Internet can become an active part of the treatment. I see the main challenge of the project in the integration of the data and the proper settings of the user interface because this is the linchpin of the entire operation. How do the users access this information? >>

We need to keep it simple. We need to think about the proper screen application, but also mobile application, which might not be the key point today, but will become more and more important, especially for the medical doctors who have to be mobile in their daily business. I am thinking of old people, patients with limited access and people not used to using computers, respectively search engines. As a member of the advisory board, my expertise and my main interest will be the integration of the image data, especially 3D image data in the process. Furthermore, I will follow closely on the abstraction from the images and the indexing of this media. I was part of a project for semantic annotation of 3D and 4D data. We developed standards for the metadata for 3D and 4D models. So, I will try and bring this expertise into the project.

Integration of multimodal search within intuitive interfaces

Ted Briscoe (Khresmoi Advisory Board)

It is a pleasure to be invited onto the KHRESMOI advisory board. Many of the project's key aims, such as integration of image and text based multimodal search within intuitive interfaces, are ones that we have explored in work on scientific paper search and information extraction in the Natural Language and Information Processing group at the University of Cambridge. I hope that I will be able to pass on some of our experience and also gain ideas and insights from the talented and multidisciplinary group assembled for this project. Certainly the application of advanced search and retrieval techniques to the vast but largely inaccessible quantities of data held in hospital records is a critical one and one where even small amounts of progress should translate into significant benefit to society.

Coping with the Data Flood

John Tait (Khresmoi Advisory Board)

Many medical practitioners are literally drowning in data: Automated lab tests, layered CAT scans, digital x-rays and so on, let alone the ever rising tide of scientific articles and public sources of medical information. Khresmoi will provide new ways of dealing with this data flood. Further it is not a research project (although some research will be needed). The outcome will be the basis of a continuing operational service for both medical professionals (of all kinds) and the general public. The barriers to effective use of medical information are not only volume and format (images and so on), they are also linguistic. Even textual information may be difficult to access in a useful way, because it may be expressed in a language with which the searcher is not familiar. Khresmoi will also deal with this problem in an affordable and timely way.

Team Khresmoi @ Billrothhaus

To order the newsletter and receive regular updates:
http://www.khresmoi.eu/contact-us/keep-me-updated/

At a glance

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Health on the Net (CH),
Medical University of Vienna (AT),
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Duration:
09/2010 - 08/2014

Funding scheme: IP

Total Cost:
€ 10.534 m

EC Contribution:
€ 8.036 m

GA number: 257528

http://khresmoi.eu