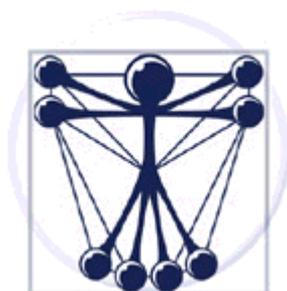# MedCIRCLE Workshop Report

"Towards a collaborative, open, semantic web of trust for health information on the web: Interoperability of Health Information Gateways"

12 Sep 2002, Brussels, Belgium

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1. Overview

Facing new possibilities and technical innovations, especially the idea of the semantic web, the MedCIRCLE Consortium organized an interoperability workshop entitled "Towards a collaborative, open, semantic web of trust for health information on the web: Interoperability of Health Information Gateways" on 12th Sep 2002 in Brussels, Belgium. The MedCIRCLE Consortium intended to bring together third-party evaluation services in the health field, for example Government sponsored health portals, Health Information Gateways, Annotation/Evaluation Services, and Kitemarking/Certification Services - basically everybody who is annotating, cataloguing or evaluating health information on the web. Leading key players in the field of health information quality from all over the world attended this event.

The workshop focussed on metadata and semantic web technologies, and demonstrated the use of these technologies for a decentralised, distributed quality management of health information on the web.

The aim of the Project Consortium was to disseminate the MedCIRCLE ideas and its vision at this workshop, to sensitise the members of the participating organisations to this new technological approach, to promote the use of the HIDDEL vocabulary among the participating organizations, to emphasise the decentralized approach of the MedCIRCLE project, and to foster collaborations and partnerships among the participating organizations under the umbrella of the MedCIRCLE Collaboration.

The following topics were discussed:

- What does the "semantic web" mean for metadata provider?

- How can third-party evaluation services (health gateways, accreditation services etc.) collaborate to achieve interoperability and to create a semantic web of evaluated health information, without giving up their own identity?

- How can open source semantic web tools, developed in the EU projects MedCERTAIN and MedCIRCLE, be used by third-party evaluation services?

- How can third-party evaluation services stimulate health information providers to provide metadata?

- How can end-users (consumers, researchers and policy makers) use and benefit from such technologies?

2. Workshop: Talks & Presentations

The following talks & presentations were held at the workshop:

KEYNOTE PRESENTATION:

The vision of the Semantic Web

Michael Sintek

German Research Center for Artificial Intelligence (DFKI GmbH), Kaiserslautern, Germany and visiting researcher at Stanford Medical Informatics Dept., Stanford University, Stanford, USA

About Michael Sintek: Michael Sintek studied computer science and economics at the University of Kaiserslautern and received the Diploma (master's degree) in 1996. Since then, he is working as a research scientist at the German Research Center for Artificial Intelligence (DFKI GmbH) Kaiserslautern. As a visiting researcher at the Stanford Medical Informatics department (August - October 1999 and November 2000 - February 2001) he developed various plugins for the the frame-based knowledge acquisition tool Protégé-2000, including the OntoViz ontology visualization tab and the RDFS backend. Currently, he is a visiting researcher at the Stanford Database Group and at ISI, working on the Edutella project and TRIPLE.
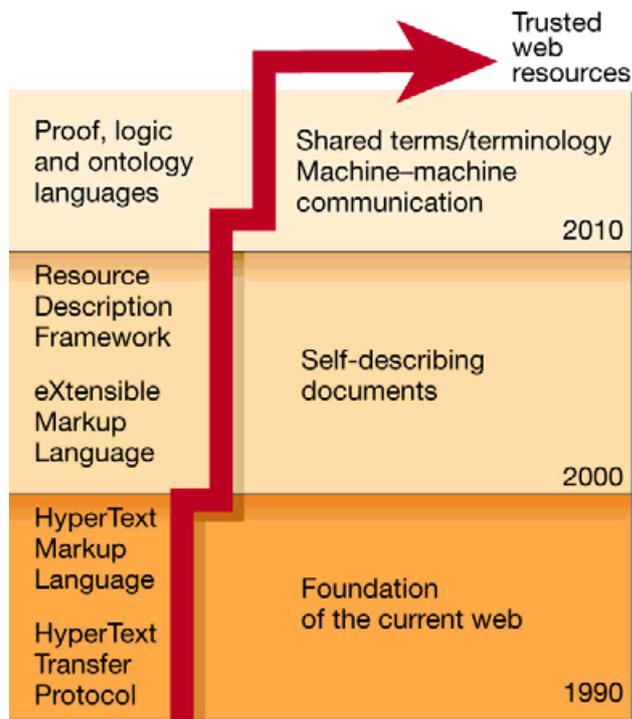
In his talk, Michael emphasised the vision and goal of the semantic web, which is an extension of World Wide Web as it currently exists.

He gave an overview about the technical requirements to transfer the idea of the semantic web from a vision to a real-world application and outlined certain projects in this field.

The Semantic Web is a vision: "the idea of having data on the web defined and linked in a way, that it can be used by machines - not just for display purposes, but for using it in various applications." (http://www.semanticweb.org/introduction.html)

The world-wide-web might evolve in the near future from an environment with largely narrative, human-understandable information, to an environment, where much of the information is machine-readable and directly processable by computers. This vision has been called the "Semantic Web" by its inventor, Tim Berners-Lee, who from the beginning had envisaged the web to be a worldwide, distributed knowledge base, rather than a medium with primarily narrative information targeted only for human consumption.[1-3] The "Semantic Web" can be thought of an extension of the present web, as an additional layer of machine-processable data beneath the visible layer of human-readable information. Building standards and tools for the Semantic Web is currently one the focus of the activities of the W3C (World Wide Web Consortium), which describes the aim of its activities as follows: "The goal of the Semantic Web is to develop enabling standards and technologies designed to help machines understand more information on the Web so that they can support richer discovery, data integration, navigation, and automation of tasks. With the Semantic Web we not only receive more exact results when searching for information, but also know when we can integrate information from different sources, know what information to compare, and can provide all kinds of automated services

in different domains from future home and digital libraries to electronic business and health services.“ [4]

Trusted web resources

Proof, logic and ontology languages	Shared terms/terminology Machine–machine communication 2010
Resource Description Framework eXtensible Markup Language	Self-describing documents 2000
HyperText Markup Language HyperText Transfer Protocol	Foundation of the current web 1990

While today much of information seeking is done by humans using search engines, in the near future people will use intelligent "agents", specialised software which is able to crawl the web in response to an individuals' specific request and which can draw inferences from the knowledge chunks provided on different websites. To this end, websites and webdocuments have to provide richer machine-processable information, essentially metadata. Metadata is "data about data". Metadata for web-based health information can be compared with food labels: Similar to producers of food, who have to display ingredients on standardised labels, telling consumers for example the amount of fat and sodium contained in their products, health information providers on the web should use standadised labels to disclose certain facts about their information, so that consumers can make informed decisions.[5-7] Previously there have been many different ways to link metadata to web documents, for example using META tags in HTML or using PICS (Platform for Internet Content Selection) for self-a and third-party description of information. The World Wide Web Consortium (W3C) has tried to unify different approaches and the result of these efforts is the Resource Description Framework (RDF) – the current standard to transport metadata and a major pillar of the Semantic Web. RDF can be expressed in XML syntax (extensible Markup Language) [8]. Although RDF is basically an XML file, the difference between XML and RDF is significant: While XML-Schemas tell computers how a application form for a drivers licence looks like, RDF is able to explain to a machine what a drivers licence is. It is able to give a meaning to the concept of a drivers licence, by explaining what the relationships of the concept of a drivers licence *is*, i.e. how this concept is related to other concepts. As the RDF developers point out, RDF is a simple frame system, i.e. a format for knowledge representation, where objects (concepts) and their relationships to each other are specified. The RDF specification does not contain a reasoning system; this needs to be build on top of it.

The uptake of providing metadata on the web has been slow so far – web content is still largely devoid of metadata labels [9]. Thus, the question is arises how a critical mass of RDF

metadata - machine processable chunks of knowledge - on the web can be generated. There are two answers to this. One is that software developers will increasingly create tools and applications which automatically embed RDF metadata in documents, making it easy for authors to produce metadata. One example is Adobe, which now uses RDF as a standard to transport metadata across its applications (http://www.adobe.com/products/xmp/main.html). There are currently millions of PDF (Adobes' Portable Document Format) documents on the web, and in the future all of them will carry PDF metadata. Another example from the health field is the MedCERTAIN project (explained in detail below), which developed open source tools for health information providers to express disclosure information on websites in a machine-processable metadata. The health information provider does not need to understand RDF – all he needs to do is to fill in a questionnaire for self-disclosure and description, and his answers will be translated into metadata. [10]

The second answer to the question of how a critical mass of metadata can be generated is that essentially all structured information, which is currently generated from databases and presented on dynamic webpages (created on the fly) can be easily enriched with metadata tags, which are essentially the field names of the database table.

MedCIRCLE: A collaboration for Internet rating, certification, labeling and evaluation of health information

Gunther Eysenbach

Centre for Global eHealth Innovation, University of Toronto, Canada and Research Unit for Cybermedicine & eHealth, University of Heidelberg, Germany

About Gunther Eysenbach: Dr. Eysenbach, MD, was coordinator of the MedCERTAIN project and is coordinator of the follow-up project MedCIRCLE. He works at the Department of Clinical Social Medicine in Heidelberg, where is was founder and head of a research group on cybermedicine and eHealth. He is author of a German textbook for computers in medicine (which he wrote at the age of 24), editor of a German loose-leaf book on computers for physicians, founding editor and editor-in-chief of the international Journal of Medical Internet Research (which was selected for Medline indexing in 2001), editor of an English-language book on Medicine and Medical Education in Europe, and editorial board member of various medical journals. Dr. Eysenbach has authored more than 90 publications, including more than 30 book-chapters as well as several pioneer studies and comments on cybermedicine, e-health and Consumer health informatics, published in respected international journals such as JAMA, BMJ, Lancet. He also holds an academic appointment as Senior Scientist at the Centre for Global eHealth Innovation and the Division of Medical Decision Making and Health Care Research at the Toronto Research Institute/Toronto General Hospital and as Associate Professor at the Department of Health Policy, Management and Evaluation, University of Toronto, and is Associate Faculty Member at the University of Toronto School of Graduate Studies.

Gunther Eysenbach presented the MedCIRCLE project in detail and illuminated all facets of the project and its approach. He especially stressed the chances and impact of machine-processable metadata (HIDDEL) on health information websites as well as the collaborative approach of the MedCIRCLE project. He pointed out, that MedCIRCLE hopes to provide and act as a stimulus for other gateways and accreditation bodies to join the collaboration by implementing HIDDEL, thereby weaving a global, collaborative, open semantic web of trust for health information.

When people today write and talk about the Semantic Web, they mainly stress the advantages for knowledge management and enhancing information retrieval. However, the Web is an information space that reflects not just human knowledge but also human relationships, thus the Semantic Web can also represent trust relationships among people and organizations.

"Trust management" is a prerequisite for successful knowledge management on the web. Without the possibility for people to filter information or for agents to make semi-automated decisions on which knowledge chunks, ontologies or sources to trust, the jewels on the web will be lost in a "noise" of imperfect, cheaply produced or commercially motivated, biased information.

There has been considerable debate about the variable quality of health information on the world-wide-web and its impact on public health. A recent systemtic review on empirical studies evaluating health information on the web has identified 79 distinct studies, the majority of which investigators were wary about the quality of health information and demanded some sort of quality control or system able to guide consumers to the best available evidence [11]. While central authorities to regulate, control, censor, or centrally approve information, information providers or websites are neither realistic nor desirable [5], public health professionals are interested in making systems available that direct patient streams to the best available information sources.

Unfortunately, the project MedCERTAIN was (and is) frequently misinterpreted (even in the peer-reviewed literature) as a "third-party rating organization" or "trustmark" project, on par with for example URAC while in fact, MedCERTAIN - and even more so the follow-up project MedCIRCLE – is more correctly to be seen as a infrastructure project or a model for a federation or a kind of "Cochrane Collaboration" of organizations active in field of annotating, describing, and evaluating health information on the web

The MedCERTAIN/MedCIRCLE instigators argue since 1997 that on a decentralised, electronic medium such as the web, a global metadata infrastructure is the most appropriate answer to the ongoing debate on the "quality of health information on the web". One has to think along the lines of a collaborative "Semantic Web of trust", when it comes to the question on how we can steer consumers to the best available health information on the web.[5; 20-23]. A "Collaboration for Critical Appraisal of Health Information on the Web" - a loose community of health information providers and health gateways using metadata to describe and annotate health websites – had been proposed in 1997 [5; 20] and is now – at least partly - realized in the MedCIRCLE project by having three independent gateways collaborating with each other and forming a "circle of trust". The basic idea is that quality management on the web should be based on a collaborative model with many actors saying different things about anything in a machine-processable way (i.e. using metadata). This would enable software to analyses the trust relationships, would enable „downstream filtering" at the client computer, or positive selection of trusted content using agents, instead of relying on upstream filtering approaches such as static kitemarks [5] or even proposals for abusing top-level domains to centrally approve health information providers [24]. A metadata vocabulary, MedPICS (based on the W3C PICS=Platform for Internet Content Selection Standard) was proposed, which also contained metadata elements which could be used by third parties to express evaluative statements about other sites [20]. The MedPICS proposal later led to the MedCERTAIN (2000-2001) and MedCIRCLE (2002-2003) projects, both aiming to implement such metadata on health websites and third party organisations. With the PICS standard being superseded by XML/RDF [9], the projects were part from the beginning „Semantic Web" projects, using RDF to transport metadata. As the PICS standard became obsololete, MedPICS was renamed into HIDDEL (Health Information Disclosure, Description and Evaluation Language)[10]. Unlike other initiatives in this field MedCERTAIN never attempted to be a traditional „kitemark" project, but instead tried to develop an infrastructure, to link existing approaches and to make

them interoperable, and to generate a critical mass of health-related descriptive and evaluative metadata on the web. Unfortunately, very few people seemed to understand these ideas, and MedCERTAIN is consistenly and repeatedly misunderstood and misrepresented as a third party certification program [25], while the main goal of the MedCERTAIN project was to develop and demonstrate a decentralised web-of-trust infrastructure using of metadata.

The constant misunderstandings concerning MedCERTAIN were one reason to change the project name to MedCIRCLE (Collaboration for Internet Rating, Certification, Labeling and Evaluation of Health Information) in the second round of funding under the EU Internet Action Plan. MedCIRCLE is an international project with the aim to increase the accessibility and availability of trusted websites using "Semantic Web" approaches. It builds on, expands and continues work on rating health information on the Internet piloted within the MedCERTAIN project. While MedCERTAIN provided the core technologies, open source software and the metadata vocabulary for self- and third-party rating (=annotating, describing, evaluating) health information, MedCIRCLE uses and develops these technologies further. Moreover, the Collaboration involves a wider medical community to assess health information, demonstrating the power of collaborative and interoperable evaluations in an Semantic Web environment. Three major European gateway sites for consumer health information, two of whom are backed by official professional physician associations, are already using the metadata vocabulary HIDDEL (Health Information Disclosure, Description and Evaluation Language)[10] to express ratings in a machine-processable XML/RDF format and to describe their relations to other organisations. Other health subject gateways, accreditation, or rating services are encouraged to join the Collaboration simply by implementing HIDDEL on their gateways, allowing intelligent agents or client-side software to harvest statements and opinions about the trustworthiness of other websites, assisting users in selecting trustworthy websites. Eventually it is hoped to establish a global web of trust for networked health information.

MedCERTAIN and MedCIRCLE from the beginning used the Semantic Web approach realizing that „in medicine there is no absolute truth, so that in practice the evaluation of quality criteria such as ‚accuracy' of health information poses huge practical barriers" [26]. It is one of the principles of the Semantic Web that there is no need for absolute truth: „Not everything found from the Web is true and the Semantic Web does not change that in any way. Truth - or more pragmatically, trustworthiness - is evaluated by each application that processes the information on the Web. The applications decide what they trust by using the context of the statements; e.g. who said what and when and what credentials they had to say it " [4]

Presentation slides are available at:

http://yi.com/home/EysenbachGunther/talks/medcircle-workshop-brussels.htm

CISMeF - a search tool based on "encapsulated" MeSH thesaurus: Integration with HIDDEL

Stefan Darmoni

CISMeF, France

About Stefan Darmoni: Stefan Darmoni is Professor of Medical Informatics, Rouen Medical School, France and Advanced Technology Unit Manager in the Computing & Networks Department, Rouen University Hospital.

CISMeF, a quality-controlled subject gateway, will use HIDDEL as a third-party and include HIDDEL into the CISMeF database. Stefan Darmoni presented the selected subset of HIDDEL elements and explained the implementation process at CISMeF.

HIDDEL metadata impementation at COMB: Web Medica Acreditada in Spain

Miquel Angel Mayer

Col·legi Oficial de Metges de Barcelona (COMB), Spain

About Miquel Angel Mayer: Dr. Mayer acts as a Scientific Project Officer in MedCIRCLE project. He is a physician and specialist in Family Medicine, member of the National Health Prevention and Promotion Activities Programme in Primary Care (PAPPS), member of the Spanish Continious Medical Trainning Programme and three national Primary Care Journal Editorial Board.

Miquel Angel Mayer presented, how Web Médica Acreditada, a service to develop quality and ethical standards for health information, implements HIDDEL to accredit Spanish health information on the Internet.

Perspectives of health information at AQUMED: HIDDEL implementation to foster interoperability by using machine processable metadata

Michael Fiene

Agency for Quality in Medicine (AQuMed), Germany

About Michael Fiene: Michael Fiene is a physician, Hospital Management Advisor and Quality Manager at AQUMED, the Agency for Quality in Medicine founded in March 1995 as a joint institution of the German Medical Association (GMA = Bundesärztekammer) and the National Association of Statutory Health Insurance Physicians (NASHIP = Kassenärztliche Bundesvereinigung).

Michael Fiene presented how AQuMed implements HIDDEL on its consumer focussed health gateway www.patienten-information.de, where lay persons have access to reliable consumer health and human services information. AQuMed describes and annotates web resources using the HIDDEL vocabulary to lead consumers to selected online publications, clearinghouses, databases, web sites, support and self-help groups, as well as not-for-profit organizations that produce reliable information for the public.

3. Participating Organizations

- AFGIS (Aktionsforum Gesundheitsinformationssystem)
- Agency for Quality in Medicine (AQuMed)
- BIOME
- Centre for Global eHealth Innovation, University of Toronto
- CISMeF
- European Commission, DG Information Society
- European Committee for Standardization (CEN)
- German Research Center for Artificial Intelligence
- Health on the Net Foundation (HON)
- HealthInsite
- Institute of Telematics
- National electronic Library for Health
- Research Unit for Cybermedicine & eHealth, University of Heidelberg
- U.S. Department of Health and Human Services
- URAC
- Web Medica Accreditada, Col legi Oficial de Metges de Barcelona (COMB)
- WHO, Regional Office for Europe
- World Health Organization

(Please see section "5" for a detailed list of the participating organizations.)

4. Workshop Results

The workshop was attended by 24 participants from three continents (Europe, North-America, Australia), all representatives of major health information gateways, accreditors, or similar potential providers metadata.

The workshop took place in a pleasant atmosphere and provided many interesting approaches and points of view both on the need and the requirements of using HIDDEL as a standardized machine-readable metadata vocabulary to weave a global, collaborative, open semantic web of trust for health information.

The participants actively discussed the advantages of an open RDF repository describing health information on the Word Wide Web.

In the aftermath of the workshop, several participants expressed interest in

1   implementing HIDDEL;

2   creating a steering committee which further develops and promotes the idea of a global collaboration of health information gateways and accreditors

3   participating in a joint follow-up project

Several participants showed an active interest in implementing HIDDEL, among them health-finder.gov and Afgis.
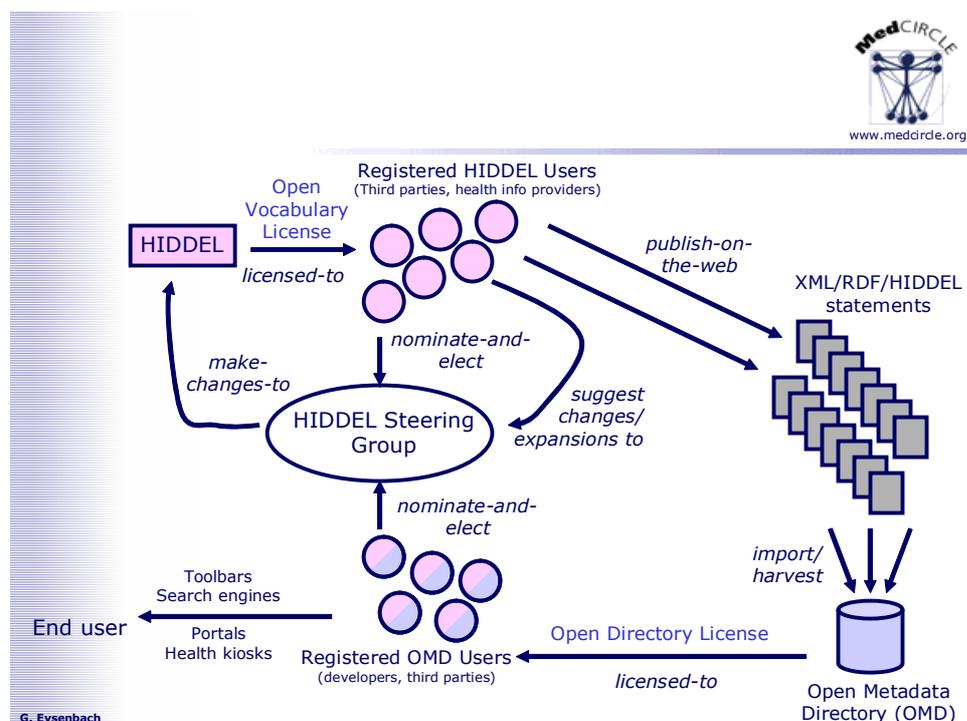

Figure 1. Suggested organizational collaboration structure of HIDDEL implementers

5. Appendix: Participating organizations

In the following, the participating organizations are listed with their addresses and some information about the institutions. The descriptions were entered by the participants via an online registration form for the workshop.

5.1.1 AFGIS (Aktionsforum Gesundheitsinformationssystem)

afgis-Coordination

Alex Möller, Heribert Balks

Westerbreite 7

49084 Osnabrück

Telefon: 0541 / 9778-800

Fax: 0541 / 9778-801

URL: www.afgis.de

Representatives:

Stefan Hebenstreit, Stefan Schug

5.1.2 Agency for Quality in Medicine (AQuMed)

Agency for Quality in Medicine (AQUMED)

Aachner Strasse 233 - 237

D-50931 Cologne

Germany

URL: www.aezq.de

The Agency for Quality in Medicine (AQUMED) was founded in March 1995 as a joint institution of the German Medical Association (GMA = Bundesärztekammer) and the National Association of Statutory Health Insurance Physicians (NASHIP = Kassenärztliche Bundesvereinigung).

AQUMED takes special care in:

- the preparation for recommendations of GMA and NASHIP concerning the assurance of structural-, procedure- and result-quality in the medical profession

- the support of the State Medical Associations and the State Associations of Statutory Health Insurance Physicians concerning the execution of quality-assurance-progress

- the organisation of common advisory committees

- the assessment and preparation of evidence-based clinical practice guidelines for the medical profession in ambulatory and hospital care

- the support and preparation of standardization within National or European Institutions.

In 1999 AQUMED in co-operation with the Department of Epidemiology, Social Medicine and Public Health Research of the Medical Academy Hannover, the German Cochrane Centre and the Centre of Quality Management in Health Service of the Medical Association of Niedersachsen established an internet based patient information system. Under the web address www.patienten-information.de lay persons have access to a gateway to reliable consumer health and human services information. www.patienten-information.de leads to selected online publications, clearinghouses, databases, web sites, support and self-help groups, as well as not-for-profit organizations that produce reliable information for the public. These websites are currently rated according to the HON and DISCERN criteria, and adoption of MedCERTAIN elements and procedures within MedCIRCLE is envisaged. Since 2001 AQUMED is acknowledged by the German Health Insurances as a official advisory board for consumers and patients.

Representatives:

Michael Fiene, Christian Thomeczek

5.1.3 BIOME

BIOME

Queen's Medical Centre

NG7 2UH

NG7 2UH Nottingham

U.K.

URL: http://biome.ac.uk/

BIOME, University of Nottingham. BIOME is funded to provide a catalogue of Internet sites in a range of subject areas for the UK HE and FE communities. Topics covered are Health, Medicine and Nursing, Agriculture Forestry and Food, Veterinary sciences and The Natural World. We use documented guidelines and standards to provide a filter and ensure all resources meet a minimum standard.

Representative:

Bob Parkinson

5.1.4 Centre for Global eHealth Innovation, University of Toronto

URL: www.uhnres.utoronto.ca/ehealth/

The Program in eHealth Innovation was created in October 2000 as a joint initiative of the University Health Network (UHN), the largest hospital grouping in Canada, consisting of the Princess Margaret, Toronto General and Toronto Western Hospitals, and the University of Toronto (U of T), Faculty of Medicine. These institutions realized that information and communication technologies (ICTs) are having a major impact on health, research and education, as well as offering tremendous opportunities for worldwide collaboration.

The Centre for Global eHealth Innovation has been designed to provide innovators with expertise in ICTs, the social sciences, and health knowledge management, with access to resources that do not exist anywhere else in the world for the study of eHealth innovations.

Thanks to these resources, which are supported by the UHN and an award from the Canadian Foundation for Innovation, researchers associated with the Centre are able to engage in collaborative, trans-disciplinary efforts that cross both institutional and geographic boundaries.

The guiding principle driving all of this is to ensure that people, regardless of who or where they are, are able to access the information and services they need to maintain the highest levels of health, and to make informed choices regarding their own health care.

Representative:

Gunther Eysenbach

5.1.5 CISMeF

CISMeF

1 rue de Germont

76031 Rouen Cedex

France

URL: www.chu-rouen.fr/cismef/

The objective of CISMeF (French acronym for Catalog and Index of French-language health resources) is to describe and index the main French-language health resources to assist health professionals and consumers in their search for electronic information available on the Internet. CISMeF is a quality-controlled subject gateway originally initiated by Rouen University Hospital (RUH).

Representative:

Stefan J. Darmoni

5.1.6 European Commission, DG Information Society

European Commission

DG Information Society

Applications for Health

URL: http://europa.eu.int/comm/dgs/information_society/index_en.htm

Representatives:

Gerhard Heine, Petra Wilson

5.1.7 European Committee for Standardization (CEN)

URL: http://www.cenorm.be/

Representative:

Anders Thurin

5.1.8 German Research Center for Artificial Intelligence

German Research Center for Artificial Intelligence DFKI GmbH

Erwin-Schrödinger-Straße 57,

D-67663 Kaiserslautern, Germany

URL: www.dfki.de

The German Research Center for Artificial Intelligence DFKI GmbH, with sites in Kaiserslautern and Saarbrücken, is the leading German research institute in the field of innovative software technology. In the international scientific community, the DFKI is among the important "Centers of Excellence". The Knowledge Management department, directed by Prof. Dr. Andreas Dengel, develops innovative AI-based technologies to support the management of data, information and knowledge in companies.

The skills of the group comprise the know-how of the two former departments Document Analysis and Intelligent Enginieering Systems that have been merged into one group. Hence the experiences range from image based document analysis technologies such as segmentation on various object-levels, model based and model free labeling, general information retrieval tasks like classification and content extraction, abstracting, passage

retrieval, etc. towards formalisation of knowledge, modeling of domain ontologies to facilitate high level inferencing on the data. The research of the group is driven by the vision of an organisational memory.

Representative:

Thomas Roth-Berghofer, Michael Sintek

5.1.9 Health on the Net Foundation (HON)

Health On the Net is an NGO organisation accredited by the Economic and Social Council of the United Nations.

HON's Mission: HON's innovative approach is to help people combat disease and enjoy healthy lives by offering practical guidance to certified medical information and support on the Internet.Pioneering the field of health information ethics, HON was first to introduce a code of conduct for medical and health web sites (HONcode). The HONcode has since been adopted by over 3000 web sites worldwide. HON presents its research at international academic gatherings and collaborates on severalEuropean Union projects. Although best known for the HONcode, Health On the Net has also developed online applications for patients and caregivers, including HONselect search engine, an encyclopedic resource of medical and health information containing over 70,000 references.

The HONcode© initiated by HON in 1996 was the first set of ethical management principles for health and medical web sites, established with the objective of raising the quality of Web-based health information, easing safety concerns and accelerating the acceptance of e-health. It is the original active-seal system for healthcare web site developers, obliging them to disclose, among other things, their sources of funding, clearly separate advertising from editorial content and exercise scientific rigour in the presentation of information.

The HONcode© has become the leading international standard for medical web sites worldwide, and exists in 21 language versions. Over 3,300 sites subscribe to it from 5 continents in 66 countries. HON monitors each of them regularly for compliance before awarding an "Active HONcode Seal".

URL: www.hon.ch

Representative:

Celia Boyer

5.1.10 HealthInsite

URL: www.healthinsite.gov.au

HealthInsite. HealthInsite is an Internet gateway developed by the Australian federal Department of Health and Ageing. It aims to provide Australians with current and reliable health information through information partnerships with authoritative health organisations.

Healthinsite links to the information resources on partner websites. Partner websites undergo a quality assessment process. Currently we have over 50 information partners and 9000 linked resources. Dublin Core is used for metadata records.

Representative:

Prue Deacon

5.1.11 Institute of Telematics

Institut für Telematik

Bahnhofstrasse 30-32,

D-54292 Trier

Germany

URL: www.ti.fhg.de

Representative:

Lutz Vorwerk

5.1.12 National electronic Library for Health

National electronic Library for Health

Oxford

UK

URL: www.nelh.nhs.uk

The National electronic Library for Health is the English National Health Service's Digital Library. It is primarily aimed at health professionals but is useful to the patient requiring detailed information. The Library has a wide range of resources from national guidlines to three dimensional anatomical images. The library receives just under 100,000 hits per day Although some resources are restricted it is predominately open to non-NHS users at www.nelh.nhs.uk.

Representative:

Nick Rosen

5.1.13 Research Unit for Cybermedicine & eHealth, University of Heidelberg

Research Unit for Cybermedicine & eHealth,

Dept. of Clinical Social Medicine,

University of Heidelberg

Bergheimer Str. 58

69115 Heidelberg

Germany

URL: www.dermis.net/aks

The Research Unit for Cybermedicine and eHealth belongs to the Dept. of Clinical Social Medicine of the Medical Faculty of the University in Heidelberg, Germany. The personal experience of the researchers include project management of a great amount of research studies in the field of Public Health as well as project co-ordination (e.g. of the EU funded projects MedCERTAIN & MedCIRCLE).

They have authored a number of research papers on quality of Internet information and were among the very first proposing a "collaborative" approach in labeling medical information on the Internet by using metadata.

Representatives:

Christian Koehler Thomas Roth-Berghofer, Gunther Eysenbach

5.1.14 U.S. Department of Health and Human Services

URL: www.hhs.gov

Representative:

Mary Jo Deering

5.1.15 URAC

URL: www.urac.org

Representative:

Guy D'Andrea

5.1.16 Web Medica Accreditada, Col legi Oficial de Metges de Barcelona (COMB)

Web Medica Accreditada,

Col legi Oficial de Metges de Barcelona (COMB)

8021 Barcelona, Spain

URL: www.comb.es

COMB is a centennial corporation, created to defend the interests of the medical profession and ensure that it adheres to ethical and scientific norms in order to offer the best healthcare services to society. COMB promotes the Web Médica Acreditada, WMA (Certified Medical Web Site Seal) (http://wma.comb.es). From 1999 the seal of quality, created to serve as a virtual reference point of the medical community, seeks to establish (using a rating process and certification) a set of norms that the owners of medical and healthcare websites from Spain and Southamerica, can voluntarily follow to offer consumers a good quality Internet health services.

Representatives:

Miquel Angel Mayer, Carles Soler

5.1.17 WHO, Regional Office for Europe

WHO, Regional Office for Europe

Scherfigsvej 8 KH OE

2100 Kopenhagen

Denmark

URL: www.who.dk

The World Health Organization (WHO) is a specialized agency of the United Nations with primary responsibility for international health matters and public health. Through WHO, which was created in 1948, the health professions of over 180 countries exchange their knowledge and experience, working for the attainment by all citizens of the world of a level of health that will permit them to lead socially and economically productive lives.

WHO/Europe (the WHO Regional Office for Europe) is one of six regional offices throughout the world, each with its own programme geared to the particular health problems of the countries it serves.

The WHO European Region embraces some 870 million people living in an area that stretches from Greenland in the north-west and the Mediterranean in the south to the Pacific coast of the Russian Federation in the east. WHO/Europe therefore concentrates both on the problem of industrial and post-industrial societies and on those faced by the emerging democracies of central and eastern Europe and the former USSR.

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