

Newsletter

February 2014

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M. Scott Marshall – Maastricht Clinic, Maastricht, Netherlands

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Dr. Pascal Coorevits - Ghent University, Belgium

Partner profile

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Enabling information re-Use by linking clinical REsearch and CAre



Anca Bucur, Project Coordinator

An important objective of the second year of **EURECA** has been to finalize the clinical requirements analysis underpinning our research. We focused on the consolidation of the user needs, on the technical use case development and on the analysis of the key requirements of the clinical users involved in the project. During the first year we have explored the user needs in the domain of the project and defined a significant number of clinical scenarios which were further refined into use cases; in the second year, in order to drive the development of IT solutions, we classified and prioritized these use cases. To obtain access to the datasets all the necessary legal and regulatory steps were carried out by the consortium partners in full compliance with the **EURECA** legal framework.

The overall **EURECA** architecture was also refined and extended with the definition of interface layers towards external systems relevant for the environment. The integration guidelines elaborated helped tool developers to build components that fit well in the **EURECA** ecosystem and can leverage the key central components. A seamless integration was supported with several workshops and tutorials focused on integration with the security infrastructure and with the semantic interoperability layer.

The work on information extraction has also advanced with a focus on relation identification between concepts in available clinical text. Services to provide uniform access to clinical trial data and other external sources were also specified. With the release of several datasets including free text reports, the information extraction research will gain speed and have significant impact on the tool development this year.

Standard ontologies are at the centre of our semantic solution being the source of the semantic core dataset and enabling a shared understanding of the information and knowledge available within **EURECA**. We analyzed the clinical datasets available in **EURECA** and evaluated the percentage of the concepts of the selected ontologies that are present in our datasets and the coverage of these ontologies.

All the above work has provided the basis for the core objective of last year: the development of **EURECA** innovative services and tools addressing the identified needs of the users. We have implemented prototypes for the patient recruitment service for clinical trials, the trial feasibility service, the patient safety service, the patient diary application in the context of a PHR and the personal medical information recommender for cancer patients. The data-mining component of the project has also achieved significant progress with work on mining of expert consultation data and on hypotheses generation.

We are looking forward to the third year of **EURECA** to refine our tools, and to start their evaluation and validation with our clinical end-users with the end goal to deliver solutions that fit the context and the needs of the user communities.

Semantic Web Applications and Tools for Life Sciences

On December 9-12, 2013, the 6th International Workshop on **Semantic Web Applications and Tools for Life Sciences (SWAT4LS 2013)** took place in Edinburgh at the Edinburgh University Informatics Forum (Tutorials and Hackathon) and the Royal Society of Edinburgh (Workshop).

SWAT4LS is an international workshop series set up to meet and to present high-quality research results and relevant demonstrations, applications and tutorials from all fields of Semantic Web technologies in the Life Sciences.

The objective of the **SWAT4LS** workshop is to provide a forum dedicated to the dissemination of original research, the discussion of practical insights, and the reporting of relevant experience relating to the adoption of Web-based information systems and Semantic technologies in biomedical informatics and computational biology. The workshop is also aimed at providing a forum to exchange ideas, for example, through poster papers and demo papers. The topics covered by **SWAT4LS** are relevant to a number of European projects including: **EURECA**, **INTEGRATE**, **p-medicine**, **EHR4CR**, **Linked2Safety**, **Euregional Computer Assisted Theragnostics project (EuroCAT)**, **eTRIKS**, **PhUSE**, **SALUS**, **OpenPHACTS**, **Granatum – think tank for biomedical progress**, **SemanticHealthNet**, **IT Future of Medicine**, as well as U.S. initiatives such as the **NCBO (Nation Center for Biomedical Ontologies)**, **Neuroscience Information Framework (NIF)**, **Indivo**, **Dossia**, **CTS2**, **I2B2**, **SHRINE**, **Health Ontology Mapper**, and **SMART**. More information on such related projects is available on the **Clinical Observations Interoperability** wiki page of the **W3C Semantic Web Health Care**

and Life Sciences (HCLS) Interest Group.

EURECA held a Technical Meeting following the **SWAT4LS** Workshop, which was hosted by Heriot-Watt University.

The call for papers solicited research contributions in eHealth, biomedical and clinical informatics, systems biology, computational biology, drug discovery, bioinformatics and biocomputing. The call for contributions attracted 47 submissions from around the globe. The technical program shows a carefully selected presentation of research and development in 13 full papers, 1 short paper, 6 demos and 11 posters. These were complemented by 5 tutorials and 3 keynote talks provided by:

Keynotes

- **David A. Kerr, Director, Watson for Healthcare, IBM Corporation** - IBM Watson: Improving care for complex diseases
- **Kerstin Forsberg, Astra Zeneca, Sweden** - “Pushing back” - standards and standard organizations in a Semantic Web enabled world
- **Frank Van Harmelen, VU University, Amsterdam** - SWAT4CC: Semantic Web Applications and Tools for Clinical Care

Tutorials

- **Alasdair J G Gray and Andrea Splendiani** - The (Hitch-)hackers Guide to the Semantic Web
- **James Malone, Simon Jupp, Marco Brandizi, Sarala Wimalaratne** - RDF linked data and identifiers.org at the European Bioinformatics Institute
- **Charlie Mead and Eric Prud’hommeaux** - Applying Semantic Web Technologies in Clinical Care and Clinical Research: A SWOT (Strength, Weaknesses, Opportunities, and Threats) Perspective
- **Pedro Lopes** - The COEUS Platform
- **Trish Whetzel** - The Neuroscience Information Framework (NIF)

SWAT4LS Workshop Edinburgh

December 2013



M. Scott Marshall – Maastric Clinic, Maastrich, Netherlands

The speakers, a few tutorial givers, and a professor specialized in medical applications of Semantic Web were interviewed by ecancer. The interviews can be viewed at the [ecancer Conferences web page](#) for the **SWAT4LS** Workshop.

To place emphasis on the practical use of Semantic Web technologies in Life Sciences, SWAT4LS 2013 included a two day Hackathon. Data sets provided and experimented with during the Hackathon included artificial patient data for breast cancer clinical trials, de-identified patient data from the VATE project, adverse event data, pathways from Wikipathways, the linked data API from Open PHACTS and data from the EBI (European Bioinformatics Institute) RDF Platform.

EBI also announced the RDFApp Challenge during the Hackathon. Institutes and projects providing data and SPARQL access to triple stores included EBI, VU Amsterdam, MAASTRO Clinic, University of Maastricht, Data2Semantics (COMMIT project), DisGeNET project, Mayo Clinic, and Open PHACTS (EU IMI project). The results of several activities were presented at the end of the first day and most are documented at <http://bit.ly/SWAT4LSHackathon2013>.

Activities included creating dataset descriptions in RDF based on a W3C Note from the HCLS interest group, validators for RDF data, dynamic translation from one data schema to another, access control for SPARQL endpoints, EBI-WikiPathways-Disgenet integration, and an exploration of cancer therapy drugs extracted from NCI Thesaurus, and molecular targets, interactions, and pathways contained in EBI RDF resources.

The workshop was a great success with more than 30 people attending the tutorials and hackathon, and over 70 attendees at the workshop. Proceedings of the workshop have been made available on <http://ceur-ws.org/Vol-1114/>.

Edinburgh UK, January 2014,

**Albert Burger
Adrian Paschke
Paolo Romano
M. Scott Marshall
Andrea Splendiani**



International SWAT4LS Workshop
Semantic web applications and tools for life sciences

The Convergence Initiatives



Dr. Pascal Coorevits - Ghent University, Belgium



Dr. Pascal Coorevits

Many European research projects and organisations are dealing with the same issues (e.g. re-use of data, semantic interoperability, privacy and security, etc.) so the need for more “convergence” between these initiatives is obvious. Two Convergence workshops (June 2010

in Reykjavik and August 2011 in Oslo) were initiated by the **DebugIT project** (Prof. Dr. Christian Lovis). In November 2012 Prof. Dr. Georges De Moor, at that time President of The European Institute for Health Records (EuroRec) and representative of the Managing Entity of the **EHR4CR project**, re-initiated the Convergence initiatives with the organisation of the third Convergence Workshop in Basel during the EHR4CR Annual Conference. The aim was to organize a Think Tank roundtable with a limited number of representatives from EC - and IMI-JU funded research projects. **EURECA** was one of the projects represented at this roundtable. As a result of the roundtable five convergence topics have been identified and leaders for each of these topics have been assigned:

- **Topic 1:** Semantic Interoperability / Metadata / Glossaries (lead: Dipak Kalra)
- **Topic 2:** Quality Metrics (lead: Bart Vannieuwenhuysse)
- **Topic 3:** Privacy policy & requirements (including ethics) (leads: Peter Singleton / Anne Bahr)
- **Topic 4:** Privacy Protection Techniques & Security (lead: Brecht Claerhout)
- **Topic 5:** Business Modelling (lead: Danielle Dupont)

The fourth Convergence workshop was later held in Brussels on March 2013 and was co-organised by the European Commission (DG Connect) and **EuroRec**. The aim was – for each of the topics – to identify opportunities and challenges, to present the major results achieved so far within the projects, and to initiate and support cooperation and consensus building among these many projects and organisations.

This latter workshop was well attended, with over 80 participants representing 22 research projects and 7 organisations (see figures below). Several consortium partners from EURECA participated in this workshop. This initiative has also led to concrete results, with the creation of a Code of Conduct on how to re-use health data in collaborative scientific research projects, a document which was released by Anne Bahr as a result of the work within Convergence Topic 3.



List of projects represented at the Brussels 2013 Convergence Workshop

The convergence story still continues. The EHR4CR project is organizing the First European Hospital Conference “Enriching the Opportunities for Clinical Research in European Hospitals: the EHR4CR platform” on April 9th in Brussels. During that conference Bart Vannieuwenhuysse and Prof. Dr. Georges De Moor will give a presentation on “The Convergence between EC projects in the field of ICT for Research”. Moreover, a fifth Convergence Workshop will be organized during the eHealth Forum week (May 12-14th 2014) in Athens. More details will soon be published on the EuroRec website

<http://www.eurorec.org/>



List of organisations represented at the Brussels 2013 Convergence Workshop

The radiotherapy institute **MAASTRO CLINIC** delivers cancer care to patients in the Limburg region of the Netherlands. In 2012, a satellite opened at the location of the VieCuri Medical Centre in Venlo. **MAASTRO CLINIC** works closely with the radiotherapy department of the University Hospital Maastricht (MUMC+), the department of radiotherapy at the University of Maastricht (UM) and regional hospitals.

MAASTRO CLINIC's strategic goal is to deliver "individualized medicine": by applying advanced medical technology and scientific research, the cancer treatment will be tailored to the clinical, biological, and genetic characteristics of an individual patient so that the best outcome can be achieved.

Circa **265** employees work at **MAASTRO CLINIC** and yearly around **4000** radiation treatments are performed.

MAASTRO CLINIC is a leading radiotherapy facility for both treatment and research, embedded within the GROW institute of the Faculty of Health, Medicine and Life Sciences at Maastricht University. Research at **MAASTRO** spans the fields of clinical trials, medical physics, and medical imaging, biology and computer sciences.

In order to further research in outcome prediction, imaging biomarkers, and expertise sharing, **MAASTRO** is investigating techniques for data sharing between clinics, as well as an approach to distributed learning where the data remains in the clinic and is 'visited' by software programs for 'learning'. This research is taking place in several international projects, such as **EuroCAT**, **Semantic DICOM**, and **EURECA**.

MAASTRO CLINIC contributes to several aspects of the **EURECA** project, both in the role of clinical user as well as technical partner in the area of Semantic Web technology. **MAASTRO** brings a unique clinical perspective from the radiotherapy oncology domain and provides sample data from its radiotherapy clinical practice. **MAASTRO** is participating in most of the work packages of **EURECA**. In particular, **MAASTRO** is engaging with **EURECA** partners in order to develop software support to more efficiently and reliably identify patients eligible for its trials.

