



## Combining and Uniting Business Intelligence with Semantic Technologies

Acronym: CUBIST

Project No: 257403

Small or Medium-scale Focused Research Project

FP7-ICT-2009-5

Duration: 2010/10/01-2013/09/30



| CUBIST Dissemination Report v.1 |                    |  |  |  |
|---------------------------------|--------------------|--|--|--|
| Abstract: n/a                   |                    |  |  |  |
| Type                            | Report             |  |  |  |
| Document ID:                    | CUBIST D5.1.5      |  |  |  |
| Workpackage:                    | WP5                |  |  |  |
| Leading partner:                | SAP                |  |  |  |
| Author(s):                      | Frithjof Dau (SAP) |  |  |  |
| Dissemination level:            | PU                 |  |  |  |
| Status:                         | Final              |  |  |  |
| Date:                           | 17 October 2011    |  |  |  |
| Version:                        | 1.0                |  |  |  |





# Versioning and contribution history

| Version | Description   | Contributors       |
|---------|---|--------------------|
| 0.1     | draft   | Frithjof Dau (SAP) |
| 0.2     | Incorporated papers and talks from Ontotext and CRSA.  Deliverable ready for review | Frithjof Dau (SAP) |
| 1.0     | Incorporated comments from reviewers  | Frithjof Dau (SAP) |

# Reviewers

| Name           | Affiliation |
|----------------|-------------|
| Kenneth McLeod | HWU         |
| Simon Polovina | SHU         |





| 1 | 11  | NTRODUCTION                      | 4  |
|---|-----|----------------------------------|----|
|   | 1.1 | DISSEMINATION APPROACH           | 4  |
|   | 1.2 | Instruments                      | 5  |
| 2 | G   | SENERAL                          | 6  |
|   | 2.1 | CUBIST Website                   | 6  |
|   | 2.2 | GENERAL INFORMATION MATERIAL     | 7  |
|   | 2.3 | PUSHING INFORMATION TO THE PRESS | 9  |
| 3 | V   | VEB 2.0 DISSEMINATION CHANNELS   | 11 |
|   | 3.1 | YOUTUBE CHANNEL                  | 11 |
|   | 3.2 | Wiki (external)                  | 12 |
|   | 3.3 | BLOG                             | 12 |
|   | 3.4 | LINKEDIN GROUP                   | 13 |
|   | 3.5 | LINKS TO THE WEB 2.0 CHANNELS    | 13 |
| 4 | S   | CIENTIFIC DISSEMINATION          | 14 |
|   | 4.1 | CUBIST Workshop                  | 15 |
|   | 4.2 | ARTICLES AND TALKS               | 16 |
|   | 4.3 | Invited Talks                    | 19 |
| 5 | C   | IIMMADV                          | 21 |





## 1 Introduction

CUBIST is an EC-funded research project which investigates and implements a concept that leverages Business Intelligence to a new level of precise, meaningful and user-friendly analytics of data. CUBIST follows a best-of-breed approach that combines capabilities of Business Intelligence, Semantic Technologies, and Visual Analytics.

In CUBIST, Task 5.1 "Dissemination" will promote and empower the dissemination, transfer, exploitation, assessment and broad take-up of CUBIST project results to the target audience and stakeholders. The goal of the CUBIST dissemination activity is to ensure high visibility of the scientific results of the research project, leading to an increased profile for European researchers in the field of Semantic Technologies, Business Intelligence and Visual Analytics, and to early use of these results by European industry.

Dissemination activities on one hand will focus on scientific institutions in order to spread the scientific progress and establish external quality assurance. On the other hand, the project results will be continuously provided to a broader public audience interested in the results of CUBIST, in order to gain domain related feedback.

### 1.1 Dissemination Approach

The project and its results will be communicated to the internal audience, the scientific community and the potential business users of CUBIST. All partners are aware of and committed to this communication. It is the principle of all dissemination activities to use research results to create value within the targeted communities of the European Union, to ensure that government funding will lead to further advancements, and to keep industry at the leading edge of BI solutions using ST. Thus wherever possible, research results will be communicated to create awareness and add to knowledge within targeted user and scientific communities of the European Union. The communication should guide and prepare potential users for the benefits of the expected outcomes of CUBIST. In order for dissemination to be effective, an integrated approach is necessary. Steps which have been undertaken in this direction are:

- Templates for deliverables and presentations have been created which particularly are branded through the use of the project logo and the logo of the EC.
- A quality approval process for deliverables has been set up: Each Deliverable must be approved by a two-partner quality committee assigned for each Work Package.
- An approval process for publication of papers and project results have been set up.





#### 1.2 Instruments

There are different ways to disseminate CUBIST results. Dissemination means can be roughly distinguished

- w.r.t. the information "direction": Some means push information to the public (like actively distributes press releases or scientific publications), whereas other means request interested parties to pull information (like the CUBIST homepage or the CUBIST youtube channel). Some means allow users to give direct feedback to the CUBIST project team (like web 2.0 means), whereas other means do not (like factsheets or presentations).
- w.r.t. the targeted audience: Some means contain overview and business related information, thus mainly targeting interested business users and stakeholders, whereas scientific dissemination means target the scientific communities.

Due to this, it is of vital importance to set up different dissemination means in CUBIST. We can roughly distinguish between the following instruments:

- First of all, some "classical" means for dissemination are set in place. These means comprise a CUBIST homepage, overview documents like factsheets and presentations, and press releases. These means particularly address interested business users and stakeholders.
- Secondly, to address a wider audience, web 2.0 channels like a youtube channel or a blog have been set up as well. Similarly to the classical means, web 2.0 channels mainly address interested business users and stakeholders.
- Finally, there are dissemination means which particularly address the scientific community. These means comprise existing scientific conferences and journals as well as a CUBIST-dedicated workshop.

In the next chapters, these means are elaborated in more detail.





## 2 General

In this chapter, standard dissemination activities pushing information to the general public are described.

### 2.1 CUBIST Website

A website for CUBIST has been set up in the very beginning of the project. It contains information about the project, partners, publication, CUBIST-related events, press releases, etc. Its URL is www.cubist-project.eu. In the next figure, a screenshot of the website is provided. More information can be found in D5.1.3 "Project Website".

Below a screenshot of the website is provided.

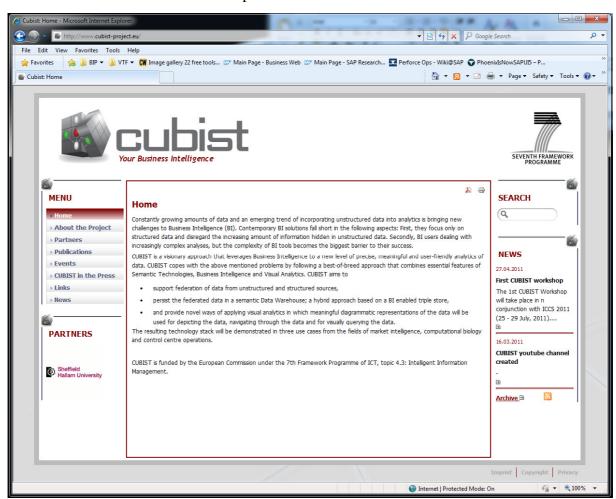


Fig 1: The CUBIST website (August 2011)





### 2.1.1 CUBIST on partner websites

Apart from the project's website, nearly all partners have mentioned their participation in CUBIST on their websites.

- Ontotext: www.ontotext.com/research/cubist
- SHU: www.shu.ac.uk/news/release.html?ID=704 and www3.shu.ac.uk/c3ri/NewsDownloads/CCRC%20Newsletter%20May%202010.pdf
- CRSA: www.mas.ecp.fr/BI/New/projects.html
- HWU: www.macs.hw.ac.uk/bisel/cubist.html
- SAS: www.spaceapplications.com/index.php?option=com\_content&task=view&id=58&Itemid=114

### 2.2 General Information Material

On the CUBIST website, introductory information material is provided for being downloaded. This material comprises the CUBIST factsheet and a presentations. Moreover, the annual report for 2010 which summarizes the 2010 results in a concise manner is available as well. As materials can be found on the website under "Publications\General Information".

#### 2.2.1 CUBIST Fact Sheet

For CUBIST, two versions of the project's fact sheet are provided:

- A one-page factsheet about CUBIST.
- A two-page fact sheet about CUBIST, which extends the one-page fact sheet by including research challenges and expected impact.

Both versions can be downloaded from the CUBIST website<sup>1</sup> or from the site of the European Commission<sup>2</sup>. Below in the next figure, a screenshot of the one-page fact sheet is provided.

<sup>&</sup>lt;sup>1</sup> http://www.cubist-project.eu/uploads/media/CUBIST\_factsheet\_short.pdf

<sup>&</sup>lt;sup>2</sup> http://ec.europa.eu/information\_society/apps/projects/logos/3/257403/080/publishing/readmore/CUBIST\_factsheet\_extended.pdf





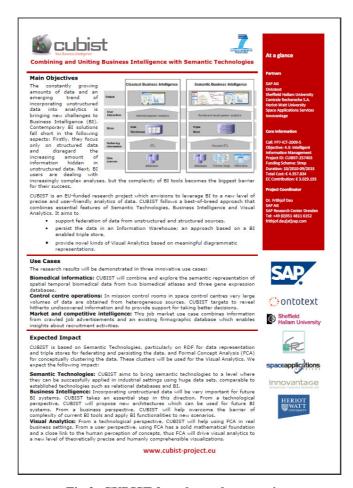


Fig 2: CUBIST fact sheet, short version

More details on the fact sheet can be found in D5.1.1 "Project Fact Sheet".

#### 2.2.2 CUBIST Presentation

An introductory presentation about CUBIST is provided on the website. It contains information about the main approach of CUBIST, technical challenges and research questions, project setup, expected results, as well as a very short introduction into Formal Concept Analysis in its appendix. An screenshot of the presentation is given below.





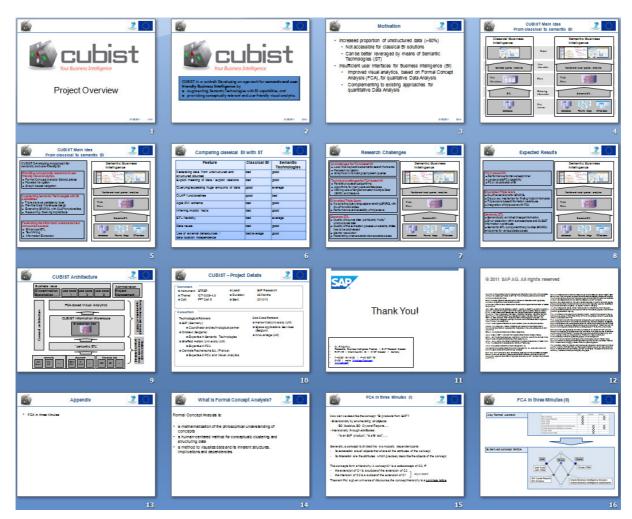


Fig 3: CUBIST overview presentation

### 2.2.3 CUBIST Annual Report

The CUBIST 2010 Annual Report can be downloaded as well. It contains information about the first project activities, used technologies and tools, as well as user involvement, promotion and awareness.

## 2.3 Pushing information to the press

Press releases are an essential mechanism for immediate and widespread dissemination of project news items. In addition, publication of articles in trade or professional technical magazines provides a valuable opportunity to present the project to practitioners.

Actively pushing information about CUBIST to the press has been carried out in the beginning of the project by Sheffield Hallam University (SHU). SHU has utilized its contact to RTC North, an independent company delivering initiatives and business services to a variety of customers. RTC North's activities span from SMEs, over regional development





agencies and local government, to schools, colleges and universities. RTC North's press release prompted V3 magazine, Semantic Web.com and IET to contact RTC North who put them in touch with SHU for interviews and an email correspondence with semanticweb.com. The interview with semanticweb.com, in turn, spawned numerous mentions on other IT news web sites. In addition to these activities, an article about CUBIST has been published in Headline, a print magazine from SHU.

In the following, a list with the most important articles about CUBIST in the press is provided. The list is not exhaustive. Particularly, there are more websites reporting on CUBIST, but some of them copied text from the articles given below and are therefore omitted.

- 2010-09: "CUBIST project aims at better Semantic Web search". Article on kntheiet.org.
- 2010-08: "Semantic Web Meets BI In New Project Whose Partners Include SAP, Sheffield Hallam University, Ontotext". Article on semanticweb.com.
- 2010-08: "Researchers win funds for semantic business intelligence". Article on www.zdnet.co.uk.
- 2010-08: Sheffield scientists lead £4m semantic web search project. Article on www.computerweekly.com
- 2010-08: "Connecting To The Semantic Web"- Article on www.businesscomputingworld.co.uk/.
- 2010-08: "UK researchers tap semantic web for BI innovation". Article on www.c3.co.uk.

#### 2.3.1.1 Articles in the printed press:

• 2010-11: "€4m web project looks set to open up access to hidden knowledge". Article in Headlines 17 (print magazine from SHU, see www.shu.ac.uk/business/download)

More details about the Initial Press release can be found in D5.1.2 "Initial Press Release".





## 3 Web 2.0 Dissemination Channels

In addition to the "classical" dissemination means, as described in the last chapter, additional web 2.0 channels for CUBIST have been set up. They allow to target a broader audience by utilizing well-established web 2.0 sites like youtube. These web 2.0 channels are

- a youtube channel
- a (publicly accessible) wiki
- a blog
- a LinkedIn group

and have already been described in D4.1.4 "Web 2.0 Dissemination Channels". Here we reiterate some main information on those channels.

#### 3.1 Youtube channel

A youtube channel for CUBIST has been created. It is intended to host screencasts and videos of the non-integrated and integrated CUBIST prototypes. The web-address of the channel is <a href="http://www.youtube.com/user/CUBISTFP7ICT">http://www.youtube.com/user/CUBISTFP7ICT</a>. For the time being, the channel hosts a video of the Visual Analytics Prototype as developed by the technological partner CRSA.







Fig 4: Screenshot of the CUBIST youtube channel (August 2011)

## 3.2 Wiki (external)

A semantic MediaWiki for CUBIST has been created. It is intended to host general information about technologies used in CUBIST (like semantic technologies, triple stores, Formal Concept Analysis, Visual Analytics). It is readable by the public audience. Write access to the Wiki is granted by the CUBIST coordinator. It is not planned to grant write access to people outside the CUBIST consortium. The Wiki is part of the CUBIST webpage and reachable either directly with its URL <a href="http://wiki.cubist-project.eu/">http://wiki.cubist-project.eu/</a> or via a link in the linkpage of the CUBIST website.

#### **3.3 BLOG**

The existing blog of the CUBIST project manager Frithjof Dau in the SAP Community Network SCN<sup>3</sup> will serve as a blog for CUBIST. SCN has a quite high visibility: The blog's URL is <a href="http://www.sdn.sap.com/irj/scn/weblogs?blog=/pub/u/251918136">http://www.sdn.sap.com/irj/scn/weblogs?blog=/pub/u/251918136</a>. As of August 2011, the blog has been viewed more than 400 times.

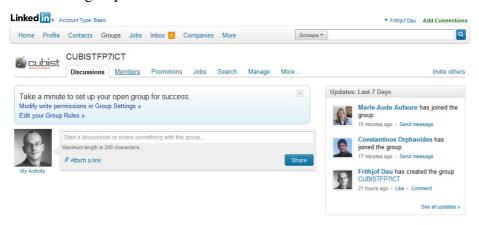
<sup>&</sup>lt;sup>3</sup> http://www.sdn.sap.com/irj/sdn/index?language=en





## 3.4 LinkedIn Group

A LinkedIn group for CUBIST has been created.



### 3.5 Links to the Web 2.0 channels

In order to make the new web 2.0 channels better visible to the public audience, they are linked from the CUBIST website.





## **4 Scientific Dissemination**

CUBIST copes with several research challenges, as there are:

- challenges concerning semantic ETL, like quality of source data, identity resolution, and federating unstructured and structured sources
- enabling triple stores for BI-applications, like extending SPARQL with OLAP functionalities, and tuning the performance and scalability of the triple store w.r.t. BI applications,
- technical challenges for FCA-based VA, like developing scalable and fast algorithms
  for computing formal concepts (including algorithms for many-core architectures),
  altering the formal concept in order to decrease the number of formal concepts, or
  mining extracting association rules, and
- UI challenges for FCA-based VA, like developing sophisticated approaches to visualize, filter and explore large-scale concept lattices or interaction paradigms with concept lattices.

For this reason the scientific dissemination in CUBIST is of high importance: First of all, one goal of the CUBIST dissemination activity is to ensure high visibility of its scientific findings, leading to an increased profile for European researchers in the field of Semantic Technologies, Business Intelligence and Visual Analytics. Moreover, the CUBIST consortium actively seeks contact to appropriate research communities in order to facilitate an exchange of knowledge and experiences with researchers in the field.

For this reason, the project and its research results will be communicated to create awareness and add to knowledge within targeted user and scientific communities of the European Union. Due to the fact that CUBIST copes with several research fields, the consortium targets different scientific communities with their respective conferences and journals. Conferences and workshops that we will target include:

- ESWC/ISWC (European and International Semantic Web Conferences) and STC/ESTC (International and European Semantic Technology Conferences) for publications related to Semantic Technologies. VLDB (Very Large Databases) and SIGMOD (ACM SIGMOD Conference on Management of Data) for results related to handling huge amounts of data in triple stores.
- OBI (workshop on Ontology-supported Business Intelligence) and More-BI (International Workshop on Modelling and Reasoning for Business Intelligence) for results concerning the link between BI and SI.
- ICCS (International Conference on Conceptual Structures), IFCFA (International Conference on Formal Concept Analysis) and CLA (Concept Lattices and their Applications) for FCA-related developments.





- ACM CHI (Conference on Human Factors in Computing Systems), IEEE Infovis (IEEE Information Visualization Conference) and the Workshop on Human-Computer Interaction and Information Retrieval for results in visual analytics and user interaction.
- WWW (The World Wide Web Conference), KDD (The Knowledge Discovery and Data Mining Conference) and CIKM (International Conference on Information and Knowledge Management) for semantics over unstructured data and BI developments.

Moreover, apart from addressing existing conferences, the consortium organizes an annual, dedicated CUBIST workshop.

In this chapter, the scientific dissemination activities of the CUBIST project are described in detail.

### 4.1 CUBIST Workshop

A scientific workshop for CUBIST has been conducted in July 2011. The workshop was collocated with the 19th International Conference on Conceptual Structures (ICCS), 25-29 July 2011, University of Derby, UK.<sup>4</sup> The worskhop has been dedicated to topics related to CUBIST, but not to participation of CUBIST members only. Indeed, three papers from outside CUBIST have been submitted to the workshop; two of them have been accepted. The proceedings of the workshop have been published on CEUR, Vol 753.<sup>5</sup> Moreover, a printed version has been distributed during the workshop.

The worskhop has been well visited by ICCS attendendes. In particular we have created a contact to a research group in Korea with similar interests<sup>6</sup>, as well as to the organizer of the next International Conference on Formal Concept Analysis (ICFCA). The next CUBIST workshop is already planned to be colocated with ICFCA 2012.<sup>7</sup>

Below, a screenshot of the workshop's proceedings on CEUR is provided.

<sup>&</sup>lt;sup>4</sup> http://www.derby.ac.uk/computing/iccs2011/workshops/cubist

<sup>&</sup>lt;sup>5</sup> http://ftp.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-753/

 $<sup>^6</sup>$  We have been addressed by Hanmin Jung from the Institute of Science and Technology Information - KISTI , see http://www.ksc.re.kr/ and http://ontoframe.kr

<sup>&</sup>lt;sup>7</sup> http://www.econ.kuleuven.be/ICFCA/





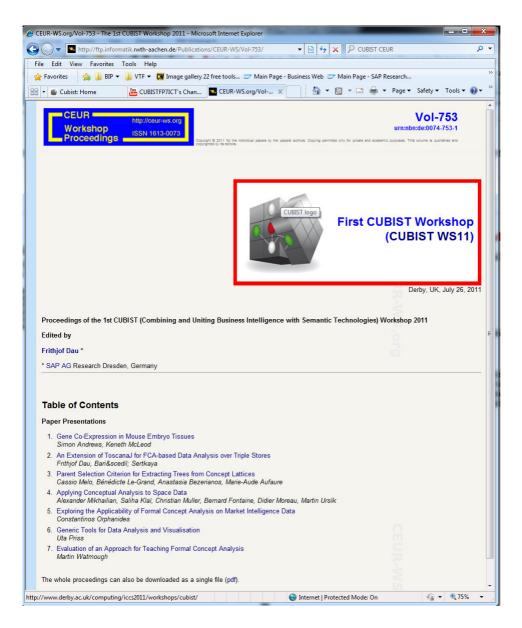


Fig 5: CEUR-Proceedings of the 1srt CUBIST Workshop

#### 4.2 Articles and Talks

This section lists all publications from CUBIST consortium members with results of the CUBIST project. It is divided into those articles which have been presented and published in the CUBIST workshop, articles which have been published in journals or conference proceedings, and finally invited talks.





### 4.2.1 Papers of Consortium Members in the CUBIST workshop

All papers in this section have been published in: Frithjof Dau (Ed): the Proceedings of the 1st CUBIST (Combining and Uniting Business Intelligence with Semantic Technologies) Workshop, in conjunction with the 19th International Conference on Conceptual Structures (ICCS) 2011. CEUR Workshop Proceedings, Vol 753, ISSN 1613-0073.

#### List of papers:

- Simon Andrews, Kenneth McLeod: Gene Co-Expression in Mouse Embryo Tissues
- Frithjof Dau, Baris Sertkaya: An Extension of ToscanaJ for FCA-based Data Analysis over Triple Stores
- Cassio Melo, Bénédicte Le-Grand, Anastasia Bezerianos, Marie-Aude Aufaure: Parent Selection Criterion for Extracting Trees from Concept Lattices
- Alexander Mikhailian, Saliha Klaï, Christian Muller, Bernard Fontaine, Didier Moreau, Martin Ursík: Applying Conceptual Analysis to Space Data
- Constantinos Orphanides: Exploring the Applicability of Formal Concept Analysis on Market Intelligence Data

### 4.2.2 Other Papers

• K. McLeod, K., Ferguson, G., and Burger, A.: Argudas: arguing with gene expression information

BMC Bioinformatics, in press. Extended version of the next paper.

• K. McLeod, K., Ferguson, G., and Burger, A.: Argudas: arguing with gene expression information

In Proceedings of the 3rd International Workshop on Semantic Web Applications and Tools for the Life Sciences, 10 December 2010, Berlin, Germany.

• Andrews, S., Orphanides, C.: Knowledge Discovery through Creating Formal Contexts

In Hill, R. (ed.): First International Workshop on Computational Intelligence in Networks and Systems (CINS 2010), in Xhafa, F., Demetiadis, S., Caballe, S., Abraham, A. (eds.): Second International Conference on Intelligent Networking and Collaborative Systems (INCOS 2010), pp. 455-460. ISBN: 978-0-7695-4278-2/10. DOI 10.1109/INCOS.2010.53. IEEE Computer Society, 2010.

• Andrews, S. and Orphanides, C. (2010). Analysis of Large Data Sets using Formal Concept Lattices.

In: Kryszkiewicz, M. and Obiedkov, S. (eds.). Proceedings of the 7th International Conference on Concept Lattices and Their Applications (CLA) 2010, ISBN 978-84614-4027-6. Seville: University of Seville. pp. 104-115





- Andrews, S., Orphanides, C., Polovina, S. (2010). Visualising Computational Intelligence through Converting Data into Formal Concepts.
  - In: Bessis, N., Xhafa, F. (eds.), Proceedings of the 1st International Workshop on Emerging Data Technologies for Collective Intelligence (EDTCI) 2010, in: Xhafa, F., Barolli, L., Nishino, H., Aleksy, M. (eds.), Proceedings of the 2010 International Conference on P2P, Parallel, Grid, Cloud and Internet Computing (3GPCIC), Fukuoka Institute of Technology, Fukuoka, Japan. ISBN 978-0-7695-4237-9/10. IEEE Computer Society. pp. 302-307.
- Andrews, S., Orphanides, C. and Polovina, S. (2011) Visualising Computational
  Intelligence through converting Data into Formal Concepts.
  Book Chapter. In: Bessis, N. and Xhafa, F. (eds.) Next Generation Data Technologies for
  Collective Computational Intelligence. Studies in Computational Intelligence (352).
  Berlin: Springer. pp. 139-166.
- Andrews, S. (2011) In-Close2, a High Performance Formal Concept Miner. In: Andrews, S., Polovina, S., Hill, R. and Akhgar, B. (eds.): Conceptual Structures for Discovering Knowledge Proceedings of the 19th International Conference on Conceptual Structures (ICCS) 2011. LNAI 6828. Berlin: Springer. pp. 50-62.
- Dimitrov, M.: Semantic Technologies and Triplestores for Business Intelligence' To be published by Springer in the LNBIP series.
- Aufare, M.-A.: Graph Mining and Community Detection To be published by Springer in the LNBIP series.
- Melo, C.A., Aufare, M.-A., Le Grand, B. and Bezerianos, A.: Extracting and Visualizing Tree-like Structures from Concept Lattices
   In: 15th International Conference on Information Visualization (IV 2011). London, UK, 2011.
- Melo, C.A., Aufare, M.-A., Bezerianos, A. and Le Grand, B.: Cubix: A Visual Analytics Tool for Formal Concept Analysis.
   In: 23ième Conférence Francophone Sur l'IHM (IHM 2011) – Demo. Sophia-Antipolis, France, 2011.
- Dau, F., Sertkaya, B.: Formal Concept Analysis for Qualitative Data Analysis over Triple Stores
  - Will be published in the proceedings of the 1st International Workshop on Modeling and Reasoning for Business Intelligence, in conjunction with the 30th International Conference on Conceptual Modeling (ER 2011).





#### 4.3 Invited Talks

#### 4.3.1 ICCS 2011

• Frithjof Dau has been invited as keynote speaker to the 19<sup>th</sup> International Conference on Conceptual Structures, Derby, UK, in July 2011. He has given a talk about "Semantic Technologies for Enterprises".

Abstract: After being mainly a research topic, semantic technologies (ST) have reached an inflection point in the market. This paper discusses the benefits (data integration and federation, agile schema development, semantic and collaborative / social computing search capabilities) and costs (namely technical, modeling, measuring and educational challenges) of Semantic Technologies with respect to their utilization in enterprises. The paper has been published in the proceedings of the ICCS and moreover been published in the public SAP developer network.

The publication details are:

- Frithjof Dau: Semantic Technologies for Enterprises.
   In: Andrews, S., Polovina, S., Hill, R. and Akhgar, B. (eds.): Conceptual
   Structures for Discovering Knowledge Proceedings of the 19th International
   Conference on Conceptual Structures 2011. LNAI 6828. Berlin: Springer.
- SDN: see
   http://www.sdn.sap.com/irj/scn/go/portal/prtroot/docs/library/uuid/10e372a0-7258-2e10-2a85-c894c6340b61?QuickLink=index&overridelayout=true

## **4.3.2 1st European Business Intelligence Summer School**

In July 2011, the First European Business Intelligence Summer School (eBiss2011) has been conducted in Paris, France. This summer school will be held each year and is part of the Erasmus Mundus IT4BI, accepted in July 2011 (http://it4bi.univ-tours.fr/) in which Ecole Centrale is partner. It has been organized by Marie-Aude Aufaure (Ecole Centrale de Paris, France) from the CUBIST consortium and Esteban Zimányi (Université Libre de Bruxelles, Belgium) and sponsored by SAP. Information about the summer school can be found at http://cs.ulb.ac.be/conferences/ebiss2011/

There have been two lectures given by direct members of the CUBIST consortium:

- Marin Dimitrov from Ontotext gave the lecture "Triple Store & Semantic Technologies".
  - Abstract: Semantic Technologies have a great potential for improving information management in the enterprise, by lowering the cost of data integration, extracting value from unstructured content and providing means for more intelligent information





discovery, search, and navigation. In this tutorial we will describe how Business Intelligence processes in the enterprise can be enhanced by Semantic Technologies, in particular, semantic data integration from multiple structured and unstructured data sources, agility of data modelling with ontologies and RDF, using an RDF data warehouse for inferring implicit facts and incremental, using semantic search for efficient discovery and exploration.

• Marie-Aude Aufare gave the lecture "Graphs for Business Intelligence". Abstract. Data manipulated in an enterprise context are structured data as well as unstructured data such as e-mails, documents, etc. Graphs are a natural way of representing and modeling such data in a unified manner (structured semi-structured and unstructured ones). The main advantage of such structure relies on (or resides in) its dynamic aspect and its capability to represent relations, even multiple ones, between objects. It also facilitates data query using graph operations. Explicit graphs and graph operations allow a user to express a query at a very high level of abstraction. This talk will introduce graph models and associated query language. We will then present an all-in-one tool for extracting and aggregating underlying graphs from relational databases.

Apart from these two lectures, there had been three additional lectures from SAP members, two of them belonging to SAP Research and being SAP-internal stakeholders. The three lectures are:

- Chahab Nastar, head of Business Intelligence research at SAP, gave a lecture "The Business Web"
- David Trastour, Portfolio and Practice Manager for the Business Intelligence (BI) Practice at SAP Research, gave a lecture "Extracting semantic networks from BI reports"
- Yannick Cras, Chief Development Architect, Core BI technology at SAP BusinessObjects, gave a lecture "Why simple business questions are not that simple, and what to do about it"





# **5 Summary**

In this deliverable, we summarized all dissemination activities of CUBIST. We have described

- standard means like the CUBIST website and press activities
- Web 2.0 dissemination channels like a youtube channel and a blog,
- and the scientific dissemination

As it can be seen from the previous chapters, we have particularly put strong effort in press activities and scientific dissemination.

- For the press activities, SHU has taken a leading role with spreading information about CUBIST, which lead to CUBIST-articles on variety of important web-journals
- For the scientific dissemination, CUBIST can exhibit some significant results, as there are
  - o the dedicated CUBIST workshop,
  - o several invited talks
  - o and a number of published scientific papers.