

Preface

The 5th European Business Intelligence Summer School (eBISS 2015) took place in Barcelona, Spain, in July 2015. Tutorials were given by renowned experts and covered several recent topics in business intelligence. This volume contains the lecture notes of the summer school.

The first paper reports on the state of the art (including research and tools) in relational database schema evolution (with special emphasis on data warehouse evolution) and how this impacts the surrounding applications. It includes a discussion on query-rewriting techniques to adapt database client software to the changes.

The second paper compares RDF Data Cube Vocabulary (QB) with QB4OLAP, an extension to support OLAP analysis. The former is an initiative of W3C to publish multi-dimensional data on the Web in such a way that it can be linked to related data sets and concepts. The later extends it to explicit aggregation functions, hierarchies, and descriptive attributes. Such extension facilitates the definition of a user-friendly query language (QL) that allows OLAP users not familiar with SW concepts or languages to retrieve data without any knowledge of RDF or SPARQL (QL is automatically translated into SPARQL queries). Examples of usage of QB4OLAP on Eurostat data sets are provided.

Next, the third paper presents a concrete application domain for linked open data analysis, which is social information. It presents a proposal for modeling social (mainly textual) data, so that it can be analyzed with OLAP tools. The complexity of the problem justifies the proposal of a software architecture and methodology for the management of this kind of project. The feasibility of the proposed approach is analyzed in the context of two specific projects: one in the subject area of Italian politics, and another in the subject area of a large consumer goods company.

The fourth paper explores the possibility of including linked open data in analytical tasks. Traditional data warehousing has relied on internal data to enable decision making. Nevertheless, more recent big data trends have moved the focus to external data. Success stories based on the use of data coming from social networks are well known, but we can also benefit from publicly available semantically annotated data, which is growing fast mainly but not exclusively with governmental support. In any case, the integration of external data presents new challenges in terms of lack of structure, high heterogeneity, and poor quality.

The last paper discusses the feasibility and importance of deriving key performance indicator (KPI) calculations (i.e., aggregate queries) from their informal specifications. Since the majority of KPIs are process-oriented, process models (i.e., Petri nets) are used. Thus, seven different patterns are identified, which relate query elements to process models tasks.

In addition to the lectures corresponding to the papers described here, eBISS 2015 had two other lectures directly related to industry:

- Toni Cebrián from Enerbyte, Spain: “Time Series DBs and Streaming Algorithms”
- Wilinton Tenorio and Eduard Gil from ClearPeaks, Spain: “Life at ClearPeaks, An Overview of the Most Relevant Projects”

These lectures are not included in this volume.

In this edition, eBISS joined forces with the Erasmus Mundus IT4BI-DC consortium and hosted its doctoral colloquium aiming at community building and promoting a corporate spirit among PhD candidates, advisors, and researchers of different organizations. The corresponding session, organized in two parallel tracks, included eight presentations, as follows:

- Waqas Ahmed, Pakistan: “Modeling Data Warehouses with Multiversion and Temporal Functionality”
- Nurefsan Gur, Turkey: “Business Intelligence over Linked Open Spatio-Temporal Data”
- Dilshod Ibragimov, Uzbekistan: “OLAP over Distributed RDF Sources”
- Azadeh Nasiri, Iran: “Requirements Engineering for Big Data Predictive Analytics”
- Bijay Neupane, Nepal: “Intelligence Detection and Prediction of Energy at the Device Level”
- Kasun Parera, Sri Lanka: “Model-Based Database Systems”
- Vasileios Theodorou, Greece: “Automating User-Centered Design of Data-Intensive Processes”
- Jovan Varga, Serbia: “Discovering Analytical Concepts from User Profiles”

We would like to thank the attendees of the summer school for their active participation, as well as the speakers and their co-authors for the high quality of their contribution in a constantly evolving and highly competitive domain. Finally, the lectures in this volume benefited greatly from the comments of the external reviewers.

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