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Editors

Towards a Trans-disciplinary Technology for Business Intelligence

Gathering Knowledge Discovery, Knowledge Management
and Decision Making



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Prologue

The book is the result of an impressive joint venture of Iberian-American universities and research institutions organized by Project Eureka. The main goal of the Eureka-Iberian-American network was to support the development of an appropriate technology for discovering strategically useful knowledge for Latin-American organizations.

The book includes twenty six papers which all together are concerned with Business Intelligence in the broad sense, i.e. Explorative Data Analysis (“data mining”), Knowledge Discovery and Storing based on ontologies (systematics) and Management as well as Decision Making. There is one characteristic which makes the book quite specific. It is its inter-disciplinary approach. Consequently, the interested reader will find a lot about imprecision, uncertainty, and Fuzzy Logic almost accompanied by interesting case studies of Business Intelligence taken from various domains.

The book is handy in so far as it well structured. It is a matter of fact that a collection of twenty five papers written by more than sixty authors cannot be completely disjoint, non-redundant and homogeneous with respect to notation, subject, methodology, and style of presentation. However, the nearness of almost all contributions to the main topic is a good counterbalance. Therefore there is no doubt that the editors have done a very good job.

The three chapters are devoted to “Business Intelligence and Ontology Engineering”, “Knowledge Discovery” and “Knowledge Management and Decision Making”. Instead of an introduction as an “hours d’oeuvre” the book immediately starts with a potpourri of seven papers on topics like Fuzzy Logic, Fuzzy Ontologies, Business Intelligence treated from a competitiveness or organizational point of view, integration of industrial and information system engineering, compensatory Fuzzy Logic carefully applied to business reporting (Business Score Cards) and combined with SWOT-OA Analysis – an acronym of ‘Strengths, Weaknesses, Opportunities, Trends, Objectives and Actions’. The first chapter closes with the merge problem of ontologies and related alignment methods.

Chapter two is an interesting mixture of different contributions to Knowledge Discovery. As knowledge discovery is intrinsically based upon visualization the first contribution is on ontology visualization. The Compensatory Fuzzy Logic (CFL) approach as developed by one of the editors is studied in three papers picking up special phenomenon of x-ray images classification and segmentation. A declarative approach for unscrambling CFL predi-

cates using meta-heuristic search is completely discussed. An innocent reader should start with that contribution for understanding all about Compensatory Fuzzy Logic. Multi-criteria decision making techniques like DEA are applied to R&D costs in Latin-America and Europe. Student performance is discovered by a cohort analysis combined with Self Organizing Maps. Text Mining is reviewed by common pre-processing techniques and an ant-based clustering procedure.

The third chapter is devoted to Knowledge Management and Decision Theory. Two papers apply Compensatory Fuzzy Logic to solve a problem of information system integration and hierarchical clustering. Aspirant-job assignment is performed using classic classification trees or neural networks. Except for a not fully worked out study for applying the very special purpose “old” expert systems to knowledge management in business, the final five papers are devoted to multi-criteria decision making, a topic which was already attacked in the preceding chapter. All five contributions illustrate their methods proposed by a small case study. The methods span a wide range of procedures from simple linear ranking and indexing, TOPSIS or DEA analysis to fuzzy ranking.

We hope that the book will have a strong impact on cross-disciplinary collaboration in practice and academic research world-wide.

December, 2010

Hans-J. Lenz,
Freie Universität Berlin, Germany

Preface

“Towards a trans-disciplinary technology for Business Intelligence: Gathering Knowledge Discovery, Knowledge Management and Decision Making” is an editorial initiative from Eureka Iberoamerica Network and its extra-regional international collaborator, the University of Oldenburg.

The book brings together an interesting group of papers about the four mentioned subjects. They will be evidencing separation among scientific groups studying these topics, and some tendencies to join concepts and methods too.

First part of the book about Business Intelligence includes very different approaches. The first chapter is covering some concepts and methods expressing the strategy of Eureka Iberoamerica Network. It is explained a very wide conception of Knowledge Discovery pointing towards the expressed objective in the book title.

Other chapters of this first part are dealing about different tools and models very useful in this context. Some of them have as a principal matter the use of ontologies. Because of that the title of this second part is Business Intelligence and Ontology Engineering.

Second and third parts titled Knowledge Discovery and Knowledge Management and Decision Making includes different disciplinary approaches; a sample of different methods from different disciplines of Applied Mathematics and Computer Sciences like Operations Research, Artificial Intelligence and Soft-computing is included.

An interdisciplinary outlook is incorporated through case studies solving economic, managerial, and social problems.

Ways to achieve that Business and Organizational Intelligence joins the mentioned disciplines in only one trans-discipline and only one process, are proposed.

December, 2010

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