

# Preface

I met Rudi more than 20 years ago, while I was searching for a place to do a PhD on Artificial Intelligence. Originally, I was more interested in Machine Learning but with his great spirit of non-directional leadership, Rudi slowly moved me in the direction of knowledge acquisition and knowledge engineering. What surprised me most about these areas was that they looked more like applied sociology than computer science, and only the recent web science adventure surprised me even more. Anyway, I followed his advice-for many years trying to discover what the “formal semantics” of these areas really were. After earning my PhD with Rudi and my interesting research period in Amsterdam, I really gained some insight and got excited about it. I focused on heuristic problem solvers and tried to answer the questions of why and when they are better than global problem solvers. In the end, all our life is about compromising results by restricting effort. This culminated in an exciting Habilitation that, aside from myself, very few people in the world have ever understood.<sup>1</sup>

Then Rudi shocked me once again. Basically, he told me that I should either focus on something simpler, or I should forget the idea of ever getting a Professorship. I did not like his message but I felt he was right. Reality was simply not ready for my genius. He proposed that I work on Ontologies. Frankly, I hated this suggestion as I regarded Ontologies as quite a boring area of Science and Engineering. First, they are only about data structure, where very few dynamic events happen. Second, most Ontologists have missed the last five hundred years of philosophical development that introduced the notion of an observer and his perspective on any world view. Even conservative physicians had to adopt this point of view nearly one hundred years ago. It was naive of me to assume to know THE model of reality, and to be surprised that others do not share this point of view. That is really not appropriate to the state of philosophy after Descartes and others. Anyway, I had been infected with a virus in Amsterdam that generated an interesting potential of using Ontologies as flexible data schemas. It was the **Web**. Academics from the hypertext area found

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<sup>1</sup>My colleague Enrico Motta from Open University managed to implement some pieces of this grand vision.

the Web primitive, academics from the database area found it even illegal, but I got caught by it. So in Karlsruhe in 1996, we began to work on extending HTML by means of adding semantics to textual and graphical information on the Web. Happily, we found similar work published by Jim Hendler's group and through Tim Berners-Lee's work, and then later the RDF work of W3C. This period of time significantly changed my life and I would like to thank Rudi for the great support he gave me for nearly a decade and for the great cooperation we have had since then. Therefore, it is my duty and pleasure to edit this "Festschrift" that has collected contributions from his colleagues and academic offspring.

The book starts with a preface by Jim Hendler that you have already read if you are reading this book in linear order. He provides a historical view on the development of semantic web research and we would like to mention again his early work on SHOE that was a great encouragement for our work.

We then collected six contributions from Rudi's peers (and actually, one 'super peer' is included). The core usage of semantic technology is to provide scalable means to achieve interoperability in large, distributed, heterogeneous, and dynamic environments. The article by Haslhofer and Neuhold<sup>2</sup> puts Rudi's work in context by providing a retrospective on semantics and interoperability research as applied in computer science. His colleagues Oberweis, Schmeck, Seese, Stucky, and Tai from the Institute AIFB, relate Rudi's work to other areas of applied computer science such as Logic, Complexity Management, Efficient Algorithms, Organic Computing, and Business Process Management. There has always been a close link between semantic technology and database technology on the one hand, and knowledge technology on the other. One could even argue that there is a complexity chain of data, information, and knowledge where semantics is mostly busy with the intermediate item, i.e., information. The article contributed by Lockemann, a colleague from the University of Karlsruhe, provides an excellent analysis of the communalities and differences between database and Ontology technology in terms of efficiency and effectiveness. Personally, I think this article already makes this book a good buy! Van Harmelen and Ten Teije from the VU Amsterdam and Wache from the University of Applied Science in Switzerland take a look from the opposite angle, considering semantics from the knowledge technology perspective. Their work on knowledge-based web service selection discusses a pathway for reunifying heuristic problem solving with semantic web technology. The application of semantic technologies for knowledge management issues is discussed in the article by Davies, British Telecom, Warren, Eurescom, and Sure,<sup>3</sup> GESIS and the University of Koblenz-Landau. Using semantics for knowledge management also indicates that the borderline between semantic and knowledge technology is at least as fuzzy as the borderline between database and semantic technology. Finally, Horrocks, from the University of Oxford, takes a technical view on the core of semantic technology, focussing on tools to work and reason with Ontologies.

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<sup>2</sup>Obviously, it is the role of Erich Neuhold to put the work of Rudi in context!

<sup>3</sup>Each classification system has to deal with exceptions. York Sure is actually an academic offspring of Rudi.

These articles are followed by eleven contributions provided by Rudi's Academic offspring. Four articles are about the *Web of data, information and knowledge*, focusing on knowledge mining, knowledge networks, and knowledge diversity. The following four articles go beyond the static web of data and discuss the role semantic technology can play in the *Web of software and services* by modeling software, services, cloud computing, and event-driven architectures. Finally, applications of semantic technology are discussed for knowledge management scenarios.

I wish Rudi many more years of productivity and I am looking forward to cooperating with him in as many projects in the future as we have in the past.

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