# Preface

A few years after Google announced that their 'Knowledge Graph' would have allowed searching for *things, not strings*,[1] knowledge graphs start entering information retrieval, databases, Semantic Web, artificial intelligence, social media and enterprise information systems. But what exactly is Knowledge Graph? Where did it come from? What are the major differences between knowledge graphs for enterprise information management and those for Web search? What are the key components in a knowledge graph architecture? How can knowledge graphs help in enterprise information management? How can you build good quality knowledge graphs and utilise them to achieve your goals?

The main purpose of this book is to provide answers to these questions in a systematic way. Specifically, this book is for academic researchers, knowledge engineers and IT professionals who are interested in acquiring industrial experiences in using knowledge graphs for enterprises and large organisations. The book provides readers with an updated view on methods and technologies related to knowledge graphs, including illustrative corporate use cases.

In the last four years, we have been working hard and closely in the K-Drive—Knowledge Driven Data Exploitation—project (286348), which was funded by EU FP7/Marie Curie Industry-Academia Partnerships and Pathways schema/PEOPLE Work Programme. The main purpose of this project was to apply and extend advanced knowledge techniques to solve real-world problems, such as those in corporate knowledge management, healthcare and cultural heritage. Most of the challenges we encountered and techniques we dug into are highly related knowledge graph techniques. This book is a natural outcome of the K-Drive project that reflects and concludes the understanding we accumulated from the past four years of work, the lessons we have learned and the experiences we gained.

Contentwise, we will focus on the key technologies for constructing, understanding and consuming knowledge graphs, which constitute the three parts of this book, respectively. **Part I** introduces some background knowledge and technologies,

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[1]Introducing the Knowledge Graph: things, not strings, googleblog.blogspot.com May 16, 2012

and then presents a simple architecture in order to help you to understand the main phases and tasks required during the lifecycle of knowledge graphs. **Part II** is the main technical part that starts with the state-of-the-art Knowledge Graph construction approaches, then focuses on exploration and exploitation techniques and finishes with advanced topics of Question Answering over/using knowledge graphs. Finally, **Part III** demonstrates successful stories of knowledge graph applications in Media Industry, Healthcare and Cultural Heritage; and ends with conclusions and future visions.

It is true that there is no *gold standard* definition of Knowledge Graph (KG). While working on the book, the editors and chapter contributors have debated lively on *what constitutes KG?*, *how is it related to relevant techniques like Semantic Web and Linked Data techniques?* and *what are its key features?* Fortunately, most, if not all, arguments have been settled and the conclusions and agreements have been put into the book, e.g. into the last two sections of Chap. 2. Even luckier, when finalising the book, editors have got the opportunity to collect opinions on *visions, barriers and next steps of Knowledge Graph* from key figures in the community including outstanding researchers, practitioners in leading organisations and start-ups, and representative users of various domains. Such valuable opinions have also been compiled into this book as part of its conclusion and future vision.

We would like to thank all of the chapter contributors as well as all members of the K-Drive project, who have given so much of their time and efforts for this book, in particular Dr. Yuting Zhao, who offered much helpful advice on the organisation of the book.

We had great pleasure in having Chris Welty write a touching Foreword for this book, sharing with us his rich experience and epiphany he had during the compelling BlueJ project, as well as his opinions on the motivation ('*Knowledge Graphs are Everywhere!*') and the importance of this book.

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| Aberdeen, UK | Jeff Z. Pan |
| Rome, Italy | Guido Vetere |
| Madrid, Spain | Jose Manuel Gomez-Perez |
| Aberdeen, UK | Honghan Wu |
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