Business Process Management

Mathias Weske

Business Process Management

Concepts, Languages, Architectures

With 265 Figures

Springer

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Library of Congress Control Number: 2007933897

ACM Computing Classification (1998): J.1, H.4.1, D.2.2

ISBN 978-3-540-73521-2 Springer Berlin Heidelberg New York

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springer.com

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Typeset by the author
Production: LE-TEX Jelonek, Schmidt & Vöckler GbR, Leipzig
Cover design: KünkelLopka Werbeagentur, Heidelberg

Printed on acid-free paper 45/3180/YL - 5 4 3 2 1 0

To Jonathan, Emilia, and Theresa, for their questions,
which are the answers to mine

Foreword

Business Process Management (BPM) is a "hot topic" because it is highly relevant from a practical point of view while at the same it offers many challenges for software developers and scientists. Traditionally information systems used information modeling as a starting point, i.e., data-driven approaches have dominated the information systems landscape. However, over the last decade it has become clear that processes are equally important and need to be supported in a systematic manner. This resulted in a "wave" of workflow management systems in the mid-nineties. These systems aimed at the automation of structured processes. Therefore, their application was restricted to only a few application domains. However, the basic workflow concepts have been adopted by different types of "process-aware" information systems. BPM addresses the topic of process support in a broader perspective by incorporating different types of analysis (e.g., simulation, verification, and process mining) and linking processes to business and social aspects. Moreover, the current interest in BPM is fueled by technological developments (service oriented architectures) triggering standardization efforts (cf. languages such as BPMN and BPEL).

Given the huge interest in BPM it is good that Mathias Weske took on the challenge to write a comprehensive book on BPM. The textbook covers the broad space of BPM in-depth. Most books on BPM are rather superficial or closely linked to a particular technology. In this book the topic is viewed from different angles without becoming superficial. Therefore, it is a valuable contribution to BPM literature.

The book "Business Process Management: Concepts, Languages, and Architectures" is motivated by practical challenges and is grounded in both computer science and business administration. The subtitle of the book adequately describes its scope. Unlike many other books in this space the focus is not on a particular notation or XML syntax. Instead the book focuses on the essential concepts. Different process languages are described (Petri nets, EPCs, Workflow nets, YAWL, BPMN, etc.) on the basis of these concepts. Moreover, the different languages are characterized and related using meta models. This is very important because it provides a view on the essence of business process models and prepares the reader for new languages and standards that will emerge in the future. Interestingly, the book also contains a chapter on process analysis. Here different soundness notions relevant for process verification are described and related. The last part of the book is related to architectures and methodologies. Two critical topics are discussed in detail: flexibility and service composition. Process flexibility is very important for the application of BPM in less structured domains. Through service composition a bridge is established between the service-oriented architecture and workflow technology.

The book provides an excellent introduction into BPM. On the one hand, the book covers many topics and links concepts to concrete technologies. On the other hand, the book provides formal definitions and relates things through

meta modeling. This makes it a superb textbook for students in both computer science and business administration. Moreover, it is also a very useful book for practitioners since it provides a comprehensive coverage of BPM independently of industry hypes around workflow management, business process management, and service-oriented architectures. Therefore, I expect that this book will help organizations in addressing the BPM topic in a more mature way.

Prof. dr.ir. Wil van der Aalst
Eindhoven University of Technology, July 15th, 2007

Preface

The extensive ground covered by business process management is divided between representatives from two communities: business administration and computer science. Due to the increasingly important role of information systems in the realization of business processes, a common understanding of and productive interaction between these communities are essential.

Due to different viewpoints, however, the interaction between these communities is seldom seamless. Business administration professionals tend to consider information technology as a subordinate aspect in business process management that experts will take care of. On the other hand, computer science professionals often consider business goals and organizational regulations as terms that do not deserve much thought, but require the appropriate level of abstraction.

This book argues that we need to have a common understanding of the different aspects of business process management addressed by all communities involved. Robust and correct realization of business processes in software that increases customer satisfaction and ultimately contributes to the competitive advantage of an enterprise can only be achieved through productive communication between these communities.

By structuring business process management, this book aims at providing a step towards a better understanding of the concepts involved in business process management—from the perspective of a computer scientist.

If business persons find the book too technical, software people find it too non-technical, and formal persons find it too imprecise, but all of them have a better understanding of the ground covered by our discipline, this book has achieved its goal.

The Web site bpm-book.com contains additional information related to this book, such as links to references that are available online and exercises that facilitate the reader's getting into deeper contact with the topics addressed. Teaching material is also available at that Web site.

This book is based on material used in the business process management lectures that the author has conducted in the Master's and Bachelor's program in IT Systems Engineering at the Hasso Plattner Institute for IT Systems Engineering at the University of Potsdam. I am thankful for the critical remarks by my students, who encouraged me to shape the content of my lectures, which ultimately led to this book.

Many persons contributed to this book. First of all, I like to thank my colleague researchers in business process management for developing this area in recent years, most prominently Wil van der Aalst, Alistair Barros, Marlon Dumas, Arthur ter Hofstede, Axel Martens, and Manfred Reichert. The chapter on case handling is based on joint work with Wil van der Aalst and Dolf Grünberg. I am grateful to Barbara Weber for her detailled comments on the manuscript that have led to improvements, mainly in the chapter on process orchestrations.

I acknowledge the support of the members of my research group at Hasso Plattner Institute. Gero Decker, Frank Puhlmann, and Hilmar Schuschel were involved in the preparation of the assignments of the business process management lectures. Together with Dominik Kuropka and Harald Meyer, they provided valuable comments on earlier versions of the manuscript. Special thanks to Gero Decker for contributing the first version of the process choreographies chapter.

The lion's share of my acknowledgements goes to my family, and foremost to Daniela.

Potsdam, July 2007 *M. W.*

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