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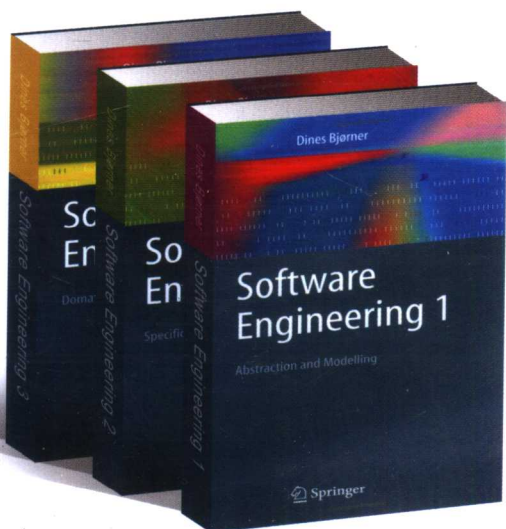
SOFTWARE ENGINEERING 3

DOMAINS, REQUIREMENTS, AND SOFTWARE DESIGN

软件工程 领域、需求与软件设计

卷3

Dines Bjørner 著



清华大学出版社

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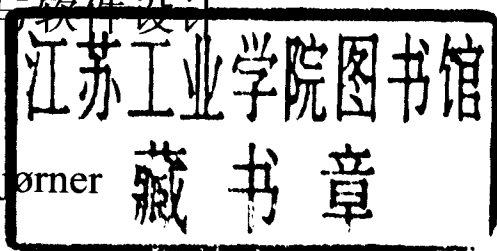
Software Engineering 3

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北京

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中 文 序

信息化社会的发展越来越依赖于软件。如何在期望的时限内、以可承受的开销、开发具有满意质量的软件成为人们特别是软件开发人员所关心的问题。自 1969 年 NATO 会议首次提出“软件工程”一词以来，软件工程已成为了一门学科。IEEE 的 SWEBOK 和 SEEK，以及 ACM/IEEE 的计算教程 2005 相继发布，标志着软件工程的学科内涵及其教育逐步走向规范与成熟。

软件形式化开发方法是软件工程的重要组成，荟萃了软件工程在原理和科学上的许多精华，被认为是开发可靠、安全软件的重要途径。Dines Bjørner 教授所著的《软件工程》(卷 1~3) 系统地介绍了软件形式化开发方法，包括数学基础、形式化模型与建模、形式化规约、领域与需求分析以及软件设计等内容。该书对如何运用形式化方法进行软件开发进行了比较全面的阐述。Dines 是软件工程领域的著名专家，是著名的 VDM 方法和 RAISE 方法的创建者之一，因其在形式化软件开发方法及其在工业界的应用的突出贡献和倡导作用而获选 ACM Fellow 和 IEEE Fellow。这本书是他长期研究和实践的总结和提炼，内容丰富，想必会令中国的软件工程人员开卷有益。

很高兴得知《软件工程》(卷 1~3) 的英文影印版和中文翻译版即将出版，应老友之邀，提笔作序，以资庆贺。

陈火旺
于梦泽园

Preface

General

The present volume is but the third of three textbooks on the engineering principles and techniques of software engineering. With these three volumes we claim that we show how formal techniques, also known as formal methods, can be exploited to their fullest in industry-scale development projects. We risk our reputation by going further: We can now justifiably claim that there is no longer any excuse for not using formal techniques throughout all phases, stages and steps of development. Usually such excuses are claimed due to a *lack of a fully comprehensive guide on the use of formal methods in even very-large-scale software developments*. Here is a set of books that tells you how to do most of it in minute detail!

Surely not all development facets are today clarified down to the level of formal techniques that we would wish were available. But to refrain from using what there is — in our perhaps not so humble opinion — outright criminal! As these volumes, and many excellent monographs, show: there is so much already now available that the arrogance of not using these techniques boils down to, yes, criminal neglect.

Some so-called software engineering practitioners “hang on” to the lack of management guidance. To them I say: Once you have understood the principles and techniques of these volumes, and if you are otherwise a sensible person with some management experience, the rest follows. You, as well as I, can “fill in” the management principles and techniques.

Appendix B of Vol. 1 contains an extensive glossary, and Appendix A of Vol. 2 contains an overview of our naming convention.

Brief Guide to Volume 3

This volume can be studied in a number of ways. Any path — through chapters, that is, nodes of the graph of Fig. 2 — from the input node, labelled 1,

to the output node, labelled 32, can form a course. Let us elaborate briefly on Fig. 2:

Base course on SE: A minimum course covers Chaps. 1, 2, 5, 8, 11, 16, 17, 19, 24–26, 30–32. That is, all the left column chapters of Fig. 2.

Domain engineering: A course focusing on domain engineering would additionally cover Chaps. 9, 10 and 12–15.

Requirements engineering: A course focusing, instead, on requirements engineering would in addition to the base course cover Chaps. 18 and 20–23.

Software design: A course focusing on software design would in addition to the base course cover Chaps. 27–29.

Any of the four courses outlined above can be given in either of two ways:

Informal: In this way of studying this volume the reader can skip the formalisation bits and focus just on the informal material. That is, one can study this volume in principle and in reality without first having studied Vol. 1 or Vols. 1 and 2.

Formal: In this way of studying this volume the reader covers all the informal material as well as the formal material – and thus a study of at least Vol. 1 is a prerequisite for studying the present volume.

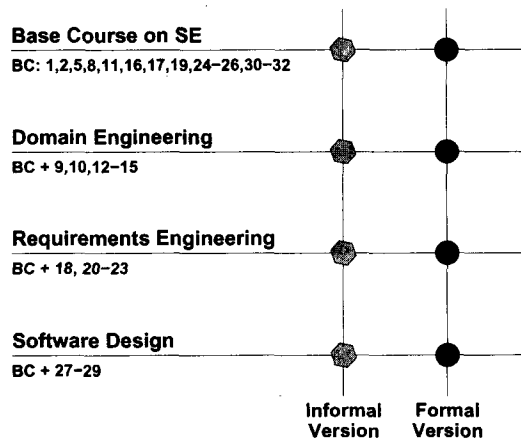


Fig. 1. Course alternatives

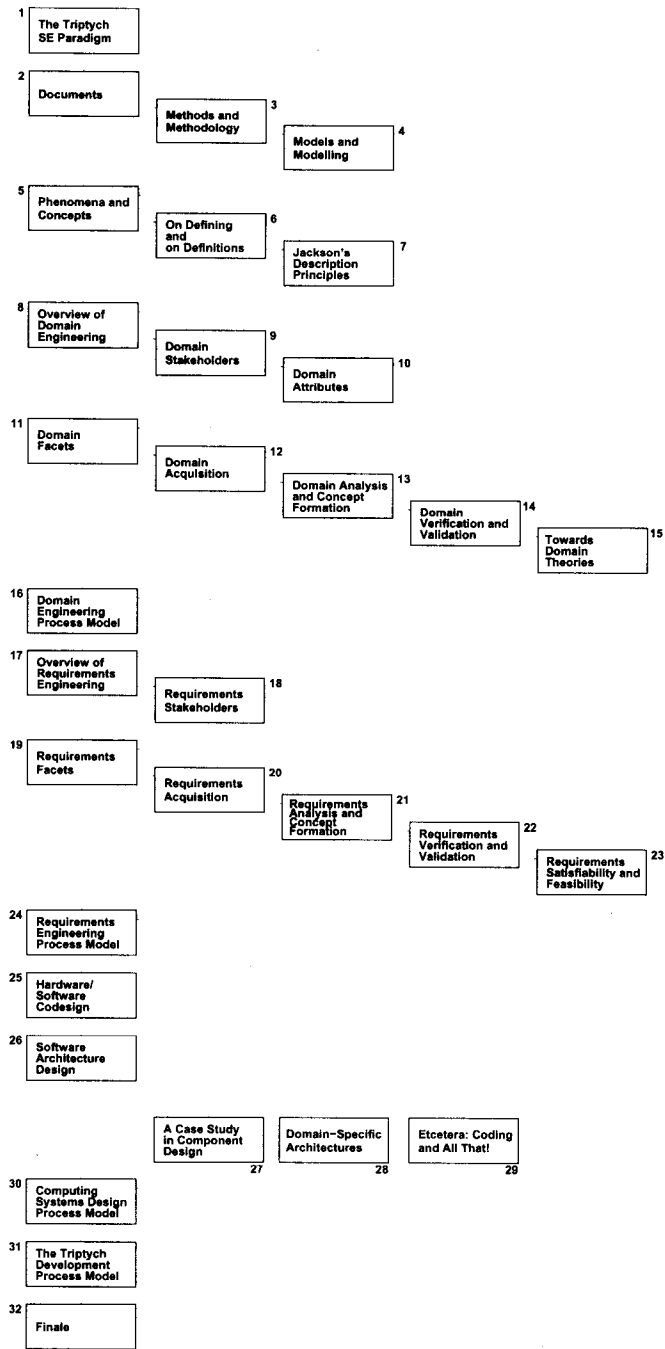
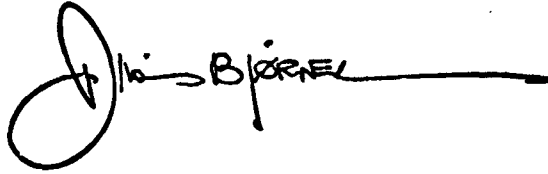


Fig. 2. Chapter precedence graph

Acknowledgments

The acknowledgments of Vols. 1 and 2 carry over to this volume. In addition I wish to acknowledge with gratitude Kirsten Mark Hansen for allowing me to use Chap. 4 of her splendid PhD Thesis [141] in edited form as Sect. 19.6.5. Again I wish to specifically acknowledge the main source of my academic joy over the last almost 30 years, namely my university: the Technical University of Denmark.








A handwritten signature in black ink. The signature starts with a large, stylized 'D' that loops back to the left. This is followed by 'ines' and 'BJØRNER' in a more standard, slightly slanted font. A long horizontal line extends to the right from the end of the name.

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