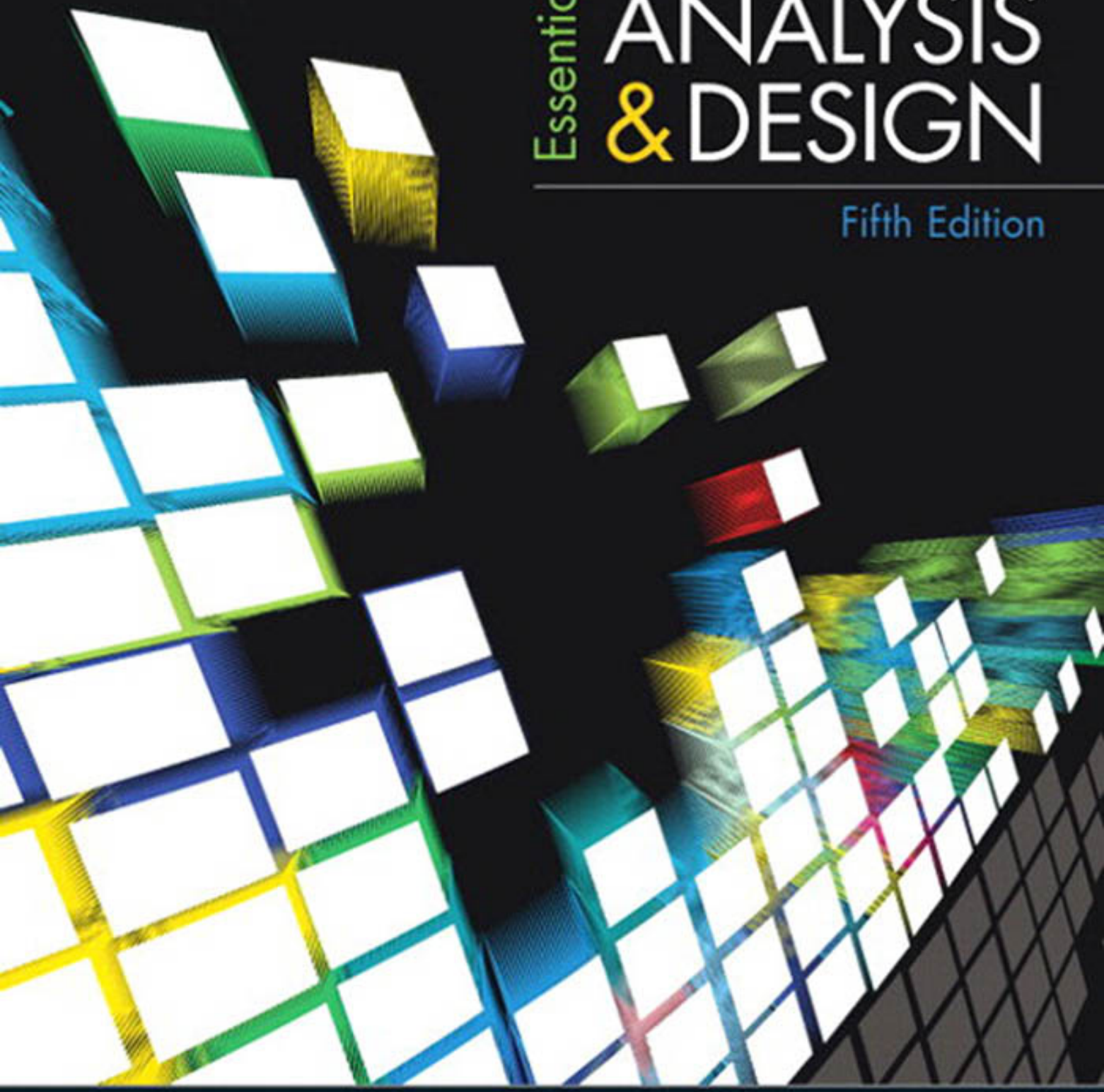
Essentials of SYSTEMS ANALYSIS & DESIGN

Fifth Edition



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Essentials of Systems Analysis and Design

FIFTH EDITION

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To Jackie, Jordan, and James,
for your sacrifices, encouragement,
and support.

—Joe

To Karen, Evan, and Caitlin.

—Joey

To Patty, for her sacrifices,
encouragement, and support.
To my students, for being receptive
and critical, and for challenging me
to be a better teacher.

—Jeff

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Preface

Our Approach

In today's information- and technology-driven business world, students need to be aware of three key factors. First, it is more crucial than ever to know how to organize and access information strategically. Second, success often depends on the ability to work as part of a team. Third, the Internet will play an important part in their work lives. *Essentials of Systems Analysis and Design, Fifth Edition*, addresses these key factors.

More than 50 years' combined teaching experience in systems analysis and design have gone into creating *Essentials of Systems Analysis and Design, Fifth Edition*, a text that emphasizes hands-on, experimental learning. We provide a clear presentation of the concepts, skills, and techniques students need to become effective systems analysts who work with others to create information systems for businesses. We use the systems development life cycle model as an organizing tool throughout the book to provide a strong conceptual and systematic framework.

Internet coverage is provided in each chapter via an integrated, extended illustrative case (Pine Valley Furniture WebStore) and an end-of-chapter case (Petrie's Electronics).

Many systems analysis and design courses involve lab work and outside reading. Lecture time can be limited. Based on market research and our own teaching experience, we understand the need for a book that combines depth of coverage with brevity. So we have created a ten-chapter book that covers key systems analysis and design content without overwhelming students with unnecessary detail.

New to the Fifth Edition

The following features are new to the Fifth Edition:

- *Emphasis on current changes in systems analysis and design.* The move to structured analysis and design in the late 1970s was considered to be a revolution in systems development. We are undergoing another revolution now, as we move away from complex, plan-driven development to new approaches called "Agile Methodologies." Although the best-known Agile Methodology is eXtreme Programming, many other approaches are also available. The Agile revolution in systems development is acknowledged and briefly explained in Chapter 1 and then explored in much greater depth in Appendix B.
- *Increased focus on make versus buy and systems integration.* More and more systems development involves the use of packages in combination with legacy applications and new modules. Coverage of the make-versus-buy decision and of the multiple sources of software and software components is highlighted in Chapter 2 to show how companies deal with these issues.
- *New end-of-chapter running case.* Petrie's Electronics, a fictional electronics retailer, is a student project case that allows students to study and develop a Web-based customer loyalty program to enhance a customer relationship management system.

- *Updated illustrations of technology.* Screen captures have been updated throughout the text to show examples using the latest versions of programming and Internet development environments, and user interface designs.
- *New entity-relationship notation.* We now use a new notation for entity-relationship diagramming in Chapter 7 and elsewhere. This notation is consistent with that used in *Modern Database Management*, *Tenth Edition*, by Hoffer, Ramesh, and Topi (2011).
- *Updated content.* Throughout the book, the content in each chapter has been updated where appropriate.
- *End-of-chapter updates.* We have provided extensive updates to existing problems along with several new problems in every chapter.

Themes

Essentials of Systems Analysis and Design, *Fifth Edition*, is characterized by the following themes:

- *Systems development is firmly rooted in an organizational context.* The successful systems analyst requires a broad understanding of organizations, organizational culture, and operations.
- *Systems development is a practical field.* Coverage of current practices as well as accepted concepts and principles is essential for today's systems analyst.
- *Systems development is a profession.* The text presents standards of practice, and fosters a sense of continuing personal development, ethics, and a respect for and collaboration with the work of others.
- *Systems development has significantly changed with the explosive growth in databases, data-driven architecture for systems, and the Internet.* Systems development and database management can be taught in a highly coordinated fashion. The Internet has rapidly become a common development platform for database-driven electronic commerce systems.
- *Success in systems analysis and design requires not only skills in methodologies and techniques, but also in the management of time, resources, and risks.* Learning systems analysis and design requires a thorough understanding of the process as well as the techniques and deliverables of the profession.

Given these themes, the text emphasizes these approaches:

- A business rather than a technology perspective
- The role, responsibilities, and mind-set of the systems analyst as well as the systems project manager, rather than those of the programmer or business manager
- The methods and principles of systems development rather than the specific tools or tool-related skills of the field

Audience

The book assumes that students have taken an introductory course on computer systems and have experience writing programs in at least one programming language. We review basic system principles for those students who have