Testing IT

An Off-the-Shelf Software Testing Process

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Chapter

1 Introduction

Hmm, The Wheel you say! Well, I don't wish to belittle your achievement, but I've traveled far and wide and I've seen a great many of these things invented by a great many people in a great many different caves!

Big Ugg, Neander Valley, 35,000 B.C.

1.1 Purpose of the Book

This book provides comprehensive and rigorous guidance to workers in the field of software testing for researching or setting up a software testing process within organizations.

The book provides advice and guidance on all aspects of the testing process, including:

- The need to test software and the approach to testing
- Specific details of testing techniques with worked examples
- The planning and management of testing projects
- Testing roles and responsibilities
- Comprehensive details of the testing phases
- Extensive testing document templates, proformas, and checklists
- Recommendations for testing process improvement and the role and use of metrics
- The testing issues facing developers of Object-Oriented and Component-Based systems.

The book covers the testing of software from a number of sources, including software developed or modified in-house, software that represents the modification or extension of exisiting legacy software systems, and software developed on behalf of an organization by a third party.

The book also covers the acceptance testing of *commercial off-the-shelf (COTS)* software procured by an organization, or COTS software that has undergone development either internally or by a third party on behalf of an organization.

This book should be used in a pragmatic manner, in effect providing a testing framework that can be used by all members of staff involved in software development and testing within an organization to improve the quality of the software they deliver and to reduce timescales, effort, and cost of testing.

Alternatively, the testing process described in this book can be customized to match the specific testing requirements of any particular organization, and a series of real-world case studies are provided to illustrate how this can be achieved.

1.2 Readership

The target audience for this book includes the following people:

- **Technical Director/Managers** who need to improve the software testing process within their organization (in terms of quality, productivity, cost, and/or repeatability of the process)
- **Quality Assurance (QA) professionals** (such as company QA Directors or Managers) who need to put in place a formal organization-wide approach to software testing
- **Project Managers/Leaders** who need to save time, effort, and money and improve quality by adopting a complete, standard, off-the-shelf solution to their testing requirements
- **Independent Information Technology (IT), QA,** or **Management Consultants** who provide advice and guidance to clients on their software testing process, for whom the book will represent a key item in their "Consultants Tool Kit"
- **Testing/QA Professionals** (such as Test Analysts, Testers, or QA Representatives) who wish to save time and effort by adopting predefined testing artifacts (such as standard templates for Test Script, Test Plan, and Test Specification documents)
- **IT Professionals** who need to understand the software testing process (such as developers involved in Unit or Integration testing)
- **Any staff members** who are keen to improve their career prospects by advocating a complete testing solution to their organizations' software testing needs, particularly where there is a need to improve quality or save time, effort, and cost
- **Training Managers/Trainers** who are in the process of writing or amending testing training materials and who need to obtain a pragmatic view of the testing process and its application
- **Students** who need to obtain a pragmatic/real-world view of the application of testing theory and principles to organizational software testing requirements, or who have an interest in testing-process improvement and the role and use of metrics.

1.3 How to Read This Book

This book is divided into three parts, all closely linked, but each of which can be read and applied separately.

Part 1 (Chapters 2–13) documents the "traditional view" of the components comprising a software testing process. Part 1 provides detailed information that can be used as the basis for setting up a testing-process framework tailored to the individual requirements of any organization involved in software testing.

Part 2 (Chapters 14–18) provides a series of case studies that show how a number of organizations have implemented their own testing process based on the "classic view" described in Part 1. These case studies can be read to provide real world

guidance on how an individual organization can implement a testing-process framework to meet its own testing requirements.

Part 3 (the appendices) contains a set of standard testing document templates, proformas, and checklists plus a number of appendices that expand on topics described in passing in the main body of the book. The standard testing document templates, proformas, and checklists are also available from the following URL: <us.cambridge.org/titles/052179546X> so that they can be used immediately without modification or customized to reflect the particular requirements of any organization (such as a corporate style, branding, or documentation standard).

Terms in italics are fully defined in the glossary.

1.4 Structure and Content of This Book

Specifically, the chapters and appendices comprising this book are:

- Chapter 2, which discusses just how challenging it is to thoroughly test even the most simple software system, reviews a number of definitions of testing, provides a brief overview of the approach to software testing, and lists definitive testing references for further reading.
- Chapter 3, which describes the principal techniques used in designing effective and efficient tests for testing software systems and provides, where appropriate, references to illustrative worked examples in the appendices.
- Chapter 4, which deals with the issues associated with the management and planning of the testing process, provides guidance on the organization of testing and testing projects and on the need for thorough planning, describing a number of techniques for supporting the planning process.
- Chapters 5–11, which provide details on each of the testing phases (from Unit Testing to Acceptance Testing and on to Regression Testing[1]) and their interrelationships. Each chapter is presented in a standard format and covers:
  - *the overall testing approach for that phase*
  - *test data requirements for that phase*
  - *the roles and responsibilities associated with that phase*
  - *any particular planning and resourcing issues for that phase*
  - *the inputs to and the outputs from that phase*
  - *a review of the specific testing techniques that are appropriate to that phase.*
- Chapter 12 considers the need for process improvement within the testing process and reviews the role of metrics (proposing a pragmatic metrics set that can be used effectively within and across testing projects). It also provides references to further sources of information on test process improvement.

[1]While not strictly speaking a separate testing phase, Regression Testing is included in this list for the sake of completeness.

- Chapter 13, which for organizations adopting the testing process described in this book or using it as the basis for setting up their own testing-process framework, discusses the approach to introducing testing into an organization and managing its successful adoption, reviews the need to maintain that testing process, and proposes an approach to satisfy this requirement.
- Chapters 14–18 provide a series of real-world case studies describing how a number of commercial organizations have implemented their own customized view of the testing process described in Chapters 2–13. Specifically, the organizations covered in the case studies are:
  - *The British Library*
  - *Reuters Product Acceptance Group*
  - *Crown Quality Assurance Group*
  - *The Wine Society*
  - *Automatic Data Processing (ADP) Limited.*
- Appendices A–J provide a set of testing document templates, proformas, and checklists:
  - *terms of reference for testing staff*
  - *summary testing guides for each testing phase*
  - *a Test Plan document template*
  - *a Test Specification document template*
  - *a Test Script template*
  - *a Test Result Record Form template*
  - *a Test Log template*
  - *a Test Certificate template*
  - *a Re-use Pack checklist*
  - *a Test Summary Report template.*
- Appendices K–M present a series of worked examples of testing techniques described in Chapter 3.
- Appendices N–Q expand on topics described in passing in the main body of the book and include:
  - *a scheme and set of criteria for evaluating the relative merits of commercially available automated software testing tools*
  - *an overview of the process of Usability Testing and its application*
  - *a scheme and set of criteria for performing an audit of a testing process*
  - *a discussion of the issues involved in the testing of object-oriented and component-based applications.*
- A list of the references cited in the book.
- A glossary of terms used in this book.