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KEY=TOOLS - SHANIYA WATERS

Software Engineering at Google Lessons Learned from Programming Over Time

O'Reilly Media Today, software engineers need to know not only how to program effectively but also how to develop proper engineering practices to make their codebase sustainable and healthy. This book emphasizes this difference between programming and software engineering. How can software engineers manage a living codebase that evolves and responds to changing requirements and demands over the length of its life? Based on their experience at Google, software engineers Titus Winters and Hyrum Wright, along with technical writer Tom Manshreck, present a candid and insightful look at how some of the world's leading practitioners construct and maintain software. This book covers Google's unique engineering culture, processes, and tools and how these aspects contribute to the

effectiveness of an engineering organization. You'll explore three fundamental principles that software organizations should keep in mind when designing, architecting, writing, and maintaining code: How time affects the sustainability of software and how to make your code resilient over time How scale affects the viability of software practices within an engineering organization What trade-offs a typical engineer needs to make when evaluating design and development decisions

Software Development and Professional Practice

Apress **Software Development and Professional Practice** reveals how to design and code great software. What factors do you take into account? What makes a good design? What methods and processes are out there for designing software? Is designing small programs different than designing large ones? How can you tell a good design from a bad one? You'll learn the principles of good software design, and how to turn those principles back into great code. **Software Development and Professional Practice** is also about code construction—how to write great programs and make them work. What, you say? You've already written eight gazillion programs! Of course I know how to write code! Well, in this book you'll re-examine what you already do, and you'll investigate ways to improve. Using the Java language, you'll look deeply into coding standards, debugging, unit testing, modularity, and other characteristics of good programs. You'll also talk about reading code. How do you read code? What makes a program readable? Can good, readable code replace documentation? How much documentation do you really need? This book introduces you to software engineering—the application of engineering principles to the development of software. What are these engineering principles? First, all engineering efforts follow a defined process. So, you'll be spending a bit of time talking about how you run a software development project and the different phases of a project. Secondly, all engineering work has a basis in the application of science and mathematics to real-world problems. And so does software development! You'll therefore take the time to examine how to design and implement programs that solve specific problems. Finally, this book is also about human-computer interaction and user interface design issues. A poor user interface can ruin any desire to actually use a program; in this book, you'll figure out why and how to avoid those errors. **Software Development and Professional Practice** covers many of the topics described for the ACM Computing Curricula 2001 course C292c **Software Development and Professional Practice**. It is designed to be both a textbook and a manual for the working professional.

Building Software Teams

Ten Best Practices for Effective Software Development

"O'Reilly Media, Inc." Why does poor software quality continue to plague enterprises of all sizes in all industries? Part of the problem lies with the process, rather than individual developers. This practical guide provides ten best practices to help team leaders create an effective working environment through key adjustments to their process. As a follow-up to their popular book, *Building Maintainable Software*, consultants with the Software Improvement Group (SIG) offer critical lessons based on their assessment of development processes used by hundreds of software teams. Each practice includes examples of goalsetting to help you choose the right metrics for your team. Achieve development goals by determining meaningful metrics with the Goal-Question-Metric approach Translate those goals to a verifiable Definition of Done Manage code versions for consistent and predictable modification Control separate environments for each stage in the development pipeline Automate tests as much as possible and steer their guidelines and expectations Let the Continuous Integration server do much of the hard work for you Automate the process of pushing code through the pipeline Define development process standards to improve consistency and simplicity Manage dependencies on third party code to keep your software consistent and up to date Document only the most necessary and current knowledge

Adaptive Code

Agile coding with design patterns and SOLID principles

Microsoft Press Write code that can adapt to changes. By applying this book's principles, you can create code that accommodates new requirements and unforeseen scenarios without significant rewrites. Gary McLean Hall describes Agile best practices, principles, and patterns for designing and writing code that can evolve more quickly and easily, with fewer errors, because it doesn't impede change. Now revised, updated, and expanded, *Adaptive Code, Second Edition* adds indispensable practical insights on Kanban, dependency inversion, and creating reusable abstractions. Drawing on over a decade of Agile consulting and development experience, McLean Hall has updated his best-seller with

deeper coverage of unit testing, refactoring, pure dependency injection, and more. Master powerful new ways to:

- Write code that enables and complements Scrum, Kanban, or any other Agile framework
- Develop code that can survive major changes in requirements
- Plan for adaptability by using dependencies, layering, interfaces, and design patterns
- Perform unit testing and refactoring in tandem, gaining more value from both
- Use the “golden master” technique to make legacy code adaptive
- Build SOLID code with single-responsibility, open/closed, and Liskov substitution principles
- Create smaller interfaces to support more-diverse client and architectural needs
- Leverage dependency injection best practices to improve code adaptability
- Apply dependency inversion with the Stairway pattern, and avoid related anti-patterns

About You This book is for programmers of all skill levels seeking more-practical insight into design patterns, SOLID principles, unit testing, refactoring, and related topics. Most readers will have programmed in C#, Java, C++, or similar object-oriented languages, and will be familiar with core procedural programming techniques.

Practices of an Agile Developer

Working in the Real World

Pragmatic Bookshelf These are the proven, effective agile practices that will make you a better developer. You'll learn pragmatic ways of approaching the development process and your personal coding techniques. You'll learn about your own attitudes, issues with working on a team, and how to best manage your learning, all in an iterative, incremental, agile style. You'll see how to apply each practice, and what benefits you can expect. Bottom line: This book will make you a better developer.

Mastering Software Quality

Assurance

Best Practices, Tools and Techniques for Software Developers

J. Ross Publishing This comprehensive reference on software development quality assurance addresses all four dimensions of quality: specifications, design, construction and conformance. It focuses on quality from both the micro and macro view. From a micro view, it details the aspect of building-in quality at the component level to help ensure that the overall

deliverable has ingrained quality. From a macro view, it addresses the organizational level activities that provide an environment conducive to fostering quality in the deliverables as well as developing a culture focused on quality in the organization. Mastering Software Quality Assurance also explores a process driven approach to quality, and provides the information and guidance needed for implementing a process quality model in your organization. It includes best practices and valuable tools and techniques for software developers.

Key Features

- Provides a comprehensive, inclusive view of software quality
- Tackles the four dimensions of quality as applicable to software development organizations
- Offers unique insights into achieving quality at the component level
- Deals comprehensively with all aspects of measuring software quality
- Explores process quality from the standpoint of implementation rather than from the appraiser/assessor point of view
- Delivers a bird's eye view of the ISO and CMMI models, and describes necessary steps for attaining conformance to those models

Code Complete

Pearson Education Widely considered one of the best practical guides to programming, Steve McConnell's original **CODE COMPLETE** has been helping developers write better software for more than a decade. Now this classic book has been fully updated and revised with leading-edge practices—and hundreds of new code samples—illustrating the art and science of software construction. Capturing the body of knowledge available from research, academia, and everyday commercial practice, McConnell synthesizes the most effective techniques and must-know principles into clear, pragmatic guidance. No matter what your experience level, development environment, or project size, this book will inform and stimulate your thinking—and help you build the highest quality code.

Discover the timeless techniques and strategies that help you:

- Design for minimum complexity and maximum creativity
- Reap the benefits of collaborative development
- Apply defensive programming techniques to reduce and flush out errors
- Exploit opportunities to refactor—or evolve—code, and do it safely
- Use construction practices that are right-weight for your project
- Debug problems quickly and effectively
- Resolve critical construction issues early and correctly
- Build quality into the beginning, middle, and end of your project

Software Engineering Design

Theory and Practice

CRC Press Taking a learn-by-doing approach, **Software Engineering Design: Theory and Practice** uses examples, review questions, chapter exercises,

and case study assignments to provide students and practitioners with the understanding required to design complex software systems. Explaining the concepts that are immediately relevant to software designers, it begins with a review of software design fundamentals. The text presents a formal top-down design process that consists of several design activities with varied levels of detail, including the macro-, micro-, and construction-design levels. As part of the top-down approach, it provides in-depth coverage of applied architectural, creational, structural, and behavioral design patterns. For each design issue covered, it includes a step-by-step breakdown of the execution of the design solution, along with an evaluation, discussion, and justification for using that particular solution. The book outlines industry-proven software design practices for leading large-scale software design efforts, developing reusable and high-quality software systems, and producing technical and customer-driven design documentation. It also: Offers one-stop guidance for mastering the Software Design & Construction sections of the official Software Engineering Body of Knowledge (SWEBOK®) Details a collection of standards and guidelines for structuring high-quality code Describes techniques for analyzing and evaluating the quality of software designs Collectively, the text supplies comprehensive coverage of the software design concepts students will need to succeed as professional design leaders. The section on engineering leadership for software designers covers the necessary ethical and leadership skills required of software developers in the public domain. The section on creating software design documents (SDD) familiarizes students with the software design notations, structural descriptions, and behavioral models required for SDDs. Course notes, exercises with answers, online resources, and an instructor's manual are available upon qualified course adoption. Instructors can contact the author about these resources via the author's website: <http://softwareengineeringdesign.com/>

Software Requirement Patterns

Pearson Education Learn proven, real-world techniques for specifying software requirements with this practical reference. It details 30 requirement “patterns” offering realistic examples for situation-specific guidance for building effective software requirements. Each pattern explains what a requirement needs to convey, offers potential questions to ask, points out potential pitfalls, suggests extra requirements, and other advice. This book also provides guidance on how to write other kinds of information that belong in a requirements specification, such as assumptions, a glossary, and document history and references, and how to structure a requirements specification. A disturbing proportion of computer systems are judged to be inadequate; many are not even delivered; more are late or over budget. Studies consistently show one of the single biggest causes is poorly defined requirements: not properly

defining what a system is for and what it's supposed to do. Even a modest contribution to improving requirements offers the prospect of saving businesses part of a large sum of wasted investment. This guide emphasizes this important requirement need—determining what a software system needs to do before spending time on development. Expertly written, this book details solutions that have worked in the past, with guidance for modifying patterns to fit individual needs—giving developers the valuable advice they need for building effective software requirements

Software Engineering

The Current Practice

CRC Press Software Engineering: The Current Practice teaches students basic software engineering skills and helps practitioners refresh their knowledge and explore recent developments in the field, including software changes and iterative processes of software development. After a historical overview and an introduction to software technology and models, the book discusses the software change and its phases, including concept location, impact analysis, refactoring, actualization, and verification. It then covers the most common iterative processes: agile, directed, and centralized processes. The text also journeys through the software life span from the initial development of software from scratch to the final stages that lead toward software closedown. For Professionals The book gives programmers and software managers a unified view of the contemporary practice of software engineering. It shows how various developments fit together and fit into the contemporary software engineering mosaic. The knowledge gained from the book allows practitioners to evaluate and improve the software engineering processes in their projects. For Instructors Instructors have several options for using this classroom-tested material. Designed to be run in conjunction with the lectures, ideas for student projects include open source programs that use Java or C++ and range in size from 50 to 500 thousand lines of code. These projects emphasize the role of developers in a classroom-tailored version of the directed iterative process (DIP). For Students Students gain a real understanding of software engineering processes through the lectures and projects. They acquire hands-on experience with software of the size and quality comparable to that of industrial software. As is the case in the industry, students work in teams but have individual assignments and accountability.

Solid Code

Microsoft Press Get best-in-class engineering practices to help you write more-robust, bug-free code. Two Microsoft .NET development experts

share real-world examples and proven methods for optimizing the software development life cycle—from avoiding costly programming pitfalls to making your development team more efficient. Managed code developers at all levels will find design, prototyping, implementation, debugging, and testing tips to boost the quality of their code—today. Optimize each stage of the development process—from design to testing—and produce higher-quality applications. Use metaprogramming to reduce code complexity, while increasing flexibility and maintainability. Treat performance as a feature—and manage it throughout the development life cycle. Apply best practices for application scalability. Employ preventative security measures to ward off malicious attacks. Practice defensive programming to catch bugs before run time. Incorporate automated builds, code analysis, and testing into the daily engineering process. Implement better source-control management and check-in procedures. Establish a quality-driven, milestone-based project rhythm—and improve your results!

Software Requirements

Publisher Fact Sheet A concise, hands-on approach to managing & improving the critical requirements process in software development.

Managing the Unmanageable

Rules, Tools, and Insights for Managing Software People and Teams

Addison-Wesley “Mantle and Lichty have assembled a guide that will help you hire, motivate, and mentor a software development team that functions at the highest level. Their rules of thumb and coaching advice are great blueprints for new and experienced software engineering managers alike.” —Tom Conrad, CTO, Pandora “I wish I’d had this material available years ago. I see lots and lots of ‘meat’ in here that I’ll use over and over again as I try to become a better manager. The writing style is right on, and I love the personal anecdotes.” —Steve Johnson, VP, Custom Solutions, DigitalFish All too often, software development is deemed unmanageable. The news is filled with stories of projects that have run catastrophically over schedule and budget. Although adding some formal discipline to the development process has improved the situation, it has by no means solved the problem. How can it be, with so much time and money spent to get software development under control, that it remains so unmanageable? In *Managing the Unmanageable: Rules, Tools, and Insights for Managing Software People and Teams*, Mickey W. Mantle and Ron Lichty answer that

persistent question with a simple observation: You first must make programmers and software teams manageable. That is, you need to begin by understanding your people—how to hire them, motivate them, and lead them to develop and deliver great products. Drawing on their combined seventy years of software development and management experience, and highlighting the insights and wisdom of other successful managers, Mantle and Lichty provide the guidance you need to manage people and teams in order to deliver software successfully. Whether you are new to software management, or have already been working in that role, you will appreciate the real-world knowledge and practical tools packed into this guide.

Rethinking Productivity in Software Engineering

Apress Get the most out of this foundational reference and improve the productivity of your software teams. This open access book collects the wisdom of the 2017 "Dagstuhl" seminar on productivity in software engineering, a meeting of community leaders, who came together with the goal of rethinking traditional definitions and measures of productivity. The results of their work, Rethinking Productivity in Software Engineering, includes chapters covering definitions and core concepts related to productivity, guidelines for measuring productivity in specific contexts, best practices and pitfalls, and theories and open questions on productivity. You'll benefit from the many short chapters, each offering a focused discussion on one aspect of productivity in software engineering. Readers in many fields and industries will benefit from their collected work. Developers wanting to improve their personal productivity, will learn effective strategies for overcoming common issues that interfere with progress. Organizations thinking about building internal programs for measuring productivity of programmers and teams will learn best practices from industry and researchers in measuring productivity. And researchers can leverage the conceptual frameworks and rich body of literature in the book to effectively pursue new research directions. What You'll Learn
Review the definitions and dimensions of software productivity See how time management is having the opposite of the intended effect Develop valuable dashboards Understand the impact of sensors on productivity Avoid software development waste Work with human-centered methods to measure productivity Look at the intersection of neuroscience and productivity Manage interruptions and context-switching Who Book Is For
Industry developers and those responsible for seminar-style courses that include a segment on software developer productivity. Chapters are written for a generalist audience, without excessive use of technical terminology.

Rapid Development

Microsoft Press Corporate and commercial software-development teams all want solutions for one important problem—how to get their high-pressure development schedules under control. In **RAPID DEVELOPMENT**, author Steve McConnell addresses that concern head-on with overall strategies, specific best practices, and valuable tips that help shrink and control development schedules and keep projects moving. Inside, you'll find: A rapid-development strategy that can be applied to any project and the best practices to make that strategy work Candid discussions of great and not-so-great rapid-development practices—estimation, prototyping, forced overtime, motivation, teamwork, rapid-development languages, risk management, and many others A list of classic mistakes to avoid for rapid-development projects, including creeping requirements, shortchanged quality, and silver-bullet syndrome Case studies that vividly illustrate what can go wrong, what can go right, and how to tell which direction your project is going **RAPID DEVELOPMENT** is the real-world guide to more efficient applications development.

Coder to Developer

Tools and Strategies for Delivering Your Software

John Wiley & Sons "Two thumbs up" —Gregory V. Wilson, Dr. Dobbs Journal (October 2004) No one can disparage the ability to write good code. At its highest levels, it is an art. But no one can confuse writing good code with developing good software. The difference—in terms of challenges, skills, and compensation—is immense. **Coder to Developer** helps you excel at the many non-coding tasks entailed, from start to finish, in just about any successful development project. What's more, it equips you with the mindset and self-assurance required to pull it all together, so that you see every piece of your work as part of a coherent process. Inside, you'll find plenty of technical guidance on such topics as: Choosing and using a source code control system Code generation tools—when and why Preventing bugs with unit testing Tracking, fixing, and learning from bugs Application activity logging Streamlining and systematizing the build process Traditional installations and alternative approaches To pull all of this together, the author has provided the source code for **Download Tracker**, a tool for organizing your collection of downloaded code, that's used for examples throughout this book. The code is provided in various states of completion, reflecting every stage of development, so that you can dig deep into the actual process of building software. But you'll also

develop "softer" skills, in areas such as team management, open source collaboration, user and developer documentation, and intellectual property protection. If you want to become someone who can deliver not just good code but also a good product, this book is the placeto start. If you must build successful software projects, it's essential reading.

Software Product Lines in Action

The Best Industrial Practice in Product Line Engineering

Springer Science & Business Media Software product lines represent perhaps the most exciting paradigm shift in software development since the advent of high-level programming languages. Nowhere else in software engineering have we seen such breathtaking improvements in cost, quality, time to market, and developer productivity, often registering in the order-of-magnitude range. Here, the authors combine academic research results with real-world industrial experiences, thus presenting a broad view on product line engineering so that both managers and technical specialists will benefit from exposure to this work. They capture the wealth of knowledge that eight companies have gathered during the introduction of the software product line engineering approach in their daily practice.

Software Estimation

Demystifying the Black Art

Microsoft Press Often referred to as the "black art" because of its complexity and uncertainty, software estimation is not as difficult or puzzling as people think. In fact, generating accurate estimates is straightforward—once you understand the art of creating them. In his highly anticipated book, acclaimed author Steve McConnell unravels the mystery to successful software estimation—distilling academic information and real-world experience into a practical guide for working software professionals. Instead of arcane treatises and rigid modeling techniques, this guide highlights a proven set of procedures, understandable formulas, and heuristics that individuals and development teams can apply to their projects to help achieve estimation proficiency. Discover how to: Estimate schedule and cost—or estimate the functionality that can be delivered within a given time frame Avoid common software estimation mistakes Learn estimation techniques for you, your team, and your organization * Estimate specific project activities—including development, management,

and defect correction Apply estimation approaches to any type of project—small or large, agile or traditional Navigate the shark-infested political waters that surround project estimates When many corporate software projects are failing, McConnell shows you what works for successful software estimation.

Software Engineering

Barry W. Boehm's Lifetime Contributions to Software Development, Management, and Research

John Wiley & Sons This is the most authoritative archive of Barry Boehm's contributions to software engineering. Featuring 42 reprinted articles, along with an introduction and chapter summaries to provide context, it serves as a "how-to" reference manual for software engineering best practices. It provides convenient access to Boehm's landmark work on product development and management processes. The book concludes with an insightful look to the future by Dr. Boehm.

The Pragmatic Programmer

From Journeyman to Master

Addison-Wesley Professional What others in the trenches say about *The Pragmatic Programmer*... “The cool thing about this book is that it’s great for keeping the programming process fresh. The book helps you to continue to grow and clearly comes from people who have been there.” —Kent Beck, author of *Extreme Programming Explained: Embrace Change* “I found this book to be a great mix of solid advice and wonderful analogies!” —Martin Fowler, author of *Refactoring and UML Distilled* “I would buy a copy, read it twice, then tell all my colleagues to run out and grab a copy. This is a book I would never loan because I would worry about it being lost.” —Kevin Ruland, Management Science, MSG-Logistics “The wisdom and practical experience of the authors is obvious. The topics presented are relevant and useful.... By far its greatest strength for me has been the outstanding analogies—tracer bullets, broken windows, and the fabulous helicopter-based explanation of the need for orthogonality, especially in a crisis situation. I have little doubt that this book will

eventually become an excellent source of useful information for journeymen programmers and expert mentors alike.” —John Lakos, author of *Large-Scale C++ Software Design* “This is the sort of book I will buy a dozen copies of when it comes out so I can give it to my clients.” —Eric Vought, Software Engineer “Most modern books on software development fail to cover the basics of what makes a great software developer, instead spending their time on syntax or technology where in reality the greatest leverage possible for any software team is in having talented developers who really know their craft well. An excellent book.” —Pete McBreen, Independent Consultant “Since reading this book, I have implemented many of the practical suggestions and tips it contains. Across the board, they have saved my company time and money while helping me get my job done quicker! This should be a desktop reference for everyone who works with code for a living.” —Jared Richardson, Senior Software Developer, iRenaissance, Inc. “I would like to see this issued to every new employee at my company....” —Chris Cleeland, Senior Software Engineer, Object Computing, Inc. “If I’m putting together a project, it’s the authors of this book that I want. . . . And failing that I’d settle for people who’ve read their book.” —Ward Cunningham

Straight from the programming trenches, *The Pragmatic Programmer* cuts through the increasing specialization and technicalities of modern software development to examine the core process—taking a requirement and producing working, maintainable code that delights its users. It covers topics ranging from personal responsibility and career development to architectural techniques for keeping your code flexible and easy to adapt and reuse. Read this book, and you’ll learn how to Fight software rot; Avoid the trap of duplicating knowledge; Write flexible, dynamic, and adaptable code; Avoid programming by coincidence; Bullet-proof your code with contracts, assertions, and exceptions; Capture real requirements; Test ruthlessly and effectively; Delight your users; Build teams of pragmatic programmers; and Make your developments more precise with automation. Written as a series of self-contained sections and filled with entertaining anecdotes, thoughtful examples, and interesting analogies, *The Pragmatic Programmer* illustrates the best practices and major pitfalls of many different aspects of software development. Whether you’re a new coder, an experienced programmer, or a manager responsible for software projects, use these lessons daily, and you’ll quickly see improvements in personal productivity, accuracy, and job satisfaction. You’ll learn skills and develop habits and attitudes that form the foundation for long-term success in your career. You’ll become a Pragmatic Programmer.

Software Configuration

Management Patterns

Effective Teamwork, Practical Integration

Addison-Wesley Professional

IronPython in Action

Simon and Schuster In 2005, Microsoft quietly announced an initiative to bring dynamic languages to the .NET platform. The starting point for this project was a .NET implementation of Python, dubbed IronPython. After a couple years of incubation, IronPython is ready for real-world use. It blends the simplicity, elegance, and dynamism of Python with the power of the .NET framework. IronPython in Action offers a comprehensive, hands-on introduction to Microsoft's exciting new approach for programming the .NET framework. It approaches IronPython as a first class .NET language, fully integrated with the .NET environment, Visual Studio, and even the open-source Mono implementation. You'll learn how IronPython can be embedded as a ready-made scripting language into C# and VB.NET programs, used for writing full applications or for web development with ASP. Even better, you'll see how IronPython works in Silverlight for client-side web programming. IronPython opens up exciting new possibilities. Because it's a dynamic language, it permits programming paradigms not easily available in VB and C#. In this book, authors Michael Foord and Christian Muirhead explore the world of functional programming, live introspection, dynamic typing and duck typing, metaprogramming, and more. IronPython in Action explores these topics with examples, making use of the Python interactive console to explore the .NET framework with live objects. The expert authors provide a complete introduction for programmers to both the Python language and the power of the .NET framework. The book also shows how to extend IronPython with C#, extending C# and VB.NET applications with Python, using IronPython with .NET 3.0 and Powershell, IronPython as a Windows scripting tool, and much more. Purchase of the print book comes with an offer of a free PDF, ePub, and Kindle eBook from Manning. Also available is all code from the book.

Code Simplicity

The Fundamentals of Software

"O'Reilly Media, Inc." Good software design is simple and easy to understand. Unfortunately, the average computer program today is so complex that no one could possibly comprehend how all the code works. This concise guide helps you understand the fundamentals of good design through scientific laws—principles you can apply to any programming language or project from here to eternity. Whether you're a junior programmer, senior software engineer, or non-technical manager, you'll learn how to create a sound plan for your software project, and make better decisions about the pattern and structure of your system. Discover why good software design has become the missing science Understand the ultimate purpose of software and the goals of good design Determine the value of your design now and in the future Examine real-world examples that demonstrate how a system changes over time Create designs that allow for the most change in the environment with the least change in the software Make easier changes in the future by keeping your code simpler now Gain better knowledge of your software's behavior with more accurate tests

Extreme Programming Explained

Embrace Change

Pearson Education The first edition of "Extreme Programming Explained" is a classic. It won awards for its then-radical ideas for improving small-team development, such as having developers write automated tests for their own code and having the whole team plan weekly. Much has changed in five years. This completely rewritten second edition expands the scope of XP to teams of any size by suggesting a program of continuous improvement based on: five core values consistent with excellence in software development; eleven principles for putting those values into action; and, thirteen primary and eleven corollary practices to help you push development past its current business and technical limitations. Whether you have a small team that is already closely aligned with your customers or a large team in a gigantic or multinational organization, you will find in these pages a wealth of ideas to challenge, inspire, and encourage you and your team members to substantially improve your software development.

New Perspectives in Software

Engineering

Proceedings of the 9th International Conference on Software Process Improvement (CIMPS 2020)

Springer Nature This book contains a selection of papers from the 2020 International Conference on Software Process Improvement (CIMPS 20), held between the 21st and 23rd of October in Mazatlán, Sinaloa, México. The CIMPS 20 is a global forum for researchers and practitioners that present and discuss the most recent innovations, trends, results, experiences and concerns in the several perspectives of Software Engineering with clear relationship but not limited to software processes, Security in Information and Communication Technology and Big Data Field. The main topics covered are: Organizational Models, Standards and Methodologies, Software Process Improvement, Knowledge Management, Software Systems, Applications and Tools, Information and Communication Technologies and Processes in Non-software Domains (mining, automotive, aerospace, business, health care, manufacturing, etc.) with a demonstrated relationship to Software Engineering Challenges.

Application of Software Engineering Best Practices and Principles to Small Development Teams

The motivation of this thesis comes from the professional experience of the author. Having worked with very small software development teams in various capacities, he realized that significant improvements could be achieved by the application of modern software engineering practices and principles. This paper is the result of researching how the principles and practices promoted by the leading software development authors can be applied to the small development team as they transition from "programming in the small" to "programming in the medium." This paper investigates the best practices and principles in various case studies with the objective to clearly define how the application of these practices and principles contributed to a successful software project. Several chapters are dedicated to reviewing techniques applicable to each of the phases of the software lifecycle with examples of each technique. The paper culminates with the author's recommendation of principles and practices

for the small development team which can and should be used to improve the quality and overall time of the software development lifecycle of a small project. Each practice used in these case studies is evaluated for practical use in a small project, discussing the advantages and disadvantages of each tool while also exposing some reasons why trained software engineers often neglect these practices. The paper concludes with suggestions from the author of appropriate application of the practices and principles to small development teams.

Communication Risks and Best Practices in Global Software Development

Ajmal Iqbal This book focusses on the identification of communication risks, their causes and effects and the practices to mitigate the risks from both state of the art and state of the practice perspectives. It's like puzzle solving game. According to Casey "Communication is one the biggest issue that cause due to geographical, temporal and socio-cultural distances." At the end of the book authors provide set of recommendations based on the best practices that need to be followed by the globally distributed organizations to achieve communicated environment just like co-located settings.

REQUIREMENTS ENGINEERING: A GOOD PRACTICE GUIDE

John Wiley & Sons Market_Desc: Software Designers/Developers and Systems Analysts, Managers/Engineers of Organizational Process Improvement Programmers. Special Features: · Reputable and authoritative authors.· Written in a clear and easy to read format, packed full of jargon-free and unthreatening advice.· Structured as FAQs (questions and answers) - an ideal format for busy practitioners.· Cover quotes from leading software gurus. About The Book: Requirements Engineering is a new term for an old problem, in the past known as Systems Analysis (and also Knowledge Elicitation). Requirements constitute the earliest phase of the software development cycle. Requirements are precise statements that reflect the needs of customers and users of an intended computer system, e.g. a word processor must include a spell-checker, security access is to be given to authorized personnel only, updates to customer information must be made every 10 seconds. Requirements engineering is being recognized as increasingly important - no other aspect of software engineering has enjoyed as much

growth in recent years. More and more organizations are either improving their requirements engineering process or thinking about doing so.

Debugging

The 9 Indispensable Rules for Finding Even the Most Elusive Software and Hardware Problems

AMACOM When the pressure is on to resolve an elusive software or hardware glitch, what's needed is a cool head courtesy of a set of rules guaranteed to work on any system, in any circumstance. Written in a frank but engaging style, this book provides simple, foolproof principles guaranteed to help find any bug quickly. Recognized tech expert and author David Agans changes the way you think about debugging, making those pesky problems suddenly much easier to find and fix. Agans identifies nine simple, practical rules that are applicable to any software application or hardware system, which can help detect any bug, no matter how tricky or obscure. Illustrating the rules with real-life bug-detection war stories, *Debugging* shows you how to: Understand the system: how perceiving the "roadmap" can hasten your journey Quit thinking and look: when hands-on investigation can't be avoided Isolate critical factors: why changing one element at a time can be an essential tool Keep an audit trail: how keeping a record of the debugging process can win the day Whether the system or program you're working on has been designed wrong, built wrong, or used wrong, *Debugging* helps you think correctly about bugs, so the problems virtually reveal themselves.

Rapid Development

Taming Wild Software Schedules

Pearson Education Project managers, technical leads, and Windows programmers throughout the industry share an important concern--how to get their development schedules under control. *Rapid Development* addresses that concern head-on with philosophy, techniques, and tools that help shrink and control development schedules and keep projects moving. The style is friendly and conversational--and the content is impressive.

Clean C++

Sustainable Software Development Patterns and Best Practices with C++ 17

Apres Write maintainable, extensible, and durable software with modern C++. This book is a must for every developer, software architect, or team leader who is interested in good C++ code, and thus also wants to save development costs. If you want to teach yourself about writing clean C++, Clean C++ is exactly what you need. It is written to help C++ developers of all skill levels and shows by example how to write understandable, flexible, maintainable, and efficient C++ code. Even if you are a seasoned C++ developer, there are nuggets and data points in this book that you will find useful in your work. If you don't take care with your code, you can produce a large, messy, and unmaintainable beast in any programming language. However, C++ projects in particular are prone to be messy and tend to slip into bad habits. Lots of C++ code that is written today looks as if it was written in the 1980s. It seems that C++ developers have been forgotten by those who preach Software Craftsmanship and Clean Code principles. The Web is full of bad, but apparently very fast and highly optimized C++ code examples, with cruel syntax that completely ignores elementary principles of good design and well-written code. This book will explain how to avoid this scenario and how to get the most out of your C++ code. You'll find your coding becomes more efficient and, importantly, more fun. What You'll Learn Gain sound principles and rules for clean coding in C++ Carry out test driven development (TDD) Discover C++ design patterns and idioms Apply these design patterns Who This Book Is For Any C++ developer and software engineer with an interest in producing better code.

Working Effectively with Legacy Code

WORK EFFECT LEG CODE _p1

Prentice Hall Professional Get more out of your legacy systems: more performance, functionality, reliability, and manageability Is your code easy to change? Can you get nearly instantaneous feedback when you do change it? Do you understand it? If the answer to any of these questions is

no, you have legacy code, and it is draining time and money away from your development efforts. In this book, Michael Feathers offers start-to-finish strategies for working more effectively with large, untested legacy code bases. This book draws on material Michael created for his renowned Object Mentor seminars: techniques Michael has used in mentoring to help hundreds of developers, technical managers, and testers bring their legacy systems under control. The topics covered include Understanding the mechanics of software change: adding features, fixing bugs, improving design, optimizing performance Getting legacy code into a test harness Writing tests that protect you against introducing new problems Techniques that can be used with any language or platform—with examples in Java, C++, C, and C# Accurately identifying where code changes need to be made Coping with legacy systems that aren't object-oriented Handling applications that don't seem to have any structure This book also includes a catalog of twenty-four dependency-breaking techniques that help you work with program elements in isolation and make safer changes.

The Practice of Programming

Addison-Wesley Professional With the same insight and authority that made their book *The Unix Programming Environment* a classic, Brian Kernighan and Rob Pike have written *The Practice of Programming* to help make individual programmers more effective and productive. The practice of programming is more than just writing code. Programmers must also assess tradeoffs, choose among design alternatives, debug and test, improve performance, and maintain software written by themselves and others. At the same time, they must be concerned with issues like compatibility, robustness, and reliability, while meeting specifications. *The Practice of Programming* covers all these topics, and more. This book is full of practical advice and real-world examples in C, C++, Java, and a variety of special-purpose languages. It includes chapters on: debugging: finding bugs quickly and methodically testing: guaranteeing that software works correctly and reliably performance: making programs faster and more compact portability: ensuring that programs run everywhere without change design: balancing goals and constraints to decide which algorithms and data structures are best interfaces: using abstraction and information hiding to control the interactions between components style: writing code that works well and is a pleasure to read notation: choosing languages and tools that let the machine do more of the work Kernighan and Pike have distilled years of experience writing programs, teaching, and working with other programmers to create this book. Anyone who writes software will profit from the principles and guidance in *The Practice of Programming* .

Visual Models for Software Requirements

Pearson Education Apply best practices for capturing, analyzing, and implementing software requirements through visual models—and deliver better results for your business. The authors—experts in eliciting and visualizing requirements—walk you through a simple but comprehensive language of visual models that has been used on hundreds of real-world, large-scale projects. Build your fluency with core concepts—and gain essential, scenario-based context and implementation advice—as you progress through each chapter. Transcend the limitations of text-based requirements data using visual models that more rigorously identify, capture, and validate requirements Get real-world guidance on best ways to use visual models—how and when, and ways to combine them for best project outcomes Practice the book’s concepts as you work through chapters Change your focus from writing a good requirement to ensuring a complete system

Agile Processes in Software Engineering and Extreme Programming

8th International Conference, XP
2007, Como, Italy, June 18-22,
2007, Proceedings

Springer This book constitutes the refereed proceedings of the 8th International Conference on Agile Processes in Software Engineering and eXtreme Programming, XP 2007, held in Como, Italy in June 2007. It covers managing agile processes, extending agile methodologies, teaching and introducing agile methodologies, methods and tools, empirical studies, and methodology issue.

Guide to the Software Engineering

Body of Knowledge (Swebok(r))

Version 3.0

In the **Guide to the Software Engineering Body of Knowledge (SWEBOK(R) Guide)**, the IEEE Computer Society establishes a baseline for the body of knowledge for the field of software engineering, and the work supports the Society's responsibility to promote the advancement of both theory and practice in this field. It should be noted that the Guide does not purport to define the body of knowledge but rather to serve as a compendium and guide to the knowledge that has been developing and evolving over the past four decades. Now in Version 3.0, the Guide's 15 knowledge areas summarize generally accepted topics and list references for detailed information. The editors for Version 3.0 of the SWEBOK(R) Guide are Pierre Bourque (Ecole de technologie superieure (ETS), Universite du Quebec) and Richard E. (Dick) Fairley (Software and Systems Engineering Associates (S2EA)).

The Data Science Handbook

John Wiley & Sons A comprehensive overview of data science covering the analytics, programming, and business skills necessary to master the discipline Finding a good data scientist has been likened to hunting for a unicorn: the required combination of technical skills is simply very hard to find in one person. In addition, good data science is not just rote application of trainable skill sets; it requires the ability to think flexibly about all these areas and understand the connections between them. This book provides a crash course in data science, combining all the necessary skills into a unified discipline. Unlike many analytics books, computer science and software engineering are given extensive coverage since they play such a central role in the daily work of a data scientist. The author also describes classic machine learning algorithms, from their mathematical foundations to real-world applications. Visualization tools are reviewed, and their central importance in data science is highlighted. Classical statistics is addressed to help readers think critically about the interpretation of data and its common pitfalls. The clear communication of technical results, which is perhaps the most undertrained of data science skills, is given its own chapter, and all topics are explained in the context of solving real-world data problems. The book also features:

- Extensive sample code and tutorials using Python™ along with its technical libraries
- Core technologies of “Big Data,” including their strengths and limitations and how they can be used to solve real-world problems
- Coverage of the practical realities of the tools, keeping theory to a minimum; however, when theory is presented, it is done in an intuitive way to encourage

critical thinking and creativity • A wide variety of case studies from industry • Practical advice on the realities of being a data scientist today, including the overall workflow, where time is spent, the types of datasets worked on, and the skill sets needed The Data Science Handbook is an ideal resource for data analysis methodology and big data software tools. The book is appropriate for people who want to practice data science, but lack the required skill sets. This includes software professionals who need to better understand analytics and statisticians who need to understand software. Modern data science is a unified discipline, and it is presented as such. This book is also an appropriate reference for researchers and entry-level graduate students who need to learn real-world analytics and expand their skill set. FIELD CADY is the data scientist at the Allen Institute for Artificial Intelligence, where he develops tools that use machine learning to mine scientific literature. He has also worked at Google and several Big Data startups. He has a BS in physics and math from Stanford University, and an MS in computer science from Carnegie Mellon.

Software Assessments, Benchmarks, and Best Practices

Addison-Wesley Professional Teaching software professionals how to combine assessments (qualitative information) and benchmarking (quantitative information) this text aims to encourage better software analysis.

Satellite Events at the MoDELS 2005 Conference

MoDELS 2005 International
Workshop OCLWS, MoDeVA,
MARTES, AOM, MTiP, WiSME,
MODAUI, Nfc, MDD, WUsCaM,
Montego Bay, Jamaica, October 2-7,

2005, Revised Selected Papers

Springer Science & Business Media This book constitutes the thoroughly refereed post-proceedings of 10 international workshops held as satellite events of the 8th International Conference on Model Driven Engineering Languages and Systems, MoDELS 2005, in Montego Bay, Jamaica in October 2005 (see LNCS 3713). The 30 revised full papers were carefully selected for inclusion in the book and are presented along with an educators's and a doctoral symposium section comprising additional 13 short articles. The papers are organized in topical sections representing the various workshops: tool support for OCL and related formalisms, model design and validation (MoDeVA), modeling and analysis of real-time and embedded systems (MARTES), aspect oriented modeling (AOM), model transformations in practice (MTiP), software model engineering (WiSME), model driven development of advanced user interfaces (MODAUI), models for non-functional aspects of component-based software (NfC), MDD for software product-lines, and use cases in model-driven software engineering (WUsCaM).

Accelerate

The Science of Lean Software and DevOps: Building and Scaling High Performing Technology Organizations

IT Revolution Winner of the Shingo Publication Award Accelerate your organization to win in the marketplace. How can we apply technology to drive business value? For years, we've been told that the performance of software delivery teams doesn't matter—that it can't provide a competitive advantage to our companies. Through four years of groundbreaking research to include data collected from the State of DevOps reports conducted with Puppet, Dr. Nicole Forsgren, Jez Humble, and Gene Kim set out to find a way to measure software delivery performance—and what drives it—using rigorous statistical methods. This book presents both the findings and the science behind that research, making the information accessible for readers to apply in their own organizations. Readers will discover how to measure the performance of their teams, and what capabilities they should invest in to drive higher performance. This book is ideal for management at every level.