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# Making Software What Really Works And Why We Believe It Andy Oram

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**Engineering Pro  
duction-Grade  
Shiny Apps**  
"O'Reilly  
Media, Inc."  
Are you  
working on a

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codebase where bottlenecks their effect,  
cost overruns, among teams. find implicit  
death marches, Best of all, dependencies  
and heroic the techniques between  
fights with build on different  
legacy code behavioral data modules, and  
monsters are that you automatically  
the norm? already have: create  
Battle these your version- knowledge maps  
adversaries control system. of your system  
with novel ways Join the fight based on actual  
to identify and for better code  
prioritize code! Use contributions.  
technical debt, statistics and In a radical,  
based on data science to much-needed  
behavioral data uncover both change from  
from how problematic common  
developers work code and the practice, guide  
with code. And behavioral organizational  
that's just for patterns of the decisions with  
starters. developers who objective data  
Because good build your by measuring  
code involves software. This how well your  
social design, combination development  
as well as gives you teams align  
technical insights you with the  
design, you can can't get from software  
find surprising the code alone. architecture.  
dependencies Use these Discover a  
between people insights to comprehensive  
and code to prioritize set of  
resolve refactoring practical  
coordination needs, measure analysis

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techniques based on version-control data, where each point is illustrated with a case study from a real-world codebase. Because the techniques are language neutral, you can apply them to your own code no matter what programming language you use. Guide organizational decisions with objective data by measuring how well your development teams align with the software architecture. Apply research findings from

social psychology to software development, ensuring you get the tools you need to coach your organization towards better code. If you're an experienced programmer, software architect, or technical manager, you'll get a new perspective that will change how you work with code. What You Need: You don't have to install anything to follow along in the book. The case studies in the book use well-known open source projects hosted on

GitHub. You'll use CodeScene, a free software analysis tool for open source projects, for the case studies. We also discuss alternative tooling options where they exist.

[Software for Artists Book](#) Prentice Hall Professional Peter Seibel interviews 15 of the most interesting computer programmers alive today in *Coders at Work*, offering a companion volume to Apress' s highly acclaimed best-seller *Founders at Work* by Jessica Livingston. As the words " at work " suggest, Peter Seibel focuses on how his interviewees tackle the day-to-day

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work of programming, framework, now at while revealing much more, like how they became great programmers, how they recognize programming talent in others, and what kinds of problems they find most interesting. Hundreds of people have suggested names of programmers to interview on the Coders at Work web site: [www.codersatwork.com](http://www.codersatwork.com). The complete list was 284 names. Having digested everyone ' s feedback, we selected 15 folks who ' ve been kind enough to agree to be interviewed: Frances Allen: Pioneer in optimizing compilers, first woman to win the Turing Award (2006) and first female IBM fellow Joe Armstrong: Inventor of Erlang Joshua Bloch: Author of the Java collections

Google Bernie Cosell: One of the main software guys behind the original ARPANET IMPs and a master debugger Douglas Crockford: JSON founder, JavaScript architect at Yahoo! L. Peter Deutsch: Author of Ghostscript, implementer of Smalltalk-80 at Xerox PARC and Lisp 1.5 on PDP-1 Brendan Eich: Inventor of JavaScript, CTO of the Mozilla Corporation Brad Fitzpatrick: Writer of LiveJournal, OpenID, memcached, and Perlbal Dan Ingalls: Smalltalk implementor and designer Simon Peyton Jones: Coinventor of Haskell and lead designer of Glasgow Haskell Compiler Donald

Knuth: Author of The Art of Computer Programming and creator of TeX Peter Norvig: Director of Research at Google and author of the standard text on AI Guy Steele: Coinventor of Scheme and part of the Common Lisp Gang of Five, currently working on Fortress Ken Thompson: Inventor of UNIX Jamie Zawinski: Author of XEmacs and early Netscape/Mozilla hacker [Working Effectively with Legacy Code](#) Springer Science & Business Media An accessible, comic book-like, illustrated introduction to how the internet works under the hood, designed to give people a basic understanding of the

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technical aspects of the Internet that they need in order to advocate for digital rights. The internet has profoundly changed interpersonal communication, but most of us don't really understand how it works. What enables information to travel across the internet? Can we really be anonymous and private online? Who controls the internet, and why is that important? And... what's with all the cats? How the Internet Really Works answers these questions and more. Using clear language and whimsical illustrations, the authors translate highly technical topics into accessible, engaging prose that demystifies the world's most

intricately linked computer network. Alongside a feline guide named Catnip, you'll learn about: • The "How-What-Why" of nodes, packets, and internet protocols • Cryptographic techniques to ensure the secrecy and integrity of your data • Censorship, ways to monitor it, and means for circumventing it • Cybernetics, algorithms, and how computers make decisions • Centralization of internet power, its impact on democracy, and how it hurts human rights • Internet governance, and ways to get involved This book is also a call to action, laying out a roadmap for using your newfound knowledge to influence the

evolution of digitally inclusive, rights-respecting internet laws and policies. Whether you're a citizen concerned about staying safe online, a civil servant seeking to address censorship, an advocate addressing worldwide freedom of expression issues, or simply someone with a cat-like curiosity about network infrastructure, you will be delighted -- and enlightened -- by Catnip's felicitously fun guide to understanding how the internet really works! **Head First Software Development** CRC Press **Building on their breakthrough bestsellers** *Lean Software Development* and

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Implementing Lean Software Development, Mary and Tom Poppendieck 's latest book shows software leaders and team members exactly how to drive high-value change throughout a software organization—and make it stick. They go far beyond generic implementation guidelines, demonstrating exactly how to make lean work in real projects, environments, and companies. The Poppendiecks organize this book around the crucial concept of frames, the unspoken mental constructs that shape

our perspectives and control our behavior in ways we rarely notice. For software leaders and team members, some frames lead to long-term failure, while others offer a strong foundation for success. Drawing on decades of experience, the authors present twenty-four frames that offer a coherent, complete framework for leading lean software development. You ' ll discover powerful new ways to act as competency leader, product champion, improvement mentor, front-line leader, and even visionary. Systems thinking: focusing on

customers, bringing predictability to demand, and revamping policies that cause inefficiency

Technical excellence: implementing low-dependency architectures, TDD, and evolutionary development processes, and promoting deeper developer expertise

Reliable delivery: managing your biggest risks more effectively, and optimizing both workflow and schedules

Relentless improvement: seeing problems, solving problems, sharing the knowledge

Great people: finding and growing professionals with purpose, passion,

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persistence, and pride  
Aligned leaders:  
getting your entire  
leadership team on  
the same page  
From the world 's  
number one experts in  
Lean software  
development,  
Leading Lean  
Software  
Development will be  
indispensable to  
everyone who wants  
to transform the  
promise of lean into  
reality—in enterprise  
IT and software  
companies alike.  
Mastering Shiny  
CRC Press  
Software project  
managers and  
their team  
members work  
individually  
towards a  
common goal.  
This book guides  
both, emphasizing

basic principles  
that work at work.  
Software at work  
should be  
pleasant and  
productive, not  
just one or the  
other. This book  
emphasizes  
software project  
management at  
work. The author's  
unique approach  
concentrates on  
the concept that  
success on  
software projects  
has more to do  
with how people  
think individually  
and in groups than  
with programming.  
He summarizes  
past successful  
projects and why  
others failed.  
Visibility and  
communication  
are more  
important than

SQL and C. The  
book discusses  
the technical and  
people aspects of  
software and how  
they relate to one  
another. The first  
part of the text  
discusses four  
themes: (1)  
people, process,  
product, (2)  
visibility, (3)  
configuration  
management, and  
(4) IEEE  
Standards. These  
themes stress  
thinking,  
organization,  
using what others  
have built, and  
people. The  
second part  
describes the  
software  
management  
principles of  
process, planning,  
and risk

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management. Part three discusses software engineering principles, the technical aspects of software projects. The fourth part examines software practices giving practical meaning to the individual topics covered in the preceding chapters. The final part of this book continues these practical aspects by illustrating a sample project through seven distinctive documents.

*Domain-driven Design* "O'Reilly Media, Inc."

You need to get value from your software project.

You need it "free, now, and perfect." We can't get you there, but we can help you get to "cheaper, sooner, and better." This book leads you from the desire for value down to the specific activities that help good Agile projects deliver better software sooner, and at a lower cost. Using simple sketches and a few words, the author invites you to follow his path of learning and understanding from a half century of software development and from his engagement with Agile methods from their very

beginning. The book describes software development, starting from our natural desire to get something of value. Each topic is described with a picture and a few paragraphs. You're invited to think about each topic; to take it in. You'll think about how each step into the process leads to the next. You'll begin to see why Agile methods ask for what they do, and you'll learn why a shallow implementation of Agile can lead to only limited improvement. This is not a detailed map, nor a step-by-step set of



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instructions for building the perfect project. There is no map or instructions that will do that for you. You need to build your own project, making it a bit more perfect every day. To do that effectively, you need to build up an understanding of the whole process. This book points out the milestones on your journey of understanding the nature of software development done well. It takes you to a location, describes it briefly, and leaves you to explore and fill in your own understanding.

What You Need:

You'll need your Standard Issue Brain, a bit of curiosity, and a desire to build your own understanding rather than have someone else's detailed ideas poured into your head.

Coders at Work  
Pearson Education  
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,

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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.

*Leading Lean Software Development* MIT Press  
Salary surveys worldwide  
regularly place software architect in the top 10 best jobs, yet no real guide exists to help developers become architects. Until now. This book provides the first comprehensive overview of software architecture's many aspects. Aspiring and existing architects alike will examine architectural characteristics, architectural patterns, component determination,

diagramming and presenting architecture, evolutionary architecture, and many other topics. Mark Richards and Neal Ford—hands-on practitioners who have taught software architecture classes professionally for years—focus on architecture principles that apply across all technology stacks. You'll explore software architecture in a modern light, taking into account all the innovations of the past decade. This book examines:  
Architecture

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patterns: The technical basis for many architectural decisions  
Components: Identification, coupling, cohesion, partitioning, and granularity  
Soft skills: Effective team management, meetings, negotiation, presentations, and more  
Modernity: Engineering practices and operational approaches that have changed radically in the past few years  
Architecture as an engineering discipline:  
Repeatable results, metrics, and concrete

valuations that add rigor to software architecture  
*Making Embedded Systems* John Wiley & Sons  
Interested in developing embedded systems? Since they don't tolerate inefficiency, these systems require a disciplined approach to programming.  
This easy-to-read guide helps you cultivate a host of good development practices, based on classic software design patterns and new patterns unique to embedded programming.

Learn how to build system architecture for processors, not operating systems, and discover specific techniques for dealing with hardware difficulties and manufacturing requirements.  
Written by an expert who's created embedded systems ranging from urban surveillance and DNA scanners to children's toys, this book is ideal for intermediate and experienced programmers, no matter what platform you use.  
Optimize your system to reduce cost and increase

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performance  
Develop an architecture that makes your software robust in resource-constrained environments  
Explore sensors, motors, and other I/O devices  
Do more with less: reduce RAM consumption, code space, processor cycles, and power consumption  
Learn how to update embedded code directly in the processor  
Discover how to implement complex mathematics on small processors  
Understand what interviewers look for when you

apply for an embedded systems job  
"Making Embedded Systems is the book for a C programmer who wants to enter the fun (and lucrative) world of embedded systems. It's very well written, entertaining, and filled with clear illustrations."  
Jack Ganssle, author and embedded system expert.  
**The Secret Life of Programs**  
Pearson Education  
Master the Shiny web framework—and take your R skills

to a whole new level. By letting you move beyond static reports, Shiny helps you create fully interactive web apps for data analyses. Users will be able to jump between datasets, explore different subsets or facets of the data, run models with parameter values of their choosing, customize visualizations, and much more.  
Hadley Wickham from RStudio shows data scientists, data analysts, statisticians, and scientific researchers with no knowledge of

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HTML, CSS, or JavaScript how to create rich web apps from R. This in-depth guide provides a learning path that you can follow with confidence, as you go from a Shiny beginner to an expert developer who can write large, complex apps that are maintainable and performant. Get started: Discover how the major pieces of a Shiny app fit together Put Shiny in action: Explore Shiny functionality with a focus on code samples, example apps, and useful techniques Master reactivity: Go deep

into the theory and practice of reactive programming and examine reactive graph components Apply best practices: Examine useful techniques for making your Shiny apps work well in production

**The Software Project Manager's Handbook**  
Addison-Wesley Professional "Domain-Driven Design" incorporates numerous examples in Java- case studies taken from actual projects that illustrate the application of domain-driven

design to real-world software development. [Software Engineering at Google](#) No Starch Press  
A primer on the underlying technologies that allow computer programs to work. Covers topics like computer hardware, combinatorial logic, sequential logic, computer architecture, computer anatomy, and Input/Output. Many coders are unfamiliar with the underlying technologies that make their programs run. But why should you care when your code appears to work? Because you want it to run well

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and not be riddled with hard-to-find bugs. You don't want to be in the news because your code had a security problem. Lots of technical detail is available online but it's not organized or collected into a convenient place. In *The Secret Life of Programs*, veteran engineer Jonathan E. Steinhart explores--in depth--the foundational concepts that underlie the machine. Subjects like computer hardware, how software behaves on hardware, as well as how people have solved problems using technology over time. You'll learn: How the real world is converted into a

form that computers understand, like bits, logic, numbers, text, and colors The fundamental building blocks that make up a computer including logic gates, adders, decoders, registers, and memory Why designing programs to match computer hardware, especially memory, improves performance How programs are converted into machine language that computers understand How software building blocks are combined to create programs like web browsers Clever tricks for making programs more efficient, like loop invariance, strength reduction, and recursive

subdivision The fundamentals of computer security and machine intelligence Project design, documentation, scheduling, portability, maintenance, and other practical programming realities. Learn what really happens when your code runs on the machine and you'll learn to craft better, more efficient code. [Team Geek](#) Pragmatic Bookshelf Many claims are made about how certain tools, technologies, and practices improve software development. But which claims

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are verifiable, and better code  
 which are merely faster? Can code  
 wishful thinking? metrics predict  
 In this book, the number of  
 leading thinkers bugs in a piece  
 such as Steve of software? Do  
 McConnell, Barry design patterns  
 Boehm, and actually make  
 Barbara better software? Ahmed E.  
 Kitchenham offer What effect does  
 essays that personality have  
 uncover the truth on pair  
 and unmask programming?  
 myths commonly What matters  
 held among the more: how far  
 software apart people are  
 development geographically,  
 community. Their or how far apart  
 insights may they are in the  
 surprise you. Are org chart?  
 some Contributors  
 programmers include: Jorge  
 really ten times Aranda Tom Ball  
 more productive Victor R. Basili  
 than others? Andrew Begel  
 Does writing Christian Bird  
 tests first help Barry Boehm  
 you develop Marcelo Cataldo Forrest Shull

Steven Clarke  
 Jason Cohen  
 Robert DeLine  
 Madeline Diep  
 Hakan Erdogmus  
 Michael Godfrey  
 Mark Guzdial Jo  
 E. Hannay  
 Hassan Israel  
 Herraiz Kim  
 Sebastian Herzig  
 Cory Kapser  
 Barbara  
 Kitchenham  
 Andrew Ko  
 Lucas Layman  
 Steve McConnell  
 Tim Menzies Gail  
 Murphy Nachi  
 Nagappan  
 Thomas J.  
 Ostrand  
 Dewayne Perry  
 Marian Petre  
 Lutz Prechelt  
 Rahul Premraj  
 Forrest Shull

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Beth Simon	development	Many claims are
Diomidis	environment.	made about how
Spinellis Neil	Mancuso shows	certain tools,
Thomas Walter	how software	technologies, and
Tichy Burak	craftsmanship fits	practices improve
Turhan Elaine J.	with and helps	software
Weyuker Michele	students improve	development. But
A. Whitecraft	upon best-practice	which claims are
Laurie Williams	technical	verifiable, and
Wendy M.	disciplines such as	which are merely
Williams Andreas	agile and lean,	wishful thinking? In
Zeller Thomas	taking all	this book, leading
Zimmermann	development	thinkers such as
<i>The Software</i>	projects to the	Steve McConnell,
<i>Craftsman</i>	next level.	Barry Boehm, and
Pragmatic	Readers will learn	Barbara
Bookshelf	how to change the	Kitchenham offer
In The Software	disastrous	essays that uncover
Craftsman,	perception that	the truth and
Sandro Mancuso	software	unmask myths
explains what	developers are the	commonly held
craftsmanship	same as factory	among the software
means to the	workers, and that	development
developer and his	software projects	community. Their
or her	can be run like	insights may
organization, and	factories.	surprise you. Are
shows how to live	<i>Site Reliability</i>	some programmers
it every day in	<i>Engineering</i>	really ten times
your real-world	Pragmatic	more productive
	Bookshelf	than others? Does
		writing tests first
		help you develop
		better code faster?



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Can code metrics predict the number of bugs in a piece of software? Do design patterns actually make better software? What effect does personality have on pair programming? What matters more: how far apart people are geographically, or how far apart they are in the org chart?	Herraiz Kim Sebastian Herzig Cory Kapser Barbara Kitchenham Andrew Ko Lucas Layman Steve McConnell Tim Menzies Gail Murphy Nachi Nagappan Thomas J. Ostrand Dewayne Perry Marian Petre Lutz Prechelt Rahul Premraj Forrest Shull Beth Simon Diomidis Spinellis Neil Thomas Walter Tichy Burak Turhan Elaine J. Weyuker Michele A. Whitecraft Laurie Williams Wendy M. Williams Andreas Zeller Thomas Zimmermann	technology companies succeed and grow, so do their engineering departments. In your career, you'll may suddenly get the opportunity to lead teams: to become a manager. But this is often uncharted territory. How can you decide whether this career move is right for you? And if you do, what do you need to learn to succeed? Where do you start? How do you know that you're doing it right?
Contributors include: Jorge Aranda Tom Ball Victor R. Basili Andrew Begel Christian Bird Barry Boehm Marcelo Cataldo Steven Clarke Jason Cohen Robert DeLine Madeline Diep Hakan Erdogmus Michael Godfrey Mark Guzdial Jo E. Hannay Ahmed E. Hassan Israel	<i>INSPIRED</i> O'Reilly Media Software startups make global headlines every day. As	

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What does "it" even mean? And isn't management a dirty word? This book will share the secrets you need to know to manage engineers successfully. Going from engineer to manager doesn't have to be intimidating. Engineers can be managers, and fantastic ones at that. Cast aside the rhetoric and focus on practical, hands-on techniques and tools. You'll become an effective and

supportive team leader that your staff will look up to. Start with your transition to being a manager and see how that compares to being an engineer. Learn how to better organize information, feel productive, and delegate, but not micromanage. Discover how to manage your own boss, hire and fire, do performance and salary reviews, and build a great team. You'll also learn the psychology: how to ship while keeping staff

happy, coach and mentor, deal with deadline pressure, handle sensitive information, and navigate workplace politics. Consider your whole department. How can you work with other teams to ensure best practice? How do you help form guilds and committees and communicate effectively? How can you create career tracks for individual contributors and managers? How can you support flexible and remote working?

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How can you improve diversity in the industry through your own actions? This book will show you how. Great managers can make the world a better place. Join us.

**How to Design Programs, second edition**  
"O'Reilly Media, Inc."

Improve Your Creativity, Effectiveness, and Ultimately, Your Code In Modern Software Engineering, continuous delivery pioneer David Farley helps software professionals think about their

work more effectively, manage it more successfully, and genuinely improve the quality of their applications, their lives, and the lives of their colleagues.

Writing for programmers, managers, and technical leads at all levels of experience, Farley illuminates durable principles at the heart of effective software development. He distills the discipline into two core exercises: learning and exploration and managing complexity. For each, he defines principles that can

help you improve everything from your mindset to the quality of your code, and describes approaches proven to promote success. Farley's ideas and techniques cohere into a unified, scientific, and foundational approach to solving practical software development problems within realistic economic constraints. This general, durable, and pervasive approach to software engineering can help you solve problems you haven't encountered yet,

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using today's technologies and tomorrow's. It offers you deeper insight into what you do every day, helping you create better software, faster, with more pleasure and personal fulfillment. Clarify what you're trying to accomplish. Choose your tools based on sensible criteria. Organize work and systems to facilitate continuing incremental progress. Evaluate your progress toward thriving systems, not just more "legacy code". Gain more value from experimentation and empiricism.

Stay in control as systems grow more complex. Achieve rigor without too much rigidity. Learn from history and experience. Distinguish "good" new software development ideas from "bad" ones. Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details.

**Experimentation in Software Engineering**  
"O'Reilly Media, Inc."  
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,

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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

**Fundamentals of Software Architecture**  
Pragmatic Bookshelf  
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.

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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. *The Nature of Software Development* O'Reilly Media The system design interview is considered to be the most complex and most difficult technical job interview by many. Those questions are intimidating, but don't worry. It's just that nobody has taken the time to prepare you systematically. We take the time. We go slow. We draw lots of diagrams and use lots of examples. You'll learn step-by-step, one question at a time. Don't miss

out. What's inside? - An insider's take on what interviewers really look for and why. - A 4-step framework for solving any system design interview question. - 16 real system design interview questions with detailed solutions. - 188 diagrams to visually explain how different systems work.