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A Mike Cohn Signature Book

Essential Scrum

A Practical Guide to the Most Popular Agile Process

Kenneth S. Rubin

Forewords by Mike Cohn and Ron Jeffries

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Praise for *Essential Scrum*

"Agile coaches, you're gonna be happy with this book. Kenny Rubin has created an indispensable resource for us. Do you have a manager who just doesn't 'get it'? Hand them this book and ask them to flip to Chapter 3 for a complete explanation of how Scrum is less risky than plan-driven management. It's written just for them—in management-speak. Want to help the team come to a common understanding of Scrum? The visual icon language used throughout this book will help you help them. These are just two ways this book can aid you to coach Scrum teams. Use it well."

—Lyssa Adkins, Coach of Agile Coaches, Agile Coaching Institute; author, *Coaching Agile Teams*

"One of the best, most comprehensive descriptions of the core Scrum framework out there! *Essential Scrum* is for anyone—new to or experienced with Scrum—who's interested in the most important aspects of the process. Kenny does an excellent job of distilling the key tenets of the Scrum framework into a simple format with compelling visuals. As a Scrum coach for many teams, I continually reference the material for new ways to help teams that are learning and practicing the framework. I've seen Scrum continually misinterpreted and poorly implemented by big companies and tool vendors for more than ten years. Reading this book will help you get back to the basics and focus on what's important."

—Joe Balistrieri, Process Development Manager, Rockwell Automation

"Corporate IT leadership, which has been slow to embrace agile methods, would benefit immensely from giving a copy of this book to all of their project and delivery managers. Kenny Rubin has laid out in this book all the pragmatic business case and process materials needed for any corporate IT shop to successfully implement Scrum."

—John F. Bauer III, veteran of technical solution delivery in large corporate IT shops

"Kenny's extensive experience as a consultant, trainer, and past managing director of the Scrum Alliance is evident in this book. Along with providing the basics and introduction to Scrum, this book addresses the questions of masses—what happens to project managers? *Essential Scrum* helps us understand the big picture and guides how organization leaders can support and be involved with their Scrum teams for successful agile transformations."

—Sameer S. Bendre, CSM, PMP, Senior Consultant, 3i Infotech Inc.

“If you’re new to agile development or to Scrum, this book will give you a flying start. The examples and descriptions are clear and vivid, and you’ll often find yourself asking a question just before the book addresses that very topic.”

—Johannes Brodwall, Principal Solution Architect, Steria Norway

“Kenny’s well-structured explanations have a clarity to them that echoes the sensibilities of Smalltalk—the development environment with which he worked for years and from which both Scrum and Extreme Programming were born. This book pulls together a thorough set of agile management principles that really hit the mark and will no doubt guide you toward a more effective agile approach.”

—Rowan Bunning, Founder, Scrum WithStyle

“There are lots of books on Scrum these days, but this book takes a new angle: a reality check for software practitioners. Kenny uses real-world examples and clear illustrations to show what makes a solid foundation for successful agile development. Readers will understand the value of building quality in, and the reality that we can’t get everything right up front; we must work incrementally and learn as we go. It might have ‘Scrum’ in the title, but the book leverages effective practices from the larger agile universe to help managers and their teams succeed.”

—Lisa Crispin, coauthor, *Agile Testing*

“Kenny Rubin managed to write the book that I want everyone associated with Scrum development to read! He covers everything you’ll need to know about Scrum and more!”

—Martine Devos, European Scrum Pioneer and Certified Scrum Trainer

“I’ve reviewed a number of agile books in the past few years, so the question of ‘Do we really need another one?’ always comes to my mind. In the case of Kenny’s book, I very much believe the answer is ‘yes.’ Getting the benefit of different, experienced perspectives on commonly encountered and needed material is valuable. Kenny has one of those valuable perspectives. One unique aspect of the book is an interesting ‘iconography’—a new icon language for Scrum and agile that Kenny has created. I believe you’ll find value-added material in this book to expand your ideas for how Scrum can be applied.”

—Scott Duncan, Agile/Scrum coach and trainer

“Anyone who has had Scrum training or has been part of a Scrum team will find *Essential Scrum* to be a great follow-up read. It dives into the details of how to become more agile through implementing Scrum processes, and it explains exactly how to break down complex projects into manageable initiatives (or ‘sprints’). Kenny Rubin provides a wealth of relevant case studies on what worked—or what didn’t—in a variety of organizations. The simple layout and businesslike graphics make it easy to scan quickly and find specific topics. Any organization that is seeking to evolve from a traditional waterfall approach toward a more agile methodology will find *Essential Scrum* a definitive guidebook for the journey."

—Julia Frazier, product manager

"Developing software is hard. Adopting a new way of working while in a project is even harder. This book offers a bypass of many of the pitfalls and will accelerate a team's ability to produce business value and become successful with Scrum. I wish I had this kind of book when I started using Scrum."

—Geir Hedemark, Development Manager, Basefarm AS

"I am convinced that *Essential Scrum* will become the foundation reference for the next generation of Scrum practitioners. Not only is it the most comprehensive introduction to Scrum available today, but it is also extremely well written and easy on the eye with its fantastic new visual Scrum language. If that isn't enough, Kenny shares a range of his valuable personal insights and experiences that we can all certainly learn from."

—Ilan Goldstein, Agile Solutions Manager, Reed Elsevier

"Scrum is elegantly simple, yet deceptively complex. In *Essential Scrum,* Kenny Rubin provides us with a step-by-step guide to those complexities while retaining the essential simplicity. Real-world experiences coupled with enlightening illustrations make Scrum come to life. For senior managers and team members alike, this is a must-read book if you are starting or considering whether to implement Scrum in your organization. This will certainly be a book recommended to my students."

—John Hebley, Hebley & Associates

"Kenny unpacks a wealth of wisdom and knowledge in *Essential Scrum,* providing valuable and comprehensive insights to the practical application of agile/Scrum. Whether you're new to agile or are looking to reach a greater maturity of continuous improvement in your organization, this is a definitive handbook for your toolbox."

—David Luzquiños, Head of Agile Enablement, Agile Coach, Betfair

"Kenny Rubin continues to provide clarity and insight into adopting agile in a pragmatic way. In one hand he holds the formal or ideal Scrum definition, and in the other, the pragmatic application of it. He brings the wisdom of his workshops and years of experience to the table for you to read in his latest book. If you are about to start out on your agile adoption journey or are seeking guidance midcourse, grab a copy."

—Cuan Mulligan, freelance coactive Agile coach

“A decade after publication of the first Scrum books, it is time to combine the essential aspects of the Scrum framework with the practical experiences and approaches of the last ten years. Kenny Rubin does so in a satisfying and nondogmatic way. The reader gets a pragmatic look at Scrum and learns when and how to best apply Scrum to achieve business benefits.”

—Yves Stalgies, Ph.D., Director IT, www.etracker.com

“Adoption of Scrum is most successful when everyone involved—even peripherally—with product development has a good understanding of the fundamentals. *Essential Scrum* provides an ideal overview of both the big picture and the details in an accessible style. It is sure to become a standard reference.”

—Kevin Tureski, Principal, Kevin Tureski Consulting

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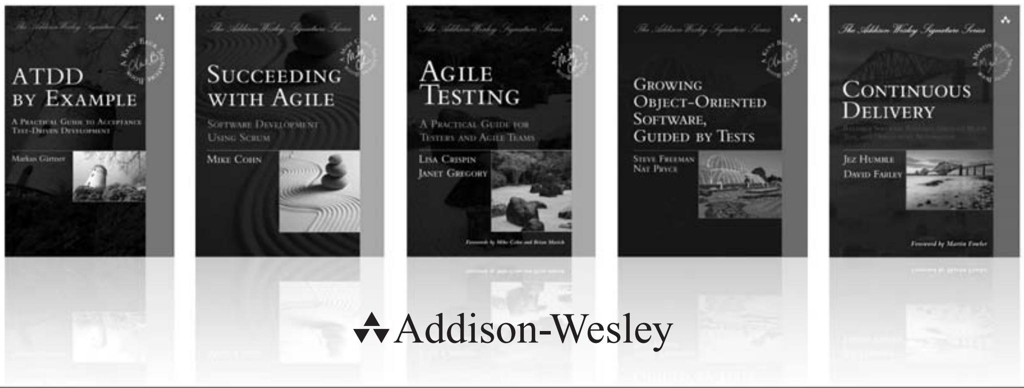

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Essential Scrum

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Kenneth S. Rubin

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To my wife, Jenine, for all your loving support
To my sons, Jonah and Asher, for inspiring me
To my father, Manny, for teaching me the value of hard work
To my mother, Joyce, for showing me what real courage looks like
(may her memory be a blessing)

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FOREWORD BY MIKE COHN

I had lunch today at a Burger King. A sign on the wall proclaimed the restaurant the "Home of the Whopper" and then proceeded to tell me there were over a million different ways to order a Whopper. If various combinations of extra or no pickles, tomatoes, lettuce, cheese, and so on can lead to over a million ways to make a hamburger, there must be billions of possible ways to implement Scrum. And while there is no single right way, there are better and worse ways to implement Scrum.

In *Essential Scrum*, Kenny Rubin helps readers find the better ways. His isn't a prescriptive book—he doesn't say, "You must do this." Instead, he teaches the essential principles underlying success with Scrum and then gives us choices in how we live up to those principles. For example, there is no one right way for all teams to plan a sprint. What works in one company or project will fail in another. And so Kenny gives us choices. He describes an overall structure for why Scrum teams plan sprints and what must result from sprint planning, and he gives us a couple of alternative approaches that will work. But ultimately the decision belongs to each team. Fortunately for those teams, they now have this book to help them.

An unexpected benefit of *Essential Scrum* is the visual language Kenny introduces for communicating about Scrum. I found these images very helpful in following along with the text, and I suspect they will become commonplace in future discussions of Scrum.

The world has needed this book for a long time. Scrum started as a small concept. The first book to talk about it—*Wicked Problems, Righteous Solutions* in 1990 by DeGrace and Stahl—did so in six pages. But in the more than 20 years since that book appeared, Scrum has expanded. New roles, meetings, and artifacts have been introduced and refined. With each new piece that was added, we were at risk of losing the heart of Scrum, that part of it that is about a team planning how to do something, doing some small part of it, and then reflecting on what the team members did and how well they did it together.

With *Essential Scrum*, Kenny brings us back to the heart of Scrum. And from there teams can begin to make the decisions necessary to implement Scrum, making it their own. This book serves as an indispensable guide, helping teams choose among the billions of possible ways of implementing Scrum and finding one that leads to success.

—Mike Cohn
Author of *Succeeding with Agile*, *Agile Estimating and Planning*, and *User Stories Applied*
www.mountaingoatsoftware.com

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Foreword by Ron Jeffries

When Kenny asked me to write a foreword for *Essential Scrum,* I was thinking, "This will be quick and easy; it must be a short book going straight to a simple description of what Scrum is." I knew Kenny's work, so I knew it would be a good read, and short, too. What could be better!

Imagine my surprise and delight when I found that this book covers just about everything you'll need to know about Scrum, on the first day or years into your use of Scrum. And Kenny doesn't stop there. He starts with the central ideas, including the agile principles that underlie all the agile methods, and a quick view of the Scrum framework. Then he drills in, deeper and deeper. It's still a good read, and it's quite comprehensive as well.

Kenny covers planning in good detail, looking at requirements, stories, the backlog, estimation, velocity. Then he takes us deeper into the principles and helps us deal with all the levels of planning and all the time horizons. He describes how sprints are planned, executed, reviewed, and improved. And throughout, he gives us more than the basics, highlighting key issues that you may encounter as you go along.

My own focus in Scrum and agile is on the necessary developer skills to ensure that teams can deliver real, running, business-focused software, sprint after sprint. Kenny helps us understand how to use ideas like velocity and technical debt safely and well. Both of these are critical topics, and I commend them to your attention.

Velocity tells us how much the team is delivering over time. We can use it to get a sense of how much we're getting done and whether we're improving. Kenny warns us, however, that using velocity as a performance measure is damaging to our business results, and he helps us understand why.

Technical debt has become a very broad term, referring to almost everything that could go wrong in the code. Kenny helps us tease apart all the various meanings and helps us understand why we care about these seemingly technical details. In particular, I like his description of how putting a team under pressure will inevitably damage our prospects of getting a good product on time.

Scrum, like all agile methods, relies on an exploratory approach with rapid feedback. Kenny tells a story of his brief use of punch cards, and it reminded me of my earliest experience with computing, many years before Kenny saw his first punch card.

As a college student, I was lucky enough to get a job as a sort of intern at Strategic Air Command headquarters in Omaha. In those days all computing was on cards. My cards got sent down several floors underground at SAC HQ and run on the computer that would run the war, if we ever had one. I was lucky to get one or two runs a day.

As soon as my security clearance came through, I would go down to the computer room in the middle of the night. I would sweet-talk Sergeant Whittaker into letting me run my own programs, sitting at the console of the machine—yes, the machine whose main job was to launch a nuclear attack. Rest easy, though: The red button was not in that room.

Working hands-on with the machine, I got ten times as much work done as when I had to wait for my cards to be taken down and my listings to be brought back up. Feedback came faster, I learned faster, and my programs worked sooner.

That's what Scrum is about. Instead of waiting months or even years to find out what the programmers are doing, in Scrum we find out every couple of weeks. A Scrum product owner with a really good team will be seeing actual features taking shape every few days!

And that is what Kenny's book is about. If you're new to Scrum, read it through from beginning to end. Then keep it nearby. If you've been doing Scrum for a while, scan it, then keep it nearby.

When you find yourself thinking about something that's happening to your team, or wondering about different things to try, pick up this book and look around. Chances are you'll find something of value.

—Ron Jeffries

Preface

This book discusses Essential Scrum—the things you have to know if you're going to be successful when using Scrum to develop innovative products and services.

What Is Essential Scrum?

Scrum is based on a small set of core **values**, **principles**, and **practices** (collectively the **Scrum framework**). Organizations using Scrum should embrace the Scrum framework in its entirety, perhaps not through the entire organization all at once, but certainly within the initial teams that will use Scrum. Embracing all of Scrum does not mean, however, that organizations must implement Scrum according to some cookie-cutter, one-size-fits-all formula. Rather, it means that organizations should always stay true to the Scrum framework while choosing an appropriate blend of **approaches** for their Scrum implementations.

Essential Scrum combines the values, principles, and practices of Scrum with a set of tried-and-true approaches that are consistent with, but not mandated by, the Scrum framework. Some of these approaches will be appropriate to your situation; others will not. Any approach will need to be inspected and adapted to your unique circumstances.

Origins of This Book

As an agile/Scrum coach and trainer, I am frequently asked for a reference book for Scrum—one that provides a comprehensive overview of the Scrum framework and also presents the most popular approaches for applying Scrum. Because I have been unable to find a single book that covers these topics at a level deep enough to be useful to today's practitioners, I found myself recommending a collection of books: a few that discuss the Scrum framework but are out of date or incomplete; several highly regarded agile books that do not focus solely on Scrum; and a handful that are focused on a specific aspect of Scrum or a specific approach but do not cover the full Scrum framework in depth. That's a lot of books for someone who just wants a single, stand-alone resource that covers the essentials of Scrum!

The originators of Scrum (Jeff Sutherland and Ken Schwaber) do have a Scrum-specific publication called "The Scrum Guide." This short document (about 15 pages) is described by its authors as the "definitive rule book of Scrum and the documentation of Scrum itself" (Schwaber and Sutherland 2011). They equate their document to the rules of the game of chess, "describing how the pieces move, how turns are taken, what is a win, and so on." Although useful as a Scrum overview or rule book, "The Scrum Guide" is by design not intended to be a comprehensive source of essential Scrum knowledge. Extending the authors' analogy, giving a new Scrum team just "The Scrum Guide" and expecting good results would be like giving a new chess player a 15-page description of the rules of chess and expecting her to be able to play a reasonable game of chess after reading it. It just isn't a stand-alone resource.

This book, *Essential Scrum,* is an attempt to be the missing single source for essential Scrum knowledge. It includes an in-depth discussion of Scrum's principles, values, and practices—one that in most cases agrees with other agile thought leaders and "The Scrum Guide." (Where this book offers a different perspective from what is widely promoted elsewhere, I point it out and explain why.) This book also describes approaches that are consistent with the Scrum framework and that have been used successfully by me and teams I have coached. I did not intend for this book to replace other books that provide a deep vertical treatment of a given Scrum practice or approach. Such books are complementary to and extend this book. Rather, think of *Essential Scrum* as the starting point on the journey of using Scrum to delight customers.

Intended Audience

For the many thousands of people who have taken my Working on a Scrum Team, Certified ScrumMaster, and Certified Scrum Product Owner classes, and the many teams I have coached, this book will refresh and perhaps even clarify topics we have already discussed. And for the even larger number of people with whom I have not yet had the pleasure of working, this book will either be your first introduction to Scrum and agile or it will be a chance to look at Scrum in a different light and perhaps even improve how you perform Scrum.

I did not write this book for any one specific role—this is not a book specifically for product owners, or ScrumMasters, or members of the development team. Instead, it is a book intended to give everyone involved with Scrum, from all the members of the Scrum team to those with whom they interact in the organization, a common understanding of Scrum based on a core set of concepts with a clear vocabulary for discussing them. With this shared foundation my hope is that your organization will be in a better position to successfully use Scrum to deliver business value.

I imagine that every Scrum team member would have a copy of this book on her desk open to a chapter relevant to the work at hand. I also envision managers at all levels of the organization reading it to understand why Scrum can be an effective approach for managing work and to understand the type of organizational change that may be necessary to successfully implement Scrum. Organizations using or planning to use an agile approach other than Scrum will also find the information relevant and helpful to their specific agile adoption.

Organization of This Book

This book begins with a brief introduction to Scrum (Chapter 1) and concludes with a discussion of where you might go next (Chapter 23). The remaining chapters are organized into four parts:

- Part I—Core Concepts (Chapters 2–8): Scrum framework, agile principles, sprints, requirements and user stories, product backlog, estimating and velocity, and technical debt
- Part II—Roles (Chapters 9–13): product owner, ScrumMaster, development team, Scrum team structures, and managers
- Part III—Planning (Chapters 14–18): Scrum planning principles, multilevel planning, portfolio planning, envisioning/product planning, and release planning
- Part IV—Sprinting (Chapters 19–22): sprint planning, sprint execution, sprint review, and sprint retrospective

How to Use This Book

As you would expect, I wrote the book assuming that most people would read it linearly from front to back. If you are new or newer to Scrum, you should take this approach because the chapters do tend to build on one another. That being said, if you are looking for one place to get an end-to-end overview of the Scrum framework (a highly visual Scrum primer), read and reference Chapter 2.

For those who are more familiar with Scrum, you can use this book as a Scrum reference guide. If you're interested in sprint retrospectives, jump directly to Chapter 22. If you are interested in exploring the nuances of the product backlog, jump directly to Chapter 6. I highly recommend, however, that everyone, even those familiar with Scrum, read Chapter 3 in its entirety. The principles laid out there form the foundation of the Scrum framework and the rest of the book. It is not simply a restatement of the values and principles of the Agile Manifesto (Beck et al. 2001) that is common in many other written descriptions of Scrum.

Visual Icon Language

I am proud to include in this book a new visual language for describing Scrum. This language is composed from a vocabulary of icons that have been designed to capture essential Scrum roles, artifacts, and activities. This visual Scrum language is an effective way to communicate concepts and improves the overall shared understandability of Scrum. If you are interested in obtaining and using the new full-color visual Scrum language art (this book is printed in two colors), visit www.innolution.com for details. This website will also host a variety of resources and discussions related to the book.

Let's Get Started

So, whatever your role, whatever your situation, you have picked up this book for a reason. Spend a little time getting to know Scrum. In the pages that follow you just might find a powerful framework that you can make your own, allowing you to substantially improve the way you develop and deliver products and services to delight your customers.

Acknowledgments

This book would not have been possible without the input of many people, including the thousands of people who have attended my agile-related classes and coaching sessions. By mentioning some people by name, I run the risk of failing to mention others. To those whose names I fail to mention, please know that all of our discussions and email exchanges have been invaluable to me and have definitely influenced this book!

There are three people in particular I would like to thank: Mike Cohn, Rebecca Traeger, and Jeff Schaich. Without the unique involvement of each, this book would be a mere shadow of itself.

Mike Cohn has been a friend and colleague since we first worked together at Genomica in 2000. He was gracious enough to include my book in the Mike Cohn Signature Series; by being affiliated with Mike and the other prestigious authors in that book series, "I look good by the company that I keep," as my parents would say. Mike was my go-to person whenever I wanted to bounce around ideas or discuss book strategies. He always made time in his insane schedule to review each chapter and give me his thoughtful feedback. Working with Mike all these years has been a very rewarding experience—one that I hope will continue long into the future.

Rebecca Traeger has been my personal editor on this book. We have worked together since my days as managing director of the Scrum Alliance in 2007. At that time Rebecca was the editor of the Scrum Alliance website and through that work (and much more since) became the industry's foremost editor on agile-related materials. Early on in writing this book I reached out to Rebecca and asked if she would work with me again, and to my good fortune, she agreed. Nobody saw any chapter unless Rebecca had seen it first. At times her feedback would make me blush, because she frequently improved how I said something, making it sound both more understandable and approachable. If you just love a section of this book, you can be sure Rebecca had her hands in it. If you don't, I probably foolishly chose to ignore her recommendations.

Jeff Schaich is an artist/designer extraordinaire. We have worked on so many different art projects that I can't recall them all. Early on in the formulation of this book I wanted to create an agile/Scrum icon vocabulary to use as the basis for my training presentations and many of the over 200 figures in the book. I knew that I needed a great designer to pull off this feat. Jeff agreed to take on the challenge. There are times when this book seemed like two different projects—writing the content and creating the artistic concepts. I'm honestly not sure which took more time. I am sure, however, that without Jeff's artistic input, this book would have suffered immeasurably.

I am deeply honored to have both Mike Cohn and Ron Jeffries, two luminaries in the agile community, write forewords for the book! In their own unique ways each has done a great job of properly placing the book in context and opening the door for a discussion of Essential Scrum. Also, Mike, stop eating at Burger King, and Ron, thanks for not pushing the red button!

I'd also like to thank the many people who took time out of their busy schedules to review chapters and send me their feedback. Let me start by mentioning reviewers who provided extensive feedback: Joe Balistrieri, Johannes Brodwall, Leyna Cotran, Martine Devos, Scott Duncan, Ilan Goldstein, John Hebley, Geir Hedemark, James Kovacs, Lauri Mackinnon, Robert Maksimchuk, and Kevin Tureski.

In addition, I would like to thank other reviewers who provided excellent feedback on select chapters: Lyssa Adkins, John Bauer, Sameer Bendre, Susan Briscoe, Pawel Brodzinski, Rowan Bunning, Josh Chappell, Lisa Crispin, Ward Cunningham, Cornelius Engelbrecht, Julia Frazier, Brindusa Gabur, Caroline Gordon, Drew Jemilo, Mike Klimkosky, Tom Langerhorst, Bjarne Larsen, Dean Leffingwell, Maurice le Rutte, David Luzquiños, Lv Yi, Shay McAulay, Armond Mehrabian, Sheriff Mohamed, Cuan Mulligan, Greg Pease, Roman Pichler, Jacopo Romei, Jens Schauder, Bill Schroeder, Yves Stalgies, Branko Stojaković, Howard Sublett, Julie Sylvain, Kevin Tambascio, Stephen Wolfram, and Michael Wollin.

I would also like to thank the staff at Pearson who were great partners in this project. They tolerated my delays with patience and always offered encouragement. Special thanks to Chris Guzikowski, who oversaw the whole thing from soup to nuts. He was there from my first Pearson meeting at a pub in Lexington, MA, through the final production. I would also like to thank Olivia Basegio for adeptly handling logistics and Julie Nahil who did a fantastic job overseeing the project. In addition, thanks to Barbara Wood for the great job of helping polish the manuscript and Gail Cocker for pulling all of the art together into a coherent and beautiful whole.

I am also grateful to my assistant, Lindsey Kalicki, to whom I was able to offload many important tasks so that I could stay focused on book development. I am lucky to be able to work with such a skilled professional.

Most of all, I would like to acknowledge my family—Jenine, Jonah, and Asher—and the critical role that they played. I have asked so very much from them during the long effort of creating this book. No amount of gratitude can make up for the family pressure it caused and our lost time together.

Jenine is my loving soulmate and has stuck by me through all of the ups and downs of writing this book. The sacrifices she made so that I could write would double the size of this book if I tried to list them all. I couldn't have done it without her!

Funny thing is, a year after we were married in 1993, I published my first book, *Succeeding with Objects*. At that time Jenine made me promise that I would never write another book again. Luckily for me, after 15 years memories fade and the crushing workload doesn't seem as bad in hindsight, so when she urged me to write this one I was surprised to say the least! She hasn't yet told me I can't do book number three, but I suspect it might be 15 more years before the memory of this one fades enough for either of us to want me to write another one!

I also deeply appreciate the loving support from my sons, Jonah and Asher. They gave up time with their dad so that I could write. They were always there to bounce around ideas and to give input on the book. A number of their content and art suggestions have made their way into the book—and it's better because of them! I hope they learned the value of perseverance and that even the most daunting work can be completed if you take it a step at a time and don't give up.

Finally, I would like to acknowledge my mom, Joyce Rubin (Genesha Esther bat Avrahm), for all of the love and support she gave me. Without her influence this book would never have been possible. Sadly, she did not survive to see its publication. Her passing in January 2012 left a void in my life and the lives of her family that can never be filled. She was a very special person to the many whose lives she touched. Mom, I miss you more than I can possibly express.

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About the Author

Kenny Rubin provides Scrum and agile training and coaching to help companies develop products in an effective and economically sensible way. A Certified Scrum Trainer, Kenny has trained over 18,000 people on agile and Scrum, Smalltalk development, managing object-oriented projects, and transition management. He has coached over 200 companies, ranging from start-ups to Fortune 10.

Kenny was the first Managing Director of the worldwide Scrum Alliance, a nonprofit organization focused on the successful adoption of Scrum. In addition to this book, Kenny is also the coauthor of the 1995 book *Succeeding with Objects: Decision Frameworks for Project Management*. He received his B.S. in Information and Computer Science from the Georgia Institute of Technology and his M.S. in Computer Science from Stanford University.

Kenny's background is rooted in the object-oriented technology community. He started as a Smalltalk developer on a NASA-funded project back in 1985 and developed the first blackboard expert system outside of LISP. In 1988 he was fortunate to join ParcPlace Systems, a start-up company formed as a Xerox PARC spin-off, whose charter was to bring object-oriented technology out of the research labs and release it to the world. As a Smalltalk development consultant with many different organizations in the late 1980s and throughout the 1990s, Kenny was an early adopter of agile practices. His first use of Scrum was in 2000 for developing bioinformatics software.

In the course of his career, Kenny has held many roles, including successful stints as a Scrum product owner, ScrumMaster, and member of development teams. In addition, he has held numerous executive management roles: CEO, COO, VP of Engineering, VP of Product Management, and VP of Professional Services. He has also overseen the development of five commercial software product suites, generating over $200M in aggregate revenue. In addition, he has been directly involved in raising over $150M in venture capital funding and assisted in taking two companies public on the NASDAQ.

His multifaceted background gives Kenny the ability to understand (and explain) Scrum and its implications equally well from multiple perspectives: from the development team to the executive board.

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Chapter 2
Scrum Framework

This chapter provides an overview of the Scrum framework with a primary focus on its practices, including roles, activities, and artifacts. Subsequent chapters will provide a deeper treatment of each of these practices, including an in-depth look at the principles that underlie the practices.

Overview

Scrum is not a standardized process where you methodically follow a series of sequential steps that are guaranteed to produce, on time and on budget, a high-quality product that delights customers. Instead, Scrum is a **framework** for organizing and managing work. The Scrum framework is based on a set of values, principles, and practices that provide the foundation to which your organization will add its unique implementation of relevant engineering practices and your specific approaches for realizing the Scrum practices. The result will be a version of Scrum that is uniquely yours.

To better grasp the framework concept, imagine that the Scrum framework is like the foundation and walls of a building. The Scrum values, principles, and practices would be the key structural components. You can't ignore or fundamentally change a value, principle, or practice without risking collapse. What you can do, however, is customize inside the structure of Scrum, adding fixtures and features until you have a process that works for you.

Scrum is a refreshingly simple, people-centric framework based on the values of honesty, openness, courage, respect, focus, trust, empowerment, and collaboration. Chapter 3 will describe the Scrum principles in depth; subsequent chapters will highlight how specific practices and approaches are rooted in these principles and values.

The Scrum practices themselves are embodied in specific roles, activities, artifacts, and their associated rules (see Figure 2.1).

The remainder of this chapter will focus on Scrum practices.

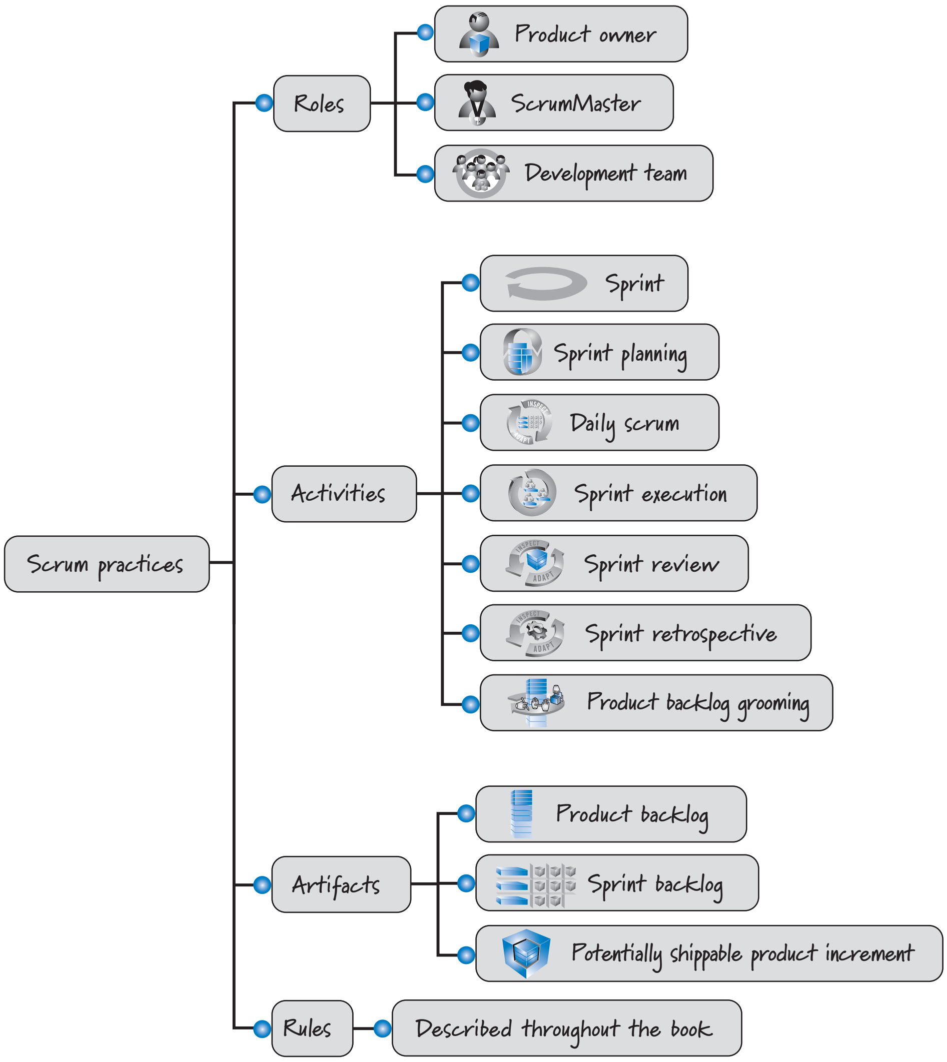

FIGURE 2.1 Scrum practices

Scrum Roles

Scrum development efforts consist of one or more **Scrum teams**, each made up of three Scrum roles: **product owner**, **ScrumMaster**, and the **development team** (see Figure 2.2). There can be other roles when using Scrum, but the Scrum framework requires only the three listed here.

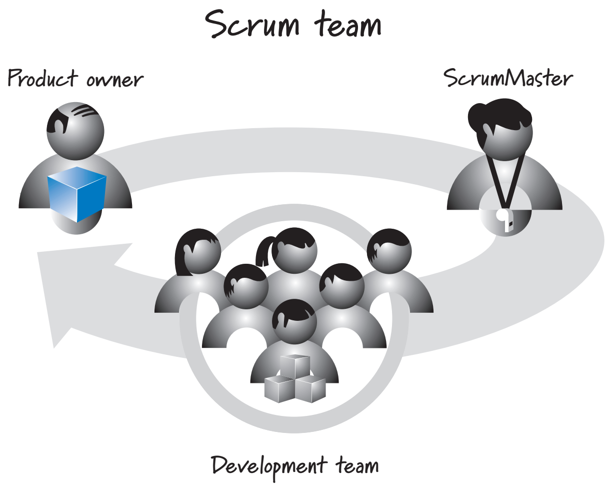

FIGURE 2.2 Scrum roles

The product owner is responsible for what will be developed and in what order. The ScrumMaster is responsible for guiding the team in creating and following its own process based on the broader Scrum framework. The development team is responsible for determining how to deliver what the product owner has asked for.

If you are a manager, don't be concerned that "manager" doesn't appear as a role in Figure 2.2; managers still have an important role in organizations that use Scrum (see Chapter 13). The Scrum framework defines just the roles that are specific to Scrum, not all of the roles that can and should exist within an organization that uses Scrum.

Product Owner

The product owner is the empowered central point of product leadership. He[1] is the single authority responsible for deciding which features and functionality to build and the order in which to build them. The product owner maintains and communicates to all other participants a clear vision of what the Scrum team is trying to achieve. As such, the product owner is responsible for the overall success of the solution being developed or maintained.

It doesn't matter if the focus is on an external product or an internal application; the product owner still has the obligation to make sure that the most valuable work possible, which can include technically focused work, is always performed. To

1. In this book the product owner will always be referred to as "he" or "him" and the ScrumMaster as "she" or "her." This is consistent with the visual representation of each role within the figures.

ensure that the team rapidly builds what the product owner wants, the product owner actively collaborates with the ScrumMaster and development team and must be available to answer questions soon after they are posed. See Chapter 9 for a detailed description of the product owner role.

ScrumMaster

The ScrumMaster helps everyone involved understand and embrace the Scrum values, principles, and practices. She acts as a coach, providing process leadership and helping the Scrum team and the rest of the organization develop their own high-performance, organization-specific Scrum approach. At the same time, the ScrumMaster helps the organization through the challenging change management process that can occur during a Scrum adoption.

As a facilitator, the ScrumMaster helps the team resolve issues and make improvements to its use of Scrum. She is also responsible for protecting the team from outside interference and takes a leadership role in removing **impediments** that inhibit team productivity (when the individuals themselves cannot reasonably resolve them). The ScrumMaster has no authority to exert control over the team, so this role is not the same as the traditional role of project manager or development manager. The ScrumMaster functions as a leader, not a manager. I will discuss the roles of functional manager and project manager in Chapter 13. See Chapter 10 for more details on the ScrumMaster role.

Development Team

Traditional software development approaches discuss various job types, such as architect, programmer, tester, database administrator, UI designer, and so on. Scrum defines the role of a development team, which is simply a diverse, cross-functional collection of these types of people who are responsible for designing, building, and testing the desired product.

The development team self-organizes to determine the best way to accomplish the goal set out by the product owner. The development team is typically five to nine people in size; its members must collectively have all of the skills needed to produce good-quality, working software. Of course, Scrum can be used on development efforts that require much larger teams. However, rather than having one Scrum team with, say, 35 people, there would more likely be four or more Scrum teams, each with a development team of nine or fewer people. See Chapter 11 for more details on the development team role and Chapter 12 for more details on coordinating multiple teams.

Scrum Activities and Artifacts

Figure 2.3 illustrates most of the Scrum activities and artifacts and how they fit together.

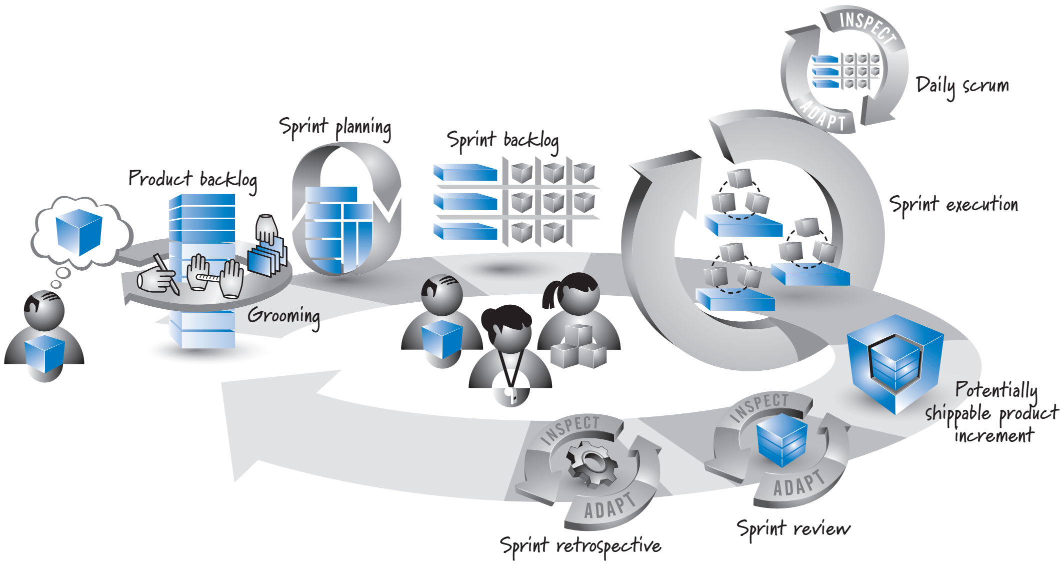

FIGURE 2.3 Scrum framework

Let's summarize the diagram, starting on the left side of the figure and working clockwise around the main looping arrow (the sprint).

The product owner has a vision of what he wants to create (the big cube). Because the cube can be large, through an activity called **grooming** it is broken down into a set of features that are collected into a prioritized list called the product backlog.

A sprint starts with sprint planning, encompasses the development work during the sprint (called sprint execution), and ends with the review and retrospective. The sprint is represented by the large, looping arrow that dominates the center of the figure. The number of items in the product backlog is likely to be more than a development team can complete in a short-duration sprint. For that reason, at the beginning of each sprint, the development team must determine a subset of the product backlog items it believes it can complete—an activity called sprint planning, shown just to the right of the large product backlog cube.

As a brief aside, in 2011 a change in "The Scrum Guide" (Schwaber and Sutherland 2011) generated debate about whether the appropriate term for describing the result of sprint planning is a **forecast** or a **commitment**. Advocates of the word *forecast* like it because they feel that although the development team is making the best estimate that it can at the time, the estimate might change as more information becomes known during the course of the sprint. Some also believe that a commitment on the part of the team will cause the team to sacrifice quality to meet the commitment or will cause the team to "under-commit" to guarantee that the commitment is met.

I agree that all development teams should generate a forecast (estimate) of what they can deliver each sprint. However, many development teams would benefit from using the forecast to derive a commitment. Commitments support mutual trust between the product owner and the development team as well as within the development team. Also, commitments support reasonable short-term planning and decision making within an organization. And, when performing multiteam product development, commitments support synchronized planning—one team can make decisions based on what another team has committed to do. In this book, I favor the term *commitment*; however, I occasionally use *forecast* if it seems correct in context.

To acquire confidence that the development team has made a reasonable commitment, the team members create a second backlog during sprint planning, called the sprint backlog. The sprint backlog describes, through a set of detailed **tasks**, how the team plans to design, build, integrate, and test the selected subset of features from the product backlog during that particular sprint.

Next is sprint execution, where the development team performs the tasks necessary to realize the selected features. Each day during sprint execution, the team members help manage the flow of work by conducting a synchronization, inspection, and adaptive planning activity known as the daily scrum. At the end of sprint execution the team has produced a potentially shippable product increment that represents some, but not all, of the product owner's vision.

The Scrum team completes the sprint by performing two inspect-and-adapt activities. In the first, called the sprint review, the stakeholders and Scrum team inspect the product being built. In the second, called the sprint retrospective, the Scrum team inspects the Scrum process being used to create the product. The outcome of these activities might be adaptations that will make their way into the product backlog or be included as part of the team's development process.

At this point the Scrum sprint cycle repeats, beginning anew with the development team determining the next most important set of product backlog items it can complete. After an appropriate number of sprints have been completed, the product owner's vision will be realized and the solution can be released.

In the remainder of this chapter I will discuss each of these activities and artifacts in greater detail.

Product Backlog

Using Scrum, we always do the most valuable work first. The product owner, with input from the rest of the Scrum team and stakeholders, is ultimately responsible for determining and managing the sequence of this work and communicating it in the form of a prioritized (or ordered) list known as the **product backlog** (see Figure 2.4). On new-product development the product backlog items initially are features required to meet the product owner's vision. For ongoing product development, the product backlog might also contain new features, changes to existing features, defects needing repair, technical improvements, and so on.

The product owner collaborates with internal and external stakeholders to gather and define the product backlog items. He then ensures that product backlog items

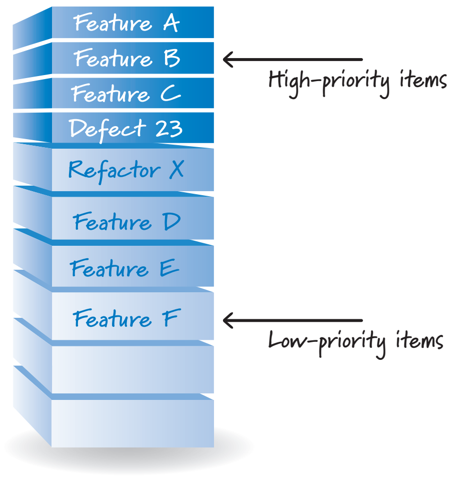

FIGURE 2.4 Product backlog

are placed in the correct sequence (using factors such as value, cost, knowledge, and risk) so that the high-value items appear at the top of the product backlog and the lower-value items appear toward the bottom. The product backlog is a constantly evolving artifact. Items can be added, deleted, and revised by the product owner as business conditions change, or as the Scrum team's understanding of the product grows (through feedback on the software produced during each sprint).

Overall the activity of creating and refining product backlog items, estimating them, and prioritizing them is known as grooming (see Figure 2.5).

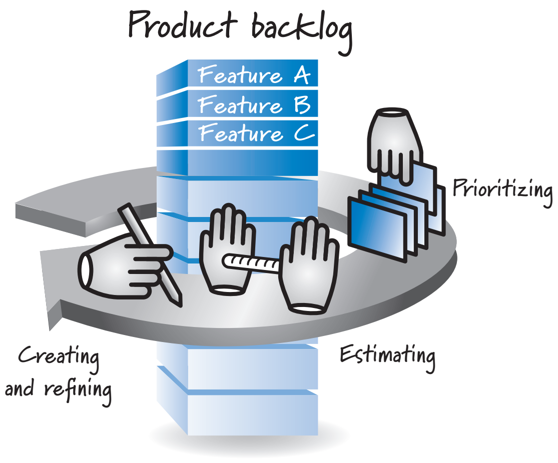

FIGURE 2.5 Product backlog grooming

As a second brief aside, in 2011 there was another debate as to whether the appropriate term for describing the sequence of items in the product backlog should be *prioritized* (the original term) or *ordered*, the term used in "The Scrum Guide" (Schwaber and Sutherland 2011). The argument was that prioritizing is simply one form of ordering (and, according to some, not even the most appropriate form of ordering). The issue of how to best sequence items in the product backlog, however, is influenced by many factors, and a single word may never capture the full breadth and depth of the concept. Although there may be theoretical merit to the ordered-versus-prioritized debate, most people (including me) use the terms interchangeably when discussing the items in the product backlog.

Before we finalize prioritizing, ordering, or otherwise arranging the product backlog, we need to know the size of each item in the product backlog (see Figure 2.6).

Size equates to cost, and product owners need to know an item's cost to properly determine its priority. Scrum does not dictate which, if any, size measure to use with product backlog items. In practice, many teams use a **relative size measure** such as **story points** or **ideal days**. A relative size measure expresses the overall size of an item in such a way that the absolute value is not considered, but the relative size of an item compared to other items is considered. For example, in Figure 2.6, feature C is size 2 and feature E is size 8. What we can conclude is that feature E is about four times larger than feature C. I will discuss these measures further in Chapter 7.

Sprints

In Scrum, work is performed in iterations or cycles of up to a calendar month called **sprints** (see Figure 2.7). The work completed in each sprint should create something of tangible value to the customer or user.

Sprints are **timeboxed** so they always have a fixed start and end date, and generally they should all be of the same duration. A new sprint immediately follows the completion of the previous sprint. As a rule we do not permit any goal-altering changes in scope or personnel during a sprint; however, business needs sometimes make adherence to this rule impossible. I will describe sprints in more detail in Chapter 4.

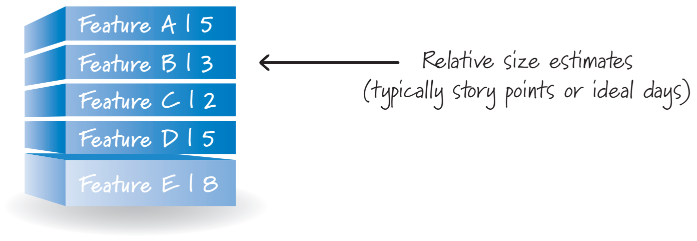

FIGURE 2.6 Product backlog item sizes

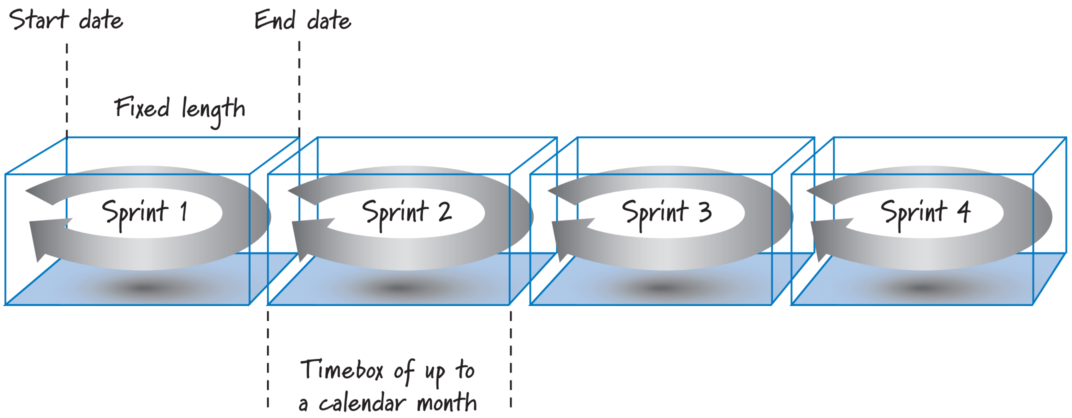

FIGURE 2.7 Sprint characteristics

Sprint Planning

A product backlog may represent many weeks or months of work, which is much more than can be completed in a single, short sprint. To determine the most important subset of product backlog items to build in the next sprint, the product owner, development team, and ScrumMaster perform **sprint planning** (see Figure 2.8).

During sprint planning, the product owner and development team agree on a **sprint goal** that defines what the upcoming sprint is supposed to achieve. Using this

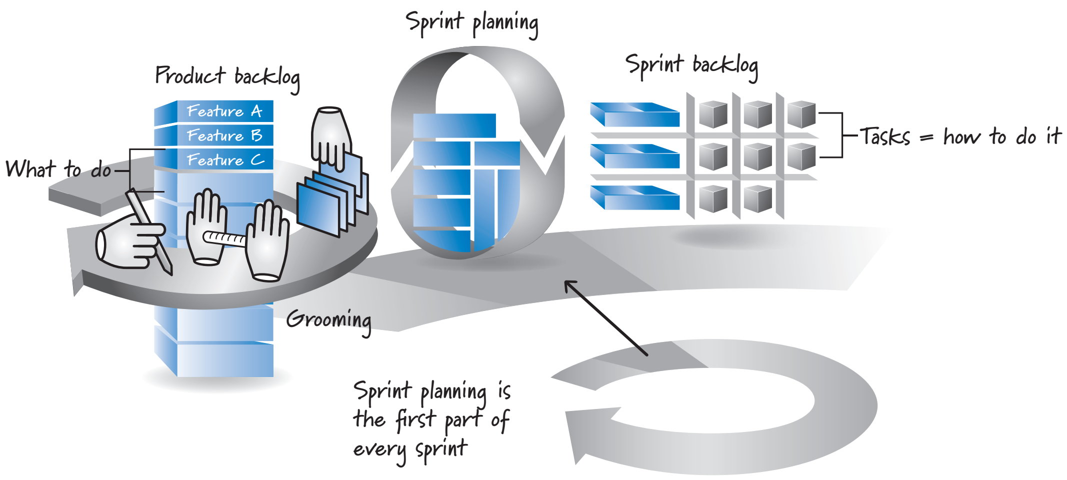

FIGURE 2.8 Sprint planning

goal, the development team reviews the product backlog and determines the high-priority items that the team can realistically accomplish in the upcoming sprint while working at a **sustainable pace**—a pace at which the development team can comfortably work for an extended period of time.

To acquire confidence in what it can get done, many development teams break down each targeted feature into a set of tasks. The collection of these tasks, along with their associated product backlog items, forms a second backlog called the **sprint backlog** (see Figure 2.9).

The development team then provides an estimate (typically in hours) of the effort required to complete each task. Breaking product backlog items into tasks is a form of design and **just-in-time** planning for how to get the features done.

Most Scrum teams performing sprints of two weeks to a month in duration try to complete sprint planning in about four to eight hours. A one-week sprint should take no more than a couple of hours to plan (and probably less). During this time there are several approaches that can be used. The approach I use most often follows a simple cycle: Select a product backlog item (whenever possible, the next-most-important item as defined by the product owner), break the item down into tasks, and determine if the selected item will reasonably fit within the sprint (in combination with other items targeted for the same sprint). If it does fit and there is more capacity to complete work, repeat the cycle until the team is out of capacity to do any more work.

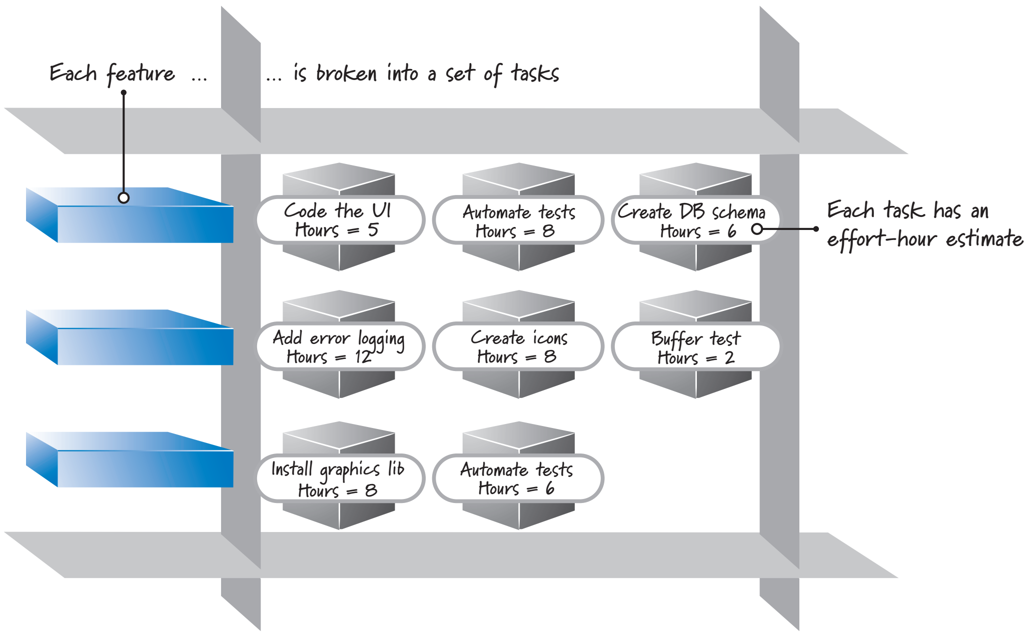
Each feature ...
... is broken into a set of tasks
Code the UI Hours = 5
Automate tests Hours = 8
Create DB schema Hours = 6
Each task has an effort-hour estimate
Add error logging Hours = 12
Create icons Hours = 8
Buffer test Hours = 2
Install graphics lib Hours = 8
Automate tests Hours = 6

FIGURE 2.9 Sprint backlog

An alternative approach would be for the product owner and team to select all of the target product backlog items at one time. The development team alone does the task breakdowns to confirm that it really can deliver all of the selected product backlog items. I will describe each approach in more detail in Chapter 19.

Sprint Execution

Once the Scrum team finishes sprint planning and agrees on the content of the next sprint, the development team, guided by the ScrumMaster's coaching, performs all of the task-level work necessary to get the features done (see Figure 2.10), where "done" means there is a high degree of confidence that all of the work necessary for producing good-quality features has been completed.

Exactly what tasks the team performs depends of course on the nature of the work (for example, are we building software and what type of software, or are we building hardware, or is this marketing work?).

Nobody tells the development team in what order or how to do the task-level work in the sprint backlog. Instead, team members define their own task-level work and then self-organize in any manner they feel is best for achieving the sprint goal. See Chapter 20 for more details on sprint execution.

Daily Scrum

Each day of the sprint, ideally at the same time, the development team members hold a timeboxed (15 minutes or less) **daily scrum** (see Figure 2.11). This inspect-and-adapt activity is sometimes referred to as the **daily stand-up** because of the common practice of everyone standing up during the meeting to help promote brevity.

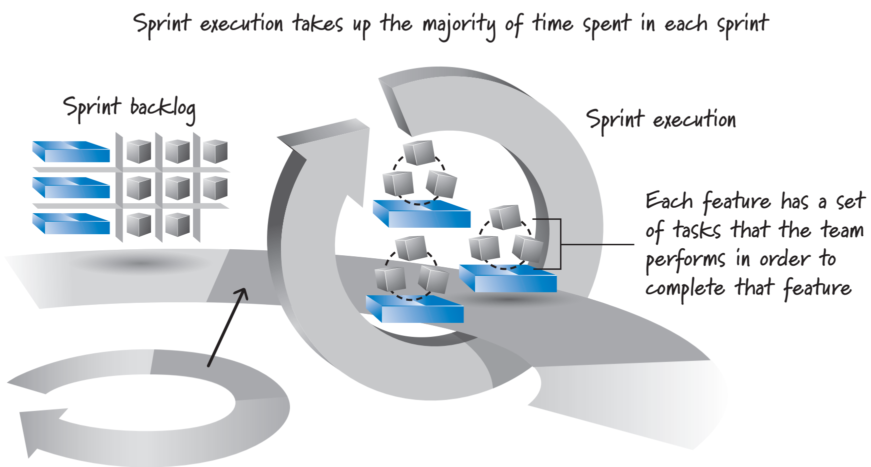
Sprint execution takes up the majority of time spent in each sprint
Sprint backlog
Sprint execution
Each feature has a set of tasks that the team performs in order to complete that feature

FIGURE 2.10 Sprint execution

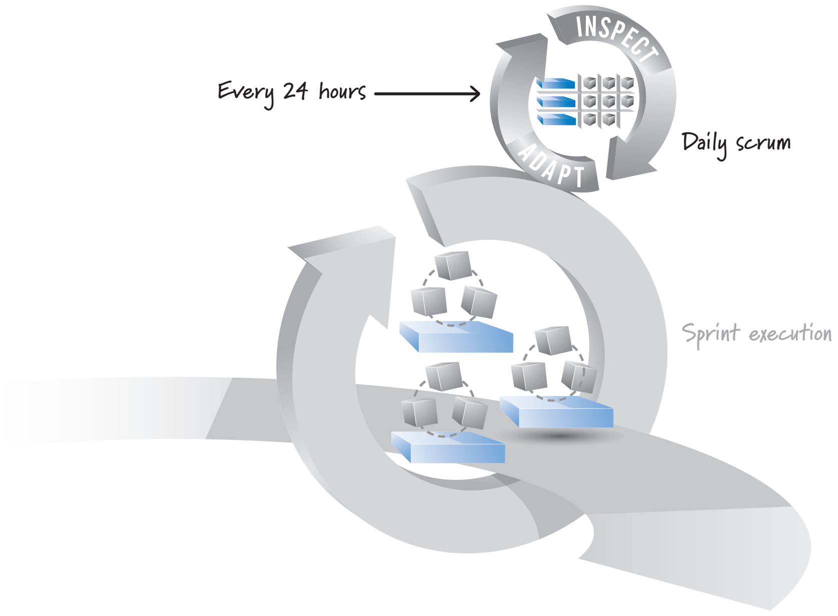

FIGURE 2.11 Daily scrum

A common approach to performing the daily scrum has the ScrumMaster facilitating and each team member taking turns answering three questions for the benefit of the other team members:

- What did I accomplish since the last daily scrum?
- What do I plan to work on by the next daily scrum?
- What are the obstacles or impediments that are preventing me from making progress?

By answering these questions, everyone understands the big picture of what is occurring, how they are progressing toward the sprint goal, any modifications they want to make to their plans for the upcoming day's work, and what issues need to be addressed. The daily scrum is essential for helping the development team manage the fast, flexible flow of work within a sprint.

The daily scrum is not a problem-solving activity. Rather, many teams decide to talk about problems after the daily scrum and do so with a small group of interested people. The daily scrum also is not a traditional status meeting, especially the kind historically called by project managers so that they can get an update on the project's status. A daily scrum, however, can be useful to communicate the status of sprint backlog items among the development team members. Mainly, the daily scrum is an inspection, synchronization, and adaptive daily planning activity that helps a self-organizing team do its job better.

Although their use has fallen out of favor, Scrum has used the terms "**pigs**" and "**chickens**" to distinguish who should participate during the daily scrum versus who simply observes. The farm animals were borrowed from an old joke (which has several variants): "In a ham-and-eggs breakfast, the chicken is involved, but the pig is committed." Obviously the intent of using these terms in Scrum is to distinguish between those who are involved (the chickens) and those who are committed to meeting the sprint goal (the pigs). At the daily scrum, only the pigs should talk; the chickens, if any, should attend as observers.

I have found it most useful to consider everyone on the Scrum team a pig and anyone who isn't, a chicken. Not everyone agrees. For example, the product owner is not required to be at the daily scrum, so some consider him to be a chicken (the logic being, how can you be "committed" if you aren't required to attend?). This seems wrong to me, because I can't imagine how the product owner, as a member of the Scrum team, is any less committed to the outcome of a sprint than the development team. The metaphor of pigs and chickens breaks down if you try to apply it within a Scrum team.

Done

In Scrum, we refer to the sprint results as a **potentially shippable product increment** (see Figure 2.12), meaning that whatever the Scrum team agreed to do is really done according to its agreed-upon definition of done. This definition specifies the degree

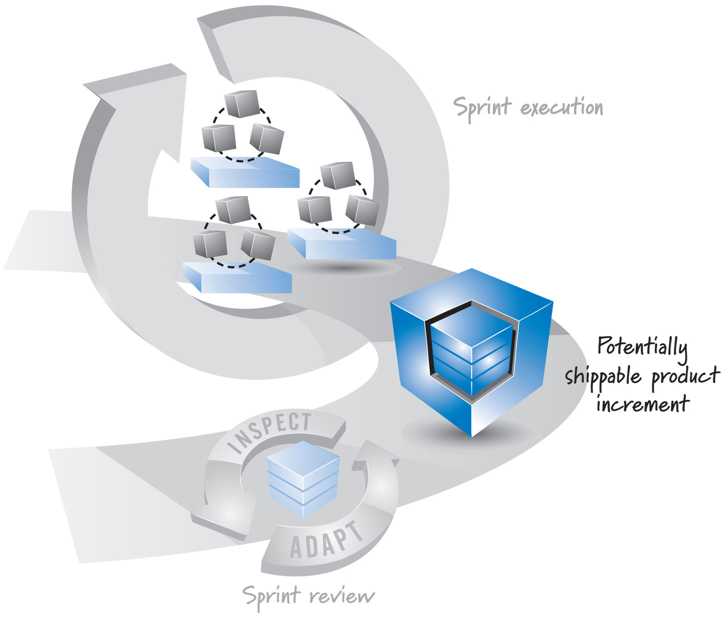

FIGURE 2.12 Sprint results (potentially shippable product increment)

of confidence that the work completed is of good quality and is potentially shippable. For example, when developing software, a bare-minimum definition of done should yield a complete slice of product functionality that is designed, built, integrated, tested, and documented.

An aggressive definition of done enables the business to decide each sprint if it wants to ship (or deploy or release) what got built to internal or external customers.

To be clear, "potentially shippable" does not mean that what got built must actually be shipped. Shipping is a business decision, which is frequently influenced by things such as "Do we have enough features or enough of a customer workflow to justify a customer deployment?" or "Can our customers absorb another change given that we just gave them a release two weeks ago?"

Potentially shippable is better thought of as a state of confidence that what got built in the sprint is actually done, meaning that there isn't materially important undone work (such as important testing or integration and so on) that needs to be completed before we can ship the results from the sprint, if shipping is our business desire.

As a practical matter, over time some teams may vary the definition of done. For example, in the early stages of game development, having features that are potentially shippable might not be economically feasible or desirable (given the exploratory nature of early game development). In these situations, an appropriate definition of done might be a slice of product functionality that is sufficiently functional and usable to generate feedback that enables the team to decide what work should be done next or how to do it. See Chapter 4 for more details on the definition of done.

Sprint Review

At the end of the sprint there are two additional inspect-and-adapt activities. One is called the **sprint review** (see Figure 2.13).

The goal of this activity is to inspect and adapt the product that is being built. Critical to this activity is the conversation that takes place among its participants, which include the Scrum team, stakeholders, sponsors, customers, and interested members of other teams. The conversation is focused on reviewing the just-completed features in the context of the overall development effort. Everyone in attendance gets clear visibility into what is occurring and has an opportunity to help guide the forthcoming development to ensure that the most business-appropriate solution is created.

A successful review results in bidirectional information flow. The people who aren't on the Scrum team get to sync up on the development effort and help guide its direction. At the same time, the Scrum team members gain a deeper appreciation for the business and marketing side of their product by getting frequent feedback on the convergence of the product toward delighted customers or users. The sprint review therefore represents a scheduled opportunity to inspect and adapt the product. As a

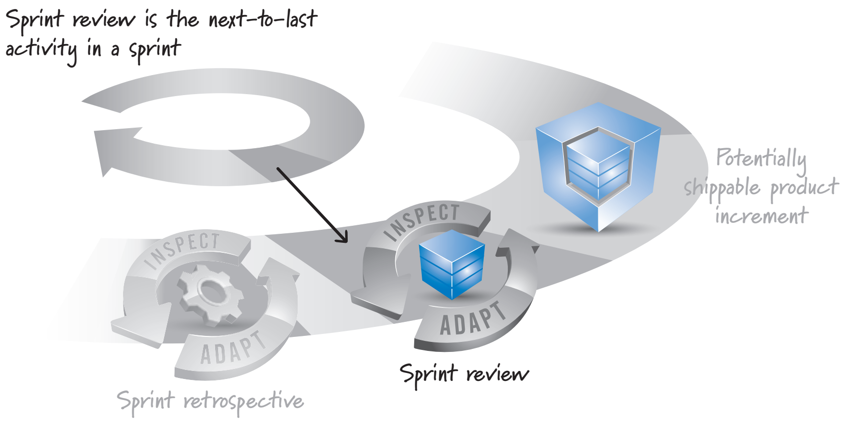
Sprint review is the next-to-last activity in a sprint
INSPECT
ADAPT
Potentially shippable product increment
INSPECT
ADAPT
Sprint review
Sprint retrospective

FIGURE 2.13 Sprint review

matter of practice, people outside the Scrum team can perform intra-sprint feature reviews and provide feedback to help the Scrum team better achieve its sprint goal. See Chapter 21 for more details on the sprint review.

Sprint Retrospective

The second inspect-and-adapt activity at the end of the sprint is the **sprint retrospective** (see Figure 2.14). This activity frequently occurs after the sprint review and before the next sprint planning.

Whereas the sprint review is a time to inspect and adapt the product, the sprint retrospective is an opportunity to inspect and adapt the process. During the sprint retrospective the development team, ScrumMaster, and product owner come together

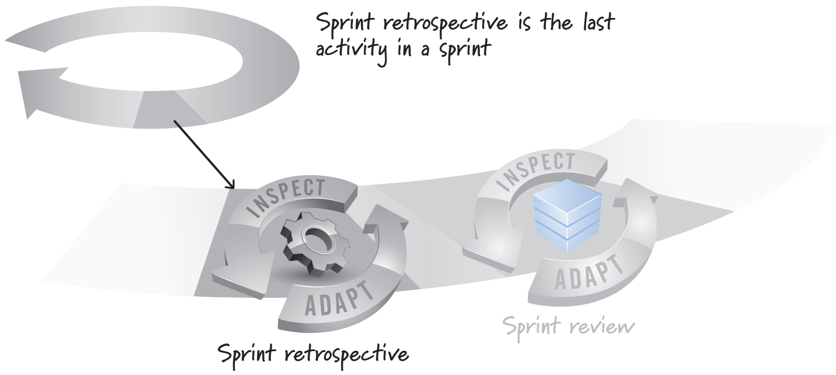

FIGURE 2.14 Sprint retrospective

to discuss what is and is not working with Scrum and associated technical practices. The focus is on the continuous process improvement necessary to help a good Scrum team become great. At the end of a sprint retrospective the Scrum team should have identified and committed to a practical number of process improvement actions that will be undertaken by the Scrum team in the next sprint. See Chapter 22 for details on the sprint retrospective.

After the sprint retrospective is completed, the whole cycle is repeated again—starting with the next sprint-planning session, held to determine the current highest-value set of work for the team to focus on.

Closing

This chapter described core Scrum practices, focusing on an end-to-end description of the Scrum framework's roles, activities, and artifacts. There are other practices, such as higher-level planning and progress-tracking practices, that many Scrum teams use. These will be described in subsequent chapters. In the next chapter, I will provide a description of the core principles on which Scrum is based. This will facilitate the deeper exploration of the Scrum framework in subsequent chapters.

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