Compliments of

DevOps

for dummies®
A Wiley Brand

3rd IBM Limited Edition

The business need and value of DevOps

DevOps capabilities and adoption paths

How cloud accelerates DevOps

Sanjeev Sharma
Bernie Coyne

DevOps

for dummies®
A Wiley Brand

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

DevOps

3rd IBM Limited Edition

by Sanjeev Sharma and Bernie Coyne

for dummies®
A Wiley Brand

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

DevOps For Dummies®, 3rd IBM Limited Edition

Published by
John Wiley & Sons, Inc.
111 River St.
Hoboken, NJ 07030-5774
www.wiley.com

Copyright © 2017 by John Wiley & Sons, Inc.

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without the prior written permission of the Publisher. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at http://www.wiley.com/go/permissions.

Trademarks: Wiley, For Dummies, the Dummies Man logo, The Dummies Way, Dummies.com, Making Everything Easier, and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates in the United States and other countries, and may not be used without written permission. IBM and the IBM logo are registered trademarks of International Business Machines Corporation. All other trademarks are the property of their respective owners. John Wiley & Sons, Inc., is not associated with any product or vendor mentioned in this book.

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: THE PUBLISHER AND THE AUTHOR MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZATION OR WEBSITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUBLISHER ENDORSES THE INFORMATION THE ORGANIZATION OR WEBSITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTERNET WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.

For general information on our other products and services, or how to create a custom *For Dummies* book for your business or organization, please contact our Business Development Department in the U.S. at 877-409-4177, contact info@dummies.biz, or visit www.wiley.com/go/custompub. For information about licensing the *For Dummies* brand for products or services, contact BrandedRights&Licenses@Wiley.com.

ISBN: 978-1-119-41589-3 (pbk); ISBN: 978-1-119-41588-6 (ebk)

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

Table of Contents

INTRODUCTION 1

About This Book 1
Icons Used in This Book 2
Beyond the Book 2

CHAPTER 1: **What Is DevOps?** 3

Understanding the Business Need for DevOps 3
Recognizing the Business Value of DevOps 4
Enhanced customer experience 5
Increased capacity to innovate 5
Faster time to value 6
Seeing How DevOps Works 6
Develop and test against production-like systems 6
Deploy with repeatable, reliable processes 7
Monitor and validate operational quality 8
Amplify feedback loops 8

CHAPTER 2: **Looking at DevOps Capabilities** 9

Paths to DevOps Adoption 9
Steer 10
Develop/Test 11
Collaborative development 12
Continuous testing 13
Deploy 13
Operate 14
Continuous monitoring 14
Continuous customer feedback and optimization 14

CHAPTER 3: **Adopting DevOps** 15

Knowing Where to Begin 15
Identifying business objectives 16
Identifying bottlenecks in the delivery pipeline 16
People in DevOps 17
DevOps culture 17
DevOps team 18
Process in DevOps 19
DevOps as a business process 19
Change management process 20
DevOps techniques 21
Technology in DevOps 24

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

Infrastructure as code 25
Delivery pipeline 26
Deployment automation and release management 28

CHAPTER 4: **Looking at How Cloud Accelerates DevOps** 31
Using Cloud as an Enabler for DevOps 32
Full-Stack Deployments 34
Choosing a Cloud Service Model for DevOps 35
IaaS 35
PaaS 37
Understanding What a Hybrid Cloud Is 38

CHAPTER 5: **Using DevOps to Solve New Challenges** 41
Mobile Applications 42
ALM Processes 43
Scaling Agile 43
Multiple-Tier Applications 44
DevOps in the Enterprise 45
Supply Chains 46
The Internet of Things 46

CHAPTER 6: **Making DevOps Work: IBM's Story** 49
Taking a Look at the Executive's Role 50
Putting Together the Team 51
Setting DevOps Goals 51
Learning from the DevOps Transformation 52
Expanding agile practices 52
Leveraging test automation 53
Building a delivery pipeline 54
Experimenting rapidly 55
Continuously improving 56
Looking at the DevOps Results 58

CHAPTER 7: **Ten DevOps Myths** 59
DevOps Is Only for "Born on the Web" Shops 59
DevOps Is Operations Learning How to Code 60
DevOps Is Just for Development and Operations 60
DevOps Isn't for ITIL Shops 60
DevOps Isn't for Regulated Industries 61
DevOps Isn't for Outsourced Development 61
No Cloud Means No DevOps 61
DevOps Isn't for Large, Complex Systems 62
DevOps Is Only about Communication 62
DevOps Means Continuous Change Deployment 62

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

Publisher's Acknowledgments

Some of the people who helped bring this book to market include the following:

Project Editor: Carrie A. Burchfield
Acquisitions Editor: Katie Mohr
Editorial Manager: Rev Mengle
Business Development Representative: Sue Blessing
Production Editor: Vasanth Koilraj

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

Introduction

DevOps (short for development and operations), like most new approaches, is only a buzzword for many people. Everyone talks about it, but not everyone knows what it is. In broad terms, DevOps is an approach based on lean and agile principles in which business owners and the development, operations, and quality assurance departments collaborate to deliver software in a continuous manner that enables the business to more quickly seize market opportunities and reduce the time to include customer feedback. Indeed, enterprise applications are so diverse and composed of multiple technologies, databases, end-user devices, and so on, that only a DevOps approach will be successful when dealing with these complexities. Opinions differ on how to use it, however.

Some people say that DevOps is for practitioners only; others say that it revolves around the cloud. IBM takes a broad and holistic view and sees DevOps as a business-driven software delivery approach — an approach that takes a new or enhanced business capability from an idea all the way to production, providing business value to customers in an efficient manner and capturing feedback as customers engage with the capability. To do this, you need participation from stakeholders beyond just the development and operations teams. A true DevOps approach includes lines of business, practitioners, executives, partners, suppliers, and so on.

About This Book

This book takes a business-centric approach to DevOps. Today's fast-moving world makes DevOps essential to all enterprises that must be agile and lean enough to respond rapidly to changes such as customer demands, market conditions, competitive pressures, or regulatory requirements.

If you're reading this book, we assume that you've heard about DevOps but want to understand what it means and how your company can gain business benefits from it. This book is geared to executives, decision makers, and practitioners who are new to the

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.

field of DevOps, who seek more information about the approach, and who want to cut through the hype surrounding the concept to get to the meat of it.

Icons Used in This Book

You'll find several icons in the margins of this book. Here's what they mean.

The Tip icon points out helpful information on various aspects of DevOps.

Anything that has a Remember icon is something that you want to keep in mind.

The Warning icon alerts you to critical information.

Technical Stuff material goes beyond the basics of DevOps. It isn't essential reading, however.

Beyond the Book

You can find additional information about DevOps and IBM's approach and services available by visiting the following web pages:

- **IBM DevOps Solution:** `ibm.com/devops`
- **DevOps — the IBM approach (white paper):** `ibm.biz/BdEnBz`
- **The Software Edge (study):** `ibm.co/156KdoO`
- **Adopting the IBM DevOps Approach (article):** `ibm.biz/adoptingdevops`
- **DevOps Services for Bluemix (service):** `bluemix.net`

These materials are © 2017 John Wiley & Sons, Inc. Any dissemination, distribution, or unauthorized use is strictly prohibited.