Google

How Google Works

Eric Schmidt and Jonathan Rosenberg

with Alan Eagle



NEW YORK BOSTON

Copyright © 2014 by Google, Inc.

All illustrations © Nishant Choksi 2014

All rights reserved. In accordance with the U.S. Copyright Act of 1976, the scanning, uploading, and electronic sharing of any part of this book without the permission of the publisher constitute unlawful piracy and theft of the author's intellectual property. If you would like to use material from the book (other than for review purposes), prior written permission must be obtained by contacting the publisher at permissions@hbgusa.com. Thank you for your support of the author's rights.

Grand Central Publishing Hachette Book Group 237 Park Avenue New York, NY 10017

HachetteBookGroup.com

Printed in the United States of America

RRD-C

First Edition: September 2014 10 9 8 7 6 5 4 3 2 1

Grand Central Publishing is a division of Hachette Book Group, Inc. The Grand Central Publishing name and logo is a trademark of Hachette Book Group, Inc.

The publisher is not responsible for websites (or their content) that are not owned by the publisher.

Library of Congress Cataloging-in-Publication Data Schmidt, Eric.

How Google works / by Eric Schmidt and Jonathan Rosenberg, with Alan Eagle. — First edition.

pages cm

Includes bibliographical references and index.

ISBN 978-1-4555-8234-1 (hardback) — ISBN 978-1-4789-5321-0 (audio download) — ISBN 978-1-4789-8352-1 (audiobook) 1. Google (Firm) — Management. 2. Internet industry — Management — United States. I. Title.

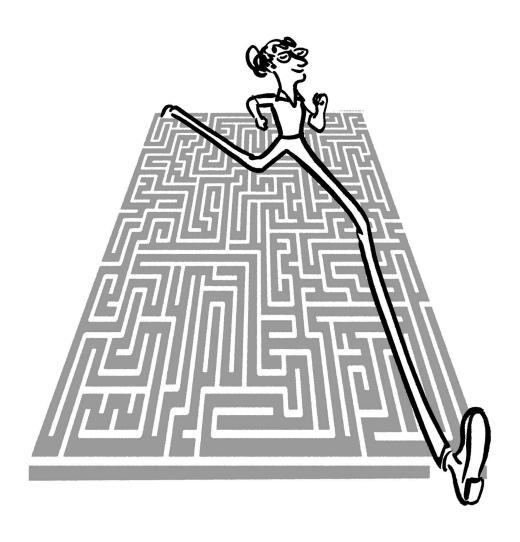
HD9696.8.U64G66647 2014 338.7'6102504—dc23

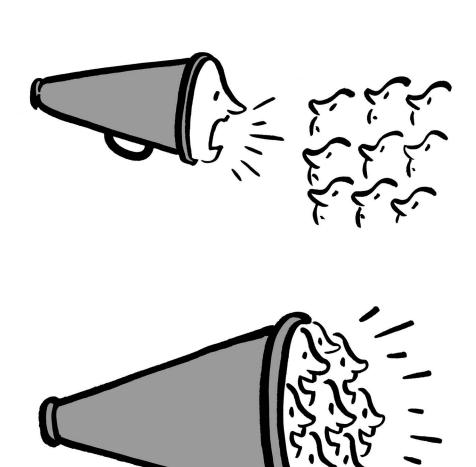














When Eric Schmidt talks people meme

Welcome to Google



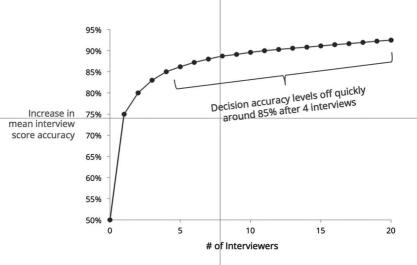


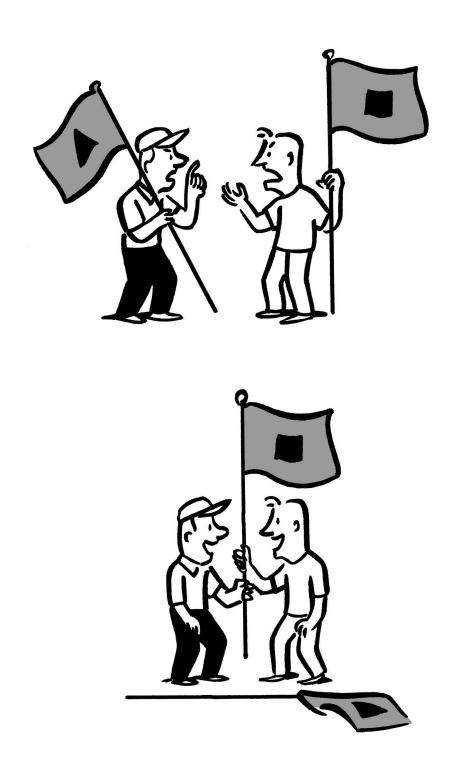














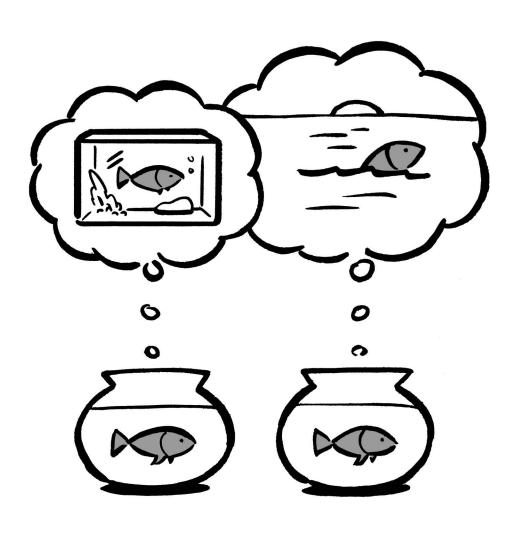
```
10101c
                     . 01101011010 1
                   ,0011010110101011001
                     0101101010110101
                       110101101010
                                              101۱، 10
                        0101101
                                             J11110101
       1 'n
                         1010101010
                                             10101010
       116
                        ٠0101010110
                                            1101001
(0101110011
                     J1101011010101 10
 `10101010101<sub>1</sub>、
                   J1101011010101101010110101r
     111011010101011010110101010101010101r
           10010101001101011010101 ----100c
              101011 011010101101
                       110101101010
                       101011010101
                       1010101010101
                       1010101011010
                        0101101010110
                       01101010110101
                       1101011/ 10101011
                       1010110 \1011000
                       0110101
                                 1010101/
                       1101011
                                 101011
                      1010110
                                 011010
                     J101010
                                 10101
                     J110101
                                10100
                                10110001
                     111010
                    10101
```

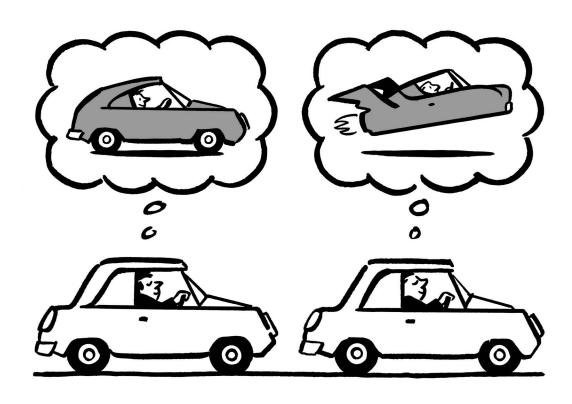
0104



















Acknowledgments

We must start by thanking Larry Page and Sergey Brin for their wisdom and friendship and for the incredible company that the two of them started. Google's founders are really as good as we describe them. The privilege of working with the two of them every day, to learn about and understand the future, is a once-in-a-lifetime gift. Many of the brilliant things that made Google so great—the strategy, culture, and emphasis on hiring excellence—were set well before either of us joined the company. Imagine having, in your mid-twenties, the presence of mind and the vision to see what Google would be and could do. Over and over, Larry and Sergey pushed hard to challenge convention, question authority and incumbency, and go their own way in building a truly great company. Google not only changed our lives, but it changed and continues to change the lives of billions of people, every day, everywhere. There is no adequate way to thank them for what they have done for us except to say we are humbled by their support and by everything they do.

Much like Google itself, this book was made possible through the help of a lot of amazing, interesting, caring, fun, good people. We are grateful for that help, but even more so for having had the privilege to work with and know these smart creatives as both colleagues and friends. Thank you to...

Ann Hiatt, Brian Thompson, and Kim Cooper, who always found

time amidst crazy schedules for the authors to meet and who gave us plenty of good feedback. You manage the chaos with serenity.

Pam Shore, who began her journey with Eric at Novell and was very much a part of building Google and his staff.

Scott Rubin, Meghan Casserly, and Emily Wood, who are PR people who know how to have interesting conversations. We look forward to having many more of them.

Rachel Whetstone, who was the other person on the to: line when Eric sent the email to Jonathan suggesting we do this book. Rachel has been our communications partner for nearly a decade and a partner on this book since its inception. She is a tireless advocate not only for Google but for always doing the right thing by people. Our thank you to Rachel is for far more than just her assistance in this book.

Kent Walker and Marc Ellenbogen, a pair of brilliant lawyers who got off their horses, rolled up their sleeves, and helped us make the book so much better. Marc was particularly helpful, and his advice seemed to get even more sage during that week he worked with us while on his Caribbean vacation.

Dennis Woodside, who somehow found the time to read our book and give us his thoughts while leading Motorola.

Urs Hölzle, the founding father of many of Google's peoplemanagement and hiring practices.

Alison Cormack, who is simply the best reader ever and perhaps the most gracious Googler around.

Jared Cohen, Eric's partner on *The New Digital Age*, who learned all about publishing just in time to help us.

Laszlo Bock, who helped preserve Google's culture and standards as we grew, whose upcoming book on talent gets into the nitty-gritty details of how to make all this happen, and who always seems to be smiling, perhaps because he used to appear on *Baywatch*.

Nikesh Arora, whose invitation to address his team started this whole project.

Susan Wojcicki, Salar Kamangar, Marissa Mayer, and Sundar

Pichai, who taught Jonathan that sometimes a good manager just needs to get out of his people's way. If a manager's work product is the sum of his people's, then Jonathan stands on a mountain created by these four.

Lorraine Twohill, who helped show us the Googley, smart-creative approach to creating truly amazing, inspiring art disguised as marketing.

Clay Bavor, one of the smartest creatives we know and whose work speaks to the culture of Google. (Google his weekend projects "The Google Logo in 884 4×6 Photographs" and "Clay Bavor Lincoln Portrait in Pennies".)

Brian Rakowski, who had the good sense to include page numbers and searchable word strings in the multiple sets of comments he provided.

Margo Georgiadis, whose perspective on how C-level execs in big companies think was a constant source of insight.

Colin McMillen, whose Memegen invention is only one of the many cool things he's done.

Prem Ramaswami, who gave us the perspective of a Harvard Business School teaching fellow and made suggestions about how to make the work accessible to students.

Devin Ivester, our resident expert in all things books and movies; creative whizzes Gary Williams, Ken Frederick, and Lauren Mulkey, who contributed a lot of great ideas that we didn't use; and Jonathan Jarvis, whose design created a book that looks more elegant and handsome than its authors ever do. And that's saying something.²¹⁴

Hal Varian, who makes economics entertaining. That's saying something too. ²¹⁵

Alan Eustace, who personifies Googley so much that he, with Jonathan's help, wrote the first Googler handbook.

Shona Brown and David Drummond, who for years were the

^{214.} It isn't.

^{215.} It is.

other two members of the management hiring review committee with Jonathan.

Cathay Bi and Chadé Severin, who calmly supported Jonathan in his role running products for Google and have been thoughtful critics from the outset of this project.

Jeff Huber, who worked with Jonathan at Excite@Home and showed up at Google to build a robust ad and revenue engine so that Jonathan could focus on managing smart creatives.

Patrick Pichette, whose operational rigor, Googley sensibilities, orange backpack, and I-ride-my-bike-to-work-even-when-it's-raining attitude continue to inspire us.

Gopi Kallayil, who is not only the best presenter we've ever known but a constant critic with insightful improvements.

Jill Hazelbaker, to whom Jonathan always turns, especially when he creates a PR problem (which is often).

Jared Smith, who helped us with details on China and is a great leader of smart creatives himself.

Bill Campbell, who is the most gifted of all management coaches, with an eye to people and how organizations work. We didn't know we needed a coach until we had one. Bill was a key person in the success of Apple and Google, now two of the most valuable corporations in America. Everyone smiles when Bill enters the room, and his ability to tell a great story is matched only by his humility in refusing the credit for the extraordinary role he has played in Silicon Valley and the success of generations of entrepreneurs.

John Doerr, Mike Moritz, Ram Shriram, John Hennessy, Art Levinson, Paul Otellini, Ann Mather, Diane Greene, and Shirley Tilgham, current and former Google board members who always take the long view of our impact on the world, and our customers, partners, and shareholders. As they should.

The many other current and former Googlers, who helped us get our stories straight while continuing to teach us some of the finer points of managing smart creatives: Krishna Bharat, Jeff Dean, Ben Gomes, Georges Harik, William Farris, Vic Gundotra, George Salah, and Martha Josephson (not technically a Googler, but as true a partner as can be found).

Jonathan's family—wife Beryl, son Joshua, and daughter Hannah—who always remind him that he needs to walk that management talk about empowering others and staying out of their way at home as well as in the office. This helps keep Jonathan humble, and for that everyone who knows Jonathan should thank them.

Jonathan's mother, Rina Rosenberg, who was a strong advocate for women and headed the Commision on the Status of Women for Santa Clara County. It is in deference to her that we start out describing our smart creative as a she. Jonathan's father, Professor Nathan Rosenberg, who is formally and accurately footnoted in the text as a leading scholar on technological innovation. What greater acknowledgment can a son offer than to show his father that through all the years, he really was listening?

Karen, Gordon, and David Rosenberg, Jonathan's siblings, from whom he learned a great deal about decision-making. The four of them continually fail to reach consensus on who owns the family title of smartest creative. Frankly, kids, it's time for Mom and Dad to ring the bell.

Dr. Lorne Rosenfield, who regularly banters with Jonathan about great quotes and life wisdom. Several references in the book come from those conversations. Lorne's daughter, Lauren, who provided more than enough corrections to prove her point that she is a more learned literary critic than Jonathan. And her brother Michael, who burnished his smart-creative credentials by giving us plenty of examples that he assures us will resonate with the college set.

Dan Chung, who had the insight that the original manuscript was "written with entrepreneurs in mind" but could be expanded to be "useful to any businessperson."

Matt Pyken, who helped polish Jonathan's papers in college and lent us a "Hollywood eye" for dramatic flair and storytelling.

Glenn Yeffeth of BenBella Books, who was the only expert on publishing Jonathan could ask for help when he embarked on this project.

Adam Grosser, who rejected misguided jokes that were not funny and generally helped elevate the tone and encouraged us to be more rigorous in our definitions.

Professors Susan Feigenbaum and Gerald Eyrich, who were prescient in their insistence that Jonathan learn statistics and provided the necessary adult supervision to help him complete his BA.

Professor and Dean Jeff Huang, and his colleague Julia Easley, who read the manuscript "like a student thesis" and provided almost as many corrections, and mercifully omitted a grade.

Professor David Teece, who gave this a read from an academic economist's perspective and pointed us at much of the excellent additional literature.

Gary Leight, Betsy Leight, Dora Futterman, Libby Trudell, Cathy Gordon, James Isaacs, Dean Gilbert, and Richard Gingras, who are all former Jonathan bosses. Jonathan is eternally grateful for your wisdom and forbearance.

Professor Jeff Ullman, who took a scraggly Princeton teenager named Eric Schmidt and turned him into a computer scientist, almost before there was such a thing.

Bill Joy, Sue Graham, and Bob Fabry, who at Berkeley trusted Eric as a computer scientist enough that they built a team around him.

Mike Lesk and Al Aho, who while working on Unix at Bell Laboratories taught Eric the value of volume, open source, and scale.

Jim Morris, Butler Lampson, Bob Taylor, and Roy Levin of Xerox PARC, who invented the future.

Scott McNealy, Andy Bechtolsheim, Bill Joy, Vinod Khosla, Bernie Lacroute, and Wayne Rosing of Sun, who gave Eric his first hands-on experience in managing in a business. Only in tech would a person with no prior management experience be trained on the job so very well.

Raymond Nasr and John Young at Novell, where the journey was the reward.

Peter Wendell, who gave Eric the opportunity to teach at Stanford's Graduate School of Business, and the thousands of students for whom Eric initially formalized his thoughts on "lessons learned the hard way."

Nishant Choksi, whose beautiful and fun illustrations perfectly capture our points in ways that we couldn't have imagined.

Melissa Thomas, a fact-checking whiz, who we would never, ever want to face in a game of *Jeopardy!*

Marina Krakovsky, our research partner, who always goes about two steps farther than we expect. She is as insightful and thoughtful as she is diligent and thorough. All great things! She's the best.

David Javerbaum, a world-class humor writer who helped make us funny too, or at least funnier. One of our proudest moments came when David saw one of the jokes that we had written and deemed it "not too bad." Thank you, David, for your help, and especially for that high praise.

Jim Levine, our agent, who helped us understand the publishing world, and our editor John Brodie, who guided us wisely from rough manuscript to finished work, from Microsoft opening to Downton Abbey conclusion. And we guided John to see the awesomeness of working with Google Docs.

Sometime in the mid-'70s, a couple of kids met while pumping quarters into the world's first coin-operated video game, *Galaxy Game*, which resided in the Coffee House café at Stanford's Tresidder student union. Jonathan regularly vanquished Alan Eagle at *Galaxy*, but the two were more evenly matched in their classes at Gunn High. While they were battling for space supremacy and tackling chemistry and math, they could not have possibly predicted that thirty years later they would start working together at a company called Google. Or that nearly forty years later they would collaborate on a book about business and management. Yet that's exactly what happened. Imagine the unimaginable, indeed. Thank you to our coauthor, Alan Eagle.

Glossary

AdSense

The ads product that places ads on a large network of publisher sites.

AdWords

Google's flagship ads product, this engine generates most of the company's revenue.

ah'cha'rye

English rendering of the Hebrew for "Follow me," the rallying cry in the Israeli army.

Android

Google's open-source mobile operating system.

API

Application Programming Interface, which enables other applications to interact with it.

APM

Associate Product Manager; APMs usually do two twelve-month rotations before they become full-fledged product managers.

cloud computing

Technology that enables Internet users to access files and run applications that reside on computers in another location. These remote computers, which are sometimes called servers, are usually clustered in large data centers that feature thousands of individual computers.

Coase's law

The principle, expressed by Nobel Prize—winning economist Ronald Coase, explaining that large firms emerged because, when you take transaction costs into account, it's often more efficient to get things done within a firm rather than contracting out on the open market. Because the Internet has lowered transaction costs, Coase's law implies

272 Glossary

that these days it's often more efficient to outsource work rather than doing it internally.

Dory

A Google internal system for posting questions for executives and voting others' questions up or down.

Excite@Home

A former employer of Jonathan's that was formed when Excite, a pioneer in web portals, merged with @Home, which helped to popularize Internet access via cable modems.

Googlegeist

Google's annual employee feedback survey.

Google[x]

A team working on some of Google's most ambitious projects, including self-driving cars, Google Glass, Project Loon, and smart contact lenses.

HiPPO (or simply "hippo")

Highest-Paid Person's Opinion.

learning animals

People who have the smarts to handle massive change and the character to love it: They so enjoy learning that they aren't afraid of asking dumb questions or getting wrong answers.

market capitalization (or "market cap")

The total market value of the issued shares of a publicly traded company.

Memegen

A Google internal site that lets Googlers create memes in the form of pithy captions attached to images, this is a fun way for employees to comment on the state of the company.

Moma

Google's intranet, used for sharing all kinds of company information among Googlers.

Moore's Law

The prediction, made by Intel cofounder Gordon Moore, that the number of transistors on a chip—and hence computing power—would double every two years. Moore initially predicted, in 1965, that the doubling would occur annually, but he revised his prediction to every two years in 1975.

multisided market

A place where different user groups can connect and provide each other with beneficial services.

Glossary 273

Noogler

New + Google (new Google employee).

obligation to dissent

The expectation that if someone thinks there is something wrong with an idea, they must raise that concern.

OKR

Objectives and Key Results, a performance management system used effectively at Google and other companies.

open

Sharing intellectual property such as software code or research results, adhering to open standards rather than creating your own, and giving customers the freedom to easily exit your platform.

open-source operating system

An operating system, like Linux and Android, in which the code is available at no charge to the public for use and modification. The opposite is a closed operating system, whose code is tightly controlled by the company that owns it.

payback period

The length of time needed to recover the cost of an investment.

platform

A base of technologies or infrastructure on which additional technologies, processes, or services can be built.

ROI

Return on investment.

scale

To grow something very quickly and globally (verb) or quick, global growth (noun).

smart creative

A person who combines deep technical knowledge of his or her trade with intelligence, business savvy, and a host of creative qualities.

tenurocracies

Companies in which power derives from tenure, not merit.

TGIF

Google's company-wide meeting, initially held every Friday afternoon, now held on Thursdays so that Googlers in the Asia Pacific offices can participate.

user interface

The part of a product with which the user interacts.

Wave

Google Wave was a system that let groups of users communicate and collaborate in real time. Google stopped working on Wave in 2010, and open sourced the code.

Web 2.0

The set of technologies that make the web what it is today (an upgrade of Web 1.0 of the 1990s).