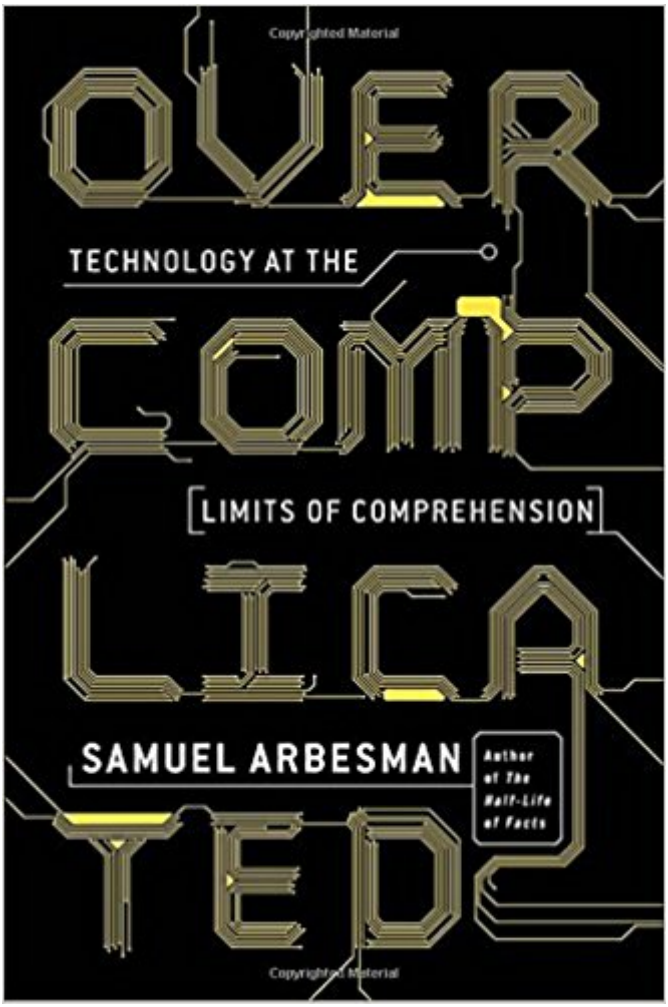
Overcomplicated: Technology At The Limits Of Comprehension



Synopsis

Ã Â Ã Â Ã Â Why did the New York Stock Exchange suspend trading without warning on July 8, 2015? Why did certain Toyota vehicles accelerate uncontrollably against the will of their drivers? Why does the programming inside our airplanes occasionally surprise its creators?Ã Â Ã Â Ã Â Ã Â After a thorough analysis by the top experts, the answers still elude us.Ã Â Ã Â Ã Â Ã Â You donÃ¢â ¬â„¢t understand the software running your car or your iPhone. But hereÃ¢â ¬â„¢s a secret: neither do the geniuses at Apple or the Ph.D.Ã¢â ¬â„¢s at ToyotaÃ¢â ¬â •not perfectly, anyway. No one, not lawyers, doctors, accountants, or policy makers, fully grasps the rules governing your tax return, your retirement account, or your hospitalÃ¢â ¬â„¢s medical machinery. The same technological advances that have simplified our lives have made the systems governing our lives incomprehensible, unpredictable, and overcomplicated.Ã Â Ã Â Ã Â Ã Â In Overcomplicated, complexity scientist Samuel Arbesman offers a fresh, insightful field guide to living with complex technologies that defy human comprehension. As technology grows more complex, Arbesman argues, its behavior mimics the vagaries of the natural world more than it conforms to a mathematical model. If we are to survive and thrive in this new age, we must abandon our need for governing principles and rules and accept the chaos. By embracing and observing the freak accidents and flukes that disrupt our lives, we can gain valuable clues about how our algorithms really work. WhatÃ¢â ¬â„¢s more, we will become better thinkers, scientists, and innovators as a result.Ã Â Ã Â Ã Â Ã Â Lucid and energizing, this book is a vital new analysis of the world heralded as "modern" for anyone who wants to live wisely.

Book Information

Paperback: 256 pages

Publisher: Portfolio; Reprint edition (June 20, 2017)

Language: English

ISBN-10: 0143131303

ISBN-13: 978-0143131304

Product Dimensions: 5.1 x 0.6 x 7.7 inches

Shipping Weight: 8 ounces (View shipping rates and policies)

Average Customer Review: 3.7 out of 5 stars 36 customer reviews

Best Sellers Rank: #287,142 in Books (See Top 100 in Books) #65 inÃ Â Books > Business & Money > Processes & Infrastructure > Research & Development #381 inÃ Â Books > Science & Math > Technology > Social Aspects #905 inÃ Â Books > Business & Money > Processes &

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Customer Reviews

Praise forÃ Â Overcomplicated:"[Arbesman] argues convincingly...He is undoubtedly right. The dream that we can fully understand our complex man-made systems is just thatÃ¢â ¬â •a dream." Ã¢â ¬â •The Wall Street Journal "Acquiring fluency in systems-speak is fast becoming a civic duty... ArbesmanÃ¢â ¬â„¢s freshly elucidated concepts are excellent field tools: they are the translucent sampling containers you take with you as you wade through the glitch-infested shallows of an algorithm."Ã¢â ¬â •New ScientistÃ¢â ¬Å“I was shocked [by] this elegant, eye-opening bookÃ¢â ¬Â¦Fascinating and full of new ideas I will use in argument from now on.Ã¢â ¬Â•Ã Â Ã¢â ¬â •Financial TimesÃ¢â ¬Å“OvercomplicatedÃ Â has the scintillating, big-idea premise of an Ã¢â ¬ËœitÃ¢â ¬â„¢ business book, but it's more than a Hudson News read: It presents a new way to think about the world that makes seemingly impossible problems approachable. By identifying how tangled our world has gotten, we can figure out the best ways to undo the knots.Ã¢â ¬Â• Ã¢â ¬â •Vox"How do we navigate a digital world too complex for any individual to understand? With a sense of wonder and the spirit of a scientist, as Samuel Arbesman argues in this terrific and thoughtful book."Ã¢â ¬â •CLIVE THOMPSON, author of Smarter Than You Think"With humor, insight, and wide-ranging examples, polymath Samuel Arbesman helps us hack through the tangle of complexity that defines our world today, and shows us how to cope with it." Ã¢â ¬â •STEVEN STROGATZ, professor of mathematics, Cornell University; author of The Joy of x "Why canÃ¢â ¬â„¢t we understand technology anymore? In this consistently entertaining and insightful book, Arbesman offers a necessary guide to where we are headed and why everything seems so strange along the way."Ã Â Ã¢â ¬â •TYLER COWEN, author of Average Is Over "Complexity science has unlocked new insights in physics, seismology, biology, even finance. In Overcomplicated, Samuel Arbesman makes an original and invaluable contribution to the field by exploring human interaction with complex systems. This excellent book is necessary reading for the layman and the expert alike." Ã¢â ¬â •JAMES RICKARDS, author of The Death of Money "Read this short book to get over the idea that we can make technology simple. Arbesman will convince you we have only one choice: to indirectly manage ever increasing complexity." Ã¢â ¬â •KEVIN KELLY, author of The Inevitable"A powerful, concise argument about how to grapple with the mystery and wonder of twenty-first-century technology. It's exactly what we all need."Ã¢â ¬â •CARL ZIMMER, author ofÃ Â EvolutionÃ¢â ¬Å“Fascinating, alarming, insightful, full of examples and funny.Ã¢â ¬Â• Ã¢â ¬â •QI.com

Samuel ArbesmanÃ Â is Scientist in Residence at Lux Capital, a science and technology venture capital firm. He is also a Senior Fellow of the Silicon Flatirons Center of Law, Technology, and Entrepreneurship at the University of Colorado and a Research Fellow at the Long Now Foundation. His writing on science, mathematics, and technology has appeared in The New York Times, The Wall Street Journal, and Wired. Arbesman's first book, The Half-life of Facts, examines how knowledge changes over time. He lives in Kansas City with his wife and children.

This is a well written book on an important topic. Arbesman swims against the tide of tech pundits who point to a glorious future of seamless technology which solves all our problems. He shows in detail how as technologies get more complicated they create complexity which is more and more beyond our ability to understand. We are headed to a future where bugs and glitches and crashes are inevitable and unpredictable. He says we need to look at technology like a biologist might look at an new animal species, the inner workings of which we cannot fully understand, but we need to learn to live with.If there is a shortcoming to the book it is that I think he does not take the argument far enough. I run a cabinet shop in Toronto, and my experience is that with the advent of new technologies such as the internet, not only does the technology itself become more and more complex, but that everything becomes more complex. Essentially what I do is cut particle board into rectangles, screw them into boxes, paint them, stand them up in peopleÃƒÂ¢Ã â ¬Ã â„¢s houses and put some doors on them. How simple is that? And yet with globalization of trade, the explosion of online information available to clients, and the market driven race to add ever expanding new features to all aspects of kitchen design and technology, my job seems to get more and more complex every day, in spite of my never ending efforts to standardize processes. Every week is some new combination of organic materials, high tech appliances, European hardware, Indian or African sculpture, high modernist design, and not uncommonly some features that defy the laws of physics. Add to that the usual budget constraints, time constraints and a list of stake holders that rivals a wedding and you get a process that is constantly pulling towards chaos. And as so many home reno show attest, kitchen renovations more often than not end in disaster. Even if all my tech devices operate flawlessly (and they never do), I still find myself ÃƒÂ¢Ã â ¬Ã Å“outside the bubleÃƒÂ¢Ã â ¬Ã Â• on a regular basis. According to Arbesman this term is used to describe when a combat soldier becomes overwhelmed by the complexity of a situation and looses the ability to grasp what is going on around them. I found it interesting that he drew this analogy because I myself have found books on military tactics and logistics more helpful than most business books

dealing with this sort of complexity. The best ones are the written by soldiers who have actually seen combat.One of ArbesmanÃƒÂ¢Ã â ¬Ã â„¢s suggestions that I found particularly interesting is the need for more ÃƒÂ¢Ã â ¬Ã Å“TÃƒÂ¢Ã â ¬Ã Â• shaped thinkers. This is a person with an in depth knowledge of a particular field combined with a broad knowledge of many other fields. He suggests that every company should have some of these. My personal feeling is that everyone who wants to have a job in the future better pursue such an educational strategy.In my own business to be a really good cabinet maker demands having an in depth knowledge of traditional cabinetry, and ability to work with computers and technology. But that is only part of the knowledge I use in a day. I am constantly forced to make complex economic trade offs, using concepts such as comparative advantage (should I sub this component out or make it myself). Cognitive science is also very useful, in assessing situations such as ÃƒÂ¢Ã â ¬Ã Å“can I reason with a client who is in a state of panicÃƒÂ¢Ã â ¬Ã Â• (not at all uncommon). Sociology and ethnography are handy as many of my clientÃƒÂ¢Ã â ¬Ã â„¢s decisions can only be understood in terms of complex social status relationships. And finally as a cabinet maker you need a strong background in geometry, design history and a good common sense knowledge of physics, chemistry, mechanics and electrical systems.This is a lot for one person to learn, and in the twentieth century this issue was resolved by Fredrick Taylor by dividing up workers and managers. Workers had technical skills and did things, and managers had general knowledge and did the thinking. Workers got a technical education and managers got a university degree.But in the twenty first century this Taylorist division of labour has become hopelessly cumbersome. With modern tools, once a decision has been made about how to solve a complex issue the technical execution is often almost instantaneous. With nail guns that can shoot hundreds of nails a minute a skilled artisan does not need a crew of hammer swingers any more. Writers and consultants donÃƒÂ¢Ã â ¬Ã â„¢t need typists, they just push ÃƒÂ¢Ã â ¬Ã ËœprintÃƒÂ¢Ã â ¬Ã â„¢.Every one I know in business says they are desperate to find workers with technical skills but who can also comprehend the big picture.Not uncommonly these days you hear about people who get a university education and then end up going back to technical school to learn some kind of practical skill. This is often seen as some kind of failure of education. In fact, it may be the way of the future.And a good knowledge of the science of complexity would also be strongly recommended. If you want to see how small changes in initial states lead to radically different outcomes (the butterfly effect) look no further than a construction site.

I’ve read a lot of books on the relationship between technology and the complex nature of life in the

first decades of the 21st century. None affected me more than Overcomplicated for two main reasons.First, while other authors get at technology per se at least as well as Arbesman does, he nails the problems growing out of it on the head from the beginning of the book on. See, for example, this statement on p. 3: "Each of our actions has more unexpected ramifications than ever before, rippling not just to every corner of our infrastructure, but to every corner of the planet, and sometimes even beyond."Second, he is one of the few authors to view our responses to complexity as kluges, an IT term used to describe Rube Goldberg like patches that work well enough but often cover over root causes of problems. As a political scientist that's what most public policy turns out to be rather than programs that actually solve a problem once and for all. If Arbesman is right, kluges are becoming harder and harder to avoid. Alas. Think about Obamacare or dealing with violent extremism or almost any other policy dilemma.I think so much of Arbesman's book that I'm beginning the next edition of my comparative politics textbook with the quote I used above and revolving much of it around his notions of complexity and kluges.And he's a biologist turned complexity scientist turned venture capitalist.

In Chapter 1 Arbesman introduces us to the complex systems that rule the world today (and describes how complex differs from the colloquial term complicated). In Chapters 2-4 we are shown how kluges, quick fixes to a problem, add up over time to make a system almost impossible for a single person to understand. In the final two chapters the author urges us to think differently and more broadlyÃƒÂ¢Ã â ¬Ã â •like a T-shaped individualÃƒÂ¢Ã â ¬Ã â •to understand the technological systems that have become as complicated and kluge-y as ecological systems found in nature. We should stop fearing and worshiping the technology around us, and instead think like a biologist to understand the technology we rely on. A quick, but fun and wide-ranging read.

Though this subject has been considered by folks before, I found Sam Arbesman's style fun and accessible, and his ability to weave together disparate ideas very convincing and enlightening. I'd recommend this book for anyone looking to better understand how fast our techie world is changing, and how some of the underpinnings are occulted from all. This only makes us need to consider the greater question, which is how are we thinking about our tech, given that not all can be understood, and how we're choosing to apply it. Those are the big questions of tomorrow, and those are the questions that require diversity of thought and ideas, not just techies building tech for tech's sake. Fascinating read!

I have mixed feelings about this book.One one hand, I agree with much of what Arbesman has to say. The systems that are integral parts of our daily lives are immensely complicated, and have arisen from an almost biological process of evolution and accretion and that this complexity leads to unexpected failures. This is the central premise of the book, and the author spends most of the book giving examples illustrating this fact. As someone who believed this before picking up the book at all, it seemed extremely repetitive. If you work in any technological field, this should be old news.After hammering home how complex and incomprehensible these systems are for the majority of the book, the author offers very little in the way of solutions besides philosophical musings on humility, or imploring the reader to "think like a field biologist".Overall this book is long on observation and diagnosis as to the problems of complexity in the systems which support modern life (which are apt and largely well argued), but short on any substantive prescriptions.

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