


PETER COCHRANE

UNCOMMON  
SENSE

OUT OF THE BOX THINKING FOR  
AN IN THE BOX WORLD

Based on the popular  silicon.com column



CAPSTONE




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*For Brenda, the bravest girl I ever knew ...*





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*The significant problems we face cannot be solved at the same level of thinking we were at when we created them.*

Albert Einstein



# Standby

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This is a book that expresses the unique view of Peter Cochrane who has watched, and been intimately engaged in, the technology roll-out over the landscape of society for decades. As an observer and commentator he has a great deal to say about the good, the bad and the ugly of the ever-increasing waves of technology deployment. Peter is anything but shy. He is refreshingly frank and honest, surprisingly accessible, and so is this book. It is a no-holds-barred presentation that will entertain, explain and challenge the layperson and the expert.

Basically, this is a collection of essays from Peter that strips away the hype and mystery surrounding ‘conventional wisdom’, and exposes the realities and truths in the sense of ‘the emperor’s new clothes’. He sees, reaches, and extracts the essence of an issue, and presents the results in a clear and passionate fashion. Peter forces the reader to see, think, and re-evaluate many long-held opinions in a fresh and logical fashion.

*Uncommon Sense* is, in Peter’s words, ‘... a book about living, rather than just surviving in a world of more technology and more change that our species has experienced hitherto.’ He expresses his thoughts in dramatic terms, making ample use of graphics and images to drive home his point; in many ways, the book is defined by his use of graphics and symbology. His goal is to set straight the confused thinking that surrounds much of the technology to which the end user has been subject. Peter has little patience for poor presentation of ideas and bemoans the ineptitude of most scientific presentations. He elaborates on the weakness of many of today’s management approaches, as well as on the failure of many technologies themselves.

He points out that it is often a lack of imagination that limits the impact and effect of the information technology revolution. He properly recognizes that wireless communications and access will be omnipresent, and addresses some of the impediments that have been thrown up that have slowed down the deployment of a full wireless infrastructure.

Peter further points out the non-intuitive behaviour of exponential growth and how it has fooled so many bright people who fail to recognize its impact. He addresses the enormous complexity that is part of the technological and societal revolution by illustrating the true meaning of exponential growth, chaotic action, and counterintuitive outcomes.

One of Peter's pet peeves and frustrations is technology that fails to deliver what was promised. He is also irritated by managers who don't understand that they don't understand, and politicians who take a disastrously focused (single or limited issue) view in order to survive rather than improve things. His dialogue and illustrations take us through the causes of technology failure and the unlikeliness of it truly recovering. For example he cites and comments on hospital records, broadband, 3G, eShopping, the local loop and last mile as continuing to present nasty and, as yet, unsolved problems of effective deployment and delivery. Peter's holistic views address issues that span the important and vital through to the apparently trivial – for example the availability of pornography on the net, the futility of personal filing systems on a PC, and control freak managers.

From a more global point of view, Peter makes the case that if we are to make any progress in solving the world's critical problems, we must apply our advanced computer modelling capability to quantify the interaction between the variables, and predict the impact of these variables on the outcomes. He argues that the problems and their interactions are far too complex for the unaided human intellect to cope with, and this applies to the various summits that continue to meet, discuss, and fail to bring light to these issues.

Peter recognizes that the world we are moving to in this 21st century is one of embedded technology, intelligent agents, mobile access, and vast,

fast networks. In this world, he sees a need for clarity and vision. It can be a magnificent place to live in, but it will not be without addressing the serious issues of privacy, security, intellectual property challenges and ethical issues.

In this book you will be entertained, amazed, concerned, challenged and invigorated by the bright future that technology is offering. It will take uncommon sense and fresh thinking to truly tame this future and make the most of it. Enjoy!

Leonard Kleinrock, UCLA, November 2003





# Where Did This Book Come From?

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## Genesis

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For me 1995 was the year when the great IT and dot-com frenzy started, and 2001 was the year it all came to a crashing halt. It was an exciting time for sure, and we made great progress on all fronts, but eventually the energy expired and the dot-com crash arrived. I had been in the thick of it, developing new technologies and writing of the likely consequences in a weekly column for the *Daily Telegraph*. I had also contributed to the *Guardian*, *The Times*, *Australian*, *USA Today*, *New York Times* and *Sentaku* et al.

## Collapse

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In just six short months most of the technology columns closed down, but I kept writing and publishing on [www.cochrane.org.uk](http://www.cochrane.org.uk) which resulted in a continued correspondence with an established and energetic global readership – people were still clearly interested even if the media were not!

## Focus

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So it was that in May 2002 Tony Hallett called and asked me to write a new weekly column for the [www.silicon.com](http://www.silicon.com) news and information service. This I agreed to do and got underway with an 850-word column that encouraged readers to comment, debate and email. The popularity of the column fostered a further relationship with Mark Allin of Wiley-Capstone Books. And so the plot was hatched to turn the columns into a book.

## Mission

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My purpose in writing and broadcasting had always been to explain and alert people to future challenges and current changes invoked by technology, or a lack of it! And my emphasis was always on a clear and concise, ‘make-em-think’, format that looked for the novel and the explicit. Hence, in content and style this book is purposely different – and associated with my home page [www.cochrane.org.uk](http://www.cochrane.org.uk).

## Thanks

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- The silicon.com readership not only acted as observers, but online commentators and editors with their numerous and varied inputs subsumed into this expanded and illuminated text.
- Tony Hallett (my silicon.com editor), John Moseley and Mark Allin (my Wiley-Capstone editors) were responsible for numerous inputs, suggestions and guidance that enriched the final product.
- Michaela Cozens considerably augmented my efforts by doing a lot of the typing, pre-printing, collation and general support at all kinds of strange hours as I traversed the planet – emailing when and where I could.
- My daughter Sarah did a super job of editing and researching, as well as keeping me on the straight and narrow. She is also responsible for whatever order you might detect in the final presentation.
- John Duggan at Sparks, and the graphics, editorial and production folks at Wiley-Capstone turned out to be a dream to work with and gave me lots of support and help.
- My colleagues, friends, family, general public, politicians, managers, companies and organizations are all featured in this book somewhere, but they will never figure out where or how!

*To all of you I owe a debt of gratitude in helping me bring to fruition a different view and presentation ... I just hope I have done justice to the human condition, our technologies, and our past, present and future.*

Peter Cochrane, Martlesham Heath, UK, February 2004

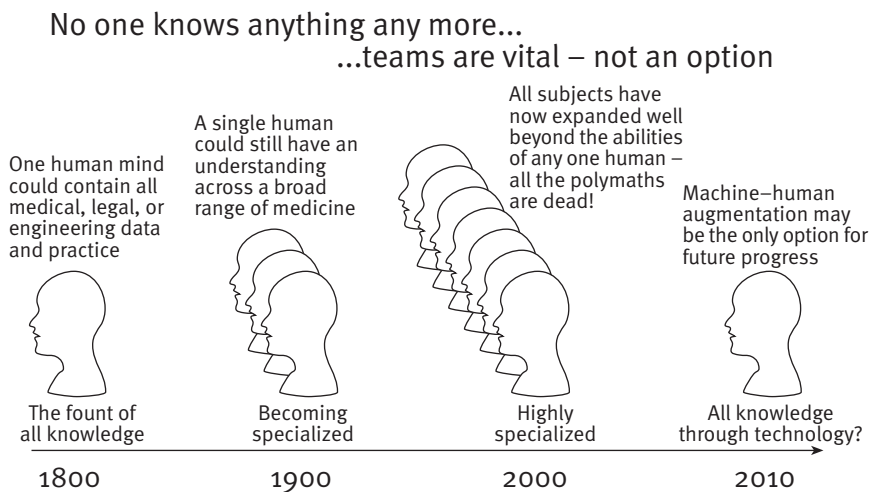
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Byte 00

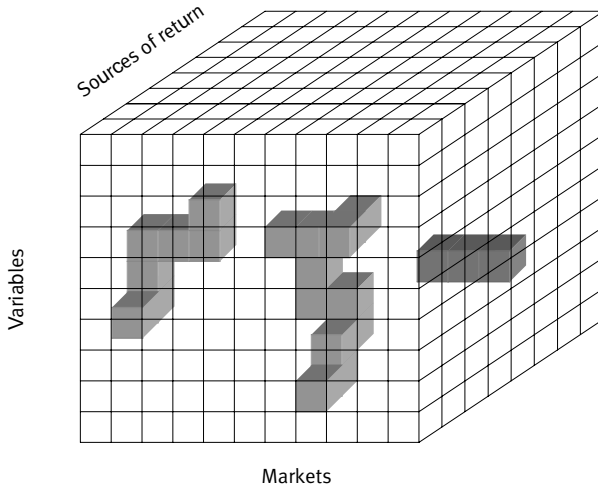
# Boot Up

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When I was a young child at school and first started to read, there was an ever-present pressure for me to move on from one book to another, away from pictures and towards a world exclusively dedicated to words. But I fell in love with images at an early age and still remember with some affection the magic of Rupert Bear, and excitement of Dan Dare, Superman, Batman and more. The education process was relentless, and soon I was lost in a world of words and no pictures, where my imagination conjured up new visions to go with Robinson Crusoe, The Three Musketeers and Horn Blower et al. Just once a week there was a ritual visit to the movies to see Errol Flynn, John Wayne and other hero's paint their vivid pictures across the silver screen. For me this was a wonderful escape from the reality of an austere post-WWII UK and black and white print.



## If only it was all this simple...

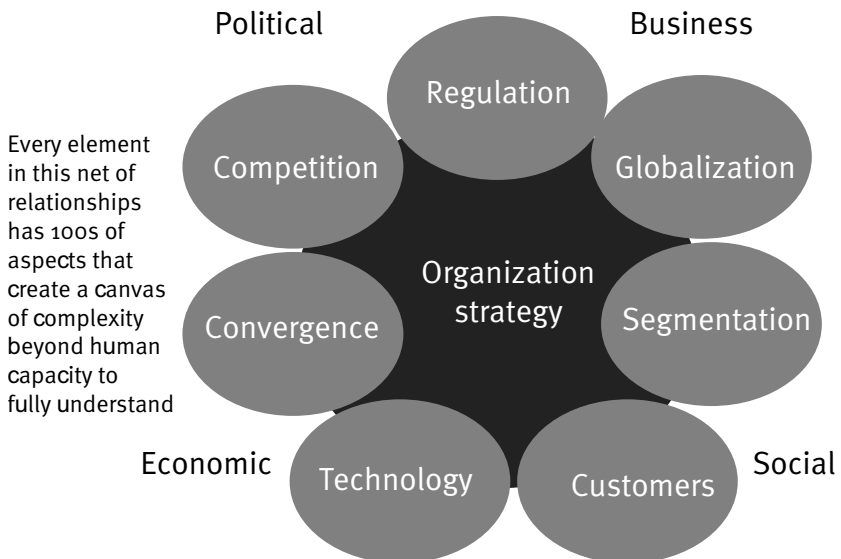


Almost nothing we deal with is confined to just three dimensions

We are mostly faced with so many that we have to simplify the picture and take an aggregate decision on the biggest parameters

In a complex non-linear world simplification can be very dangerous!

## Industry dimensions



Throughout my education and, later, professional life I returned to pictures as I became increasingly dependent on graphics to aid and abet my basic understanding. I gradually became aware that my slow and laboured progress in mathematics and science was almost entirely down to the limited artistry and lack of clarity and thinking of my early teachers. I systematically failed one class after another and gained almost nothing of worth from my schooling spanning the years 5–15, barring a mechanistic way of solving set problems with known answers.

Much later in my teens I encountered teachers, lecturers and professors with an ability to get down to my ignorance level, able to see my difficulty, and find analogies and pictures (on paper and in the mind) that allowed me to see and understand with greater clarity and insight. Even in the most esoteric of mathematical, scientific, engineering and technological corners, I still rely heavily on pictures. In fact, I consider mathematics to be both a language and a very powerful visualization tool. Unfortunately, this is a tool denied to 99.9% of all peoples due to the universally poor standards of teaching and understanding of the topic.

Now, at the age of 57, I have, in some respects, begun to resent words, resent the time spent reading and writing. To me there has to be a better way. If you permit me, an adaptation of an old adage:

*If a picture is worth 1000 words,  
 a moving picture is worth 1,000,000 words, and  
 an animated multimedia experience is worth 1,000,000,000 words.*

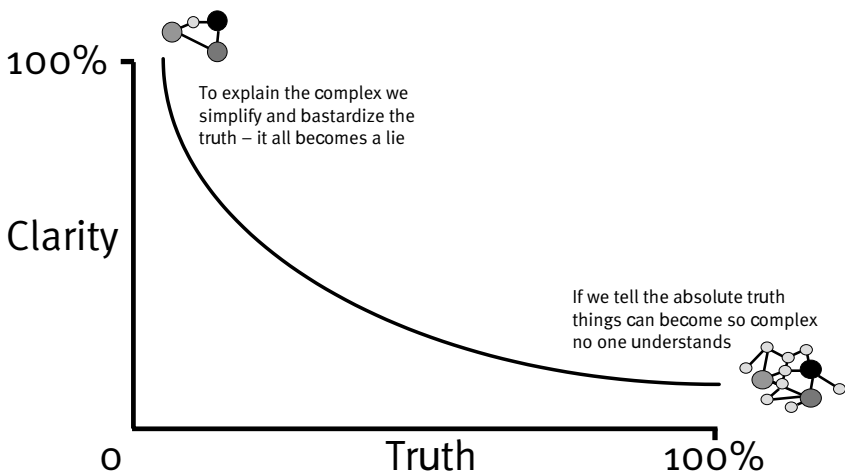
Why do people write so much and say so little; why don't they say what they mean and mean what they say? It is as if brevity and honesty have gone out of fashion. When we communicate we should remember that face-to-face is not video-conferencing, or a telephone call, a radio or TV interview, and further, a letter is not a fax, email, or text message. Moreover, none of these are the printed page or multimedia – but people still try to compare and say that one is better than the other. Such arguments are futile, each has pros and cons, and each has a very useful and appropriate place. Today we have more

ways of communicating effectively and efficiently than ever before, but the key problem is that people confuse and misuse them.

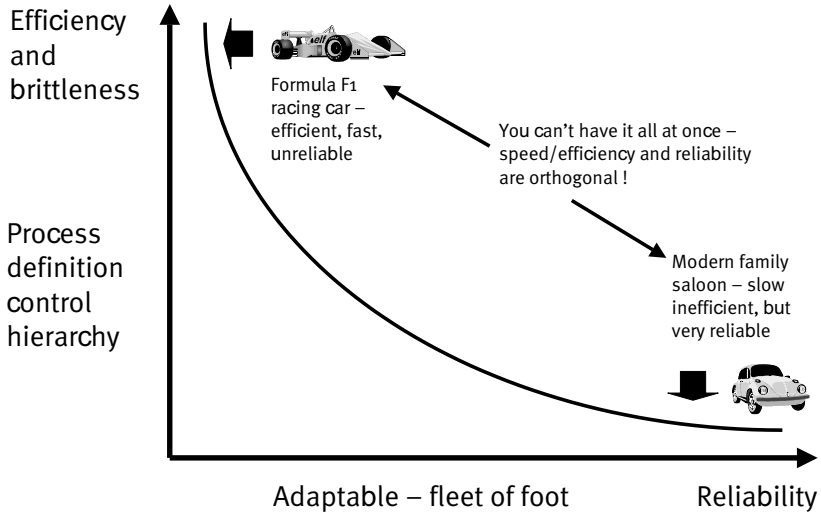
So why am I writing another book? I still give many lectures and presentations a year, and my Web site still receives over 1000 visits per week, and I find much confusion and doubt on critical issues and topics we all need to understand. I also find much flawed and confused thinking, not to mention misinformation and unwise policies used and enacted. When Capstone approached me, I made it clear that I had no interest in writing a conventional book. In my view, a book about living in a fast-moving, IT-dominated world with no pictures, animation and interaction, would see most of what I wish to communicate lost in a sea of inadequate words. It would be like a philosopher or theologian explaining the meaning of life – a complete waste of time. So, from the outset it was agreed that I could include more pictures than words and relate the whole to my active and growing Web site – [www.cochrane.org.uk](http://www.cochrane.org.uk).

Buying this book gives you more than a passport to my thoughts, words and pictures, you get access to everything I can contribute with all the media we have to hand in 2003. My concern is to try to communicate the complex and inaccessible in a clear and concise way. My primary fear is that the orthogonal nature of clarity and truth may defeat both reader and author.

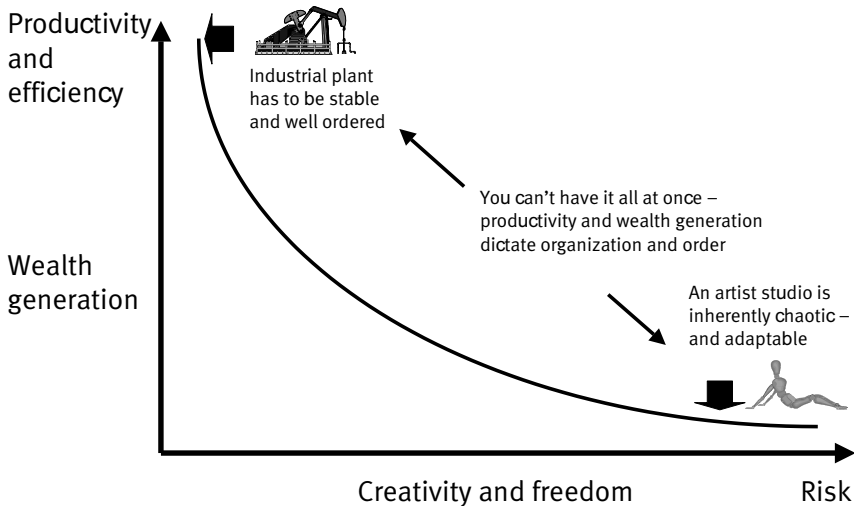
## We seek clarity and truth... ...but they are mostly orthogonal...



### Axiom 1: Mutually exclusive...



### Axiom 2: Mutually exclusive...



As a general rule, reducing descriptions and explanations to the simplest level so we can communicate quickly and others can understand sufficiently, insults the depth of the problem and blankets the audience in blissful ignorance. We always ride a curve of absolute truth to the blatant lie, and absolute clarity to total confusion. My mission is to neither insult nor confuse, but to communicate and explain with as much clarity as I can muster.

As the Chinese say, we live in interesting times. We now see the simple (and linear) being overtaken by unbridled complexity, when order is negated by chaos, when technology is pushing us individually and as organizations faster than we can adapt and adopt. I have lived on the cusp of the new for the past 30 years, and have experimented with future technologies and systems that have yet to appear, and this book is my attempt at explaining some of what has happened, what is happening and what is about to happen – it is about readying for the future and changing the way we think.

There is no set order to the text or indeed the pictures, although the illustrations and pictures do relate to the associated page set. My home page contains even more data and illustrations and is the repository of almost all that I ever did or thought - [www.cochrane.org.uk](http://www.cochrane.org.uk). So you can dip into the text and pictures at any point, see what takes your eye and interest, and explore. It is all designed to make you think, question and, I hope, understand more of this new age in which we live. But even more importantly – enjoy. This is a book about living, rather than just surviving in a world of more technology and more change that our species has experienced hitherto. It is also a book written by someone who has struggled every day to understand everything he encountered since he was truly cognitive. Someone who didn't easily fit into a rigid and unthinking education, system and corporate



world, and someone who believes in investing time and effort, trying, testing and contributing – no matter what.

In compiling this book I have attempted to meet the needs of the amateur and professional, to make the expert and the lay think, to promote the right debate, and promote right questions. We are all challenged by change, and we all have to find our own survival strategy, and it need not be full of stress and worry, it can be full of fun. Discovery, understanding and realization are fun!

Peter Cochrane

*At my home on a not so warm UK spring evening, wearing a thick shirt with the sleeves rolled down, drinking great coffee, in a garden full of new life, colour and scent, watching the sun go down – with my Apple G4 laptop linked to the www via a WiFi (802.11 link).*

Martlesham Heath,  
Suffolk, UK

Byte 01

# Education That Doesn't Fit

---

*We were all fed a diet of problems with solutions from our earliest days until we graduated. Teachers and professors had no choice but to prescribe problems that had a clear definition and route to solution.*

Almost all the mathematics, science and technology in our schools come from a prescriptive box. Students expect a clearly defined problem, a logical analysis, and clear solution. What's more, so do the academic staff and the education system. This creates mindsets that think our universe is full of problems with solutions, and that there is only a small proportion of problems that we are still trying to solve. You don't have to be out of school and into industry for very long to realize our universe is not a well-behaved place and, in fact, the converse is true.

By looking at the night sky and observing clusters of constellations, or watching the cataclysmic events on our own planet, we can quickly see that chaos is actually the natural mode rather than the exception. Natural disasters come in clusters, as do births, deaths, marriages, car accidents, and electrical appliance failures in our homes. There is also ample evidence to suggest that Mother Nature's natural mode is also chaotic. The boom/bust cycles in economies that politicians seek to smooth are also symptomatic of non-linear mechanisms. Some of the chaotic mechanisms are easy to understand, but many are not. The reality is that we have very little appreciation of the true magnitude and impact of non-linear systems.

Throughout my education I had a vision of a universe that was enclosed and well behaved, with some remote and small region that we didn't understand, which we avoided at all costs. My earliest industrial periods quickly corrected that view as most of the problems and the solutions that