



# Total Recall: How the E-Memory Revolution Will Change Everything

*C. Gordon Bell , Jim Gemmell*

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**Total Recall: How the E-Memory Revolution Will Change Everything** C. Gordon Bell , Jim Gemmell  
THE TOTAL RECALL REVOLUTION IS INEVITABLE.

IT WILL CHANGE WHAT IT MEANS TO BE HUMAN.

IT HAS ALREADY BEGUN.

What if you could remember everything? Gordon Bell and Jim Gemmell draw on their experience from their MyLifeBits project at Microsoft Research to explain the benefits to come from an earth-shaking and inevitable increase in electronic memories. In 1998 they began using Bell, a luminary in the computer world, as a test case, attempting to digitally record as much of his life as possible. Photos, letters, and memorabilia were scanned. Everything he did on his computer was captured. He wore an automatic camera, an arm-strap that logged his bio-metrics, and began recording telephone calls. This experiment, and the system they created to support it, put them at the center of a movement studying the creation and enjoyment of e-memories.

Since then the three streams of technology feeding the Total Recall revolution—digital recording, digital storage, and digital search, have become gushing torrents. We are capturing so much of our lives now, be it on the date- and location-stamped photos we take with our smart phones or in the continuous records we have of our emails, instant messages, and tweets--not to mention the GPS tracking of our movements many cars and smart phones already do automatically. We are storing what we capture either out there in the “cloud” of services such as Facebook or on our very own increasingly massive and cheap hard drives. But the critical technology, and perhaps least understood, is our magical new ability to find the information we want in the mountain of data that is our past. And not just Google it, but data mine it so that, say, we can chart how much exercise we have been doing in the last four weeks in comparison with what we did four years ago. In health, education, work life, and our personal lives, the Total Recall revolution is going to change everything. As Bell and Gemmell show, it has already begun.

*Total Recall* provides a glimpse of the near future. Imagine heart monitors woven into your clothes and tiny wearable audio and visual recorders automatically capturing what you see and hear. Imagine being able to summon up the e-memories of your great grandfather and his avatar giving you advice about whether or not to go to college, accept that job offer, or get married. The range of potential insights is truly awesome. But Bell and Gemmell also show how you can begin to take better advantage of this new technology right now. From how to navigate the serious question of privacy and serious problem of application compatibility to what kind of startups Bell is willing to invest in and which scanner he prefers, this is a book about a turning point in human knowledge as well as an immediate practical guide.

Total Recall is a technological revolution that will accomplish nothing less than a transformation in the way humans think about the meaning of their lives.

Watch a Video

## **Total Recall: How the E-Memory Revolution Will Change Everything Details**

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# From Reader Review Total Recall: How the E-Memory Revolution Will Change Everything for online ebook

## Mike Templet says

I honestly never finished this book, but I lost it and haven't really cared enough to start looking sense. If I ever really do find it I'll most likely skim through the remaining chapters, give it a whimsical "hmm", and throw it behind me and over my head where it will lay wherever it lands for around a year. I did try my best to best into it. I find the subject of extending ones memory beyond the boundaries of the mind. I got the books in hopes that it would attempt to lay down some proficiency of how easy this would be in the future; what I got instead was a journal of one persons slaving attempt to record everything. It bored me, and the reviews I read never mentioned the book delivering anything different. I was hoping he found a way to make recording and organization as close to automatic as possible, since that would seem to be the only way to make a product like this applicable to most people. He didn't. I could not justify giving this 1 star since the truth that I never finished the book, but I can't justify giving more than 2 stars to a book that lost my complete interest a quarter through.

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## Tina Ye says

This work is part personal journal, part manifesto, and part self-help book. Essentially, Gordon Bell tries to make a good case for the "inevitable revolution" towards "Total Recall" (caps, mind you) that will "force" us to "adapt" to it. His diction gives you a good sense of what's to come, sigh.

If you can stomach his single-mindedly evangelical agenda, you'll find that this book pursues some interesting ideas about the implications of recording as many details of one's life as possible. And not just in writing, but in photos, sound, video, drawings, scanned documents, GPS locations, chat logs, pedometer readings, etc. etc.

His primary argument is that we (as in the human race) are on an accelerating pathway towards this state of recording everything ever about our personal lives. He observes that we already have cultural/behavioral trends such as microblogging and increased "surveillance" of our offspring, and points out the sheer fact that we now have all the tools that enable logging, recording, and note-taking at our disposal.

He continues by saying we ought to embrace this trend because of a host of benefits in healthcare, education, national security, work, day-to-day life, and even post mortem. There are, undeniably, benefits that you can't argue with: detailed recordings of minute-to-minute physical status for health records can be invaluable in diagnosing a disease with vague symptoms. But there are thornier ideas too. For instance, Bell totally adores the idea of a "cyber-twin" that goes on "living" and pretending to be you after you die, so your grandkids can talk to "you." This simultaneously piques my curiosity and scares me silly, but the biggest part that bugs me is that he does not go on to explore it much beyond saying "Wouldn't that be SO COOL?" Clearly this is a book about breadth, not depth, and as such, it spends more time reveling in enthusiastic speculation rather than critique and inquiry. As usual, I kind of wish there were more of the latter.

Bell ends the book by providing general instructions on how you can begin recording every detail of your own life too (this is where the self-help comes in). Here's where his argument that "Total Recall" is upon us falls apart, I think. By detailing all the technological infrastructure required and all the ways we'd have to

"adapt" to using it, he only highlights how tremendous a commitment it would be to "life-log." It would pretty much have to be a person's one and only hobby. Imagine scrapbooking, but times a million. And the money, wow, you would have to have a smartphone, a GPS device, a digital camera, a scanner, a PC, an e-reader, body-monitoring devices, backup solutions x3 both on- and off-site, shelves of DVDs... Life logging is clearly not for the busy or the poor.

Of course, I buy the idea that tools will get ever-cheaper and technological paradigms will rearrange themselves beyond recognition in 10 years, but this last part of the book, his clarion call to begin lifelogging here and now, still rings utterly hollow to me because we aren't 10 years in the future yet! It is, literally, the most useless chapter, because it isn't thorough enough to be actually instructive, nor does it introduce new ideas.

By this point, he has beaten us over the head with the idea that Total Recall is coming faster and surer than the Redcoats and it will make our lives absolutely wonderous. But he has also given the reader a lot to be skeptical about. Rather than spend an extra chapter tackling the skeptics head-on, he chooses to sidestep them by saying "well, there will always be skeptics, but let's ignore them, BECAUSE THE REVOLUTION IS UPON US. LET'S DO THIS THAAAANG."

Anyway.

My last point is more about a technical shortcoming on the book's part: Bell doesn't distinguish clearly enough between the problems of "recording" and "recall." There's a lot of time spent on the endless possibilities of recording, and hardly any on how to organize it effectively. He does recognize the issues of data longevity, the importance of metadata and the need to unify our data, but he doesn't address nearly enough how monumental the challenge of organizing a lifetime's data is. His only answer seems to be "keep at it, just do it." I wish he'd share more of what he learned in his personal experiences.

The final verdict: I think it is worth a read, if only for the impassioned arguments that will hopefully result from some of its claims. Insofar as a book of potentially controversial predictions about the future goes, this is pretty good.

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## **Michael Jones says**

I abandoned this book in the middle. Actually, ironically, I was listening to it in audiobook format and forgot to rip the first disc to my player! I had no problem entering the book at the second disc, but after listening to several hours of the book I had three revelations: (1) the author is right - we are inexorably moving toward what he calls "life logging" - recording in some way almost everything that happens to us. (2) There are a lot of ins and outs to "life logging", including legality of recording certain things, security and privacy concerns (what if an identity thief gains access to your life log - an issue the author blows off as of marginal importance), and the immense difficulty of doing all of this with current technology. (3) I'm already doing some of this (witness the review you are reading!) but I'm not going to intentionally try to expand into as many areas of life as I can. It's just too much trouble.

Then I realized something else: I was getting a little bored with the actual book. Not that the book is boring; it is well-written and the topics are interesting. But it started to come across as a little bit *too* enthusiastic about recording as much of your life as possible. Am I going to spend hundreds of dollars on scanners, cameras, and hard drives, and thousands of hours of time, to get a system like his up and running? Nope, I'm

certainly not. The idea of doing that seems a little fanatical to me.

Will we all be doing much of what the author talks about within years or decades? I think most of us will. And I think it will be very valuable to us, in just the ways the author envisages. Is it worth it to start it now? It might be if you enjoy doing it, but I think the barriers are high enough at this point in history that we can afford to wait for the world to catch up with us and reduce the friction to getting started.

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## **Troy says**

A book that any tech geek will love. Bell is a strong advocate for digital storage of everything... and I mean EVERYTHING! While I don't completely agree with his mentality on many of the topics, I still admire his passion for what he has developed and his vision for the future.

There are certainly many benefits to Bell's approach to a digital catalog of one's life, but there is something to be said for the impermanence of certain aspects of life. He does touch on the subject of forgetting painful memories, but I think he glosses over the downside of holding onto these negative periods in our life. It is often helpful to forget, rather than dwell on mistakes/hardships. We need to learn from them, but part of that process includes moving on.

Overall, this is an awesome book that I wizzed through in a single day. Lots of great insights into the future of tech.

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## **Clare says**

*"The coming world of Total Recall will be as dramatic a change in the coming generation as the digital age has been for the present generation. It will change the way we work and learn. It will unleash our creativity and improve our health. It will change our intimate relationships with loved ones, both living and dead. It will, I believe, change what it means to be human."*

This book is based heavily on Gordon Bell's experience with the MyLifeBits research project - a prototype system to digitally record, store, and organise as many aspects of Bell's life as possible. This involved converting all paper based information (bills, receipts, certificates, photos, letters etc) to digital format and also digitally logging a range of life information on an ongoing basis (location, financial transactions, photos/video, health information, exercise details etc). The book distinguishes between the practices of life blogging (publicly broadcasting details of your life through sites like Facebook and Twitter) and life logging.

This is a fascinating book which highlights the growing importance and potential benefits of e-memories - while some of the potential applications discussed seem quite futuristic, others are immediately applicable. The downside of increased digital recording of our lives is discussed briefly, but the book pitches Total Recall as an inevitable future step, so the discussion is more about developments/systems that may be put in place to ensure the security/privacy of data (like the creation of Swiss data banks).

The book also includes a very comprehensive references and resources section.

More at Webby Clare.

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## David says

This book describes the adventures of computer entrepreneur Gordon Bell into the world of "lifelogging," which can best be described by the motto "capture everything, discard nothing." Bell long ago started saving all email (except spam), wears a pendant camera to automatically log photos of his surroundings, has all of his telephone calls archived as audio streams, and has converted all paper worth saving to electronic form. He has now added much more, including a complete medical history and profile.

This basic idea has been around for many years. What has changed is that the data storage to save all of this is now a trifle -- \$100 buys roughly one Tbyte of data, which is more than Bell has logged with all of his data streams. If anything, what struck me as a reader is how much of what Gordon has described in a book published just a few months ago is already available to the consumers. The iPhone, for instance, can now do much of what Gordon describes, including log GPS positions, record sound and video and hundreds of other related tasks. In fact, soon the iPhone will not only be able to record all of what a full-fledged lifelogger will need, it will be able to store it all as well (the new iPhone to be released next month is rumored to feature up to 64 Gbyte flash memory storage).

Gordon is very bullish on the "total recall" concept -- he equates it to "total freedom." He provides many examples of the benefits of storing all that data, everything from extracting the name and personal bio details of a person he met many years ago, to providing detailed documentation of his recovery from a major operation.

In one sense, it's hard to be completely objective about this book, since I know Gordon Bell quite well. For example, I headed the review committee for the Gordon Bell Prize (a prize in the field of high-performance computing that he pioneered and personally funded) for several years, and in fact received as a co-author of a paper in 2008. Even so, I very much enjoyed this book. Gordon really has a great skill in telling a good story, and it is hard to come away from reading this without resolving to follow in his footsteps to be a lifelogger myself. I've already taken several steps...

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## Michelle says

Microsoft researcher Gordon Bell is leading the charge to record every waking moment of your life (and even your sleeping ones) to digital media. \*Total Recall\* investigates what it would be like to be able to record and access all the data about your life anywhere anytime. Among other experiments, he wore a camera around his neck that took a picture automatically whenever the light changed, as when he entered a new room, and recorded his location via GPS; he tried out all sorts of health and medical recording gadgets, from the iPod pedometer to a bluetooth scale to monitor his weight, and a whole lot more.

The book describes the changes that cheap digital storage, automated recording equipment and computerized personalized search engines will make in our lives, probably whether we are willing participants or not, from careful monitoring of medical conditions over an entire lifetime to making it easier to eulogize an old friend, since you need no longer rely upon your own faulty memory or your disorganized paper records if you

record everything to your "e-memory."

Bell's enthusiasm for the possible benefits of never losing another piece of information about yourself is admirable but his point of view has to be colored by the fact that he has resources at his disposal that the ordinary mortal cannot hope to muster: a personal assistant to scan and digitize all his paper records dating back to the beginning of his career at DEC in the 1960s and even farther back including his high school yearbooks, for example. His computer probably won't crash without a backup, destroying years' worth of family photos, and he probably has tech support to protect his personal information so identity theft may not be a big concern for him.

I contemplate the pile of old photo albums in my basement and despair of ever converting them all to digital. I am also painfully aware that simply digitizing everything doesn't make it "eternal" or easy to find. In fact, digital media requires constant vigilance to avoid data loss and obsolescence, and I'm not convinced that putting my entire life story in the cloud is a good idea. I'm not ready to trust my insurance company to keep track of all my exercise and eating records "for my own good," for example. But the reality is, more and more personal information is kept in bigger and bigger databases, so better to understand and use the march of "progress" to our own advantage than stick our heads in the sand. This book presents a useful peek into the not-too-distant future.

## April Pastis says

Every year I dream of finally getting organized, going completely paperless and having all my files available at the tips of my fingertips. Then life happens. In this book, Gordon Bell attempts to record his entire life digitally and describes all of the amazing benefits of being able to recall moments, access health records, and pull up old bills. I, unfortunately, read the book 9 years after it was published. So much of the software authors Bell and Gemmell talk about have been discontinued. Even if I had read it when it was first published, it didn't satisfy the reason I picked it up, which was to create a paperless system. There's no, or very little, instructions on how to go about doing it. Even so, I really enjoyed reading the book. Bell and Gemmell have just the right amount of humor and techno-speak to make it a very interesting read. I found myself agreeing with them more than disagreeing. They also rightly point out the dangers of having the information get into the wrong hands. What would be really interesting would be an additional volume to discuss where the project is today.

## Mariam says

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## Alhamza.Fadil says

Total Recall provides a glimpse of the near future. Imagine heart monitors woven into your clothes and tiny wearable audio and visual recorders automatically capturing what you see and hear. Imagine being able to summon up the e-memories of your great grandfather and his avatar giving you advice about whether or not to go to college, accept that job offer, or get married. The range of potential insights is truly awesome. But Bell and Gemmell also show how you can begin to take better advantage of this new technology right now. From how to navigate the serious question of privacy and serious problem of application compatibility to what kind of startups Bell is willing to invest in and which scanner he prefers, this is a book about a turning point in human knowledge as well as an immediate practical guide

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## Keith says

As I began reading it soon felt like an infomercial. Thus, I set it aside for a few days. but later resumed because it is a topic I am very interested in. For the rest of the book, I used speed reading techniques.

As a boy I dreamed of having a computer in the basement. I imagined that I could put it together from scrap parts. I had no idea how I could pay for the air conditioning bill, but knew that I had to do it. I imagined that it could be doing complex computations that would not be practical without a computer, and that it could work for hours or days on those problems while I was off doing other things.

The author of this book has a dream and he is living his dream, so I read with great interest his account of Total Recall, and MyLifeBits. I wondered if I could obtain a copy of the hardware/software that he is using. But after a bit of an Internet search I concluded that it does not exist as a commercial product.

The first two sections of the book detail his experiences in getting his pictures, email, paper documents, and electronic records from various places, including at least one former place of employment, all into his storage and recall system.

In the third and last section of the book, he admits that there are some concerns; data loss, backup, the mass of data storage require, but even more importantly, some concerns about recording and keeping everything. Privacy concerns of our own selves, and out of respect for others are part of it. Another part of it is that there are some things that we would rather forget because they are embarrassing, or unpleasant, or compromising. As a technologist, he feels that these problems are solvable. My feeling is that these problems will cause the adoption of this kind of technology to be slow.

It is easy to have the impression that the adoption of the recent technologies, such as the Internet was quite rapid, but like so many other technologies, it takes many years from inception, to early adopters, to easily useable, and then to mainstream. What he describes requires both hardware and software, which increases the cost, and they are not yet available in a single package, so, it will be quite a few years for this to become common.

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## **William Winkle says**

Gordon Bell stands out as one of the most influential people in the history of computing. Unlike how it may seem at first glance, this book is not an infomercial for Microsoft. It is a series of well-meditated observations and extrapolations about what will happen to us as we're able to make the digital recording of practically everything we experience part of our permanent and immediately accessible e-memory.

For sure, there are some gaping holes in Bell's narrative, not the least of which is addressing questions concerning the commercial interests that will likely safeguard our lifetime of e-memories in the cloud. If you think Google accidentally suspending your account today is bad news, what will happen in 30 years when your life depends on being able to access that data? E-memory will be like the third hemisphere of your brain, and losing access to it may feel very much like a virtual lobotomy.

Like many other enthusiastic pioneers, Bell assumes that the dangers will ultimately sort themselves out. His eye is on the final prize. And what a prize it will be...from health benefits to radical leaps in learning to an overhaul in how jobs are conducted. It's hard to read "Total Recall" and not be swept away by Bell's vision and his proof for how near we are to taking these last few steps.

If you enjoy technology and get fired up by ideas and their potential for your future, don't miss "Total Recall." And if you're still curious to learn more about Gordon Bell, I conducted a lengthy interview with him, which will soon appear in my ebook, "Architects of Tomorrow, Volume 2."

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## **Hugh Chatfield says**

No no - not the Arnold movie

This covers much of what Robert Sawyer covered in his Neanderthal trilogy.... the ability to store everything about your life - what you saw, what you read or wrote, what you heard - everything.

However, this is no science fiction story - this is the real life activity of Gordon Bell and Jim Gemmell researching how this might be achieved. Fascinating idea. In Sawyer's novel, crime was pretty much non-existent. If you get accused of murdering someone on a particular day - all that is required is to roll back the record to that time and see if you had any contact with the victim.

Beyond what is required technically to do this is the notion of who is allowed to see this record and under what conditions.

It occurred to me that if such a technology existed - combining that with virtual reality technology would let

you "live a day as a particular person" - relive an important day of that person. However, if it did exist I'm sure the porn industry would be first adaptors and make a fortune. ;-)

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## **Josh says**

Interesting look into a future where everyone records every moment of their lives. This book was published in 2009 and the authors were on target with many of their predictions, though I believe their overall vision is a long way off. They seemed to overestimate the penetration and availability of wireless internet service. On a recent visit to Seattle I still had difficulties connecting my devices in some spots, let alone here in rural Indiana. Unless Google gets into the game or the government gets involved in regulating high speed internet or breaking up the regional monopolies of the big ISPs, we're still a decade or two away.

They also focused overmuch on the positives while glossing over or ignoring some of the possible negative ramifications of their vision. For example, employers constantly monitoring their employees. This and a host of other possible problems didn't receive much attention. Still, it was an interesting vision of what the future may hold.

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## **Gary Lang says**

This book is about a subject that I've always been fascinated by – collecting a representation of everything in your life that it is possible to store digitally. Gordon Bell has used what would be his retirement years to probe the boundaries of Extreme Personal Information Management. Making good use of what he describes would require an extraordinary combination of visualization, image processing, 3D modeling, collective intelligence, and a panoply of format processors capable of extracting meaning from images, videos, text, and audio both from the past and as they are created. Bell has covered all of this in the “My Life Bits” project for close to a decade. This book describes his journey. It also points the way for us to make the most impactful use of all of this information. This applies to our work lives of course, but the emphasis here is on the personal, and the ability to become as deep a digital curator of our own lives as Bell describes here is only now just coming online for most people.

Things move fast, so much of what Bell describes is commonplace only two years after he wrote this book. But he recognized that this would be the case, and predicts the wondrous becoming commonplace in his book. So the book will remain interesting and predictive for some time to come.

I recommend “Total Recall” whole-heartedly.

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