MIND OF THE INNOVATOR:

TAMING THE TRAPS OF TRADITIONAL THINKING

BY MATTHEW E. MAY

PART I: THE SEVEN SINS OF SOLUTIONS

Innovator? Problem-solver? Learner?

This is how I begin an inventive solutions session with 12 highly skilled bomb technicians from The Los Angeles Police Department, who have been selected to address a complex challenge regarding benchmark methods to respond to bomb calls in the age of terrorism. These are the most highly paid officers in the entire department. The guys who have to cut the right wire. It's a job that requires quick thinking, quick reads, quick decisions and quick action—all under an unbelievably pressure-cooked situation, often one that presents them with something they've never seen before. They often must improvise in a split second.

Yet, when I ask the true innovators to raise their hands, there are no takers. Not a single hand goes up. Then, when I ask the problem-solvers to identify themselves, every hand goes up. And to confirm the query, I ask the learners to raise their hands. Same result. In fact, in each of the dozens of lectures and workshops I've given recently, the results are the same.

That's why we need to change the way we think about innovation. We need to stop thinking about innovation as an outcome, and start thinking about innovation as a process. We need to move from innova*tions* to innova*tion*. Because as a practical matter, innovation, problem-solving and learning employ the same iterative process—blending supposition, logic, creativity and reflection. Time frames and territories always change, so the central challenge is having the proper mind-set, discipline and tools at our disposal so that we're able to combine "blink" and "think" strategies in an effort to create something new.

Serial innovators know this. They know that great ideas and viable solutions don't just rain down from above. They're *chased* down from the ground up. They know that if they don't stick to a solid, scientific method, the traps of traditional thinking will rule the day. If that happens, innovation becomes a distant pipedream.

Allow me to illustrate.

Suppose I gave you a fairly simple business problem to solve, based on a real case. I'll give you the one I gave the bomb techs:

You own an upscale neo-luxury health club. As part of the membership perks, each of the 40 shower stalls is stocked with a bottle of very expensive, salon-only shampoo. The customers love it and rave about it. The front desk sells the bottles. Unfortunately, bottles disappear from the showers all the time. In fact, theft rate is 33%, presenting a costly situation. You've tried reminders, penalties, and incentives to try and reduce theft, but nothing so far has worked. You do not want to discontinue or alter the shampoo offering in any way—one bottle of the current brand per stall must not change. You want the problem solved within the guidelines:

- Theft must be 100% eliminated
- Any solution must be one of zero cost
- No burden on the patron

You have fifteen minutes to arrive at an elegant solution. Grab a few other people, as it's hard to brainstorm alone. I'll wait.

Seriously. Take fifteen minutes. The rest of this manifesto will have much more resonance if you resist the urge to skip over the exercise.

Back? How did it go? What was the process you used to solve the problem?

When I give this problem and watch the action unfold, it's amazing to watch what I call the "Seven Sins of Solutions" be committed nearly every time. These are the traps of traditional thinking.

My bet is at least one of the seven popped up somewhere in your process. First I'll identify them, then provide a means by which they can be neutralized…for every problem, innovation, or challenge. They *can* be tamed!

#1: SHORTCUTTING (LEAPING TO SOLUTIONS)

Leaping to solutions in an instinctive way or intuitive way—i.e. the "blink" method of problem-solving—almost never leads to an elegant solution to a complex problem, because deeper, hidden causes don't get addressed. Now, most of the problems we face don't require us to analyze them any more deeply than to arrive at a work-around. You know the usual suspects: what time to get up, what to wear, how to avoid traffic, tall-grande-venti?

But when we face more complex challenges, we need to think deeper. Unfortunately, our brains are trained to perform mental shortcuts. Here's an example from former CIA Analyst, Morgan Jones. Name the individual described here:

A new chief executive, one of the youngest in his nation's history, is being sworn into office on a cold, cloudy day in January. He was raised as a Catholic. He rose to his new position in part because of his vibrant charisma. He is revered by the people and will play a crucial role in a military crisis that will face his nation. His name will become legendary.

Nearly 95% of people studied in the U.S. would answer John F. Kennedy. And they arrive at their conclusion around the third sentence. But the answer could also be Adolph Hitler. As soon as our brains get enough data to call up a pattern, we leap.

Interestingly, the new book, *How Doctors Think* by Jerome Groopman, cites an average diagnosis time of 18 seconds. The author, a physician, maintains that doctors shortcut their diagnosis after hearing the first or second symptom, leading to a situation where 20% of all medical errors are due to leaping to the solution.

When I watched the LAPD bomb techs work on the theft problem, nearly all of their 15 minutes was spent brainstorming solutions. Little if any time was spent understanding the root causes of the situation.

How much of the 15 minutes did you allot for digging into the possible causes of the problem?

#2: BLINDSPOTS

Blindspots are the umbrella term for assumptions, biases, mind-sets and reflexive thinking.
Our brains do a lot of "filling in" for us. And there's science behind it. Print out this page, then…

Hold the sheet at arm's length. Close your left eye and focus your right eye only on the left spot.
Bring the paper slowly toward you...the right spot will disappear. There's a physical gap where the
optic nerve leaves the retina to go back to your brain. Our brains fill in the blank for us.

When our brains make their patterns based on our experience, we have to really focus to consciously
break the pattern and "think different." We don't get to deeper problem solving until we run out of
filling-in actions. Example: When we want to watch television, we aim the remote at the box without
even thinking about it. We instinctively know from the countless times of doing so that pressing the
power button will convert the "TV off" pattern to the "TV on" pattern. When the television doesn't
come on, we keep hitting the power button repeatedly until we're certain it won't work, defending
our mind-set. Then a new pattern kicks in: play with the batteries. We don't replace them, instead
we roll them around, then revert to the first action of aiming the remote at the TV. Only when doing
so doesn't work will we replace the batteries, again reverting to the first action. If that doesn't work,
we run down the list of what's worked in the past, still not really thinking or analyzing the situation.
Only when we've exhausted every known fix will we attempt a deeper problem-solving effort and
starting asking ourselves: *Why doesn't the remote work?*

What assumptions did you make in trying to solve the shampoo problem?

The first two sins are interconnected. In trying to solve the shampoo problem, if you had spent more time thinking about the "why?" behind the what, you would have been better able to frame the problem properly without making unwarranted assumptions. Otherwise, you may have inadvertently tossed out solutions more focused on eliminating dishonesty, rather than eliminating theft.

Once you understand that you have a clientele in which a third of the population is willing to shirk responsibility when it comes to an easily-removed, relatively low-impact yet highly attractive item, the real challenge revolves around making it hard and undesirable to remove.

And to do so without cost or burden on the patron.

(*The health club simply removed the tops of shampoo bottles. Problem solved!*)

#3: NOT INVENTED HERE (N.I.H.)

'Not invented here' means that blindspots are causing tunnel vision...or a lack of perspective. NIH means "hey, if I (we) didn't come up with it, it won't work. It is of no use."

We adopt this mind-set unknowingly...shutting out another person's or group's idea immediately and without due consideration merely because they came up with it. Here's the proof: researchers repeatedly observed lobby elevators for an 8-hour period. In over 95% of the times when the elevator button was already lit (had been pushed), people would push it again.

By nature, we don't trust other people's solutions!

In the shampoo case, I specifically stated that reminders, incentives and penalties had not worked in the past. Yet, in nearly every session I've conducted, I'm given some form of a reminder, incentive or penalty. True, they are creative, but in essence no different.

The thinking goes like this: "Well, he didn't try *our* penalty. Ours is better."

Which may be true, EXCEPT few ever take the learning approach to ask: "Hey, I wonder why incentives or penalties didn't work? Maybe we need to understand the problem better."

You don't have to adopt others' solutions to learn from them. Avoid the "Not Invented Here" mentality at all costs...if for no other reason than there are few if any completely new and original ideas under the sun. Everything has a precursor somewhere or in some fashion.

How much time did you spend thinking about why previous solutions failed?

#4: SATISFICING

Here's the thought: breakthrough thinking demands something to break through. Generally, it's the space between conflicting goals, causing creative tension. In the shampoo case, I deliberately set goals in conflict under a short time-frame to force a creative tension.

Ever wonder why some solutions lack inspiration, imagination, and originality? It's because we don't think as deeply or as broadly as we must to solve the problem. We tell ourselves the optimal solution is a luxury. We throw some resources at the problem and move on. Or tweak a previous solution and fit it to the current situation. We favor implementation over incubation.

Then we wonder why the reaction to our idea is ho-hum.

It's because by nature we *satisfice.* Satisfice is the combination of satisfy and suffice, a term economist and Nobel Laureate Herbert A. Simon coined in his 1957 *Models of Man* to describe the typical human decision-making process by which we go with the first option that offers an acceptable payoff. We'll take whatever seems to meet the bare minimum requirement to achieve the goal. Then we stop looking for the best way to solve the problem. Essentially we say: "good enough."

We satisfice ALL THE TIME. Example: Leaving the plus sign and equals sign alone, turn this incorrect Roman-numeral equation, using sticks to form the numbers, into a correct one by moving as few sticks as possible:

$$XI + I = X$$

My guess is you jumped into moving things around right away. Maybe you moved one and came up with X + I = XI. Or IX + I = X. Congratulations. You satisficed. The elegant solution? You don't need to move a single stick. Instead, look at the problem upside down.

It's really all about how we frame the problem. The ability to properly frame an issue or problem goes far in avoiding the typical pitfalls that limit our ability to reach the elegant solution. There are lots of reasons why we're not as good at it as we could be. Mostly we're impatient and undisciplined. We're obsessed with solutions, but not with the process of generating the optimal one. We're also quite fond of common sense, which doesn't always square with proper framing.

Finally, we have a flair for the obvious, mostly because it provides a suitable mental shortcut.

To become a great problem framer, focus on asking the right question, not the right answer.

Studies of brainstorming sessions reveal that idea generation generally stalls after about twenty minutes. At that point most groups stop and turn their attention to evaluating their ideas. However, the research shows that teams with the best ideas don't stop there. They embrace the psychological barrier and push through the stall zone, opening up new channels of widely divergent thinking. They hold the tension.

Did you hold the tension, refusing to compromise, or did you simply pick a solution at the 15-minute mark and rationalize why it would work?

#5: DOWNGRADING

Downgrading is the close cousin of satisficing, with a twist: a formal revision of the goal or situation. It comes in two basic flavors.

First, there's the twisting and sifting of facts to suit our solution. Second, there is the "revised estimate." The result is the same. We fall short of the optimal or ideal solution, pick one that gets us most of the way there, then sell the upside and downplay the downside.

We do it all the time, because no one wants to feel like they didn't succeed.

But here's the thing: we can't win a football game by shooting for the 97-yard line. You can't score a run in baseball by only making it to third base. You can't reach Mars by shooting for the moon. You can't...well, you get the drift.

In any problem-solving effort, if you've done the homework and nailed the root cause, you should be able to paint a picture of what the world looks like if that problem goes away. From there, think in extremes: 0% this, 100% that. That's the desired, ideal state.

In the shampoo case, did you think: 0% theft is impossible?

#6: COMPLICATING

Why do we overthink? Why do we complicate? Why do we add cost? Most interestingly, why do we ALL do it so intuitively, naturally, and (here's the killer) consistently?

Answer: we're hardwired that way. Our brains are designed to drive hoarding, storing, accumulating, collecting-type behavior. We are by nature "do more/add on" types. Don't believe me? Go watch the exit door at the wildly successful Costco or Sam's Club nearest you. 36 rolls of toilet paper make us feel pretty good about ourselves.

When it comes to problem-solving, this instinct translates into adding complexity and cost as a first course of action. *I can solve the problem, but it's going to take more resources* is the oft-heard refrain. But it doesn't necessarily take genius to spend money. It takes genius to work within the resource constraints you're given. To be resourceful.

Asking for more resources right away is like Sting asking for a 9th note to write his next hit song. IT'S NOT NEEDED...8 musical notes are all he (and we) get!

Take the case of the Santa Monica Freeway devastated by the 1994 Northridge, California earthquake. The catastrophe had the potential—according to the state public transportation agency—of shutting down this major artery for well over a year at an economic hit of about $1 million per day. C.C. Myers, a commercial constructor, thought he could have things up and running in under 6 months. Putting his reputation and own money on the line, he cut a deal with Los Angeles: 140 days, $14.7 million, with an incentive of $200K for every day under the limit and $200K penalty for every day late.

66 days is all it took to get the freeway safely opened again. 74 days ahead of schedule.

Sure, they worked 24/7 and practically ran on the job. But the real innovation? Real-time inspection. Myers demanded an inspector be onsite at all times to approve/disapprove work as it was being completed instead of waiting until the end of the job.

Let limitations drive creativity. Respecting the fact that restraining forces rule and that resources are finite will go far in eliminating the deadly sin of adding cost and complexity to your solution.

What cost and complexity did you add in trying to solve the shampoo problem?

#7: STIFLING

Years ago I played a dirty trick on a group of managers at a fairly large organization. Through my consulting work, I had discovered that a particular set of individuals of the command-and-control type were causing some fairly serious issues: some extremely lucrative opportunities were being dismissed, each at a high "lost opportunity" cost. Root cause? These individuals TO A PERSON would not allow their subordinates to have ideas. They had various ways of shooting ideas down.

(Read a GREAT manifesto here called "100 Ways to Kill a Concept: Why Most Ideas Get Shot Down")

This group of managers took issue with my report. Luckily, an upcoming off-site presented me with the opportunity to prove it to them.

At the off-site, there were about 75 people of varying degrees of seniority, ranging from field supervisors to senior execs. I gave the assignment, one of those group priority exercises whereby you rank a list of items individually and then as a group and compare (sort of a "wisdom of crowds" exercise to show that "we" is smarter than "me"). This specific exercise required you to rank 25 items with which you've crashed on the moon in relation to how important they were to your survival. NASA had compiled the correct ranking, so there was a clear answer.

I did the exercise with a twist. At each table I put a ringer. I gave the lowest-ranking person the answer. It was their job to convince the command-control types they knew the right answer.

During the group exercise, NOT A SINGLE CORRECT ANSWER GOT HEARD.

After debriefing the exercise in the regular way, I had each person to whom I had given the correct answer stand up. I announced that these individuals had offered the right answer, but their ideas had been stifled, mostly due to their source and stature and seniority, or lack thereof.

I wish I had a camera to catch the red-faced managers.

We do this naturally...stifle, dismiss, and second guess the ideas of others in favor of our own. Generally speaking, whenever I conduct problem-solving workshops, groups discuss the right answer, but it doesn't get offered up as a solution. Because members second-guess, stifle, dismiss and even distrust their own genius.

Stifling is the deadliest of the sinful seven, because it is the most destructive.
Had you happened upon the right answer in your contemplation, but dismissed it?

PART II: TAMING THE TRAPS

So how do you defeat, or at least neutralize, the seven deadly sins?

IDEA Loops. IDEA is an acronym for Investigate, Design, Execute, Adjust. It's a codification of the human learning cycle...the one that starts disappearing around age 5, once we enter the formal school system. That's when it becomes about the right answer and not the right question.

Our most powerful learning experiences generally occur in a four-phase cycle of (1) Questioning; (2) Solving; (3) Experimenting; (4) Reflecting.

Everything starts with a question, which triggers an investigation and information-gathering effort. *How can I do that better?* That leads to the definition of a problem to be analyzed and solved. The search for possible answers to your question entails generating ideas, solutions and corrective measures. By experimenting with one or more of the solutions, the most appropriate and effective is discovered. You then reflect on your experiments, observing your own thinking and actions. *How well did that work?* This in turn stimulates further questions, commencing the learning cycle again.
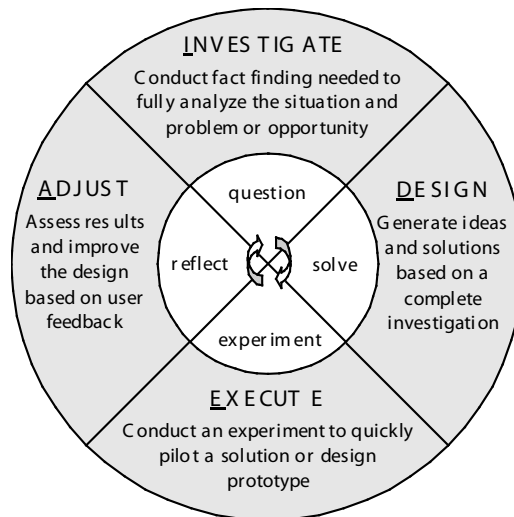
The beauty of IDEA Loops is that they can apply to all situations. Investigation, Design, Execution and Adjustment are the universal common denominators to successful innovation.

Now, we're pretty good at the middle part of the process… **Design** and **Execute.** Where we most often fall down is in the **Investigate** and **Adjust** phases.

And of the two, the Investigation phase is the easier. Most of the time we're just impatient when conducting a situational analysis. We want to leap to a solution without having to bother about identifying, defining and framing the problem properly.

INVESTIGATE
Conduct fact finding needed to fully analyze the situation and problem or opportunity

DESIGN
Generate ideas and solutions based on a complete investigation

EXECUTE
Conduct an experiment to quickly pilot a solution or design prototype

ADJUST
Assess results and improve the design based on user feedback

question — solve — experiment — reflect

Which is interesting, because if the proliferation and popularity of television shows about criminal, scientific and medical investigation is any indication, we have a real appetite for watching evidence and information be collected and analyzed.

We love to watch *CSI* on television; if they added Terre Haute to the lineup of Las Vegas, Miami, and New York, we'd still want to watch it. We love to watch the crackerjack team of diagnosticians on *House, M.D.* solve impossible afflictions.

But it's hard to imagine a police criminalist processing evidence without collecting clues at the scene of the crime. Or a medical investigator offering up a treatment without understanding the symptoms and their causes. So the question is: why don't we engage in the same level of investigation in our efforts to solve problems and innovate?

Answer: it takes effort. There's nothing difficult about it. Just do it.

That leaves us with the Adjust phase. One of the things I picked up from years of working with Toyota is the art of hansei (hahn-say), which is the Japanese word for reflection. Hansei is the rigorous review conducted after action has been taken. It's a huge and absolutely vital part of learning. And with a few notable exceptions, our Western culture is just plain miserable at it.

Hansei is not about confirmation. It's not about celebration of success. It's a sobering reality check, regardless of a project's outcome. Were you to attend a hansei meeting following a resounding success at Toyota, you would be shocked at the tone of the meeting. It's stern and serious. Fine, the team greatly exceeded expectations. Guess what, that means they didn't understand their process. Their objectives should have been met. And even if they matched perfectly to the target, the team must still examine the course of action and the interim measures, not just the final results.

In Western culture, when projects meet their objective, we celebrate. Unfortunately, there's little in the way of deep learning in that approach. Our bias for action doesn't value reflection nearly

as highly as it should. Horrors, if we catch anyone in their office staring out into space, they must be daydreaming, goofing off. We just don't seem to get it. It's about thinking. Hansei fosters real learning and insight.

Hansei is indeed an Eastern cultural artifact. Its true meaning is closer to introspection than reflection. Hansei finds its roots in Buddhism philosophy, but it is a profound skill to be mastered. Japanese school children are taught from kindergarten how to perform hansei, and it is a significant tool used to improve one's self.

The key insight is this: Hansei is performed regularly, irrespective of performance!

FINAL WORD: THE BREAK IN BREAKTHROUGHS

I can't overemphasize the value of reflection. And here's a crucial element to it: time away from the problem. I've discovered that "break" is a big part of breakthrough, both literally and figuratively. I've observed it, experienced it, and studied it.

Researchers looking into how the human brain actually solves problems now confirm what many artists and scientists instinctively know about the process of idea incubation: that seemingly unproductive times are a key ingredient of immensely productive and creative ones.

We've all heard of the apparently serendipitous occurrences—Archimedes' ("Eureka!") flash of insight regarding displacement occurring during a bath, and Einstein's theory of relativity coming to him in a daydream.

Experiments show that creative revelations come when the mind is engaged in an activity unrelated to the issue being addressed, and that pressure is not conducive to creative thought. Recent research demonstrates that the ultimate break—sleep—actually changes our mind's perspective

unconsciously. Information is consolidated by a process taking place in the hippocampus during sleep, enabling the brain to effectively clear itself and reboot, all the while forming new connections and associations. The result is new insight and the aha! feeling of the Eureka moment.

The catch is obvious: if the neural workings of the brain are hidden from our awareness, we can't speed them up or artificially influence them to work harder or more intensely. We can only let go. Ironically, when we do—when we escape either physically or mentally, we actually speed up the transformational processes.

But here's the thing: we're reticent to take those breaks. Certainly we don't include them or build them in as a formal part of our problem-solving efforts. The question is why we don't, when without the break, there may just be no breakthrough.

Enter the irrational fear of failure. Backing off is counterintuitive. It somehow feels wrong, like preemptive surrender. It's scary to ease up, because we may lose our steam, or we may abandon hope. We get anxious when the answers aren't so forthcoming, and we begin to doubt our creativity, abilities and intelligence, fearing that if we take our eye off the problem even for a moment, we may lose the energy we've invested.

The key is a quiet mind. We need to learn to rid ourselves of the potentially destructive negative self-talk: inevitable thoughts of failure, inner voices of self-criticism and judgment, and the ever-present temptations to compare ourselves to others whose circumstances have little to do with our own.

High performers know that the line between failure and success is very often drawn on the mental field of play. The good news is that turning down the chatterbox brain is something that can be learned.

Some prefer simply taking downtime to reflect and think (or not think as the case may be). Think Week is the now-legendary solitary sabbatical taken twice yearly by Microsoft founder and chairman Bill Gates. In his tiny lakeside cottage hideaway, he ponders the past, present and future of his company, of technology and of his industry. He takes long walks along the lake shore in contemplation to quiet his mind.

Meditation may be the most powerful tool known. Neuroscientists have since the 1990s been studying Tibetan monks in the hills above Dharamasala to understand how meditation affects brain activity. In the most experienced Buddhist practitioners, researchers using electroencephalography (EEG) and functional magnetic resonance imaging (fMRI) have discovered abnormally high levels of gamma brainwaves, which are believed to be associated with the brain's ability to synthesize disparate bits of data, solve problems, heighten perception, and boost consciousness.

Scientists have now concluded that mental training can create an enduring brain trait. That means we may actually be able to rewire our brains to adopt different thinking circuits. In fact, in a reversal of conventional medical wisdom which holds that mental experiences result from physical goings-on in the brain, startling new evidence suggests the reverse may also be true—that our mental machinations may actually alter the physical structure of our grey matter. Neuroscientists call the phenomenon neuroplasticity.

In other words, when you change your mind, you change your brain.
And that leaves a whole new world of opportunity for the mind of the innovator.

info
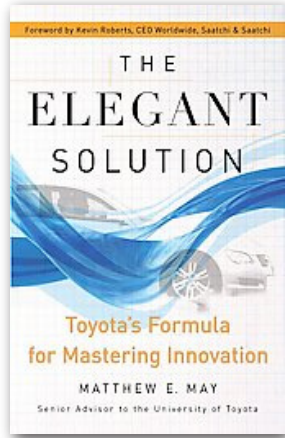
BUY THE BOOK
Get more details or buy
a copy of Matthew May's
The Elegant Solution.

ABOUT THE AUTHOR

Matthew E. May is the author of a previous manifesto, Elegant Solutions: Breakthrough Thinking the Toyota Way, the Elegant Solutions blog, and *The Elegant Solution: Toyota's Formula for Mastering Innovation* (Free Press, 2006), which drew on his over eight years of experience as a former senior advisor and master instructor at Toyota. He has contributed to or written for *Strategy & Business*, *Across the Board*, *The American*, *The Wharton Leadership Digest*, *Quality Progress*, *Consulting to Management*, *The Detroit News*, *The Detroit Free Press*, and *USA Today*. Matt is the director of the consulting and education firm, Aevitas Learning & Innovation and holds an MBA from The Wharton School and a BA from Johns Hopkins University.

SEND THIS

Pass along a copy of this manifesto to others.

SUBSCRIBE

Sign up for our free e-newsletter to learn about our latest manifestos as soon as they are available.

BORN ON DATE

This document was created on August 8, 2007 and is based on the best information available at that time. Check here for updates.

ABOUT CHANGETHIS

ChangeThis is a vehicle, not a publisher. We make it easy for big ideas to spread. While the authors we work with are responsible for their own work, they don't necessarily agree with everything available in ChangeThis format. But you knew that already.

ChangeThis is supported by the love and tender care of 800-CEO-READ. Visit us at 800-CEO-READ or at our daily blog.

COPYRIGHT INFO

The copyright of this work belongs to the author, who is solely responsible for the content.

This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs License. To view a copy of this license, visit Creative Commons or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, California 94305, USA.

Cover image from iStockphoto®

WHAT YOU CAN DO

You are given the unlimited right to print this manifesto and to distribute it electronically (via email, your website, or any other means). You can print out pages and put them in your favorite coffee shop's windows or your doctor's waiting room. You can transcribe the author's words onto the sidewalk, or you can hand out copies to everyone you meet. You may not alter this manifesto in any way, though, and you may not charge for it.