PROGRAM OR BE PROGRAMMED

TEN COMMANDS FOR A DIGITAL AGE

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Douglas Rushkoff

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Introduction

When human beings acquired language, we learned not just how to listen but how to speak. When we gained literacy, we learned not just how to read but how to write. And as we move into an increasingly digital reality, we must learn not just how to use programs but how to *make* them.

In the emerging, highly programmed landscape ahead, you will either create the software or you will be the software. It's really that simple: Program, or be programmed. Choose the former, and you gain access to the control panel of civilization.

Choose the latter, and it could be the last real choice you get to make.

For while digital technologies are in many ways a natural outgrowth of what went before, they are also markedly different. Computers and networks are more than mere tools: They are like living things, themselves. Unlike a rake, a pen, or even a jackhammer, a digital technology is programmed. This means it comes with instructions not just for its use, but also for itself. And as such technologies come to characterize the future of the way we live and work, the people programming them take on an increasingly important role in shaping our world and how it works. After that, it's the digital technologies themselves that will be shaping our world, both with and without our explicit cooperation.

That's why this moment matters. We are creating a blueprint together—a design for our collective future. The possibilities for social, economic, practical, artistic, and even spiritual progress are tremendous. Just as words gave people the ability to pass on knowledge for what we now call civilization, networked activity could soon offer us access to shared thinking—an extension of consciousness still inconceivable to most of us today. The operating principles of commerce and culture—from supply and demand to command and control—could conceivably give way to an entirely more engaged, connected, and collaborative mode of participation.

But so far, anyway, too many of us are finding our digital networks responding unpredictably or even opposed to our intentions.

Retailers migrate online only to find their prices undercut by automatic shopping aggregators. Culture creators seize interactive distribution channels only to grow incapable of finding people willing to pay for content they were happy to purchase before. Educators who looked forward to accessing the world's bounty of information for their lessons are faced with students who believe that finding an answer on Wikipedia is the satisfactory fulfillment of an inquiry. Parents who believed their kids would intuitively multitask their way to professional success are now concerned those same kids are losing the ability to focus on any one thing.

Political organizers who believed the Internet would consolidate their constituencies find that net petitions and self-referential blogging now serve as substitutes for action. Young people who saw in social networks a way to redefine themselves and their allegiances across formerly sacrosanct boundaries are now conforming to the logic of social networking profiles and finding themselves the victims of marketers and character assassination. Bankers who believed that digital entrepreneurship would revive a sagging industrial age economy are instead finding it impossible to generate new value through capital investment. A news media that saw in information networks new opportunities

for citizen journalism and responsive, twenty-four-hour news gathering has grown sensationalist, unprofitable, and devoid of useful facts.

Educated laypeople who saw in the net a new opportunity for amateur participation in previously cordoned-off sectors of media and society instead see the indiscriminate mashing and mixing up of pretty much everything, in an environment where the loud and lewd drown out anything that takes more than a few moments to understand. Social and community organizers who saw in social media a new, safe way for people to gather, voice their opinions, and effect bottom-up change are often recoiling at the way networked anonymity breeds mob behavior, merciless attack, and thoughtless responses.

A society that looked at the Internet as a path toward highly articulated connections and new methods of creating meaning is instead finding itself disconnected, denied deep thinking, and drained of enduring values.

It doesn't have to turn out this way. And it won't if we simply learn the biases of the technologies we are using and become conscious participants in the ways they are deployed.

Faced with a networked future that seems to favor the distracted over the focused, the automatic over the considered, and the contrary over the compassionate, it's time to press the pause button and ask what all this means to the future of our work, our lives, and even our species. And while the questions

may be similar in shape to those facing humans passing through other great technological shifts, they are even more significant this time around—and they can be more directly and purposely addressed.

The big, unrecognized news here is about a whole lot more than multitasking, pirated MP3s, or superfast computers at the investment houses shortcutting our stock trades. It is that thinking itself is no longer—at least no longer exclusively—a personal activity. It's something happening in a new, networked fashion. But the cybernetic organism, so far, is more like a cybernetic mob than new collective human brain. People are being reduced to externally configurable nervous systems, while computers are free to network and think in more advanced ways than we ever will.

The human response, if humanity is going to make this leap along with our networked machines, must be a wholesale reorganization of the way we operate our work, our schools, our lives, and ultimately our nervous systems in this new environment. "Interior life," such as it is, began in the Axial Age and was then only truly recognized as late as the Renaissance. It is a construction that has served its role in getting us this far, but must be loosened to include entirely new forms of collective and extra-human activity. This is uncomfortable for many, but the refusal to adopt a new style of engagement dooms us to a behavior and psychology that is increasingly vulnerable to the biases and agendas of

our networks—many of which we are utterly unaware we programmed into them in the first place.

Resistance is futile, but so is the abandonment of personal experience scaled to the individual human organism. We are not just a hive mind operating on a plane entirely divorced from individual experience. There is a place for humanity—for you and me—in the new cybernetic order.

The good news is we have undergone such profound shifts before. The bad news is that each time, we have failed to exploit them effectively.

In the long run, each media revolution offers people an entirely new perspective through which to relate to their world. Language led to shared learning, cumulative experience, and the possibility for progress. The alphabet led to accountability, abstract thinking, monotheism, and contractual law. The printing press and private reading led to a new experience of individuality, a personal relationship to God, the Protestant Reformation, human rights, and the Enlightenment. With the advent of a new medium, the status quo not only comes under scrutiny; it is revised and rewritten by those who have gained new access to the tools of its creation.

Unfortunately, such access is usually limited to a small elite. The Axial Age invention of the twenty-two-letter alphabet did not lead to a society of literate Israelite readers, but a society of hearers, who would gather in the town square to listen to the Torah scroll read to them by a rabbi. Yes, it was

better than being ignorant slaves, but it was a result far short of the medium's real potential.

Likewise, the invention of the printing press in the Renaissance led not to a society of writers but one of readers; except for a few cases, access to the presses was reserved, by force, for the use of those already in power. Broadcast radio and television were really just extensions of the printing press: expensive, one-to-many media that promote the mass distribution of the stories and ideas of a small elite at the center. We don't make TV; we watch it.

Computers and networks finally offer us the ability to write. And we do write with them on our websites, blogs, and social networks. But the underlying capability of the computer era is actually programming—which almost none of us knows how to do. We simply use the programs that have been made for us, and enter our text in the appropriate box on the screen. We teach kids how to use software to write, but not how to write software. This means they have access to the capabilities given to them by others, but not the power to determine the value-creating capabilities of these technologies for themselves.

Like the participants of media revolutions before our own, we have embraced the new technologies and literacies of our age without actually learning how they work and work on us. And so we, too, remain one step behind the capability actually being offered us. Only an elite—sometimes a new

elite, but an elite nonetheless—gains the ability to fully exploit the new medium on offer. The rest learn to be satisfied with gaining the ability offered by the last new medium. The people hear while the rabbis read; the people read while those with access to the printing press write; today we write, while our techno-elite programs. As a result, most of society remains one full dimensional leap of awareness and capability behind the few who manage to monopolize access to the real power of any media age.

And this time, the stakes are actually even higher. Before, failing meant surrendering our agency to a new elite. In a digital age, failure could mean relinquishing our nascent collective agency to the machines themselves. The process appears to have already begun.

After all, who or what is really the focus of the digital revolution? Instead of marveling at a person or group who have gained the ability to communicate in a new way, we tend to marvel at the tools through which all this is happening. We don't celebrate the human stars of this medium, the way we marveled at the stars of radio, film, or television; we are mesmerized instead by the screens and touchpads themselves. Likewise, we aspire less to the connectivity enjoyed by our peers than to the simple possession of the shiny new touchpad devices in their laps. Instead of pursuing new abilities, we fetishize new toys.

Meanwhile, we tend to think less about how to integrate

new tools into our lives than about how simply to keep up. Businesses throw money at social networks because they think that's the way to market in a digital age. Newspapers go online less because they want to than because they think they have to—and with largely disastrous results. Likewise, elementary school boards adopt "laptop" curriculums less because they believe that they'll teach better than because they fear their students will miss out on something if they don't. We feel proud that we're willing to do or spend whatever it takes to use this stuff—with little regard to how it actually impacts our lives. Who has time to think about it, anyway?

As a result, instead of optimizing our machines for humanity—or even the benefit of some particular group—we are optimizing humans for machinery. And that's why the choices we make (or don't make) right now really do matter as much or more than they did for our ancestors contending with language, text, and printing.

The difference is in the nature of the capability on offer—namely, programming. We are not just extending human agency through a new linguistic or communications system. We are replicating the very function of cognition through external, extra-human mechanisms. These tools are not mere extensions of the will of some individual or group, but tools that have the ability to think and operate other components in the neural network—namely, us. If we want to participate

in this activity, we need to engage in a renaissance of human capacity nothing short of (actually more significant than) the assumption by the Israelites of a new human code of conduct capable of organizing what had been preliterate tribes into a full-fledged civilization. The Torah was not merely a by-product of text, but a code of ethics for dealing with the highly abstracted, text-based society that was to characterize the next two millennia.

Only this time, instead of an enduring myth to elevate these ideas to laws, we need to rely on a purpose and on values as real and powerful as the science and logic our machines are using in their own evolutionary ascent.

The strategies we have developed to cope with new mediating technologies in the past will no longer serve us—however similar in shape the computing revolution may appear to previous reckonings with future shock.

For instance, the unease pondering what it might mean to have some of our thinking done out of body by an external device is arguably just a computer-era version of the challenges to self-image or "proprioception" posed by industrial machinery. The industrial age challenged us to rethink the limits of the human body: Where does my body end and the tool begin? The digital age challenges us to rethink the limits of the human mind: What are the boundaries of my cognition? And while machines once replaced and usurped the value of human labor, computers and networks do more

than usurp the value of human thought. They not only copy our intellectual processes—our repeatable programs—but they also discourage our more complex processes—our higher order cognition, contemplation, innovation, and meaning making that should be the reward of "outsourcing" our arithmetic to silicon chips in the first place.

The way to get on top of all this, of course, would be to have some inkling of how these "thinking" devices and systems are programmed—or even to have some input into the way it is being done, and for what reasons.

Back in the earliest days of personal computing, we may not have understood how our calculators worked, but we understood exactly what they were doing for us: adding one number to another, finding a square root, and so on. With computers and networks, unlike our calculators, we don't even know what we are asking our machines to do, much less how they are going to go about doing it. Every Google search is—at least for most of us—a Hail Mary pass into the datasphere, requesting something from an opaque black box. How does it know what is relevant? How is it making its decisions? Why can't the corporation in charge tell us? And we have too little time to consider the consequences of not knowing everything we might like to about our machines. As our own obsolescence looms, we continue to accept new technologies into our lives with little or no understanding of how these devices work and work on us.

We do not know how to program our computers, nor do we care. We spend much more time and energy trying to figure out how to use them to program one another instead. And this is potentially a grave mistake.

As one who once extolled the virtues of the digital to the uninitiated, I can't help but look back and wonder if we adopted certain systems too rapidly and unthinkingly. Or even irreversibly. But those of us cheering for humanity also get unsettled a bit too easily, ourselves. We are drawn into obsessing over the disconnecting possibilities of technology, serving as little more than an equal and opposite force to those techno-libertarians celebrating the Darwinian wisdom of hive economics. Both extremes of thought and prediction are a symptom of thinking too little rather than too much about all this. They are artifacts of thinking machines that force digital, yes or no, true or false reconciliation of ideas and paradoxes that could formerly be sustained in a less deterministic fashion. Contemplation itself is devalued.

The sustained thought required now is the sort of real reflection that happens inside a human brain thinking alone or relating to others in small self-selecting groups, however elitist that may sound to the techno-mob. Freedom—even in a digital age—means freedom to choose how and with whom you do your reflection, and not everything needs to be posted for the entire world with "comments on" and "copyright off." In fact, it's the inability to draw these boundaries and distinctions—or

the political incorrectness of suggesting the possibility—that paints us into corners, and prevents meaningful, ongoing, open-ended discussion. And I believe it's this meaning we are most in danger of losing. No matter the breadth of its capabilities, the net will not bestow upon humans the fuel or space we need to wrestle with its implications and their meaning.

We are aware of the many problems engendered by the digital era. What is called for now is a human response to the evolution of these technologies all around us. We are living in a different world than the one we grew up in—one even more profoundly different than the world of the alphabet was from the oral society that existed for millennia before it. That changing society codified what was happening to it through the Torah and eventually the Talmud, preparing people to live in a textual age. Like they did, we need to codify the changes we are undergoing, and develop a new ethical, behavioral, and business template through which to guide us. Only this time it must actually work.

We are living through a real shift—one that has already crashed our economy twice, changed the way we educate and entertain ourselves, and altered the very fabric of human relationships. Yet, so far, we have very little understanding of what is happening to us and how to cope. Most of the smart folks who could help us are too busy consulting to corporations—teaching them how to maintain their faltering

monopolies in the face of the digital tsunami. Who has time to consider much else, and who is going to pay for it?

But it's a conversation that needs to be started now. So please accept this first effort at a "poetics" of digital media in the humble spirit in which it is offered: ten simple commands that might help us forge a path through the digital realm. Each command is based on one of the tendencies or "biases" of digital media, and suggests how to balance that bias with the needs of real people living and working in both physical and virtual spaces—sometimes at the very same time.

A bias is simply a leaning—a tendency to promote one set of behaviors over another. All media and all technologies have biases. It may be true that "guns don't kill people, people kill people"; but guns are a technology more biased to killing than, say, clock radios. Televisions are biased toward people sitting still in couches and watching. Automobiles are biased toward motion, individuality, and living in the suburbs. Oral culture is biased toward communicating in person, while written culture is biased toward communication that doesn't happen between people in the same time and place. Film photography and its expensive processes were biased toward scarcity, while digital photography is biased toward immediate and widespread distribution. Some cameras even upload photos to websites automatically, turning the click of the shutter into an act of global publishing.

To most of us, though, that "click" still feels the same,

even though the results are very different. We can't quite feel the biases shifting as we move from technology to technology, or task to task. Writing an email is not the same as writing a letter, and sending a message through a social networking service is not the same as writing an email. Each of the acts not only yields different results, but demands different mind-sets and approaches from us. Just as we think and behave differently in different settings, we think and behave differently when operating different technology.

Only by understanding the biases of the media through which we engage with the world can we differentiate between what we intend, and what the machines we're using intend for us—whether they or their programmers even know it.

I. TIME

Do Not Be Always On

The human nervous system exists in the present tense. We live in a continuous "now," and time is always passing for us. Digital technologies do not exist in time, at all. By marrying our time-based bodies and minds to technologies that are biased against time altogether, we end up divorcing ourselves from the rhythms, cycles, and continuity on which we depend for coherence.

The beauty of the early net was its timelessness.

Conversations took place on bulletin boards over periods of weeks or months. People got onto the Internet by connecting their computers to phone lines, and then dialing in through a modem to a server. All this not only took time, but made going online an intentional act. Most of life was spent offline, and a few special moments or even hours in the evening were spent online, exploring files and participating in discussions.

Since everyone was logging in from different locations at different times, most online experiences were what we called "asynchronous." This meant that, unlike a regular conversation or phone call where we exist together in the same moment and speak back and forth in real time, these online conversations were more like passing letters back and forth. You would go online, find the conversation you were participating in, and then see all the posts that occurred between one evening and the next. After reading everyone's responses, you would then decide whether you wanted to add something—and either compose it on the spot, or write the response offline and then come back and paste it in later or even the next day.

These discussions took on the quality of playing a chess game by mail. Nothing was rushed. If anything, because our conversations were asynchronous, we had the luxury of deeply considering what we said. The net became a place for doing the kind of deliberation and contemplation that couldn't happen in the harried real world of jobs, kids, and automobiles.

Because online activities did not have to occur in real time, we ended up having all the time in the world. One actually thought before responding—sometimes a whole day.

This fostered a depth of engagement and a collaborative spirit that many of us had never experienced before. Even a heated exchange was pursued with finesse, combatants having the time to cool down and consider the best retort instead of simply lashing out. The point of conversation became the conversation itself, and the modeling of a new form of approaching problems as a group. No wonder then, that so many people saw the Internet as panacea to the world's many conflicts and intractable divides.

It shouldn't surprise us that this deliberate, highly sequential mode of behavior is utterly consistent with the programs and code underlying the digital universe. Digital technologies are biased away from time, and toward asynchronicity. Their operating systems were designed this way because, in most respects, computers think much faster than people. They can give themselves new instructions almost instantaneously. But they also need to be able to wait as long as necessary for instructions from a person typing through a keyboard. So programmers decided that computers shouldn't live in time at all. (Yes, there are clocks running in the background on all computers, but they take their orders regardless of the passage of time.)

Instead of operating in time, computers operate from

decision to decision, choice to choice. Nothing happens between the moments I type any two letters on the keyboard. As far as the computer is concerned, *this* word is the same as *this* one, even though I took one second to produce the first, and a full minute to produce the second. The machine waits for the next command, and so on, and so on. The time between those commands can be days, or a millisecond.

Because computer code is biased away from continuous time, so too are the programs built on it, and the human behaviors those programs encourage. Everything that we do in the digital realm both benefits and suffers from its occurrence outside time.

Maybe that's why the net's first true "killer app" was email. At first, email did not replace the letter so much as it replaced the phone call. Instead of having to find and catch a real person at home (cell phones were not yet very common), email found a person when he or she wanted to be found. Email was an activity one went and did, usually on a daily or twice-daily basis. (Before and after work, in most cases!)

Unlike the phone, which interrupts our day by unexpectedly ringing whenever someone wants to reach us, email was retrieved when we wanted to see it. And we were free to respond in our own time, on our own conditions. If we didn't have a response at the ready, we could come back later.

The underlying asynchronous quality of email and conferencing was much more obvious to us back then, because

we all saw the way these tools really worked. Back then, phone calls still cost money, as did our access time. So our computers generally went online, logged into a server, downloaded everything we were supposed to see, and then logged off again. We did most of our responding while we weren't even online. Then, the next time we went online, our computers would upload the email and posts we had written.

Was it slower? Perhaps. But it was also a more accurate reflection of the way the technologies work, and their bias away from real-time communication. Their strength was never their relationship to the "now," but their ability to slow down or break up the now.

The interactive urge itself—even before computers came into our lives—was consistent with this desire to break time. The first interactive device most of us ever used was the remote control. More than simply allowing us to change channels at the end of a TV program, the remote control gave us the ability to change channels *during* a TV program. The remote control allowed us to deconstruct the narrative of a show, or even a commercial.

Until interactivity, we were defenseless emotional targets for the advertiser, who could use a linear story to put us in a state of vulnerability. Think of almost any television commercial: A person gets in terrible trouble, the product gets her out. A girl gets a pimple before the prom. She tries all sorts of things to get rid of it, making matters worse. Just

when it looks like all is lost, she finds the miracle cream. It works, boyfriend shows up, happy prom girl. The continuous narrative arc is used to draw the audience into a state of tension. Only the storyteller—the advertiser—has the way out. To be released from tension, we must accept the storyteller's answer—meaning the advertiser's product. We may have understood that the people making us anxious were not our friends—that the stuff on television is called "programming" for a reason. But we were relatively powerless to do anything about it other than not watch at all.

Before the remote control, the only other way out of imposed anxiety was to get up out of the recliner, take the popcorn off our lap, manually change the channel, and maybe adjust the rabbit ears (an antenna that sat on top of the set for receiving terrestrial broadcast). The amount of effort outweighed the anxiety we were to endure by sitting through the rest of the commercial. But after the remote control, escape from the advertiser's spell becomes effortless. With a micro-motion of the thumb, we are gone. The interactive device introduces discontinuity into an otherwise continuous medium. And this discontinuity—this deconstruction of story—is a form of power.

Likewise, the VCR allowed us to record shows to watch later, and the DVR lets us do not only that, but also "pause" shows during broadcast and fast-forward through commercials. Each step of the way, we use the asynchronous bias of digital

technology to take control of time. And a medium once celebrated for its ability to "program" the public becomes open to our intervention. Instead of only fostering social programming, the television also fosters a new, postmodern perspective on society's time-honored truths. From Bart Simpson to Stephen Colbert, conventions are turned on their heads.

The spirit of the digital age still finds its expression in this reappropriation of time. Our cutting and pasting, mash-ups and remixes, satires and send-ups all originate in this ability to pause, reflect, and rework.

As Internet connections grow faster, fatter, and freer, however, we are more likely to adopt an "always on" approach to media. Our broadband connections—whether in our homes or in our phones—keep our applications on, updating, and ready at every moment. Anytime anyone or anything wants to message, email, tweet, update, notify, or alert us, something dings on our desktop or vibrates in our pocket. Our devices and, by extension, our nervous systems are now attached to the entire online universe, all the time. Is that my phone vibrating?

We scramble to keep up with the never-ending inflow of demands and commands, under the false premise that moving faster will allow us to get out from under the endless stream of pings for our attention. For answering email and responding to texts or tweets only exacerbates the problem by leading to more responses to our responses, and so on.

We strive to multitask, attempting to give partial attention to more than one thing at a time, when all we really do is move as quickly as possible from one task to another. No matter how proficient we think we are at multitasking, studies show[1] our ability to accomplish tasks accurately and completely only diminishes the more we try to do at the same time. This is not the fault of digital technology, but the way we use it.

Instead of our going online to get our email, our email comes to us. Instead of using our inbox as an asynchronous holding bin, we stick it into our phones, which are sure to thump, ding, or shudder with each new incoming message—just to make sure we know something wants our attention. We work against the powerful bias of a timeless technology, and create a situation in which it is impossible to keep up. And so we sacrifice the thoughtfulness and deliberateness our digital media once offered for the false goal of immediacy—as if we really can exist in a state of perpetual standby.

The results aren't pretty. Instead of becoming empowered and aware, we become frazzled and exhausted. We have no time to make considered responses, feeling instead obligated to reply to every incoming message on impulse. We reduce the length and complexity of our responses from paragraphs to sentences to txts, making almost everything

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1. E. Ophir, C. Nass, and A. D. Wagner. "Cognitive control in media multitaskers." *Proceedings of the National Academy of Sciences* vol. 106 no. 37 (September 2009), 15583–15587.

we transmit sound like orders barked over a walkie-talkie in a war zone. Everything must happen right away or, better, now. There is no later. This works against the no-time bias of digital media, and so it works against us, even though it might work for the phone company programming the device and inducing our dependence and compliance. (Yes, each variety of beep is studied and tested for its ability to entrain our behavior.)

It's not that the net has somehow changed from an asynchronous medium to a synchronous one. No, it's all still just commands existing in a sequence, outside time. But those commands are coming at us now in increasingly rapid bursts, stimulating us to respond at rates incompatible with human thought and emotion—and in ways that are not terribly enjoyable. Try as we might, we are slow to adapt to the random flood of pings. And our nervous systems are not happy with this arrangement.

For the first time, regular people are beginning to show the signs of stress and mental fatigue once exclusive to air traffic controllers and 911 operators. Cell phone users now complain of "phantom vibration syndrome," the sensation of a cell phone vibrating on your thigh, even though there's no phone in your pocket.

Yet this very discomfort and anxiety compels us to seek still more: The possibility of one great email from a friend, or one good contract offer somewhere down in that list of unanswered messages keeps us compulsively checking our

inboxes, iPhones and BlackBerrys like classically conditioned gamblers at the slot machines. And, perhaps counterintuitively, the faster we empty our inbox, the faster it fills up again. Every answered email spawns more. The quicker we respond, the more of an expectation we create that we will respond that rapidly again. An email chain becomes like a conversation happening in real time—except much less efficiently than a phone call. The slower we respond—the more we do the net on our own schedule instead of the one we think it is imposing on us—the more respect we command from the people on the other side of the screen. Unfortunately, many of us don't feel we have even the right to dictate our own relationship to the incoming digital traffic.

Of course, the simplest way out is to refuse to be always on. To engage with the digital—to connect to the network— can still be a choice rather than a given. That's the very definition of autonomy. We can choose to whom or what we want to be available, and when. And we can even choose people for whom we *want* to be always on. Being open to a call from a family member 24/7 doesn't require being open to everyone. The time it takes to program your phone to ring for only certain incoming numbers is trivial compared to the time wasted answering calls from people you don't want to hear from.

We are more likely, however, to ignore the timeless bias of the digital and aspire to catching up with its ever-elusive

pace. We mistake the rapid-fire stimulus of our networks for immediacy, and the moment we are actually living in for the thing that needs to catch up. We are like drivers trying to catch up with the image in the rearview mirror.

And the more we live this way, the more we value the digital's definition of the now. Our search engines preface their more relevant results with a section of "live" links to whatever blog comment, social networking message, or tweet has most recently been posted containing the words in our queries. The only weighting that matters is how few seconds have transpired since it was blurted. This in turn encourages us to value the recent over the relevant.

While media critics and concerned educators lament the effects of short messaging on brain capacity, the real influence of our interaction with these programs is not on our neurons as much as our habits and outlook. Yes, thanks to what is known as neuroplasticity, our brains do change depending on what we do. A brain learning on computers ends up wired differently than a brain learning on textbooks. This is nothing new. Brains learning through text are different than ones that learned through oral teaching, too. Likewise, a kid who plays mostly with dolls ends up wired differently than one who builds bridges with blocks.

There's a misplaced anxiety here. Our brains adapt to different situations. Technologies have always changed us. Fire gave us a way to cook meat, essentially pre-digesting food

and altering the evolution of both our teeth and digestive tract. Wearing fur allowed us to shed our own. Likewise, text changed the way we process and remember information, and television changed the way our brains relate to three-dimensional space.

Digital media now extends some of these trajectories, while adding a few of its own. The outsourcing of our memory to machines expands the amount of data to which we have access, but degrades our brain's own ability to remember things. Yet this process of offloading our remembered information began with the invention of text, and met with similar critique even back then. We have been consistently using our brains less as hard drives and more as processors—putting our mental resources into active RAM. What's different now, however, is that it's not just lists, dates, and recipes that are being stored for us, but entire processes. The processes we used to use for finding a doctor or a friend, mapping a route, or choosing a restaurant are being replaced by machines that may, in fact, do it better. What we lose in the bargain, however, is not just the ability to remember certain facts, but to call upon certain skills.

We encode a way of doing something and if the computer is capable of accomplishing that task, we never need to know how it happens again. It's a bit like doing arithmetic by algorithm, which most of us learned for calculating square roots and long division. We learn how to push the numbers

through a series of rote steps to get our answer, but forget how or why it really works. Now we're having our computers remember those processes, which removes us one step further from whatever is going on. So instead of simply offloading our memory to external hard drives, we're beginning to offload our thinking as well. And thinking is not like a book you can pick up when you want to, in your own time. It is something that's always on. Are we choosing to surrender the ability to do it without digital assistance? If so, are we prepared to remain connected to our networks all the time? What new ability, if any, are we making room for in the process?

It's not the networking of the dendrites in our skulls that matters so much as how effective and happy we are living that way and, in the case of digital media, how purposefully we get ourselves there. Recognizing the biases of the technologies we bring into our lives is really the only way to stay aware of the ways we are changing in order to accommodate them, and to gauge whether we are happy with that arrangement. Rather than accepting each tool's needs as a necessary compromise in our passively technologized lifestyles, we can instead exploit those very same leanings to make ourselves more human.

Our computers live in the ticks of the clock. We live in the big spaces between those ticks, when the time actually passes. By becoming "always on," we surrender time to a technology that knows and needs no such thing.

II. PLACE
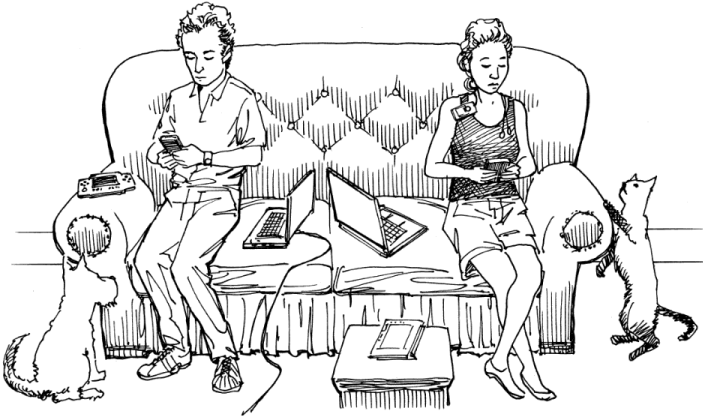
Live in Person

Digital networks are decentralized technologies. They work from far away, exchanging intimacy for distance. This makes them terrifically suitable for long-distance communication and activities, but rather awful for engaging with what—or who—is right in front of us. By using a dislocating technology for local connection, we lose our sense of place, as well as our home field advantage.

Where's Gina?

The popular urban high school senior has over five hundred followers on Twitter (most of them real people) reading her every post to find out where the action is tonight. I'm trailing her, along with a youth culture trendspotter, to see what she does on a typical Friday night: how she makes her decisions, and how she communicates them to her ever-growing posse of followers. Gina is a trendsetter, a social leader, and a creature of the moment—in more ways than one.

She's at a club on the Upper East Side, but seems oblivious to the boys and the music. Instead of engaging with those around her, she's scrolling through text messages on her phone, from friends at other parties, bars, and clubs throughout New York. She needs to know if the event she's at is "the event to be at," or whether something better is happening at that very moment, somewhere else. Sure enough, a blip on her display catches her interest, and in what seems like seconds we're in a cab headed for the East Village.

We arrive at a seemingly identical party, but it's the one that Gina has decided is "the place to be" tonight. Instead of turning the phone off and enjoying herself, however, she turns her phone around, activates the camera, and proceeds to take pictures of herself and her friends—instantly uploading them to her Facebook page for the world to see. She does this for about an hour, until a message comes through one of her