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Most of us are intimidated by computers. This is because computers involve electricity, which totally baffles us. We're still not sure how come it doesn't dribble out of the wall socket when we unplug an appliance.*

* Answer: Air pressure prevents this from happening. (Source: Stephen Hawking)

In fact, most of us are baffled by all electronic devices. Radio is a good example. We know that if we turn on a radio, it will start producing sounds, such as the song "Wooly Bully" by Sam the Sham and the Pharaohs.

If we were pressed to explain this, we'd probably parrot the explanation we got from our science teachers, which is that the radio is receiving "radio waves." But the truth is that we have no idea what this means. We can't answer such fundamental questions as:

What are "radio waves"? How come they don't make any noise when they go past our ears, causing us to hear snippets of "Wooly Bully" zipping by? How do they go through walls? Do they also go through our bodies? Do they penetrate our skulls and get trapped inside there and ricochet around? Is that why certain songs, usually songs we really hate such as "I Shot the Sheriff," get stuck in our heads?*

* Also, "Seasons in the Sun"

We can't answer any of these questions. The pathetic truth is that if our science teachers had told us that radios work because they contain tiny nuclear-powered singing hamsters, we'd repeat that, too.

We know nothing about technology, and cannot explain the principles involved in even the most basic labor-saving devices, such as the Salad Shooter. So we naturally assume that computers are way beyond our comprehension.

But that is not necessarily the case. In fact, computers operate on simple principles that can be easily understood by anybody with some common sense, a little imagination, and an IQ of 750. So let's put on our thinking caps now and get right to our discussion of:

HOW COMPUTERS WORK

The first thing that happens is, electricity goes into the computer. The electricity is supplied by the wall socket, which is in turn connected to the electrical company via big overhead wires with squirrels running on them.

A question many people ask, after a couple of martinis, is: How come the squirrels don't get electrocuted? To answer that question, we need to understand exactly what an electrical circuit is.

When you turn on a switch, electricity flows through the wire into the appliance, where it is converted via a process called electrolysis into tiny microwaves. These fly around inside the oven area until they locate the Hungry Hombre Heat 'n' Eat Hearty Burrito entree; they then signal the location to each other by slapping their tails in a distinctive pattern.

The workers, or drones, then penetrate the fallopian tubes and swarm

around the queen; this causes the rapid warming that makes the entree edible and leads, via amino acids, to digestion.

This is followed by grunting and flushing, with the outflow traveling via underground pipes to the sewage treatment plant, which in turn releases purified water into the river, where it is used to form waterfalls, which rotate the giant turbines that produce the electricity that flows through wires back to your appliance, thereby completing the circuit.

So we see that squirrels have nothing whatsoever to do with it. There is no need for you to worry about squirrels; believe me, they are not worrying about you. A much more productive use of your time, in my opinion, would be to focus your full attention on the question at hand, which is:

HOW COMPUTERS WORK

Computers are essentially counting machines, but they do not count the way we do. We use what mathematicians call the "base 10" numbering system, which means that we go zero, one, two, three, four, and so on until we reach 10, and after that point we can no longer use the Express Lane.

Granted, there are gray areas. For example, if you're buying two rutabagas, you can count them as one item, because the cashier is going to weigh them as one item and ring them up as one item.

But the same does not hold true for cereal: If you're buying a box of Shredded Wheat and a box of Froot Loops, that is clearly two separate items. Please don't try to tell me, "But they're both cereal, so really it's just one item!" The Supreme Court rejected that argument years ago.*

* The specific case was Mrs. Bernice A. Whackerdorfer v. A Bunch of Really Angry People Waiting in Line Behind Her.

Oh yes, I've stood behind extra-item people like you in checkout lines! I know your little tricks!

You get in the Express Lane with your "10 items" that are really closer to 15 or 16 items, and then, just when you reach the cashier, you suddenly realize that you forgot some vital item on your list,

and so the entire Express Lane has to stand there twiddling its thumbs while you send your 8-year-old child off on a scavenger hunt to find the Cheez Whiz Lite, which, to judge by how long your child is gone, is located somewhere in the Amazon River Basin;

and when your child finally returns, you send him or her back, because he or she brought the 16-ounce jar, and your coupon (of COURSE you have coupons!) is good only for the 12-ounce jar;

and when you FINALLY are ready to pay, then and ONLY then do you start rooting around for your checkbook (of COURSE you pay by check!) and then you ask for a pen, and then you can't find your driver's license, and then you ask what the date is, and then you want to check to make sure that the cashier also deducted the coupon for the Happy Tabby Liver 'n' Chocolate Cat Treats, and

DON'T YOU SEE WHAT YOU'RE DOING TO THE PEOPLE BEHIND YOU? DON'T YOU REALIZE THAT YOU'RE ONLY SECONDS AWAY FROM BEING ATTACKED BY A CRAZED MOB ARMED WITH POTENTIALLY LETHAL GROCERIES?

DO YOU HAVE ANY IDEA HOW MUCH DAMAGE CAN BE INFLICTED ON THE HUMAN BODY BY A FROZEN CORNISH GAME HEN?

No, you're not thinking about that at all, are you? You're stuck in your own self-centered, short-sighted little world, and it never would occur to you to consider any of the broader issues affecting society and the future of mankind, such as:

HOW COMPUTERS WORK

The key thing to understand is that computers do not count the way we do. Instead of the base 10 system, computers use what mathematicians call the binary system, in which there are only two numbers, 0 and 1.

In some ways, this is a disadvantage for computers. For example, they are incapable of doing this cheer:

Two, four, six, eight! Who do we appreciate?

Instead, computers have to cheer thusly:

One, zero! Who's our hero?

This cheer is not nearly as effective, which is why, although computers are getting really good at chess, they still suck at football.

But the binary system enables the computer to perform certain tasks far more efficiently than the human brain can. For example, the average human can take up to half an hour to remember and sing "The Twelve Days of Christmas"; even then, the human is likely to include incorrect elements such as "11 lads a-squatting."

Whereas a computer, using the binary system, has to sing only the one line about the partridge in the pear tree. The difference is even more dramatic for "99 Bottles of Beer on the Wall."

Of course you, the computer user, do not see just ones and zeros on your computer screen. You see all the normal numbers, plus all the letters, plus - if you're taking advantage of the vast array of multimedia informational resources available on the Internet - dirty pictures.

Where do all these things come from? What's going on inside that "magic box" on your desktop? To answer these questions, we really do need to explore, in depth, the question of:

HOW COMPUTERS WORK

Unfortunately, it's very difficult to answer a complicated question like this in the small amount of space remaining in this chapter. Briefly, though, what appears to happen is this: The electricity goes into the computer, where there are "parts" that do the actual computing. I frankly have no idea how they do it, but if I had to guess, I'd say it involves radio waves.

Nerdstock in the Desert or

Bill Gates Is Elvis

In researching this book, two of my most important goals, not necessarily in order of importance, were:

1. To ascertain the long-term direction, in both technological and marketing strategy, of the computer industry.
2. To lose money in slot machines.

And thus in the fall of 1995 I went to Las Vegas to attend an event called "Comdex." Comdex is the world's largest computer trade show, and the largest such show of any kind in the United States.

It's a massive, sprawling gathering of over 200,000 people seeking new ways to realize the full potential of the Information Revolution, by which I mean make money. Everybody who is anybody in the computer world goes to Comdex. It is Geek-O-Rama. It is Nerdstock.

It is also so huge that by the time I made my lodging arrangements, all the first-class hotels were booked, as were the second-, third-, and fourth- through 163rd-class hotels, as well as many of the cleaner Dumpsters. So I wound up staying in an establishment that, in an effort to avoid costly litigation, I will refer to here as the Total Lack of Quality Inn.*

*Not its real name.

All the faucets dripped; the bed was Pre-Rumpled for Your Convenience; and the toilet paper was stiff enough to be used for bridge repair. I did not see cockroaches, but I believe that this was only because my room was not up to their sanitation standards.

My room did, however, feature a TV set, and while I was unpacking, I turned it on, and there he was: Bill Gates. It was a replay of a speech Gates had given earlier that day to a standing-room-only crowd. (To the Comdex attendees, Bill Gates is Elvis.)

Gates was talking about his vision of the software of the future, and he was illustrating his points with an elaborate movie that cost at least as much as Waterworld.*

* But with WAY better acting.

The movie, which was set in the near future, told a story about a small town where a charming old resort was closing down. Some people wanted developers to take over and modernize the resort; some wanted to preserve it as a historic site.

It was a classic human conflict, and the characters resolved it via the mechanism that has been used to resolve dramatic conflicts since the Shakespearean Era: software.

These people had software that kicked butt. For one thing, it looked really cool. For another thing, it enabled people to talk to their computers.

Actually, I talk to my computer now; sometimes I call it bad names and threaten to put it in the dishwasher. The difference is that the computers in the Microsoft movie understood.

A person would say, "Get me the Fooberman contract," and the computer, with a flourish of cool futuristic graphics, would produce the contract, and then say something Jeeves-like, such as "Would you like to see more documents on this topic?"

Or: "Shall I schedule the meeting for 3 P.M. Friday?" Or: "You really ought to trim that nasal hair!" (The computers didn't actually make that last statement, but they definitely had the capability.)

I think this talking-computers thing is highly significant. If we start talking to our computers, we're eventually going to develop personal relationships with them. They'll become our office buddies. We'll start telling them jokes:

Human:...And so the guy says to the woman, "Oh, then it must be your

feet." Ha ha! Get it? "It must be your feet."

Computer: I ALREADY KNOW THAT JOKE.

Human: Oh.

Computer: I KNOW 583 MILLION JOKES.

The big question I have about talking computers is: Who's going to program them? I raise this question because a lot of programmers are young guys, which means they might be good at understanding computers, but might not have developed the social skills necessary to tell a computer how to talk to humans, especially female humans...

But getting back to the Microsoft movie: After a number of plot developments, the various characters were able, using software, to resolve their conflicts, and at the end everything worked out when the entire town was purchased by Bill Gates, who tore everything down to make room for his vacation home and attached 6,000-car garage.

No, I'm kidding. The movie had a happy ending, thanks to software, and I was feeling a warm glow of hope about the Future of Computing that stayed with me all the way to the hotel lobby, where I found out that it was impossible to get a cab to Comdex because all the cabs in Las Vegas were already occupied by people trying to get to or from Comdex.

So I walked to the convention center. This took me quite some time, because Las Vegas, being in the middle of a desert, is basically a giant optical illusion, wherein no matter where you're standing, all the major hotels and attractions appear to be close, whereas in fact they are great distances away, sometimes actually in Mexico.

But I had no choice. I walked and walked, cursing at the cabs whizzing past, filled with Comdex people.

As I walked, stepping over the skeletons of tourists who had died while attempting to walk in Las Vegas during the summer, I thought about how much better things would be in the future, when, in a situation like this, I'd have a tiny but sophisticated computer, which, using the Software of Tomorrow, with its sophisticated speech capabilities, would curse at the cabs for me.

Finally I reached the convention center, where I got my official badge and joined the vast bustling nerd throng. If I had to give you a brief description of Comdex, drawing on my years of experience as a professional observer and writer skilled in the use of language, I would describe it as "big."

There were hundreds and hundreds of swoopy, snazzy displays featuring every manner of attention-getting device - big signs; flashing lights; loud sounds; an actual waterfall; giveaway items such as hats, T-shirts, pens, and actual Corvettes; a magician; Olympic gymnasts; a guy dressed as an armadillo; women dressed as women without a lot of clothes on, etc.

There were also Big Name Celebrities. One booth, for example, had a sign saying that at 3 P.M., there would be a personal appearance by - I swear - "Lenny Sharkey, Bus Driver for Bon Jovi and Whitney Houston."

Many booths had smooth-talking, microphone-wearing, extremely outgoing people pretending to be wildly enthusiastic about things like modems. They were constantly trying to lure crowds into their booth areas to watch product demonstrations.

They reminded me a lot of those guys you see at fairs selling cutlery, the guys who are always cutting nails in half with steak knives and using a kitchen gizmo to cut a tomato so that it looks like a flower, the guys who always tell you how easy this is, except that when you try it, at home, you wind up with a tomato that looks as though it was attacked by crazed rodents.

The Comdex people give the same kind of demonstrations, except that instead of cutlery, they're selling Computer products. But the key is, it always works.

I will tell you, from harsh personal experience, that back on the Planet Earth, a whole lot of computer products - I would say a majority - do not work properly the first time you try them; some products never work, or work so badly that you find yourself wishing you were a terrorist so that you could have access to the kind of explosives you'd need to convert these products into subatomic particles.

But on the Planet Comdex, everything always works great. All the software, all the hardware, does exactly what it's supposed to do. Mainly it gives you information. Tons of it. Billions and billions of pieces of it.

The underlying philosophy of Comdex, never disputed, is that you cannot have too much information. Everywhere you look at Comdex, information is spewing out at you, in vivid color and stereo sound, from hundreds of monitors and speakers, big and small. Information! Communications! The future! Free pens!

The thing is, I'm not sure I'm ready for more information. I'm already surrounded by way more information than I can absorb in what little time I have left after performing essential daily activities such as eating, sleeping, working, laundry, and trying to locate my keys. For example, I have yet to read any of the manuals for my major appliances. I read only about 15 percent of my daily newspaper.*

* The comics, sports, Dear Abby, and the celebrity-tidbit column where they tell you things like whom Roseanne is currently pregnant by.

I can barely keep track of even the most basic facts about American life, such as what city the Cleveland Browns are currently playing in. And forget about foreign affairs.

The other day, for example, I heard a guy on the radio saying that there were riots in a place called "Jakarta," and I thought to myself, "I wonder where the hell that is." It could be anywhere. It could be in one of my major appliances. I just don't have the time to find out.

But if the Comdex people are right, I'd better get ready to receive WAY more information, because there are going to be all these swoopy new data-spewing gizmos on the market, and if I don't embrace them - if I don't let them make my life easier - then I am going to be in some deep cyberdoody.

I stopped to watch one guy demonstrate a product that offered - I think this is what the guy said - "interactive voice and text technology."

The demonstration featured a little movie - nowhere near as elaborate as the Bill Gates movie, but still a quality production about two neighbors, Fred and Frank, who are competing for the same big contract. The difference is that one of them - Frank, I think - is

hip to interactive voice and text technology, whereas Fred is not. Also, Frank has more hair.

As the movie starts, Fred and Frank come out of their homes, exchange some good-natured banter about who will get the Big Contract, then hop into their respective cars and head for work.

The difference is that Frank, using interactive voice and text technology on his car phone, is able to talk to a computer, which enables him to be an extremely busy bee - returning calls, revising contract specifications, scheduling meetings, and just generally being a fountain of productivity until he rear-ends a school bus.

No, really, Frank is somehow able to handle huge wads of information while driving, in stark contrast to Fred, who has nothing in his car but a plain old low-tech briefcase filled with the prehistoric medium of paper, which Fred paws inefficiently through on the way to work.

It's even worse at Fred's office, where we see that his desk is a vast festering paper jungle, plus he has a regular old dopey phone. Meanwhile Frank, whose desk looks like the bridge of the Starship Enterprise, clicks efficiently away at his computer and calmly gives instructions to his high-tech telephone, which is smarter than most contestants on Jeopardy!

When Frank goes to a meeting, his calls are automatically forwarded to him there; when he goes to lunch, his calls follow him there. They don't show this in the movie, but you get the feeling that Frank also receives calls when he's on the...

Needless to say, the movie ends with Frank getting the Big Contract and breaking the news, via conference call, to his associates; presumably they will celebrate by having their computers send each other hearty electronic handshakes at 17.3 billion vibrations per second.

We never find out what happens to the loser, Fred. My guess is that, as a result of not taking advantage of interactive voice and text technology, he loses his job and can't pay his mortgage and winds up living under the interstate in a refrigerator carton.

Sometimes, when Frank is processing information on his way to work, he pauses for a nanosecond and thinks about trying to get in touch with his old neighbor, but then he realizes, with a wistful shake of his head, that he can't do this, because Fred's carton has no fax machine.

Sobered by this story, I moved on to Microsoft's Comdex display, which occupied roughly the same square footage as Connecticut. The big attraction there was of course Windows 95 (smiley face). A large crowd had gathered in a sort of amphitheater to see a demonstration.

It began with a raucous recording of "Start Me Up" by the Rolling Stones, to whom Microsoft paid about a zillion dollars for the rights to use the song in its commercials. This makes perfect sense: The name "Rolling Stones" has long been synonymous with "32-bit multitasking graphical-user-interface operating system."

The Comdex crowd was stiff and serious when "Start Me Up" began playing, but as the song's raucous guitar lick and infectious, pounding beat blared from the big speaker system, the crowd responded by remaining stiff and serious.

Your Comdex attendees generally do not appear to be get-down, get-funky individuals. Your Comdex attendees strike me as the kind of people who celebrate New Year's Eve by defragmenting their hard

drives.

But they perked up when two guys came out to demonstrate Windows 95 (smiley face). One of the guys - the "project manager" - stood at a keyboard, underneath a giant computer screen; the other guy - "Jeff" - bounded enthusiastically around the audience, describing Windows 95 (smiley face) via modern hipster lingo such as "We're really jammin'!"

Jeff was especially excited about the Taskbar. The Taskbar - and here I will get technical for a moment- is this thing that Windows 95 (smiley face) has. You use it to enhance your productivity by switching quickly from one program to another.

For example, if I am utilizing the Missile Command program, and I suddenly develop a need to utilize the Space Cadet Pinball program, all I have to do is click on the Taskbar, and bang, there I am, with almost no wasted time.

Jeff was wetting his pants over the Taskbar. "No more ALT-TAB switching!" he was declaring, in the tone of voice you might use to announce a cure for cancer. And the crowd was nodding. Think of it! No more ALT-TAB switching!

The scary thing is, I was nodding. As a Windows 95 (smiley face) Taskbar user and former ALT-TAB switcher, I knew exactly what they were talking about. I was definitely getting in touch with my inner geek, here. The rest of the crowd was also getting excited, especially when Jeff and the project manager had a dramatic confrontation over the hardware configuration.

What happened was, Jeff accused the project manager of using some kind of souped-up system to make Windows 95 (smiley face) look good. So the project manager, accepting the challenge, used his mouse to boldly click on his Control Panel icon, then his System icon, and he showed that his computer had a plain old 486 processor, and - get ready - only 8 megs of RAM.

At this point, I swear, the audience actually applauded. I will admit that even I was moved. Fearing that if I stood in this crowd any longer, I would spontaneously develop a pocket pen-holder, I moved on.

Nearby, a group of San Francisco 49ers cheerleaders were helping promote the Information Revolution by sitting at a table and autographing calendars while a line of guys tried to look down the fronts of their uniforms.

A dozen yards past that was a booth where a woman in a short, tight skirt approached everybody who walked past and said, in a sultry voice, "Client server?" I'm not sure what she meant by this, but I steered clear of her, because this is exactly the kind of situation in which a guy can pick up a virus.

I did, however, stop to watch a demonstration of virtual reality, which is when you use a computer to simulate the real world. The advantage of this is that virtual reality can be better than the real world, because in your virtual world you can eliminate all traces of - to pick one obvious example - Deion Sanders.

At Comdex, the Mitsubishi company had set up a "virtual park," which was this computer-created "space" where real people would "go" and interact via computer, even though their physical bodies were miles apart.

The audience could watch them on a giant screen; they looked like

cartoon figures without necks, so their heads were hovering over their bodies. They were bicycling and jogging around the park, chatting with each other and interacting in a jovial manner until they were attacked by virtual muggers...

Yes, there's an amazing virtual future ahead of us, but in two areas of human endeavor, the incredible potential of virtual reality is already being realized. Naturally, since we're talking about a technology developed primarily by guys, these two areas of human endeavor are:

1. Games
2. Smut

There were some very high-tech computer games on display at Comdex. This is a place where games are taken seriously: You'd see businessmen wearing dark suits and wing-tipped shoes frowning with intense businesslike concentration as they fought mutant killer androids from the Death Planet.

Most of these action games work the same way: You have to keep killing the enemy units until they're all dead, at which point you move on to the next level, where you have to kill more enemy units, and so on until you reach the last level and face the final challenge, which is a fight to the death against the Maximum Doom Lord, with the winner getting the ultimate prize, which is presumably a cab at Comdex.

These games never offer the option of negotiation or compromise. You cannot say to the mutant killer androids: "Hey! Why are we always killing each other? Why don't we all put down our weapons and enjoy some refreshing virtual beverages?"

But that isn't the way guys design games. I suspect that if women designed games, there would be a lot more social interaction. You'd be wandering through the dark, maze-like basement of the Castle of Terror, lost, and as you came around a corner, you'd encounter this grotesque, insect-like, slime-dripping, multi-eyed creature, but instead of shooting at it, you'd say, "Excuse me, I'm lost."

And the creature, pleasantly surprised to finally meet somebody whose immediate reaction was not to obliterate it, would use one of its 28 arms to direct you toward the exit. The next thing you knew, the two of you would be chatting away, and the creature would be showing you photographs of its larvae.

But that's not how guys design games. In the vast majority of the games I saw at Comdex, the only type of interaction allowed was shooting. Or worse.

At one point I stood with a group of suited, wing-tipped businessmen and watched a young man demonstrate a game wherein you controlled this very lifelike-looking android as it fought with various enemy units.

At one point the young man directed the android into a tunnel, where it got too close to a huge whirling fan, which sucked the struggling android toward it, slowly at first, then faster and faster, until finally the android...gets sucked through the fan blades like a giant android zucchini going through a giant Veg-O-Matic.

The computer screen then showed us the other side of the fan, where android pieces came shooting out in highly realistic detail, covered with purple android blood.

We onlookers winced in unison. The young man demonstrating the game turned to us and said, with sincere pride, "Is that rude, or what?"

At another Comdex booth, run by a company called Forte Technologies, I tried a virtual reality game featuring a Head Mounted Display, or HMD.

This is basically a helmet with a set of goggles containing two little computer screens, one for each eyeball, so that you feel as though you're inside the computer game; the images are in 3-D, and you control what you're looking at by turning your head. In my hand I held a "cyberpuck," which was a little round thing that I could tilt and rotate to move through the game.

The game I played was called Dark Forces, and it involved - prepare yourself for a big surprise - trying to kill evil enemy units.

When you're inside this game - running around blasting the bad guys with your laser gun; leaping tall buildings at a single bound - you feel pretty cool. What you don't realize is that, from the outside, you look like a dork in a silly helmet waving a puck around...

That's all, folks. If you want to read the complete version of Dave Barry's book, you can purchase it at your local bookstore. "Dave Barry in Cyberspace" is published by Crown Publishers.